

ORDINANCE NO. 561

AN ORDINANCE OF THE CITY OF WILSONVILLE AMENDING WILSONVILLE CODE 4.140 (.09) I and J.2., PLANNED DEVELOPMENT, BY INCLUDING DEVELOPMENT AREAS THAT HAVE VESTED TRAFFIC GENERATION RIGHTS IN DETERMINING THE ESTIMATE OF THE IMPACT OF GENERATED TRAFFIC, CREATING THE RIGHT TO APPLY FOR A VESTED RIGHT TO USE AVAILABLE TRANSPORTATION CAPACITY ON WILSONVILLE ROAD BETWEEN BOONES FERRY ROAD AND TOWN CENTER LOOP WEST AND DECLARING AN EMERGENCY.

WHEREAS, the Wilsonville Council by Ordinance No. 552 adopted the City of Wilsonville 2003 Transportation Systems Plan (TSP) on June 2, 2003; and

WHEREAS, Section 4.2.2 of the TSP describes the I-5/Wilsonville Freeway Access Study and includes projects which are necessary to provide freeway access with continued growth over the next 20 years; and

WHEREAS, Section 4.2.2 describes an enhanced Wilsonville Road diamond interchange; and

WHEREAS, the City has budgeted \$3,500,000 to complete the first phases of the I-5/Wilsonville Road Interchange improvements to include ramp improvements and re-striping and traffic control improvements on Wilsonville Road to improve access to northbound and southbound I-5; and

WHEREAS, these improvements would allow for an additional 702 trips through the I-5 Wilsonville Road Interchange area at the City Level of Service D criteria as required in the Code and the ODOT volume to capacity ratio of one for the interchange ramps, of which trips 124 have been committed to approved but not yet built Stage II approvals or their equivalent; and

WHEREAS, these improvements will be completed within two years; and

WHEREAS, this additional capacity is available within two years and is being used for approval of future developments; and

WHEREAS, improvements of local City streets: the Boeckman Road extension west from 95th Avenue to Tooze Road, the Barber Street extension west from Kinsman Road to Brown Road and the Kinsman Road extension north from Barber to Boeckman are needed to best use the freeway access improvements; and

WHEREAS, construction of these roads will require a very substantial investment of local funds; and

WHEREAS, the aforementioned road projects were included in the advisory vote on formation of the West Side Urban Renewal District in which approximately 80% of the voters were in favor of formation of the District; and

WHEREAS, on November 3rd, 2003, the City Council approved by non-emergency Ordinance No. 560, adopting the West Side Urban Renewal Plan; and

WHEREAS, the aforementioned local street improvement projects are planned for accomplishment under the West Side Urban Renewal Plan; and

WHEREAS, an Urban Renewal District obtains its funds based on the sale of bonds for which the debt service is paid by the increase in the tax revenues from the increase in valuation for the area within the district; and

WHEREAS, this increase in tax revenues will primarily occur from the increase in valuation created by new construction of homes, commercial or industrial properties and the infrastructure in support thereof within the district; and

WHEREAS, concurrency for improvements is based on proving that adequate capacity is available at the time of Stage II or Preliminary Development Plan (PDP) approval either by being currently in place or by being planned and funded within two years of development occupancy or planned and funded within four years if tied to Interstate 5 improvements; and

WHEREAS, the Villebois Village District is a large percentage of the West Side Urban Renewal District; and

WHEREAS, the development of the Villebois Village District will require a substantial long term investment in infrastructure and in development of the individual properties; and

WHEREAS, it is not feasible to obtain this long-term investment without having assurance that there will be capacity through the Wilsonville Road interchange; and

WHEREAS, by means of providing capacity through the Wilsonville Road interchange and thereby allowing Villebois Village District to move forward, the Villebois Village District will, in turn, provide funding sources essential to complete the Boeckman Road extension, Barber extension and the Kinsman extension; and will assist the concurrency for development dependent on these extension projects; and

WHEREAS, a system for vesting in traffic capacity on Wilsonville Road between Town Center Loop West and Boones Ferry Road can provide a means to assure interchange capacity for the Villebois Village District to develop; and

WHEREAS, a system for vesting can provide other owners seeking to develop their property an equal opportunity to vest in trips through the Wilsonville Road/I-5 interchange by applying the system to any Master Plan or Stage 1 Master Plan that was approved after the additional capacity at the Wilsonville Road Interchange area was identified in the adopted TSP; and

WHEREAS, Wilsonville Planning Commission conducted duly noticed public hearings on November 12th, 2003 and December 10, 2003, at which this proposed amendment to the Wilsonville Code was reviewed and said Commission recommended approval of the proposed amendment; and

WHEREAS, the Wilsonville City Council conducted a duly noticed public hearing on December 15, 2003.

NOW, THEREFORE, THE CITY OF WILSONVILLE ORDAINS AS FOLLOWS:

SECTION 1. DETERMINATION AND FINDINGS:

- a. The City Council adopts the above recitals and findings and incorporates them by reference in support of this ordinance.
- b. The City Council finds that the Wilsonville Road/I-5 interchange and the interrelated intersections are now operating at capacity.
- c. The City Council finds that the previously approved Peak PM Trip Capacity through the interchange has been fully allocated either to existing developments or reserved for projects with Stage II approvals that have not yet been built.
- d. The City Council further finds that the first phase of planned and funded I-5/Wilsonville Road interchange improvements will accommodate future development and allow for an additional 702 Peak PM Trips through the I-5/Wilsonville Road interchange which can be safely accommodated while maintaining the City's and ODOT's service level requirements, 219 trips of which have been committed to approved but not yet built stage II approvals or their equivalent.

e. The City Council further finds that limiting the allocation of Peak PM Trip capacity to projects with Stage II approvals will no longer support Comprehensive Plan Goal 2.1 “To allow for urban growth while maintaining community livability, consistent with the economics of development, city administration, and the provision of public facilities and services.”

f. The City Council finds that in order to “encourage master planning of large land areas” as called for in the Comprehensive Plan and to “establish and maintain revenue sources to support the City’s policies for urbanization and maintain needed public services and facilities” as called for in Implementation Measure 2.1.1.d, and to “allow new development to proceed concurrently with the availability of adequate public services and facilities...” (Implementation Measure 2.1.1.e), that a PM Peak Hour Traffic Capacity vesting plan is necessary.

g. The City Council finds that allowing developers the option to vest in trips through the Wilsonville Road/I-5 Interchange after Master Plan or Stage I Approval supports the City’s concurrency requirements and allows the long-term financial investment in projects that were planned to be developed in phases and over time.

h. The City Council further finds that the Peak PM Hour traffic trips that are used at the Wilsonville Road/I-5 Interchange and interrelated intersections of Wilsonville Road and the Interchange Ramps, Boones Ferry Road and Town Center Loop West is a valid proportional basis for allocating intersection capacity and a proportional share of the cost to the developer.

i. The City Council determines that a Supplemental Street SDC is a reasonable and rational means to impose the cost of these capacity improvements and that payment for early vesting of trip capacity is a financially prudent requirement for the City to impose in the public interest.

j. The City Council further adopts as supplemental findings that staff report in this matter dated December 11, 2003, attached as Exhibit A and incorporated by reference as if fully set forth.

SECTION 2. AMENDMENT.

A. Wilsonville Code 4.140 (.09) J. 2. , Planned Development Regulations, is hereby amended as follows:

"2. That the location, design, size and uses are such that traffic generated by the development at the most probable used intersection(s) can be accommodated (safely and without congestion in excess of Level of Service D) as defined in the Highway Capacity Manual published by the National Highway Research Board, on existing or immediately planned arterial or collector streets and will, in the case of commercial or industrial developments, avoid traversing local streets. Immediately planned arterial and collector streets are those listed in the City's adopted Capital Improvement Program, for which funding has been approved or committed, and that are scheduled for completion within two years of occupancy of the development or four years if they are an associated crossing, interchange, or approach street improvement to Interstate 5.

"a. In determining Levels of Service D, the City shall hire a traffic engineer at the applicant's expense who shall prepare a written report containing the following minimum information for consideration by the Development Review Board.

"i. An estimate of the amount of traffic generated by the proposed development, the likely routes of travel of the estimated generated traffic, and the sources(s) of information of the estimate of the traffic generated and the likely routes of travel;

"ii. What impact the estimate of generated traffic will have on existing level of service including traffic generated by (1) the development itself, (2) all existing developments, (3) Stage II developments approved but not yet built, and (4) all developments that have vested traffic generation rights under section 4.140 (.10), through the most probable used intersection(s), including state and county intersections, at the time of peak level of traffic. This analysis shall be conducted for each direction of travel if backup from other intersections will interfere with intersection operations.

"b. The following are exempt from meeting the Level of Service D criteria standard:

"i. A planned development or expansion thereof which generates three (3) new p.m. peak hour traffic trips or less;

"ii. A planned development or expansion thereof which provides an essential governmental service.

"c. Traffic generated by development exempted under this subsection on or after Ordinance No. 463 was enacted shall not be counted in determining levels of service for any future applicant.

“d. Exemptions under 'b' of this subsection shall not exempt the development or expansion from payment of system development charges or other applicable regulations.

“e. In no case will development be permitted that creates an aggregate level of traffic at LOS 'F'.”

B. Wilsonville Code 4.140 is hereby amended by adding the following subsection:

"(.10) Early Vesting of Traffic Generation

“Applicants with Stage I or Master Plan approvals occurring after June 2, 2003 may apply to vest the right to use available transportation capacity at the intersections of Wilsonville Road with Boone’s Ferry Road and with Town Center Loop West, and/or the I-5 interchange. Vesting for properties with such approvals shall occur upon execution of a vesting agreement satisfactory to the city, which agreement shall include a proposed development schedule or phasing plan and either provide for the payment of any and all Supplemental Street SDCs or provide other means of financing public improvements. Vesting for properties pending such approvals shall occur upon such agreement and the date the approvals are final.

“The number of trips vested is subject to modification based upon updated traffic analysis associated with subsequent development approvals for the property. A reduction in vested trips shall attend repayment of vesting fees by the City. An increase in available vested trips shall occur upon payment of necessary vesting fees.

“Vesting shall remain valid and run with the property, unless an approval that is necessary for vesting to occur is terminated or a vesting agreement is terminated. If the vested right to use certain trips is lost or terminated, as determined by the Community Development Director with the concurrence of City Council, such trips shall be made available to other development upon City repayment, without interest, of associated vesting fees.”

C. W.C. 4.140 (.09) I, Planned Development Regulations, is hereby amended as follows:

"I. All Stage II Site Development plan approvals shall expire two years after their approval date, if substantial development has not occurred on the property prior to that time. Provided, however, that the Development Review Board may extend these expiration times for up to three (3) additional periods of not more than one (1) year each. Applicants seeking time extensions shall make their requests in writing at least thirty (30) days in advance of the expiration date. Requests for time extensions shall only be granted upon (1) a showing that the applicant has in good faith attempted to develop or market the property in the preceding year or that development can be expected to occur within the next year,

and (2) payment of any and all Supplemental Street SDCs applicable to the development. Upon such payment, the development shall have vested traffic generation rights under 4.140 (.10), provided however, that if the Stage II approval should expire, the vested right to use trips is terminated upon City repayment, without interest, of Supplemental Street SDCs. For purposes of this Ordinance, "substantial development" is deemed to have occurred if the required building permits or public works permits have been issued for the development, and the development has been diligently pursued, including the completion of all conditions of approval established for the permit."

3. Staff Direction.

The City Recorder is directed to make the appropriate formatting and stylistic changes to conform the aforementioned amendments to the format and style of the Wilsonville Code. Staff is directed to prepare a Supplemental Street SDC for the Wilsonville Road/I-5 Interchange and interrelated intersections.

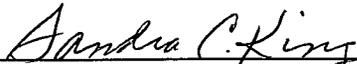
4. Effective Date.

For the reasons appearing in the recitals above, the City Council hereby determines that a delay in adopting a system for vesting in traffic capacity on Wilsonville Road between Town Center Loop West and Boones Ferry Road increases the risk that capacity through said corridor will not be available for the development of property in the West Side Urban Renewal District, with the consequent loss of financing for, and the timely construction of, the Boeckman, Barber and Kinsman Road extensions. As such, time is of the essence and the public interest militates in favor of a declaration that this Ordinance shall take effect immediately upon final reading and passage by the Council.

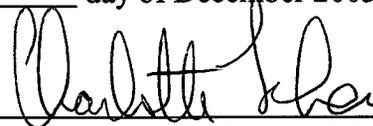
SUBMITTED to the Wilsonville City Council and read for the first and second time at a regular meeting thereof on the 15th day of December, 2003, at the hour of 7 p.m. at the Wilsonville Community Center, 7965 SW Wilsonville Road, Wilsonville, Oregon.


SANDRA C. KING, CMC, City Recorder

ENACTED by the City Council on the 15th day of December, 2003, by the following
votes: Yes: -5- No: -0-


SANDRA C. KING, CMC, City Recorder

DATED and signed by the Mayor this 17th day of December 2003.


CHARLOTTE LEHAN, MAYOR

SUMMARY OF VOTES:

Mayor Lehan	<u>Yes</u>
Councilor Scott-Tabb	<u>Yes</u>
Councilor Kirk	<u>Yes</u>
Councilor Holt	<u>Yes</u>
Councilor Knapp	<u>Yes</u>

Attachments:

Exhibit A – Planning Division Staff Report dated December 11, 2003.

Planning Division Staff Report

TO: Honorable Mayor and City Council

FROM: Chris Neamtzu AICP, Long-Range Planner

DATE: December 11, 2003

SUBJECT: Ordinance No. 561-Trip Vesting

Summary:

Proposed ordinance 561 modifies W.C 4.140 (.09) I and J.2 to provide a vested right to use available transportation capacity at the Wilsonville Road/I-5 interchange upon Stage I or Master Plan approval and entry into a vesting agreement providing for a development schedule and early payment improvement fees for the intersection. Currently, "vesting" for available system capacity occurs upon approval of Stage II final development plans.

After two public hearings on the proposed "early vesting" code amendments, the Planning Commission recommended the City Council adopt the staff version of Ordinance No.561, with minor language changes proposed by Mr. Tim Ramis, the attorney for Costa Pacific Communities (Exhibit 19). Staff concurs with these and other minor changes recommended by the Commission and have prepared Ordinance No. 561 incorporating all of the amendments.

Recommendation:

Staff respectfully recommends that the City Council 1) conduct the public hearings on the proposed Development Code changes to WC Section 4.140-Planned Development Regulations 2) adopt Ordinance No. 561 on first and second reading and 3) direct staff to return to the Planning Commission in April with a) calculations based on a detailed traffic analysis regarding the traffic capacity created by planned but not yet funded capital improvements to the Wilsonville Road/I-5 Interchange and b) an approach and methodology for possible preparation of a Public Facilities Strategy (PFS) consistent with ORS 197.768.

Background:

The Planning Commission record has been included as background information for the City Council to consider as part of deliberations on Ordinance No. 561. It is important

to note that the Planning Commission Resolution No.03PC02 recommended that the City Council direct staff to return to it with the above referenced traffic analysis and consideration of a Public Facility Strategy. This reflected a concern by the Commission and staff that the city was fast approaching the loss of capacity at the Wilsonville Road/I-5 interchange and was obliged to take steps to manage the filed and anticipated development applications that rely on planned but not yet funded capacity in this area.

This recommendation also figured prominently the actions of Fred Meyer, who had proposed amendments to Ordinance 561, in the form of a "Mandatory Concurrency Conditioning" scheme (Exhibits 10 and 11), to withdraw those proposed amendments. This scheme, which staff opposed, would have allowed those with Stage I and Master Plan approval to vest in Wilsonville Road/I-5 interchange capacity that had yet to be planned and funded. In the end however, the planned pursuit of a PFS came to be regarded as Fred Meyer's preferred way to approach the issue of allocating trips beyond those that are currently available.

Other issues related to the testimony submitted by Capital Realty Corporation (Exhibit 15), which called for the creation of vested traffic generation rights that survived the expiration of the approval upon which they were based. Staff expressed strong concerns about the proposal to allow the vested trips to run with the land in perpetuity unless they "have not been used after expiration." In staff's view, the proposal would require the DRB to go through a notice and hearing process in order to find the obvious, (that the rights have not been used) and then order what the ordinance requires anyway (repayment of vesting fees by the city). It appeared to staff that if an applicant doesn't pursue substantial development and loses approval through expiration, vested traffic generation rights associated with that approval should terminate. The Planning Commission concurred and declined to adopt the proposed amendments.

Staff did agree that proposed amendments by Costa Pacific had merit. These amendments (Exhibit 19) achieve three objectives. They: 1) provide that the development schedule or phasing plan required by the vesting agreement may be "proposed," in recognition of the fact that, especially in Villebois, such schedules are reasonably subject to modification, 2) provide that Supplemental Street SDCs and "other means of financing public improvements" may be the subject of vesting agreements and 3) broaden and clarify the basis for the loss of vesting rights as including termination of the vesting agreement or the termination of the approval necessary for the vesting to occur.

Conclusion:

Council adoption of proposed Ordinance 561 will provide mechanism for the allocation of available Wilsonville Road/I-5 interchange capacity equitably and in the public interest. The direction to staff to return with a proposed Public Facility Strategy will address the problem of managing access when that transportation capacity ceases to be available.

Attachments:

1. Community Development Department Staff Report prepared by Chris Neamtzu dated December 3, 2003-Subject: Responses to Issues Raised at the November 12, 2003 PC Hearing on 03PC02-Trip Vesting.

2. Community Development Department Staff Report and Conclusionary Findings dated revised November 5, 2003 and Revised December 3, 2003 prepared by Eldon R. Johansen, Community Development Director and Chris Neamtzu, Long-Range Planner.

**Planning Division
Staff Report**



30000 SW Town Center Loop E
Wilsonville, Oregon 97070
(503) 682-1011
(503) 682-1015 Fax
(503) 682-0843 TDD

December 11, 2003

To: City Council

From: Chris Neamtzu AICP, Long-Range Planner

Subject: Ordinance No. 561-Trip Vesting

Summary:

Proposed Ordinance No. 561 modifies W.C 4.140 (.09) I and J.2 to provide a vested right to use available transportation capacity at the Wilsonville Road/I-5 interchange upon Stage I or Master Plan approval and entry into a vesting agreement providing for a development schedule and early payment improvement fees for the intersection. Currently, "vesting" for available system capacity occurs upon approval of Stage II site development plans.

After two public hearings on the proposed "early vesting" code amendments, the Planning Commission recommended the City Council adopt the staff version of Ordinance No. 561, with minor language changes proposed by Mr. Tim Ramis, the attorney for Costa Pacific Communities (Exhibit 19). Staff concurs with these and other minor changes recommended by the Commission and have prepared Ordinance No. 561 incorporating all of the amendments.

Recommendation:

Staff respectfully recommends that the City Council 1) conduct the public hearings on the proposed Development Code changes to WC Section 4.140-Planned Development Regulations 2) adopt Ordinance No. 561 on first and second reading and 3) direct staff to return to the Planning Commission in April with a) calculations based on a detailed traffic analysis regarding the traffic capacity created by planned but not yet funded capital improvements to the Wilsonville Road/I-5 Interchange and b) an approach and methodology for possible preparation of a Public Facilities Strategy (PFS) consistent with ORS 197.768.

Background:

The Planning Commission record has been included as background information for the City Council to consider as part of deliberations on Ordinance No. 561. It is important to note that the Planning Commission Resolution No. 03PC02 recommended that the City Council direct staff to return to it with the above referenced traffic analysis and



consideration of a Public Facilities Transportation Strategy (PFTS). This reflected a concern by the Commission and staff that the city was fast approaching the loss of capacity at the Wilsonville Road/I-5 interchange and was obliged to take steps to manage the filed and anticipated development applications that rely on planned but not yet funded capacity in this area.

This recommendation also figured prominently the actions of Fred Meyer, who had proposed amendments to Ordinance No. 561, in the form of a "Mandatory Concurrency Conditioning" scheme (Exhibits 10 and 11), to withdraw those proposed amendments. This scheme, which staff opposed, would have allowed those with Stage I or Master Plan approval to vest in Wilsonville Road/I-5 interchange capacity that had yet to be planned and funded. In the end however, the planned pursuit of a PFTS came to be regarded as Fred Meyer's preferred way to approach the issue of allocating trips beyond those that are currently available.

Other issues related to the testimony submitted by Capital Realty Corporation (Exhibit 15), which called for the creation of vested traffic generation rights that survived the expiration of the approval upon which they were based. Staff expressed strong concerns about the proposal to allow the vested trips to run with the land in perpetuity unless they "have not been used after expiration." In staff's view, the proposal would require the DRB to go through a notice and hearing process in order to find the obvious, (that the rights have not been used) and then order what the ordinance requires anyway (repayment of vesting fees by the city). It appeared to staff that if an applicant doesn't pursue substantial development and loses approval through expiration, vested traffic generation rights associated with that approval should terminate. The Planning Commission concurred and declined to adopt the proposed amendments.

Staff did agree that proposed amendments by Costa Pacific had merit. These amendments (Exhibit 19) achieve three objectives. They: 1) provide that the development schedule or phasing plan required by the vesting agreement may be "proposed," in recognition of the fact that, especially in Villebois, such schedules are reasonably subject to modification, 2) provide that Supplemental Street SDCs and "other means of financing public improvements" may be the subject of vesting agreements and 3) broaden and clarify the basis for the loss of vesting rights as including termination of the vesting agreement or the termination of the approval necessary for the vesting to occur.

Conclusion:

Council adoption of proposed Ordinance No. 561 will provide mechanism for the allocation of available Wilsonville Road/I-5 interchange capacity equitably and in the public interest. The direction to staff to return with a proposed Public Facilities Strategy will address the problem of managing access when that transportation capacity ceases to be available.

Attachments:

1. Community Development Department Staff Report prepared by Chris Neamtzu dated December 3, 2003-Subject: Responses to Issues Raised at the November 12, 2003 PC Hearing on 03PC02-Trip Vesting.
2. Community Development Department Staff Report and Conclusionary Findings dated revised November 5, 2003 and Revised December 3, 2003 prepared by Eldon R. Johansen, Community Development Director and Chris Neamtzu, Long-Range Planner.

**Community Development
Department Staff Report**

December 3, 2003

To: Planning Commission

From: Chris Neamtzu AICP, Long-Range Planner

**Subject: Responses to Issues Raised at the November 12, 2003 Planning
Commission Hearing on 03CP02-Trip Vesting (Ordinance No. 561)**

At last month's public hearing on case file 03PC02-Trip Vesting (Ordinance No. 561), the Planning Commission opened the public hearing and took testimony on Staff's proposed text amendments to Wilsonville Code Section 4.140-Planned Development Regulations. The Commission continued the hearing to December 10, 2003 and encouraged the parties submit written material 14 days prior to the hearing. Staff received one additional piece of testimony, a memorandum dated November 23, 2003 from Mr. Tim Ramis, which is included in your packet and entered into the record as Exhibit 11. Staff has provided responses to the issues raised in Mr. Ramis' memorandum, which are also included in the packet (Exhibit 12).

Over the last three weeks, Staff has worked on different approaches to modifying the proposed code amendment to address many of the concerns raised. The draft ordinance (attached to the staff report) accommodates the chief concerns raised last month (Exhibit 13). Staff has modified the adopting resolution (03PC02) to recommend that the Staff return to the Planning Commission in April 2004 with calculations based on a detailed traffic analysis regarding the traffic capacity created by planned but not yet funded capital improvements to the Wilsonville Road/I-5 Interchange; and 2) Return to the Planning Commission in April 2004 to evaluate an approach and methodology for preparation of a Public Facilities Strategy (PFS) consistent with ORS 197.768. Adequate time is needed to allow for the preparation of traffic studies, and for Staff to formulate recommendations based on the information contained therein.

The following has been prepared to provide additional answers to some of the more general questions raised at last months meeting.

Issue: "Fred Meyer Proposal"

Response: Mr. Tim Ramis, attorney, submitted alternative code language titled "Fred Meyer Proposal" that effectively results in a major policy change on how the City determines concurrency for new development. The proposal, simply stated, is to allow for vesting of trips at the Stage I level for which there is no identified and funded capital improvement project that would create the capacity necessary to achieve the Level of Service required by the Development Code to adequately accommodate a new project.

A change of this nature represents a much larger policy decision that warrants detailed discussion and should not be addressed in a minor code amendment process as is proposed here. The scope of the proposal has the potential to affect policies in the Comprehensive Plan, Development Code and Transportation Systems Plan and it is important for Staff and the Commission to understand the full implication of such policy changes. Please refer to Assistant City Attorney Paul Lee's memorandum regarding the issue of concurrency, the history of how it has been practiced and the City's position regarding the "Fred Meyer Proposal".

Issue: What happens if a development reserves trips and then a different development is proposed for that property? Would the property retain those trips?

Response: The proposed code amendment has been revised to allow vested trips to run with the land as long as the land use approvals are valid and in effect. In the event the project expires, or the vested trips are lost or terminated, the trips then become available to other development, and the paid fees refunded without interest. It is conceivable that trips allocated to a project could become available to a redesign on the same property provided there were available trips for any increase in trips generated by the new proposal, and the original approval was still valid at the time of new land use review and approval.

Issue: After a developer reserves trips by paying the Supplemental Street SDC's (SSDC's), how long can that developer wait to actually move forward with the project? Do the trips expire?

Response: Under a vesting agreement entered into by the City and applicant with a Stage I or Master Plan approval, developers must provide a phasing schedule for improvements. Once the City approves a phasing schedule for a large-scale multi-year development, the applicant must complete the project along the timelines approved, or otherwise diligently pursue completion of the project. This allows for development to occur over many years without the vested trips expiring.

Regarding a Stage II project, under current process, the approval is valid for 2-years, with the ability to request up to three additional one-year extensions at which time if construction has not occurred, the project approval expires. The code is proposed to be amended to require payment of all applicable SSDC's at the time any extensions are granted. This approach has been taken to encourage the development of projects and to avoid trip capacity from being tied up for long periods of time when development is not reasonably expected to occur.

Issue: What happens if a developer reserves trips and then decides not to proceed? Do they get a refund?

Response: Yes. The proposed code language has been modified to address the issue of refunds. If a project expires, or the applicant abdicates the vesting agreement, *“such trips shall be made available to other development upon City repayment, without interest, of associated vesting fees ”(WC 4.140.10).*

Issue: Concern was raised about the term “subsequent development approvals”, and what the context of that term is in the sentence “the number of trips vested is subject to modification based upon updated traffic analysis associated with subsequent development approvals for the property”.

Response: Staff has added language clarifying that this provision applies to the specific property where the pending application applies and does not apply to other properties or approvals to address this concern. Due to the fact that trip generation would be calculated at the Stage I or Master Plan level, it is possible that modifications to the total number of trips could result from additional information provided by an applicant at the Stage II step in the process. Issues such as land use, and building size could have impacts on the number of total trips generated by a project, and the number of trips would need to be modified or fine tuned based on the subsequent development approval, being the Stage II approval for the given project.

Issue: Concern about the term “diligently pursued” in relation to vesting.

Response: The proposed code amendment has been modified to include clarification of this issue, by adding additional criteria, which states that “vesting shall remain valid and run with the property, provided the development schedule or phasing plan is adhered to or diligently pursued”. This additional criterion assists to clarify the concerns that were raised last month.

**COMMUNITY DEVELOPMENT DEPARTMENT
STAFF REPORT**

PREPARED FOR: Wilsonville Planning Commission

HEARING DATE: November 12, 2003

DATE OF REPORT: **Revised December 3, 2003**
November 5, 2003

APPLICATION #: 03PC02

REQUEST: Recommend approval of Ordinance No. 561 which proposes to modify Planning and Land Development Ordinance Section 4.140- Planned Development Regulations, allowing for vesting of traffic capacity on Wilsonville Road between Town Center Loop West and Boones Ferry Road including the Oregon Department of Transportation (ODOT) on and off ramps to Interstate-5. Please refer to pages 3-5 of the attached draft Ordinance No 561 (Exhibit 1) for the proposed code language amendments.

LOCATION: This ordinance generally applies citywide; however, the area of the City most affected will be between the Willamette River to the south and Boeckman Road to the north.

APPLICANT: City of Wilsonville

CRITERIA: Statewide Planning Goal 1: Citizen Involvement; Statewide Planning Goal 12: Transportation; Wilsonville Comprehensive Plan –Urban Growth Management Goal 2.1; Implementation Measures 2.1.1.b; 2.1.1.d; 2.1.1.e; 2.1.1.f; Public Facilities and Services; Paying for Facilities and Services-Policy 3.1.3; Implementation Measure 3.1.3a, 3.1.3b, 3.1.3c; Wilsonville Development Code Section 4.000-4.033: Administration; Section 4.140: Planned Development Regulations; Section 4.197: Zone Changes and Amendments to This Code-Procedures; Transportation Systems Plan (2003).

STAFF REVIEWER: Eldon R. Johansen, Community Development Director
Chris Neamtzu AICP, Long-Range Planner

SUMMARY:

The Community Development Department is proposing an amendment to Section 4.140 – Planned Development Regulations (Chapter 4 of the Wilsonville Code) creating a vested right for applicant's to use available transportation capacity and capture PM peak hour traffic trips on Wilsonville Road between Boones Ferry Road and Town Center Loop West upon payment of applicable Supplemental Streets Systems Development Charges and upon receipt of Master Plan approval or Stage I Master Plan approval, with the approval granted after adoption of the Transportation Systems Plan (TSP) (adopted on June 2, 2003) with the additional capacity inherent in the TSP. The City proposes this amendment to ensure that the recently adopted West Side Urban Renewal District can effectively develop tax increment sufficient to assist in financing the capital improvement projects identified in the Transportation Systems Plan.

The purpose of the Ordinance is to provide an approved master planned, multi-phase development with the ability to secure trips through the Wilsonville Road interchange area. It recognizes the financing difficulties of obtaining large up-front commitments from the financial markets if one cannot ensure that a project can be built out over time due to a lack of traffic capacity. In the case of Villebois, it could have a domino affect on securing the needed housing and supporting the other infrastructure financed through Urban Renewal. At the same time, the proposal predicates such early vesting on paying for the trips in order for the City to be able to financially support the necessary improvements. A smaller development is entitled to do the same thing, but if they did not pay, they would only be vested at the point of Stage II approval as the system currently operates. As a practical matter, smaller developments often combine the Stage I/II process mooting the issue of paying to vest early. Finally, due to the premium on trips and the fact that we have Stage II approvals that do not develop after two years, it was felt it was unfair to those waiting to develop to set aside the vested trips for greater than two years without payment.

The public hearing notice that was published for this hearing contained a proposal to amend a different portion of WC Section 4.140 – Planned Development Regulations, which would have changed the LOS standard from "D" to "E" along Wilsonville Road between Boones Ferry Road and Town Center Loop West, consistent with Policy 4.1.1 of the Transportation Systems Plan. Staff was concerned that there would be confusion with the two distinctly unrelated proposals being included together in one Code language amendment proposal and has removed the LOS amendment request at this time. It is important to note that the LOS amendment consistent with the TSP Policy is not necessary to create capacity allowing for vesting of traffic trips in the West Side Urban Renewal District and the rest of the City as there is capacity available at this time. A revised public hearing notice reflecting this change has been prepared and distributed. Staff will return to the Planning Commission with a larger package of TSP related Code and Plan amendments in the near future and will propose a series of modifications to the Code and Comprehensive Plan that will result in compliance with the recently adopted TSP Goals, Policies and Implementation Measures.

RECOMMENDATION:

Staff respectfully requests that the Planning Commission forward a recommendation of approval of Ordinance No. 561 onto the City Council.

BACKGROUND/SUMMARY OF ISSUES:

Ordinance No. 561 involves finding a way for the City of Wilsonville to effectively develop tax increment financing for the capital improvement projects included in the 2003 Urban Renewal Plan for the Wilsonville West Side Urban Renewal District. On October 8, 2003, the Planning Commission recommended approval of the Wilsonville West Side Urban Renewal Plan with some modifications to the Plan. On October 20, 2003, City Council provided additional guidance on the Wilsonville West Side Urban Renewal District and approved the Urban Renewal Plan on first reading. The Plan was approved on second reading before the City Council on November 3, 2003.

The development of streets on the west side of I-5 as identified in the Transportation Systems Plan includes the streets that would be funded in part with funds from the Wilsonville West Side Urban Renewal District. This would include the Boeckman Road Extension from 95th Avenue to Tooze Road; the Barber Street Extension from Kinsman Road to Brown Road; the Kinsman Road Extension from Barber Street to Boeckman Road; reconstruction of Tooze Road from 110th Avenue to Grahams Ferry Road; another access to Old Town; reconstruction of Grahams Ferry Road from Tooze Road to the general vicinity of the south edge of the Villebois Village. The construction of these roads is very dependent on development of the Villebois Village. This is necessary in order to develop the tax increment that would be used to support the sale of bonds to help pay for capital projects such as the critical road improvements identified above.

Currently, the City Code addresses traffic impacts and Level of Service at the time of application and approval of a Stage II Site Development Permit or in the case of the Villebois Village zone, the approval of a Preliminary Development Plan (PDP). Approval is dependent on the ability of the applicant to show that the location design, size and uses are such that traffic generated by the development at the most probable used intersection(s) can be accommodated (safely and without congestion in excess of Level of Service "D") as defined in the Highway Capacity Manual published by the National Highway Research Board on existing or immediately planned arterial or collector streets, and will in the case of commercial or industrial developments, avoid traversing local streets. The allocation of traffic capacity is currently based on a first come, first serve basis.

The main thrust of Ordinance No. 561 is to allow projects that have Master Plan approval or Stage I Master Plan approval, with the approval granted after adoption of the Transportation Systems Plan with the additional capacity inherent in the plan, that was adopted on June 2, 2003, to vest in traffic capacity on Wilsonville Road between Town Center Loop West and Boones Ferry Road including the ODOT ramps provided that they pay their Supplemental

Streets Systems Development Charges. This would not preclude vesting of trips at the time of a Stage II Site Development Permit approval or a Preliminary Development Plan.

The advantage to this change in the procedures is that it will allow development to proceed in the area included in the Wilsonville West Side Urban Renewal Plan and it will allow the development of the street system, which is necessary for overall development of the area. If we do not establish a system to direct growth into the area included in the Wilsonville West Side Urban Renewal Plan, we will not be able to develop the tax increment necessary to support bond sales and a lack of action would effectively and quickly shut off growth in that area due to a lack of traffic capacity at the Wilsonville Road interchange.

The recitals in Ordinance No. 561 include a more complete summary of the background information and the summary of issues.

The Conclusionary Findings are also attached as a separate exhibit.

Exhibits

1. Draft Ordinance No. 561
2. Conclusionary Findings
3. Draft Resolution No. 03PC02

**COMMUNITY DEVELOPMENT DEPARTMENT
STAFF REPORT**

DATE: Amended December 3, 2003
November 5, 2003

PREPARED FOR: Wilsonville Planning Commission

SUBJECT: Conclusionary Findings for Ordinance No. 561 (Exhibit 2) – Proposed modification to Planning and Land Development Ordinance Section 4.140- Planned Development Regulations, allowing for vesting of traffic capacity on Wilsonville Road between Town Center Loop West and Boones Ferry Road including the Oregon Department of Transportation (ODOT) on and off ramps to Interstate-5.

**LAND USE –
DESIGNATIONS:** This Ordinance applies to all land use designations within the City of Wilsonville.

**ZONING
DESIGNATIONS:** This Ordinance applies to all zoning designations within the City of Wilsonville.

CONCLUSIONARY FINDINGS

The proposed Ordinance complements and is consistent with the City Code, the Comprehensive Plan, its sub-elements and Statewide Planning Goals.

STATEWIDE PLANNING GOALS

Statewide Planning Goal #1 - Citizen Involvement (OAR 660-015-0000(1)): *To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.*

Finding 1: The City of Wilsonville has provided notice of public hearings before the Planning Commission and City Council consistent with the Planning and Land Development Ordinance requirements. Such notices were provided to interested individuals, and property owners within 250' of the area along Wilsonville Road between Town Center Loop W., and Boones Ferry Road. In addition, the City held a public workshop on November 7, 2003 at the City Hall Annex to discuss the proposed code amendment and respond to any citizen concerns and answer questions. At the upcoming public hearing, the public will be afforded an opportunity to provide

public testimony to the Planning Commission as part of deliberations on this matter. **This goal has been met.**

Statewide Planning Goal #12 – Transportation (OAR 660-015-0000(12)): *To provide and encourage a safe, convenient and economic transportation system.*

Finding 2: The City of Wilsonville recently adopted a Transportation Systems Plan (2003) that is in conformance with Statewide Planning Goal 12. The plan has been reviewed and acknowledged by the State of Oregon Department of Land Conservation and Development and Metro. The proposed ordinance will assist the City in developing tax increment for the West Side Urban Renewal District. This, in turn, will assist the City in selling bonds to support the development of the following streets:

- The Boeckman Road Extension from 95th Avenue to Tooze Road
- The Barber Street Extension from Kinsman Road to Brown Road
- The Kinsman Road Extension from Barber Street to Boeckman Road
- Another access to Old Town
- Reconstruction of Tooze Road from 110th Avenue to Grahams Ferry Road
- Reconstruction of Grahams Ferry Road from Tooze Road to the southern limits of the Villebois Village

Construction of the streets identified above, greatly contribute to the City's ability to provide a safe, convenient, and economic transportation system supporting Statewide Planning Goal 12. The Villebois Village, which is within the Westside Urban Renewal District, was designed with efficient vehicular, bicycle and pedestrian movement and connectivity in mind as well as an efficient and convenient connection to the future commuter rail site. **This goal has been met.**

COMPREHENSIVE PLAN

Urban Growth Management

Implementation Measure 2.1.1.f. *To insure timely, orderly and efficient use of public facilities and services, while maintaining livability within the community, the City shall establish and maintain growth management policies consistent with the City's regional growth allocation and coordinated with a Capital Improvements Plan.*

2. *To maximize design quality and conformity to the Comprehensive Plan, the City shall encourage master planning of large land areas. However, as an added growth management tool, the Development Review Board may, as a condition of approval, set an annual phasing schedule coordinated with scheduled Capital Improvements, particularly streets and related transportation facilities.*

Finding 3: The proposed code amendment supports this Implementation Measure by continuing to allow for timely, orderly and efficient use of public facilities and services by providing an

approach to securing transportation capacity that would allow for the long-term development of the Villebois Village, which is a large master plan area comprised of approximately 480 acres assisting the City to satisfy regional growth allocations. **This Implementation Measure is met.**

GOAL: 2.1 - *To allow for urban growth while maintaining community livability, consistent with the economics of development, City administration, and the provision of public facilities and services.*

Implementation Measure 2.1.1.b. *Allow urbanization to occur to provide adequate housing to accommodate workers who are employed within the City.*

Finding 4: The adoption of the proposed code amendment would allow for the long-term development of the Villebois Village, which would support this Goal and Implementation Measure by providing for long term residential development while providing adequate housing to accommodate workers who are employed within the City helping to offset the jobs to housing imbalance. **These criteria are met.**

Implementation Measure 2.1.1.d. *Establish and maintain revenue sources to support the City's policies for urbanization and maintain needed public services and facilities.*

Implementation Measure 2.1.1.e. *Allow new development to proceed concurrently with the availability of adequate public services and facilities as specified in Public Facilities and Services Section (Section C) of the Comprehensive Plan.*

Finding 5: The proposed code amendment creating a vesting process is necessary to support these Implementation Measures. **These criteria are met.**

Public Facilities and Services-Paying for Needed Facilities and Services

Policy 3.1.3 - *The City of Wilsonville shall take steps to assure that the parties causing a need for expanded facilities and services, or those benefiting from such facilities and services, pay for them.*

Finding 6: The proposed Ordinance creates a mechanism for vesting traffic trips along Wilsonville Road between Boones Ferry Road and Town Center Loop West upon receipt of Master Plan or Stage I Master Plan approval granted after the effective date of the TSP (June 2, 2003) and upon payment of required Supplemental Streets Systems Development Charges. This proposal provides for a more timely and efficient method of payment as part of new development assisting to ensure that the City can provide adequate funding for needed transportation capital improvements. The proposed Ordinance supports Policy 3.1.3. **This Policy is met.**

Implementation Measure 3.1.3.a - *Developers will continue to be required to pay for demands placed on public facilities/services that are directly related to their developments. The City may establish and collect systems development charges (SDCs) for any or all-public facilities/services, as allowed by law. An individual exception to this standard may be justified, or SDC credits given, when a proposed development is found to result in public benefits that warrant public investment to support the development.*

Finding 7: The proposed Ordinance results in collection of Supplemental Streets Systems Development Charges at an earlier point in the process than had previously been collected. The proposal would allow applicant's to vest in traffic capacity in the Wilsonville Road/I-5 area at the point of Master Plan approval or Stage I Master Plan approval, provided that the approval was granted after the adoption of the Transportation Systems Plan, which was June 2, 2003. This approach continues to allow for collection of SDC's as part of new development assisting the City to be able to financially support public improvements and satisfies this Implementation Measure. **This Implementation Measure is met.**

Implementation Measure 3.1.3.b - *The City will continue to prepare and implement a rolling five-year Capital Improvement Program, with annual funding decisions made as part of the municipal budget process.*

Finding 8: The City has a 5-Year Capital Improvement Program (CIP) with annual funding decisions made as part of the annual budget process. The collection of Street SDC's allows the City to implement the transportation improvements identified in the TSP, and included in the 5-Year CIP. **This Implementation Measure is met.**

Implementation Measure 3.1.3.c - *The City shall continue to employ pay-back agreements, development agreements, and other creative solutions for facilities that are over-sized or extended from off-site at the expense of only some of the benefited properties.*

Finding 9: The proposed Ordinance does not impact the current practice of employing pay-back agreements and using development agreements or other approaches, for developers who pay for the over sizing of infrastructure or pay more than their proportionate share according to City Code. **This Implementation Measure is met.**

Implementation Measure 3.1.6.g - *Minimum street service levels shall continue to be established. Dedication of adequate right-of-way, as established by the Street System Master Plan, or as otherwise approved by the Development Review Board or City Council shall be required prior to actual site development.*

Finding 10: The minimum service levels for streets have been established in the 2003 Transportation Systems Plan. This ordinance assists in providing funds for the implementation of the Transportation Systems Plan and will include development of streets in accordance with the TSP. **This Implementation Measure has been met.**

**PLANNING AND LAND DEVELOPMENT ORDINANCE
(CHAPTER 4 OF THE WILSONVILLE CODE)**

Wilsonville Code, Section 4.000 – 4.033 – Administration: This section of the Planning and Land Development Ordinance contains a variety of provisions that apply to this proposal. They include consistency with Plan and laws (WC 4.003), application procedures (4.008), who may initiate applications (4.009), public hearing notices (4.012), hearing procedures (4.013), record of proceedings (4.021), authority of the Planning Commission and City Council (4.032 and 4.033).

Finding 11: Section 4.000 through 4.033 of the Wilsonville Code, Planning and Land Development ordinance provide the guidelines and procedures for administering the development program within the City of Wilsonville. City Staff has followed the Code requirements for initiating an application, providing public hearing notices, and the public hearing with the Planning Commission will follow hearing procedures and Staff will provide record of proceedings through the published meeting minutes. This proposal to allow for vesting in street capacity on Wilsonville Road from Town Center Loop West to Boones Ferry Road including the ODOT on ramps is consistent with the requirements of 4.000 through 4.033. **These requirements of the City Code have been met.**

Wilsonville Code Section 4.197 – Zone Changes and Amendments to This Code – Procedures:

(.01) The following procedure shall be followed in applying for an amendment to the text of this Chapter:

- A. The Planning Commission shall conduct a public hearing on the proposed amendment at its earliest practicable meeting after it is proposed and shall, within forty (40) days after concluding the hearing, provide a report and recommendation to the City Council regarding the proposed amendment. The findings and recommendations of the Commission shall be adopted by resolution and shall be signed by the Chair-of the Commission.*

Finding 12: The Planning Commission conducted public hearings on the proposed code amendments on November 12, 2003 and December 10, 2003 with City Council hearings to follow. **This criterion is met.**

- B. In recommending approval of a proposed text amendment, the Planning Commission shall, at a minimum, adopt findings relative to the following:*

1. *That the application was submitted in compliance with the procedures set forth in Section 4.008; and*
2. *The amendment substantially complies with all applicable goals, policies and objectives set forth in the Comprehensive Plan; and*
3. *The amendment does not materially conflict with, nor endanger, other provisions of the - text of the Code; and*
4. *If applicable, the amendment is necessary to insure that the City's Land Use and Development Ordinance complies with mandated requirements of State of Federal laws and/or statutes.*

Finding 13: The application was submitted following the requirements of Section 4.008-4.024. Staff finds that the proposed amendment complies with applicable policies and implementation measures set forth in the Comprehensive Plan and that the proposal does not materially conflict with other provisions of the text of the code. **These code criteria are satisfied.**

Transportation Systems Plan Section 4.2.2 - 1-5 Wilsonville Freeway Access Study:

Finding 14: This subsection describes the I-5 Freeway Access Study and includes projects that are necessary to provide adequate freeway access with continued growth over the next 20 years and describes an enhanced Wilsonville Road diamond interchange. The City has budgeted money to complete the first phase of improvements, which will create additional capacity in the interchange area. These improvements will be completed within two years creating capacity that is being used for approval of future developments. The proposed Ordinance allows for collection of Supplemental SDC's that will assist the City in completing needed public improvements to serve new development. **This criterion is met.**

CITY COUNCIL
PUBLIC HEARING
AUGUST 1, 2005

PLANNING COMMISSION RECORD

Public Facilities Transportation Strategy
Case File 04PC03A and

LOS "D" to LOS "E"
Case File 04PC03B



04PC03A
Public Facilities Transportation Strategy
and
04PC03B
LOS "D" to LOS "E"
Planning Commission
Record Index

Actions from the May 11, 2005 Planning Commission Public Hearing:

- Notice of Decision – Recommendation to City Council
- Resolution No. 04PC03A and Resolution No. 04PC03B
- Motions
- May 11, 2005 Meeting Minutes

Distributed at the May 11, 2005 Planning Commission Public Hearing:

- Exhibit 35: A graphic, "Proposed 1-5/Wilsonville Rd/Boones Ferry Rd Alignment"
Exhibit 34: A graphic, "Existing 1-5/Wilsonville Rd/Boones Ferry Rd Alignment"
Exhibit 33: Proposed Changes to the 04PC03A May 11, 2005 PFTS Staff Report.

Included in the May 11, 2005 Planning Commission meeting packet:

Community Development Memorandum dated May 5, 2005; to Debra Iguchi, Chair – Wilsonville Planning Commission, from Dave Waffle, regarding Public Facility Transportation Strategy – Allocation and Queuing Examples; with attached:

- Exhibit 27: A table, "Allocation and Queuing Examples, Revision: Developer FM reduced trips from 318 to 260," dated 5/5/2005.
Exhibit 28: A table, "Allocation and Queuing Examples, Revision: Developer FM reduced trips to 260 not 318 + Reduction for Essential Gov't Trips" dated 5/5/2005
Exhibit 29: Community Development Memorandum dated May 5, 2005; to Debra Iguchi, Chair – Wilsonville Planning Commission, from Dave Waffle, regarding Wilsonville Road/Boones Ferry Road, with five attached maps.
Exhibit 30: An email dated May 4, 2005, to Eldon Johansen, from Reah Beach of DKS Associates, regarding Public Facilities Transportation Strategy, with attached Definition.
Exhibit 31: A letter dated May 4, 2005, from Dana Krawczuk of Ball Janik LLP, regarding Follow-up Testimony for Public Facilities Transportation Strategy (04PC03A and 04C03B)
Exhibit 32: A letter dated April 27, 2005, from Ben Altman of Urban Solutions, regarding 04PC03A & B – PFTS Ordinances

Minutes from the April 13, 2005 Planning Commission Public Hearing

Distributed at the April 13, 2005 Planning Commission Public Hearing:

- Exhibit 12: Draft Level of Service Ordinance dated 4/6/05 and amended 4/11/05.
Exhibit 26: Large photos showing the Wilsonville Road/I-5 interchange as it currently configured and proposed improvements. (This item was resubmitted as smaller maps. See Exhibits 33 and 34.)

- Exhibit 25: Suggested revisions to the draft Public Facilities Transportation Strategy ordinance submitted by Dana Krawczuk of Ball Janik LLP
- Exhibit 24: A table, "Comparison of Transportation Systems Plan & Wilsonville Freeway Access Study Growth Projections," with attached "Public Facilities Transportation Strategy Projected Growth from 2000 to 2020."
- Exhibit 23: Review Issues of the Public Facilities Transportation Strategy.
- Exhibit 22: A letter dated April 12, 2005, from Dana L. Krawczuk of Ball Janik LLP, regarding Testimony for Public Facilities Transportation Strategy (04PC03A and 04PC03B).

Items previously distributed at Planning Commission Work Sessions entered into the 04PC03A and 04PC03B record on April 13, 2005. . .

- Exhibit 16: An Interoffice Memorandum dated March 3, 2005 for the March 9, 2005 Planning Commission Work Session, to Debra Iguchi and Members of the Planning Commission, from Dave Waffle, regarding the Public Facility Transportation Strategy.
- Exhibit 17: An Interoffice Memorandum dated March 3, 2005 for the March 9, 2005 Planning Commission Work Session, to Arlene Loble, from Dave Waffle and Mike Kohlhoff, regarding the Public Facility Transportation Strategy.
- Exhibit 18: A Community Development Memorandum dated March 2, 2005, to Sandi Young, from Eldon Johansen, regarding PFTS.
- Exhibit 19: Draft Ordinance for PFTS included in the March 9, 2005 meeting packet, combining PFTS and LOS language (04PC03A & 04PC03B)
- Exhibit 20: A aerial photograph, Public Facilities Strategy Impacted Intersections (distributed at the March 9, 2005 meeting).
- Exhibit 21: A table, Allocation and Queuing Examples. (distributed at the March 9, 2005 meeting). (This table was updated after the meeting and an updated copy was emailed to the Planning Commission)

Included in the April 13, 2005 Planning Commission meeting packet:

Draft Resolution No. 04PC03A

Draft Resolution No. 04PC03B

- Exhibit 15: A memorandum dated April 5, 2005, to Chris Neamtzu, from Eldon Johansen, regarding Public Facilities Transportation Strategy.
- Exhibit 14: A letter dated March 7, 2005, to the Planning Commission, from Robert Currey-Wilson of Fred Meyer Stores.
- Exhibit 13: A table, "Capacity of Wilsonville Road Intersections (Operational Threshold)
- Exhibit 12: Draft Level of Service Ordinance dated 4/6/05
- Exhibit 11: Draft Public Facilities Transportation Strategy Ordinance dated 4/15/2005

Motion from the February 2, 2005 Planning Commission meeting to continue the Public Hearings for 04PC03A, 04PC03B and 04PC03C to the April, 13, 2005 Planning Commission meeting.

Motion from the December 8, 2004 Planning Commission meeting to continue the Public Hearings for 04PC03A, 04PC03B and 04PC03C to the February 9, 2005 Planning Commission meeting.

Minutes from the October 13, 2004 Planning Commission meeting.

Distributed at the October 13, 2004 Planning Commission Meeting:

- Exhibit 10: A letter dated October 11, 2004 from Tim Ramis of Ramis Crew Corrigan and Bachrach, regarding Proposed Public Facilities Transportation Strategy Application No. 04PC03A.
- Exhibit 9: A letter dated October 13, 2004, from Michelle Rudd of Stoel Rives, regarding Proposed Public Facilities Strategy.

No new information was submitted in the October 13, 2004 Planning Commission meeting packet.

September 8, 2004 Meeting Minutes

Included in the September 8, 2004 Planning Commission Meeting Packet:

Memorandum dated September 1, 2004, from Sandi Young regarding PFTS Policy Memo

Draft Resolution No. 04PC03A including:

Attachment 1; A Community Development Staff Report (04PC03), dated September 1, 2004, from Eldon R. Johansen, regarding Public Facilities Transportation Strategy, with the following Exhibits:

- Exhibit 1: A Community Development Memorandum dated August 23, 2003, to Arlene Loble, from Eldon Johansen regarding Wilsonville Road/I-5 interchange; with an attached memorandum dated August 28, 2003, from Ransford S. McCourt and Scott M. Mansur, of DKS Associates, regarding I-5/Wilsonville Road Interchange Capacity Memo.
- Exhibit 2: Ordinance No. 561.
- Exhibit 3: Summary of Trip Vesting, 2/2/2004
- Exhibit 4: A letter dated August 27, 2004, from Randsford McCourt of DKS Associates, regarding Public Facilities Transportation Strategy Traffic Analysis.
- Exhibit 5: Public Facilities Transportation Strategy
- Exhibit 6: Historical PM Peak Hour Count Data
- Exhibit 7: Public Facilities Transportation Strategy, Projected Growth From 2000 to 2020.
- Exhibit 8: Section 2.7 "Traffic Levels of Service" from the Transportation Systems Plan.

The following items are located in the Planning Files.

Affidavits of Mailing, Posting and Publishing
DLCD Notice of Proposed Amendment

04PC03A
Public Facilities Transportation Strategy
and
04PC03B
LOS "D" to LOS "E"
Planning Commission
Record Index

Actions from the May 11, 2005 Planning Commission Public Hearing:

- Notice of Decision – Recommendation to City Council
- Resolution No. 04PC03A and Resolution No. 04PC03B
- Motions
- May 11, 2005 Meeting Minutes



NOTICE OF DECISION
PLANNING COMMISSION
RECOMMENDATION TO CITY COUNCIL

FILE NO.: 04PC03A
APPLICANT: City of Wilsonville
REQUEST: Public Facilities Transportation Strategy

After conducting public hearings on September 8, 2004, October 13, 2004, December 8, 2004, February 9, 2005, April 13, 2005, and May 11, 2005, the Planning Commission voted to recommend this action to the City Council by passing Resolution No. 04PC03A.

A City Council public hearing on this matter has not yet been scheduled.

For further information, please contact the Wilsonville Planning Division, Community Development Annex, 8445 S.W. Elligsen Road, or telephone (503) 682-4960.

PLANNING COMMISSION
RESOLUTION NO. 04PC03A

**A WILSONVILLE PLANNING COMMISSION RESOLUTION RECOMMENDING
THAT THE CITY COUNCIL ADOPT AN ORDINANCE ADOPTING A PUBLIC
FACILITIES TRANSPORTATION STRATEGY FOR DEVELOPMENT IN THE CITY
OF WILSONVILLE DUE TO THE LACK OF STREET CAPACITY IN THE
WILSONVILLE ROAD/I-5 INTERCHANGE AREA.**

WHEREAS, the Wilsonville Planning Director submitted proposed Ordinance amendments to the Planning Commission, along with a Staff Report, in accordance with the public hearing and notice procedures that are set forth in Sections 4.008, 4.010, 4.011 and 4.012 of the Wilsonville Code (WC); and

WHEREAS, the Planning Commission, after providing the required notice, held Public Hearings on September 8, 2004, October 13, 2004, December 8, 2004, February 9, 2005, April 13, 2005, and May 11, 2005, to review a proposed ordinance adopting a Public Facilities Transportation Strategy and to gather additional testimony and evidence regarding the Ordinance; and

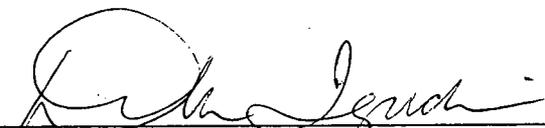
WHEREAS, the Commission has afforded all interested parties an opportunity to be heard on this subject and has entered all available evidence and testimony into the public record of their proceeding; and

WHEREAS, the Planning Commission has duly considered the subject, including the staff recommendations and all the exhibits and testimony introduced and offered by all interested parties; and

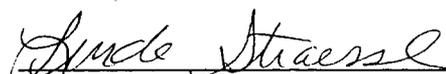
NOW, THEREFORE, BE IT RESOLVED that the Wilsonville Planning Commission does hereby adopt all Planning Staff Reports along with the findings and recommendations contained therein and, further, recommends that the Wilsonville City Council approve an ordinance adopting a Public Facilities Transportation Strategy as reviewed and amended by the Planning Commission; and

BE IT RESOLVED that this Resolution shall be effective upon adoption.

ADOPTED by the Planning Commission of the City of Wilsonville at a regular meeting thereof this 11th day of May, 2005, and filed with the Planning Administrative Assistant on May 25, 2005.


Wilsonville Planning Commission

Attest:


Linda Straessle, Administrative Assistant I

SUMMARY of Votes:

Chair Iguchi : Aye

Commissioner Goddard: Aye

Commissioner Faiman: Aye

Commissioner Guyton: Aye

Commissioner Hinds: Aye

Commissioner Juza: Nay

Commissioner Maybee: Aye

Planning Commission
May 11, 2005

MOTIONS

V. CONTINUED PUBLIC HEARINGS

A. APPLICATION NO. 04PC03A

Applicant: City of Wilsonville

Request: A Proposed Public Facilities Transportation Strategy, a strategy to accommodate future development while maintaining the City's and ODOT's level of service requirements by allocation of p.m. peak hour trips through the intersections of Wilsonville Road with I-5, Boones Ferry Road, and Town Center Loop West together with construction of planned transportation improvements and anticipated changes in driving habits.

B. APPLICATION NO. 04PC03B

Applicant: City of Wilsonville

Request: A proposal to change the Level of Service from "D" to "E" on Wilsonville Road between and including the intersections with I-5, Boones Ferry Road and Town Center Loop West and on portions of Boones Ferry Road adjacent to those intersections as authorized by Wilsonville Transportation Systems Plan Policy 4.1.1, and to exempt "essential government services" from all Level of Service standards.

Commissioner Goddard moved to adopt Resolution No. 04PC03A and Resolution No. 04PC03B with amendments to the City Staff recommendation as follows:

- Adopting the language from Exhibit 33, "Traffic generated by development exempted under this subsection...shall not be counted in determining levels of service for any future non-exempt applicant."
- Reserve 50% of available trips for small developments and request that City staff recommend a definition for small development and forward that recommendation to the City Council.

Commissioner Guyton seconded the motion, which carried 6 to 1 with Commissioner Juza opposing.

Chair Iguchi moved to have a CCI meeting prior to or in conjunction with Resolution No. 04PC03A and Resolution No. 04PC03B moving to City Council for public input regarding the Public Facilities Transportation Strategy. Commissioner Hinds seconded the motion, which carried 5 to 2 with Commissioner Faiman and Commissioner Juza opposing.

City of

WILSONVILLE
in OREGON



30000 SW Town Center Loop E
Wilsonville, Oregon 97070
(503) 682-1011
(503) 682-1015 Fax
(503) 682-0843 TDD

NOTICE OF DECISION

PLANNING COMMISSION

RECOMMENDATION TO CITY COUNCIL

FILE NO.: 04PC03B

APPLICANT: City of Wilsonville

REQUEST: Change Level of Service "D" to Level of Service "E" at Specified Intersections and Exempt Essential Government Services from the Level of Service Constraints

After conducting public hearings on September 8, 2004, October 13, 2004, December 8, 2004, February 9, 2005, April 13, 2005, and May 11, 2005, the Planning Commission voted to recommend this action to the City Council by passing Resolution No. 04PC03B.

A City Council public hearing on this matter has not yet been scheduled.

For further information, please contact the Wilsonville Planning Division, Community Development Annex, 8445 S.W. Elligsen Road, or telephone (503) 682-4960.



"Serving The Community With Pride"

**PLANNING COMMISSION
RESOLUTION NO. 04PC03B**

**A WILSONVILLE PLANNING COMMISSION RESOLUTION RECOMMENDING THAT
THE CITY COUNCIL ADOPT AN ORDINANCE AMENDING WILSONVILLE CODE
SECTION 4.140(J.) CONCERNING THE LEVEL OF SERVICE AT THE SEVERAL
INTERSECTIONS ASSOCIATED WITH THE WILSONVILLE ROAD/I-5 INTERCHANGE
AREA DUE TO A LACK OF TRANSPORTATION CAPACITY AND EXEMPTING
ESSENTIAL GOVERNMENT SERVICES FROM THE LEVEL OF SERVICE
CONSTRAINTS.**

WHEREAS, the Wilsonville Planning Director submitted proposed Ordinance amendments to the Planning Commission, along with a Staff Report, in accordance with the public hearing and notice procedures that are set forth in Sections 4.008, 4.010, 4.011 and 4.012 of the Wilsonville Code (WC); and

WHEREAS, the Planning Commission, after providing the required notice, held Public Hearings on September 8, 2004, October 13, 2004, December 8, 2004, February 9, 2005, April 13, 2005, and May 11, 2005, to review a proposed ordinance for revising the level of service at specific intersections, exempting essential government services from level of service constraints, and to gather additional testimony and evidence regarding the Ordinance; and

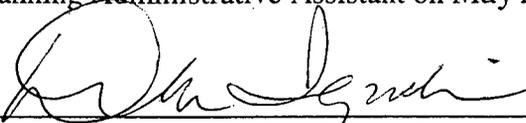
WHEREAS, the Commission has afforded all interested parties an opportunity to be heard on this subject and has entered all available evidence and testimony into the public record of their proceeding; and

WHEREAS, the Planning Commission has duly considered the subject, including the staff recommendations and all the exhibits and testimony introduced and offered by all interested parties; and

NOW, THEREFORE, BE IT RESOLVED that the Wilsonville Planning Commission does hereby adopt all Planning Staff Reports along with the findings and recommendations contained therein and, further, recommends that the Wilsonville City Council approve and adopt an ordinance revising the level of service at specific intersections, exempting essential government services from level of service constraints, as reviewed by the Planning Commission; and

BE IT RESOLVED that this Resolution shall be effective upon adoption.

ADOPTED by the Planning Commission of the City of Wilsonville at a regular meeting thereof this 11th day of May, 2005, and filed with the Planning Administrative Assistant on May 25, 2005.



Wilsonville Planning Commission

Attest:



Linda Straessle, Administrative Assistant I

Planning Commission
May 11, 2005

MOTIONS

V. CONTINUED PUBLIC HEARINGS

A. APPLICATION NO. 04PC03A

Applicant: City of Wilsonville

Request: A Proposed Public Facilities Transportation Strategy, a strategy to accommodate future development while maintaining the City's and ODOT's level of service requirements by allocation of p.m. peak hour trips through the intersections of Wilsonville Road with I-5, Boones Ferry Road, and Town Center Loop West together with construction of planned transportation improvements and anticipated changes in driving habits.

B. APPLICATION NO. 04PC03B

Applicant: City of Wilsonville

Request: A proposal to change the Level of Service from "D" to "E" on Wilsonville Road between and including the intersections with I-5, Boones Ferry Road and Town Center Loop West and on portions of Boones Ferry Road adjacent to those intersections as authorized by Wilsonville Transportation Systems Plan Policy 4.1.1, and to exempt "essential government services" from all Level of Service standards.

Commissioner Goddard moved to adopt Resolution No. 04PC03A and Resolution No. 04PC03B with amendments to the City Staff recommendation as follows:

- **Adopting the language from Exhibit 33, "Traffic generated by development exempted under this subsection...shall not be counted in determining levels of service for any future non-exempt applicant."**
- **Reserve 50% of available trips for small developments and request that City staff recommend a definition for small development and forward that recommendation to the City Council.**

Commissioner Guyton seconded the motion, which carried 6 to 1 with Commissioner Juza opposing.

Chair Iguchi moved to have a CCI meeting prior to or in conjunction with Resolution No. 04PC03A and Resolution No. 04PC03B moving to City Council for public input regarding the Public Facilities Transportation Strategy. Commissioner Hinds seconded the motion, which carried 5 to 2 with Commissioner Faiman and Commissioner Juza opposing.

SUMMARY of Votes:

Chair Iguchi :	<u>Aye</u>
Commissioner Goddard:	<u>Aye</u>
Commissioner Faiman:	<u>Aye</u>
Commissioner Guyton:	<u>Aye</u>
Commissioner Hinds:	<u>Aye</u>
Commissioner Juza:	<u>Nay</u>
Commissioner Maybee:	<u>Aye</u>

PLANNING COMMISSION

**WEDNESDAY
MAY 11, 2005
6:30 P.M.**

Approved June 8, 2005
with amendment on page
19 of 29.

**Wilsonville Community Development Annex
8445 SW Elligsen Road
Wilsonville, Oregon**

Minutes

I. CALL TO ORDER - ROLL CALL

Chair Iguchi called the meeting to order at 6:35 p.m. Those present:

Planning Commission: Debra Iguchi, Richard Goddard, Craig Faiman, Mary Hinds, Heidi Juza, Joe Maybee, Susan Guyton and City Council Liaison Sandra Scott-Tabb.

City Staff: Sandi Young, Dave Waffle, Chris Neamtzu, Eldon Johansen, Paul Lee, Mike Kohlhoff and Mike Stone.

The following was distributed at the beginning of the meeting:

- Community Recreation Center, Plan to Shape a Proposal

II. PUBLIC HEARINGS

The Commission agreed to change the agenda order to accommodate testimony from the Applicant regarding LP-2005-02-00006 and LP-2005-02-00007, on which City Staff had requested continuations.

A. FILE NO.: LP-2005-02-00006

Applicant: Costa Pacific Communities

Request: Minor amendments to the Villebois Village Master Plan, making the Master Plan consistent with subsequent land use approvals, modifications of the land uses and layout of the Village Center, identification of a specific 10-acre elementary school site, and deletion of references to the Living Enrichment Center and other minor edits. The Planning Commission action is in the form of a recommendation to the City Council.

B. FILE NO.: LP-2005-02-00007

Applicant: Costa Pacific Communities

Request: Amendments to Planning and Land Development Ordinance (Wilsonville's Development Code) Section 4.001 Village Center definition and Section 4.125 - Village Zone. The proposed Code amendments are primarily related to Specific Area Plan (SAP) Central, and design standards, and the addition of signage and wayfinding standards in Villebois. The Planning Commission action is in the form of a recommendation to the City Council.

Chair Iguchi opened the Public Hearings for both LP-2005-02-00006 and LP-2005-02-00007 at 6:40 p.m. and read the Legislative Hearing Procedure for the record. She called for comments from City Staff.

Chris Neamtzu, Manager of Long-Range Planning noted:

- No staff report or applicable review criteria were available, as City staff had requested a continuance for both applications.
- Dan. Hoyt of Costa Pacific Communities and Robert Hoffman of Fletcher Farr Ayotte would give a short presentation to update the Commission about:
 - * Master plan revisions to be addressed at the next month's public hearing.
 - * Text changes to Section 4.125 Village Zone of the Wilsonville Development Code that would follow the Villebois Village Master Plan revisions.

APPLICANT PRESENTATION:

Dan Hoyt of Costa Pacific Homes entered the following two exhibits for the record:

- A letter dated May 10, 2005; from Tim Ramis of Ramis Crew Corrigan, LLP; regarding Additional Exhibit for Inclusion in LP-2005-02-006 (Exhibit 14) and LP-005-03-007 (Exhibit 4).
- May 11, 2005 Planning Commission Meeting, Executive Summary submitted by Dan Hoyt of Costa Pacific Communities (Exhibit 13 for LP-2005-02-006 and Exhibit 5 for LP-2005-03-007).

Mr. Hoyt explained to the Commission that a complete and straightforward application has been submitted to the City. He expressed the importance of having the submittals reviewed in a timely matter. As a project, Villebois is struggling to move from the planning stages into construction mode.

- He suggested that the Villebois Village Master Plan did not need to be amended, because the changes were within the bounds of the '10% rule' of changes, but since an amendment was needed to reflect the school site more precisely, Costa Pacific Communities submitted everything.
- Using the Executive Summary for LP-2005-02-006 and LP-2005-03-007 and large maps of SAP-Central depicting the existing Villebois Village Master Plan and the Villebois Village Master Plan after the proposed changes, Mr. Hoyt explained:
 - * The school site is now identified as a large purple rectangle, not an asterisk. Street access and design surrounding the school has been reviewed with City staff.
 - * The proposed changes to the Villebois Village Master Plan reflect updates to the map due to the changes made to the Specific Area Plans (SAPs) with the application approvals for SAP-South and SAP-East, including more park area and open spaces, adjustments in spacing to meet City requirements, and Living Enrichment Center (LEC) now being called the future study area.
 - * Significant changes are requested for the Village Center.
 - Connectivity is added.
 - Plaza orientation is changed to allow for better retail/commercial development and to include remodeled existing buildings into the more active commercial area of the Plaza.
 - Diversity of land use types is now more intermingled. Apartments were on either side of Barber Street, but now rowhouses will be on Barber Street. The mixed-use buildings surround the Plaza and townhouse condominiums are mixed with urban apartment types.
 - * These refinements are shown in the Central SAP applications submitted to the City ten days ago.
 - * Village Zone Development Code text changes include adding a detailed signage and wayfinding component.
- Existing Development Code language requires a detailed, actual design with elevations, floor plans, etc. for the whole SAP.
 - * Submitting these designs is not workable because the Village Center is to have a variety of uses, with a variety of unknown owners. It was difficult to design the actual buildings in an SAP submittal knowing changes would probably have to be made later.

- * Balancing the need for flexibility for developers with the City's need and Master Planner's desire to have smart growth was a struggle. The attempt was to create a process that would last beyond those currently involved.
- * A slightly different process was developed using an architectural standards document, not an Architectural Book. This document prescribes certain types of materials and appearance to be achieved in certain areas of the Village Center. There will still be requirements, but they would be flexible.

The Commissioners questioned Mr. Hoyt regarding his testimony:

Commissioner Faiman:

- Referred to the maps and asked what the large yellow triangle was next to the school site. Mr. Hoyt clarified that it is designated as estate lots.
- Asked if the West Linn-Wilsonville School District representatives had walked the site to determine that it was suitable; flat enough for a school.
 - * Mr. Hoyt responded that he was not certain that they had walked the site.
 - * Commissioner Faiman requested that this be done and a written letter from the School District be submitted before next month's public hearing.

Commissioner Guyton:

- Referred to the maps, stating that it looked as if the boundaries had been changed. Mr. Hoyt stated that no adjustments had been made to the Central-SAP boundaries.

Commissioner Hinds:

- Asked where the new language was for the Village Center Architectural Standards Document.
- Questioned if the Pattern Books would still be used.
 - * Mr. Hoyt responded that the Pattern Book would be applicable where the Village Center Architectural Standards Document is not applied.
 - * He identified the areas where the Village Center Architectural Standards would be in effect: along Barber and Villebois Drive, in the Plaza and in the courtyard between two existing buildings. Everything outside of these areas would fall under the jurisdiction of the Pattern Book.
 - * The Village Center Architectural Standards book is to be distributed as an exhibit next month to show where the different documents would be used.

Chair Iguchi:

- Inquired about the school's change in location
 - * Mr. Hoyt stated that the school's location was not specific in the original Villebois Village Master Plan, but it did request clarification regarding the location, which was determined by school bus circulation, adequate connectivity for rest of the Village, the flatness of the site, etc.
- Referring to the map, asked if the green section in front of the school was a community park and if the park was included in the ten acres needed for the school.
 - * Mr. Hoyt responded that the green section was a park. The purple section indicates the ten acre school site, with the playing fields.

Commissioner Faiman moved to continue LP-2005-02-00006 and LP-2005-02-00007 to June 8, 2005. Commissioner Hinds seconded the motion, which passed 7 to 0.

V. CONTINUED PUBLIC HEARINGS

A. APPLICATION NO. 04PC03A

Applicant: City of Wilsonville

Request: A Proposed Public Facilities Transportation Strategy, a strategy to accommodate future development while maintaining the City's and ODOT's level of service requirements by allocation of p.m. peak hour trips through the intersections of Wilsonville Road with I-5, Boones Ferry Road, and Town Center Loop West together with construction of planned transportation improvements and anticipated changes in driving habits.

B. APPLICATION NO. 04PC03B

Applicant: City of Wilsonville

Request: A proposal to change the Level of Service from "D" to "E" on Wilsonville Road between and including the intersections with I-5, Boones Ferry Road and Town Center Loop West and on portions of Boones Ferry Road adjacent to those intersections as authorized by Wilsonville Transportation Systems Plan Policy 4.1.1, and to exempt "essential government services" from all Level of Service standards.

Distributed at the beginning of the Public Hearing:

Exhibit 33: Proposed Changes to the 04PC03A May 11, 2005 PFTS Staff Report.

Chair Iguchi opened the Public Hearings for 04PC03A and 04PC03B at 7:00 p.m. and read the Legislative Hearing Procedure for the record. She called for the Staff Report.

Dave Waffle, Community Development Director, reviewed the Staff Report for 04PC03A and 04PC03B with the following additional comments:

- Copies of the Staff Report and review criteria are available on the table at the back of the room.
- He overviewed the six elements of the Public Facilities Transportation Strategy (PFTS) outlined in a An Interoffice Memorandum dated March 3, 2005 for the March 9, 2005 Planning Commission Work Session, to Debra Iguchi and Members of the Planning Commission, from Dave Waffle, regarding the Public Facility Transportation Strategy (Exhibit 16).
 - 1) Change Level of Service (LOS) for intersections in the Wilsonville Road/I-5 area be changed from LOS "D" to LOS "E" at the intersections and the volume to capacity ratio at the I-5 north and south bound ramps.
 - 2) Continue to exempt "essential government services" from LOS restraint. This was significantly debated at the last Planning Commission meeting.
 - 3) Develop a process to allow queuing of trips and to allocate them at Stage II of the development approval process. Further examples are available to illustrate how this might work.
 - 4) Changes in the Supplemental Street System Development Charges (SSSDCs) for properties creating trips through the I-5 Interchange at Wilsonville Road.
 - 5) Investment Strategy/Capital Construction, containing a number of elements, including plans for Wilsonville Road and Boones Ferry Road. The City's intentions of the Transportation Systems Plan (TSP) need to be clarified so everyone can work from the same knowledge base.
 - 6) Adopt means of capturing changes in driver behavior as a result of congestion, fuel prices, different retail/commercial/residential developments and construction. These changes need to be monitored annually to see if trips are gained or lost, in order to reallocate them.
- Mr. Waffle highlighted the information to be discussed during the Public Hearing:
 - * A Community Development Memorandum, dated May 5, 2005, from Eldon Johansen, on page 1 of 27 of the Staff Report.

- * Graphs showing the effect essential government services have had or could have on LOS.
- * Concerns expressed last month by the Commissioners about rules being manipulated to gain an unfair advantage during the Stage II approval process are to be discussed with suggestions for mitigating against it.
- * Design of potential future road improvements.

Eldon Johansen, Special Projects Engineer, overviewed his memo dated May 5, 2005, on page 1 of 27, of the Staff Report with these additional comments:

- Regarding the concern about the continued exemption of the essential government services, the following options were considered:
 - * Deleting the paragraph in the draft Ordinance calling for the exemption, as mentioned at the bottom of page 2 of 27. However, City Attorney Paul Lee opposed the deletion.
 - * Mr. Lee suggested the following language to maintain consistency for Wilsonville Development Code Section 4.140(.09)(J)(2):
 - “c. Traffic generated by development exempted under this subsection on or after Ordinance No. 463 was enacted shall ~~not~~ be counted in determining level of service for any future *non-exempt* applicant (out of Ordinance No. 561, adopted 12/15/03.)”
- City staff recommends this change in language if the Planning Commission chooses to make a change regarding essential government services.
- When the exemption was first discussed, there were three categories: exempt, essential government services, and trips that use a different interchange. All three were counted until the City ran out of trips.
- The 702 trips of capacity to be gained from the \$3.5 million project was based on the capacity, minus the existing trips, Stage II approvals and any vacant buildings.
 - * That the City was 61 trips short was because the new records were started in August 2003.
 - * In reviewing 7 years of records, an average of 37 trips per year was needed for exempt and de minimis trips.

Mr. Waffle overviewed Exhibits 27 and 28 (pages 12 and 13 of the Staff Report) reflecting Mr. Johansen's best estimates of the expected trips per year. The spreadsheets were similar to Exhibit 21 (entered into the record at the April 13, 2005 meeting) depicting various scenarios achieved from capping maximum trips obtained per year. These exhibits intended to forecast trips over a three year period.

- Exhibit 27: The number trips given to developer FM were modified.
 - * If abutting properties to this location are acquired, fewer trips would be generated from the site, therefore changing the number of residual trips each year in the scenarios given.
 - * This option allowed development to proceed more quickly because more trips would be available.
- Exhibit 28: Illustrates the effect of setting aside the number of exempt and de minimis trips that might be needed. In this example, the addition of a high school and City Hall were included.
 - * Trips were set aside for essential government services: Year 1: 81 trips; Year 2: 36 trips; Year 3: 89 trips. These were the numbers of trips City staff believed needed to be exempted.
 - * This option increased the number of developments that might have to wait an extra year to obtain all the trips needed to proceed. This occurred at all capacity levels.
- Exhibits 27 and 28 were used to show the consequence of explicitly placing exempt and de minimis trips into the trip allocation and queuing system.

The Commissioners questioned City staff regarding the Staff Report:

Commissioner Hinds:

- Asked if any de minimis trips were set aside in the two examples of Exhibit 28 which included City Hall and the high school.

- * Mr. Waffle referred to page 11 of 27 of the Staff Report which states that the high school addition was 58 trips and 23 de minimus trips. This was the average of what City staff would expect to happen. Factors were used of small trip generating uses that would generate 3 or less trips per development.
- * The exempted development includes the high school addition, City Hall; and the SMART commuter rail.

Mr. Johansen addressed the concern raised last month by Commissioner Hinds regarding potential loopholes in the system.

- Projects could be separated into several Stage II approvals prior to a master plan approval in order to capture more trips.
 - * His initial approach was language he cited from page 4 of 27, "All projects within a master plan area shall be limited to 50% of the annual capacity as determined each year per Section 4 of this Ordinance." He believed this would still allow for loopholes.
 - * He directed the Commission to Exhibit 33 (Proposed Changes to the 04PC03A May 11, 2005 PFTS Staff Report) and read the last sentence. This language would make sure that projects were correctly defined and would narrow the ability of developers to take advantage of the system. He cautioned that this could create more problems:
 - It might become so difficult for developers to proceed that smaller master plans would be submitted. Larger master plans have been encouraged because they work better as a whole and contribute to a more cohesive development.
 - He had attempted to address Commissioner Hinds' concerns, but he was not satisfied with this as a solution.
 - Mr. Waffle added that, as stated on page 4 of 27, timing restrictions could be placed on multiple Stage II applications coming from a single master planned area. This would prevent one being filed right after another. Sixty or ninety days was suggested as a time frame, but something to legitimately reflect the process, yet allow for market changes.

Commissioner Iguchi:

- Did not see how the language in Exhibit 33 was substantially different than what was in the proposed Ordinance, except for 'the combined total' stated in Exhibit 33.
 - * Mr. Johansen clarified that the definition of projects only applied to those applications with a Stage II approval.

Commissioner Goddard:

- Asked how the proposed language in Exhibit 33 would continue the exemption of government and small projects but make the trips count for larger, private developments. The language appears to state that exempted traffic generated by exempted development would not be counted for future nonexempt applicants, so would it be counted for exempt applicants?
 - * Mr. Johansen clarified that [not] would be removed and the underlined language is to be added.

Commissioner Faiman:

- Appreciated the format of the report showing the priorities to be addressed.

Mr. Waffle explained that City Engineer Mike Stone would discuss what is implied in the element of the PFTS called "invest in facilities."

Mr. Stone overviewed key areas of the TSP, adopted June 2, 2003, with the following comments:

- The section of Wilsonville Road between Town Center Loop West and Boones Ferry Road was the subject of a lot of construction and a number of studies.

- He directed the Commission to several figures of the TSP, noting the various improvements intended for the area surrounding the intersections of Wilsonville Road and I-5. These include intersection, signal lines and improvements and additional lanes along sections of Wilsonville Road.
 - * Figure 4-7 2020 *Alternative 2 Recommended Roadway Network* of the TSP shows that the intent is to have the yellow section of Wilsonville Road constructed to 8 lanes wide.
 - Figure 2.22 *Major Arterial with Dual Left-turns Street Standards*, details this section with 8 lanes including four-12' travel lanes, two-14' left turn lanes, 6' bike lanes, planting strips, sidewalks etc.
 - In total the right of way width would vary between 113-115 feet in width.
 - Exhibit 29 (starting on page 14 of 27 of the meeting packet) includes graphics showing examples of an 8-lane roadway, 185th & Evergreen in Washington County. Improvements to the Nyberg overpass in Tualatin have also been completed. This section of roadway consists of seven lanes and provides an idea of the magnitude of such improvements.
- Mr. Stone distributed:
 - Exhibit 35: A graphic, "Proposed 1-5/Wilsonville Rd/Boones Ferry Rd Alignment"
 - Exhibit 34: A graphic, "Existing 1-5/Wilsonville Rd/Boones Ferry Rd Alignment"
- He explained that these graphics isolate what currently exists on the roadway and with suggested improvements. These exhibits are enhancements of those included in the meeting packet as part of Exhibit 29. He displayed them on a large screen during his discussion.
- Exhibit 34 shows the current configuration of the roadway.
 - * The 1991 Transportation Master Plan show Wilsonville Road as being five lanes with turn lanes.
 - * A dedicated turn lane was added when the interchange improvements were done.
 - * The improvements outlined in the 1991 Transportation Master Plan for Boones Ferry Road were exceeded with the addition of two dedicated left turn lanes onto Wilsonville Road.
 - * No improvements were shown on the south side of Boones Ferry Road other than those made during the redevelopment of the Lowries Marketplace.
 - No significant improvements were made along Boones Ferry Road with that project, given the restriction on the number of trips matching the old use.
- Exhibit 35 shows a compilation of improvements along Wilsonville Road in conjunction with two developments:
 - * The \$3.5 million project is currently in the budget and plans have been prepared to be submitted to ODOT that include:
 - Reducing the width of the islands on the west and east sides of the interchange to allow Wilsonville Road under the freeway to be re-striped, and enable 2 left turn lanes westbound to southbound onto the southbound I-5 ramp.
 - Two left-turn lanes will go from eastbound Wilsonville Road to northbound I-5 ramps.
 - Addition work will occur for two left- turn lanes off of the northbound off-ramp to westbound Wilsonville Road.
 - These improvements are currently in the design and are expected to begin this fall.
 - * These improvements were determined by the Fred Meyer traffic study and are shown as a yellow dotted line on Boones Ferry Road and where Boones Ferry intersects Wilsonville Road. It entails the same improvements shown in the TSP:
 - An additional left-turn lane off westbound Wilsonville Road to Boones Ferry Road.
 - An additional southbound lane and northbound right turn lane on Boones Ferry Road will be necessary.
 - Fred Meyer has requested that the City review the possibility of adding another lane on Boones Ferry Road, with a separate right-turn lane. Then, there would be 2 northbound right turn lanes on Wilsonville Road.
 - * Additionally, the TSP called for a dedicated right turn-only lane onto southbound I-5. It is shown to be extended across Boones Ferry Road and constructed on the west side of the intersection.

- Ultimately there would be two additional lanes on Wilsonville Road and three additional lanes on Boones Ferry Road and one additional lane and related island work on west side of intersection.
- The planned improvements are extensive and the roadway would be quite wide. Getting pedestrians safely across a seven or eight lane roadway was one of the problems being reviewed.
 - * Pedestrian refuges and landscaping islands along Wilsonville Road are being considered, but each additional foot added for these amenities must come from somewhere.
- In Fred Meyer's first application, it was determined that the improvements - the five lanes along Boones Ferry Road would go as far south as their main driveway, which is about 400-500 feet south of Wilsonville Road.
 - * Boones Ferry would taper into the three-lanes, as required by the TSP, near Bailey Street.
 - * There is no intention to install a signal at Bailey Street.
 - * Substantial changes would be needed to the signal at the Wilsonville/Boones Ferry Road intersection. Due to the width of the roadway, a signal bridge is anticipated but this is to be determined as design plans developed.

The Commissioners questioned Mr. Stone regarding his testimony:

Commissioner Goddard:

- Asked why wasn't there two right-turn lanes from westbound Wilsonville Road to northbound I-5; at least a dedicated right-turn lane and an optional right-turn lane. He suggested that this area seemed to be a continuing bottleneck and that every other direction on and off Wilsonville Road to I-5 had a least two optional lanes to turn. Mr. Stone responded:
 - * Drivers were not crossing opposing traffic during a left- turn. Vehicles heading eastbound on Wilsonville Road turning onto northbound I-5 must cross in front of traffic.
 - * Right turns are allowed on red.
 - * While warrants are agreeable for drivers to make that movement without much of a delay, but having two lanes could be reviewed further.
- Asked if there are only two options for getting onto I-5 northbound from Wilsonville Road westbound? Mr. Stone replied:
 - * There is only one westbound and one eastbound.
 - * The City is planning to add another eastbound turn lane to northbound I-5 resulting in two turn lanes. The outside turn lane would give the option of going straight or turning.
- Wouldn't the same approach work for westbound Wilsonville Road movement to northbound I-5? Commissioner Goddard suggested that this would increase the through traffic without an additional lane.
 - * Mr. Stone stated that traffic reports were not indicating any kind of a significant delay.
 - * He was curious to see how the ramp meter will impact traffic flow along Wilsonville Road.
 - * Commissioner Goddard suggested that traffic would only get worse.
 - Mr. Stone agreed but suggested that ODOT would never be convinced of that.
 - He is concerned about the trucks being stopped by the ramp meters half way up their acceleration lane. Trucks are already having difficulty getting up to speed to merge into traffic flow on this on-ramp. With the ramp meter, the distance would be cut in half.
 - Chair Iguchi added that the allotted space is only about the length of one truck.

Commissioner Faiman:

- Pointed out that once there are two left turn lanes from eastbound traffic going north, then the free right turn lane from westbound Wilsonville Road to northbound I-5 disappears because cars will be turning into that lane. It works right now since there is only one lane coming off of eastbound Wilsonville Road.
 - * Mr. Stone agreed that when two left turn lanes are constructed, it would remove that option.

- Asked Mr. Stone to outline where the \$3.5 million improvements stop and give a price estimate for everything west of that.
 - * Mr. Stone indicated that the \$3.5 million improvements include the work on the section of Wilsonville Road between and including the work on the islands just to the east and to the west of the I-5 interchange.
 - * Mr. Stone estimated the work west of the \$3.5 million project to cost about \$7-8 million. This would include redoing Wilsonville Road through the intersection with Boones Ferry Road as well as the work on Boones Ferry Road.
 - * Mr. Waffle added that within the investment element it was uncertain what elements would be done and when.
 - These might be dependent upon some ODOT funding.
 - Most of the work at the Boones Ferry Road/Wilsonville Road intersection would be dependent upon the construction of a Fred Meyer store, or something else on that site, to generate those kinds of trips.
 - At this time, the only certainty was the \$3.5 million project.
 - * City staff was reviewing what capacity would be available if only a portion of the improvements were completed. The City Council had inquired about capacities along Wilsonville and Boones Ferry Road if only seven lanes were constructed instead of eight; or making Boones Ferry Road four lanes instead of five lanes.
- Asked how much of the lane expansions are for stacking capacity. If a very high volume traffic development were built on the west end of town, for example, would the other \$7 million in improvements still be needed?
 - * Mr. Stone responded that the \$3.5 million improvements along Wilsonville Road were all improvements for vehicle stacking capacity.
 - * Yes, the other improvements would still be needed even if the timing of development were out further. There is still a lot of undeveloped areas along Wilsonville Road.

Commissioner Goddard:

- Suggested that it would be useful to know the amount of investment offset by curtailing the eight-lane approach to a seven-lane, or a five-lane to a four-lane approach. How would scaling back affect the \$7 million estimate?
- These were dramatic changes to that area in terms of impact to the community, pedestrians, potential bicycle traffic, etc. It would be useful to know if alternatives were available and what the trade-offs would be in terms of the investment component.

Commissioner Hinds:

- Noted that Exhibit 35 shows four lanes in red on Boones Ferry Road beyond Fred Meyer's main driveway, though Mr. Stone had indicated that Boones Ferry would taper to three lanes.
 - * Mr. Stone responded that there would be three lanes for cars and then a parallel parking lane.
- Asked if TSP Project C-17 "Brown Rd Extension from Wilsonville Road to 5th Street" as listed in Table 4.p *Short Range Plan Projects and Estimated Costs* and TSP C-14 "Kinsman Road extension from Wilsonville Road to Brown Road (5th Street) extension" as listed in Table 4.1 *Mid-Range Plan Projects and Estimated Costs*, was part of the Capital Improvements Program (CIP) and if it had been taken into account. She suggested that half of the people in Wilsonville live on the west side and may use that extension to get to Fred Meyer.
 - * Mr. Stone confirmed that it had been taken into account and that there was adequate capacity in the three-lane section, whether the Brown Road extension came in at Bailey or 5th Street. He suggested that if the Brown Road to Boones Ferry Road extension came in at Bailey Street that the three-lane section south on Boones Ferry Road be not be needed.
- Asked where Project C-17 or Project C-14 might be in the CIP.

- * Mr. Stone confirmed that they were not in the 2005-2006 CIP. Until a master plan was done for the last section of undeveloped property south of Wilsonville Road and east of the railroad tracks, it could not be determined where Project C-14 and Project C-17 would fall.

Chair Iguchi:

- Questioned what kind of development there would be if none of the improvements were done on Boones Ferry Road.
 - * Mr. Stone said he would review that scenario.
- She appreciated the review of the TSP.

PUBLIC TESTIMONY:

Jack Kohl, P.O. Box 145, Wilsonville, OR 97070. Mr. Kohl made the following comments:

- 1) He was opposed to including the essential government services in the trip counts. Previously, Attorney Michelle Rudd testified that the Kohl's supported the Staff Report as presented at the April 11, 2005 Planning Commission meeting.
- 2) He believed the queue should start with the payment date for the traffic study controlled by the City. Developers have no control regarding when the traffic study is done as they prepare for a Stage II approval. He suggested that money is paid for the study on a fairly large project can take a long time, meanwhile, a smaller development comes in and gets the study done first.
- 3) He was concerned about the language in the third bullet point of Exhibit 33.
 - * The Kohl's have a master plan and a Stage I approval for property in the Wilsonville Square 76 area. There are two owners of property in this area: Fred Meyer and the Kohl Family. The Kohl Family does not want to their trips to be combined with Fred Meyer's total for Stage II projects. Because both Fred Meyer and the Kohl Family are preparing Stage II applications, the language in Exhibit 33 would not work.
 - * The language intention seems to control one owner splitting a property into a number of small units. For example, the Kohl Family show three buildings in their development. If those buildings were separated into three separate ownerships, the language would prevent applications for three separate traffic studies rather than one study.

Commissioner Faiman:

- Asked for clarification regarding the third bullet of Exhibit 33 and how it related to the previous text.
 - * Mr. Waffle stated that language was intended to be a restatement of the language at the top of page 4 of 27 (in the meeting packet). This language was in response to the concern expressed at the April 13, 2005 meeting about multiple projects trying to take advantage of their position in the queue.
 - * The City staff did not necessarily recommend it, but the language was offered to help the Planning Commission address that concern.
- He thought the bulleted language should just be indented, since it was actually rewording something referred to in the second bullet.
- He was unclear why Mr. Kohl objected to the language in Exhibit 33. Mr. Kohl explained:
 - * Hypothetically, if Fred Meyer 300 trips and the Kohl Family had 200 trips, and if the number of trips assigned to Villebois would be removed leaving some for everyone else; then combining the Kohl and Fred Meyer trips would result in 500 trips, which would be split in half.
 - * He said that his property was a lot smaller at 29,000 square feet versus Fred Meyer's 180,000 square feet. He would not get any trips with the proposed language.

George K. Morris, SPM Wilsonville, P.O. Box 10638, Eugene, OR 97440. r. Morris stated that his company had recently purchased the Wilsonville Town Center. He said that while SPM Wilsonville supported some aspects of the applications, it opposed them as a whole due to the following concerns:

- In acquisition of the property, there is additional undeveloped property available for SPM to acquire from Capital Realty Corp., based on whether the necessary trip count could be delivered to permit the adequate development of those sites. SPM opted out of some of the property, but did acquire some of the undeveloped property; so SPM Wilsonville would be a candidate for more trips.
 - * As an existing property owner, SPM Wilsonville is concerned about being shut out of further development of their remaining property.
 - * He is concerned about the 50% standard mentioned. Theoretically, with two applicants, any additional capacity created would be gone.
 - * Another interpretation would be to keep fractionalizing the trips, i.e. a 1/2 of a 1/2, of a 1/2, etc. It would work for SPM Wilsonville if that standard were 25% rather than 50%.
 - * Mr. Morris expressed concern about the livability and drivability of Wilsonville Road in the subject area and questioned exempting essential government services that already exist.
 - * He suggested distinguishing between existing and future uses. This would provide the emergency ability to bring on a new essential government service, and it would make sense to exempt it. But to indulge in a fiction that there are no trip counts actually impacting the intersection was unwise.

Commissioner Goddard:

- Asked what Mr. Morris' position was regarding whether the traffic queue position should be established at the time an applicant pays for a traffic study.
 - * Mr. Morris responded that they had no objections to the queue concept and agreed with Mr. Kohl's comments regarding when applicants entered the queue.

Dana Krawczuk, 101 SW Main Street, Suite 1100, Portland, OR 97204. Ms. Krawczuk reviewed the themes she discussed at last month's hearing and reiterated the primary issues of her client, Joe Angel. She stated that it boiled down to fairness, especially regarding the following:

- There are two unique properties in Wilsonville that have partially developed master plans: Mr. Angel's Chili's/Burger King development and Mr. Kohl's property. Special exemptions should be made for them so their position in the queue reverts back to when their master plans were approved.
 - * As part of the Chili's/Burger King development, Mr. Angel made significant dedications to the public transportation system. His site was uniquely suited to accommodate the final phase of his development, which has been unable to go forward because of the lack of traffic capacity.
 - * Given his patience, he has been there since 1984, and the contributions made to the transportation system, she stated that fairness and equity required that he be given a special place in the queue.
 - * In their report, City staff questioned how to determine the number of trips Mr. Angel was entitled to.
 - An estimate was given in the 1980s of what the phase would be, but more information can be provided to assure the City of the number of trips needed.
 - * The key point was that the position in the queue be determined by the date of the master plan approval, not when Stage II approval occurs.
 - * Tying queue position to Stage II approval was a one-size-fits-all approach that was not appropriate for these few unique properties.
- How would the City ensure that smaller developers get some of the trips in the queue and have the opportunity to develop?
 - * With one or two large developers that take up 50% each of the trips and with essential government services included, there was a real possibility that smaller developers may not be able to develop.
 - * If the City was considering a policy to share trips, the trips needed to be allocated to ensure actual sharing.
 - * As in last month's testimony, she suggested starting with how many trips were given to small developers first, rather than starting with the number of trips allotted to larger developers. It used the same 50% allocation, but the smaller developers would be first in line.

- City staff said they would consider having more than one traffic engineering firm review City projects, but did not want to include it in this package. She suggested that once trips were made available, there would be numerous Stage II applications filed and this would be a good time to consider the number of traffic engineers used for those applications. The timing needed to be carefully considered.

Joe Angel, 1001 SW Water Avenue, Portland, OR 97214. Mr. Angel stated that he had dedicated a small building from his property on Wilsonville Road to the Chamber of Commerce years ago.

- He has tried to develop the Chili's/Burger King on his property over time.
- He did not want to characterize that prioritization his position in the queue as special, but as fair.
- He believed the priority system should go back to the date the two pieces were developed.
 - * At that time, property was dedicated and paid fees for system development.
 - * Having done the dedications, he believes he deserves to be placed higher in the queue.
 - * He was uniquely different in having contributed to make the system work as it does today. He just wants to finish the project.
- The queuing must recognize these dedications which benefited not only himself as the developer, but others also. This should be the test for determining positions in the queue.
- He wanted to have a certain percentage of trips for smaller developers, who create jobs in a community. As a smaller developer, he did not have the same funding available to Fred Meyer.
- He wasn't opposed to the Fred Meyer or Kohl's developments, but he did not want to be locked out, where large developers take all the trips after he had contributed land to make the system work 15 or 20 years ago.
- Regarding the traffic study issue, he believed competition kept everyone honest. Having one provider was unwise and created time and cost efficiency issues. The City should demand a certain quality of work and provide a list of qualified traffic engineering firms that developers could contact to find the engineer that best suited the needs of each developer. This would allow developers to bargain for pricing, etc.
- He did not have anything to share regarding the PFTS, though he believed the City was trying to "hide the pea," but that was their business.

Commissioner Hinds:

- Asked if Mr. Angel had Stage I or Stage II approval for the final phase of his master plan.
 - * Mr. Angel responded that he did not have a Stage II.
 - He explained that he did not create the system. He had tried to develop his property as he could afford to do it and as there were trips.
 - Part of the property has been developed, which was part of his argument, and he had contributed to the system, which was unique. He was willing to add more information if the City required it.
- Asked how he would define the small versus large developer.
 - * Mr. Angel explained that he had contacted Wayne Kittleson who had done traffic studies for Mr. Angel previously. Mr. Kittleson reported that a different system was used in Vancouver or Clark County for their traffic studies depending on the size of the development.
 - * Mr. Angel offered the Commission the memo received from Mr. Kittleson, providing a rule of thumb for defining small and large developments.
 - * As Mr. Angel recalled, anything under 100 trips was considered small within the industry. In Clark County, the bigger the development, the further out they had to go to conduct their traffic study. For example, a big developer's traffic study, such as Fred Meyer, may need to encompass two miles, but a small development with 5000 square feet of retail space may only have to conduct their study to the next stoplight. He suggested that Clark County liked this system.

Commissioner Faiman:

- Suggested that Mr. Angel had contradicted himself; stating he was a believer of competition yet those were the same arguments used for having the Stage II permits in. This showed that the developer was willing to invest in Wilsonville and should get the trips.
 - * Mr. Angel agreed that he had inadvertently argued both sides of the coin. However, he pointed out that he had also made dedications and had paid into the system, which no one else had done.

Jim Coombes, Fred Meyer, 3800 SE 22nd Avenue, SE., Portland, OR 97202 Mr. Coombes commented on Exhibit 29 "Proposed I-5/Wilsonville Road/Boones Ferry Road Improvements" aerial photo included in the meeting packet:

- 1) The lane configuration on Boones Ferry Road, south of Wilsonville Road was not part of the Fred Meyer application. This was one possible solution to gain trips for the development south of Wilsonville Road. Other options are available:
 - * Another option would involve one less dedicated right turn lane. If Fred Meyer could add a lane south of the first access point, on their side of the street and extend it down toward the church and the Albertson's entrance, two dedicated lanes would not be needed at that intersection. Instead of tapering the lane, continue it as a full lane
 - * The Boones Ferry Road/Wilsonville Road intersection would not need to be as wide as demonstrated in the photo.
- 2) The representation of Wilsonville Road improvements merely indicate what was already approved two years ago in June 2003 as part of the TSP.
- 3) Private contractors had reviewed the improvements and the cost estimates seemed closer to \$6 million rather than the previously stated \$7-8 million. These improvements would ultimately be paid for by private development through fees and the increased tax revenue the City would gain from the increased value to the improvements on these properties.

Tanney Staffenson, Lamb's Thriftway, 8255 SW Wilsonville Road, Wilsonville, OR 97070. Mr. Staffenson stated that the City had always managed the growth of the City well.

- Over the years, there has been negative feedback from Lamb's Thriftway customers about traffic. This was based on what customers are experiencing today, without any thought to future growth.
- Comments are made about what roads are being avoided due to back ups, etc.
- Some of the comments heard at the 1995 Future Search Conference were about traffic congestion issues. Attendees were determined to try to change these conditions in the future.
- As a retail business, more traffic is more negative than positive. Customers should easily be able to get to and from businesses and have a good flow, no matter how they go about it. The standard of measurement in Mr. Staffenson's industry was based on customer counts, not trips.
- A new food department at Fred Meyer would require approximately 85% of the customer base currently served by Albertson's and Lamb's Thriftway. Everyone would fight to gain his or her share of that customer base. Most likely, the marketplace would expand. His preference was to serve the needs of the customer of the Wilsonville Community as they have and especially in the future.
- This was not really about competition, it was good for everyone. It improved operations and awareness about what was happening in order to serve customers better. But too much retail is not always a good thing. Centers are left half-vacant and everyone at the retail level struggle in the market place.
- Will changing the LOS have a positive impact on the community as a whole? Currently LOS D was already higher than some other communities. The standard in Wilsonville was high and one should never be asked to lower one's standards or expectations.

Commissioner Faiman:

- Called for testimony from Ben Altman even though he had not signed up to testify.
- Explained that Mr. Altman had a long history with the City and had participated as a citizen on a number of Boards on which they had mutually served.

- He respected Mr. Altman's opinions, though he took exception to the document produced by Mr. Altman for the public hearing. (Exhibit 32)
- Asked if Stage II projects are required, as stated in Exhibit 33, would Mr. Altman reconsider his response in Exhibit 32 about giving existing developers some sort of priority?
 - * Mr. Angel had testified for prioritizing the small developer trips, not necessarily an existing developer.
 - * Mr. Altman had responded that competition was needed; the first one in was who should get priority in the queue.
- Also at the end of Exhibit 32, Mr. Altman mentioned a special consideration for Old Town, because there was only one way out. How would he entail making that special consideration work?

Ben Altman, P.O. Box 4063, Wilsonville, OR 97070. Mr. Altman stated that the first issue about the master plan was a reconsideration of what was originally written in the letter (Exhibit 32). At that time, they were not considering Wilsonville Square.

- After reviewing the language this evening, he realized that Wilsonville Square was a prior approved master plan similar to what Mr. Angel discussed. Prior development had occurred there, including apartments built by Jack Kohl. This wasn't considered in terms of the combined impact of multiple Stage IIs within one master plan.
- It is a very complicated mess. He was not sure how to resolve the issues.
- If a special clause were included, similar to what Mr. Angel discussed, it would simply be the Kohl clause. It doesn't matter what the City does, as long as Mr. Kohl receives his trips.
- When the idea of master planning was raised by one of the Commissioners, it caught our attention, but we were thinking toward the future, not previous projects and we got caught in our own trap. He would withdraw that point. His concern is about being lumped into a single master plan with Fred Meyer where the cumulative Stage IIs would count against us.

Commissioner Faiman:

- Based on quality of life issues, is the community better to finish developments that have started, or to open things up and end up with some moratorium where we have half finished developments all over the southern part of town.
 - * Mr. Altman responded that in his opinion, quality of life was not linked to any one development. It was a cumulative community aspect. Any time development was limited; quality of life was impacted negatively on one hand while benefiting it on the other. Traffic was a negative to quality of life, however opportunities for jobs, shopping and the availability of local goods and services was a real plus for any community, versus having to leave town for half of what one person needs or wants.
 - * He believes that more development in Wilsonville will result in a better quality of life cumulatively, even with congestion. Congestion occurs now when people leave town to go shopping.
 - * This was one problem pointed out in the traffic study problem. Those trips are already there. People are leaving to shop, if a store is added here, they don't leave town, but the road system is affected differently. The only new trips are from residential development and new employment. Trips are simply being shuffled.

Chair Iguchi:

- Noted that Mr. Altman referred to the Fifth Street to Brown Road connector in his letter, but didn't believe it was called that elsewhere.
 - * Mr. Altman agreed that the City had not committed to that direction, the east/west connector. He was simply pointing out that it was a very similar situation to the old Day Dream Ranch issue where Memorial Drive was constructed to vent an area with only one way in and out.
 - * A similar bottleneck occurred where Parkway Avenue connects to Wilsonville Road.

- * It was an issue that could not be solved by any one developer in the area, as was the case with Day Dream Ranch.
- Appreciated Mr. Altman's suggestion to developing alternative crossings of I-5 to promote connectivity as a priority and that the City could not afford to only invest in the Wilsonville Interchange.
 - * Mr. Altman responded that the City was working toward solutions, but if the trip counts are the major focus for solving the problem at Wilsonville Road, the problem would never really be resolved. The City was already struggling with the TSP approved not two years ago and was now second-guessing whether that was what it really wanted. The original Comprehensive Plan had every arterial in the City 120 feet wide. Though that was quickly thrown out, arterials are not too far from that now, at about 110 feet.

Commissioner Goddard:

- Questioned how to avoid combining the Fred Meyer and Kohl properties, while not allowing the separation of Kohl LLC 1, Kohl LLC 2 and Kohl LLC 3 immediate adjacent to one another.
 - * Mr. Altman answered that the City could follow their original request in 1995 to repeal the Wilsonville Square 76 master plan, which is a useless document, but binds the Kohl development to a 1973 plan, which no one can build or wants built. This would relieve the master plan link in that case.
 - * The only reason for their concern was that they do have a Stage I master plan that combines the Fred Meyer and Kohl site together.

Chair Iguchi closed public testimony at 8:42 p.m.

The Commissioners discussed 04PC03A and 04PC03B.

Commissioner Juza:

- Stated that the Planning Commission needed to focus on what they were really charged to do.
- Agreed with portions of Mr. Altman's letter stating that the Commission was to consider a PFTS that accommodated more growth, not to figure out how to limit growth.
- Added that the Commission needed to accommodate those who had waited patiently for years to develop their land; to do it responsibly while maintaining Wilsonville's high quality of life.
- Wanted to address the issue of using DKS Associates as the sole traffic engineer at some time in the future, because it had been brought up a couple of times during testimony.
- Suggested compiling a list and putting some projects out to bid. Even if the City continued to use DKS Associates, there would be competition which could help developers manage the cost of the studies. DKS Associates seem to be charging too much and taking too long to complete their work.
- Supported City staff's recommendation to move to LOS "E".
 - * Even if the road improvements were completed and there is still a lot of congestion, driving habits would not change without some level of discomfort. She believed that faced with the choice of waiting in line at the intersection or taking alternative routes, drivers would choose the latter. Without moving to the lower level of service, drivers would not pursue other alternatives, which might include bicycling, SMART or other forms of transportation.
 - * Cited high gas prices as an analogy to traffic changing driving habits. People are trying to carpool more and use their car less, or are getting a more fuel-efficient vehicle.
 - * She did not see the change in the Level of Service Standard as entirely negative.
- Disagreed with the move for not exempting essential government services.
- After considering the percentages and trip allocation, agreed with City staff's recommended allocations of 50%.
- Agreed with Mr. Altman regarding the shuffling of trips.

- * The number of trips generated from homes and subdivisions in the area had not been deliberated or discussed. Building a Fred Meyer store would not drastically increase trip levels because much of their customer base came from those stopping to shop while coming home from work, picking up kids' from schools, etc.
- Did not believe that many more trips would be created because of the new Fred Meyer store; the impact would not be as bad as most anticipated.
 - * People would not shop more because there was a new Fred Meyer. A family's demand for goods and services was pretty consistent. If a new baseball glove is needed, they will go get one, either at Fred Meyer or by traveling up I-5. Either way they are still creating a trip through those intersections.
- She noted that citizens who hated the traffic and were opposed to development had given no testimony. This also needed to be considered.

Commissioner Maybee:

- Stated that Commissioner Juza's had articulated his position very well.
- Agreed with the change to LOS "E."

Commissioner Guyton:

- Appreciated the aerial photographs provided by City staff. Her initial reaction in seeing 185th example was that it was absolutely unacceptable to her.
- She was very reluctant to widening Wilsonville Road to eight lanes, as she did not know that it would solve that many problems.
 - * Bicyclists and pedestrians already had difficulty crossing Wilsonville Road now, which would only worsen if the road were wider; essentially cars were just being stored for I-5.
 - * She referenced the expensive improvements in Tualatin for the Bridgeport mall. It was essentially a parking lot and drivers still could not get onto I-5.
- Believed I-5 was the problem, and a regional one; widening Wilsonville Road to eight lanes would not solve the issues.
- There was congestion now and it would get worse especially when trucks had to navigate the traffic ramp meters. She supposed that congestion would be alleviated somewhat with the \$3.5 million project in that there would be two lanes. But there were problems now, even without the traffic light.
- Mentioned that changes in traffic that would occur with the Barber Street and Boeckman Road extensions had not been considered. This would provide more options for drivers to get from one side of town to the other.
- Other ways to get across the freeway had been discussed in the past; drivers are not able to get on or across I-5.
- Agreed with Mr. Staffenson of Lamb's Thriftway that an additional big box development would have to draw from other parts of the community and outside town to survive. Fred Meyer's was not a typical grocery store, but nor was Albertson's.
- Believed that Mr. Kohl and Mr. Angel should be given special consideration, though she was unsure how to do it fairly and equitably.
- Suggested that the level of service must suffer to allow the new traffic patterns to progress; they would change significantly.
- She added that when the original Comprehensive Plan was done, 70,000 people were anticipated to be in Wilsonville and the City was not there yet. Mike Stone had noted that the TSP discussed Wilsonville Road being eight lanes, but that was for 2020.

Commissioner Goddard:

- Stated that a solution must include a number of elements, no single answer would solve the problem. A comprehensive approach was warranted and should include:
 - * Thoughtful improvements to connectivity in Wilsonville and I-5 crossings.

- * As discussed, allowing the level of service to decrease and the congestion to increase will have to happen for people to change their driving habits. There was not as much elasticity available in driving habits as many believed. Improvements to the connectivity and improved ways to get across I-5, which could include road expansions along Wilsonville or Boeckmen Road, or another I-5 crossing south of Wilsonville Road, might be considered for the future.
- * A fair and equitable allocation to capacity.
- * Giving priority in a queuing system, if established, to those who have made an investment or prior commitments. All desired uses may not be equal, so it might be appropriate to treat some applicants in a unique way.
- * Meaningful efforts to manage demand at constrained intersections; including working with existing businesses and employers to help shift demands to off-peak periods or encouraging alternative modes of transportation to relieve congestion.
 - Demand shifts should also include efforts to relocate developments to other parts of the community that could more easily support the infrastructure demands made by that development on the community.
 - Discussion should occur between the City and applicants to find alternative locations that accommodated the desired development and avoid placing the demands on an infrastructure that cannot handle them.
- * Recognizing the needs of the community such as bicycle and pedestrian access.
- * A fair and transparent approach to determine both existing and projected traffic demands.
- * A balance between large and small developments as well as residential, commercial and industrial projects. He was unsure how to strike the appropriate balance.
- * A balance was also needed to offset the impact to the community resulting from road improvements required to accommodate desired development and the benefits new developments provide to the community.
 - Would Wilsonville citizens agree to the further erosion of the level of service, or a further increase in traffic congestion in return for additional retail shopping opportunities? This is a choice the City Council will have to make and be accountable for.
- * Decreasing the level of service is only one component of a comprehensive solution.
- Is not convinced that essential government services ought to be exempted, particularly if the Level of Service Standard is changed to LOS "E".
- Supported having a pre-approved list of engineering firms to meet needs of developers and City.
- Believed it might be appropriate to set aside trips for small development and possibly give them some allocation of the available capacity up front.

Commissioner Faiman:

- Overviewed the exceptions he had to the comments made in Mr. Altman's document (Exhibit 32):
 - * He disagreed that this was a short term strategy. The Commission needed to be extremely cautious about the decisions made this evening. If we go from LOS "E" to LOS "F", it will never be changed. There is nothing short term about it.
 - * He disagreed that the reason for the PFTS was to accommodate growth. The reason for the strategy was to be fair about accommodating growth under conditions of potential moratorium.
 - * He also disagreed that too many trips were set aside for Fred Meyer; that they wouldn't really require that many trips. He accepted that no new trips would be created as drivers changed where they shopped for goods within Wilsonville, but pointed out that Wilsonville was the most southern point of Metro and people within the rural area south of Wilsonville on I-5 drive here to shop. Those were the people Mr. Staffenson referred to who are already complaining about the traffic here.
 - If there was too much traffic in southern Wilsonville, shoppers would stay on the freeway longer to do their shopping in north Wilsonville or further north.

- If Fred Meyer was developed, how many people coming from the south on I-5 who are currently going to points further north would now be getting off in southern Wilsonville? This would make a huge impact in terms of new trips. Those new trips are going to come primarily from outside of Wilsonville.
- Took exception to Commissioner Juza's comments that no citizens were complaining about traffic. He stated that four of the Commissioners complained last month as citizens and had all been in heated discussions with Wilsonville citizens about traffic issues. Everyone who lives on the south end of town is concerned.
- Recalled a previous discussion when Commissioner Juza commented that one of the reasons their business, which was trucking intensive, relocated to Wilsonville was because they couldn't move their trucks on the Tualatin/Sherwood Road and were paying employees to sit in a parking lot. They wanted to be in Wilsonville to move trucks in and out.
 - * He found her testimony contradictory to her earlier remarks. If those trucks were going to be struck in traffic for two hours per day, was the business going to move elsewhere, then?
 - * He explained that he was not picking on Commissioner Juza, but noted that she lived on the north end of town and her business was located there also.
- Agreed with both applications with the changes submitted in Exhibit 33. He agreed with Commissioner Goddard's comments that a fair and transparent process was needed but to do that essential government services must be counted in the total number of trips.
- Believed actions taken by the Commission regarding the PFTS would set the tone for the future of Wilsonville like nothing else. Wilsonville has already been a pro-growth community and should remain pro-growth, but growth must be managed in a way that pleases Wilsonville's citizens. Each decision must be tested: will this make Wilsonville better or at least leaving Wilsonville as good as it is now when the decision is made. If it does not pass that test then it cannot be done.
- Understood the reasons for moving from LOS "D" to LOS "E".
 - * Changes in driving behavior will be motivated by the growing congestion on I-5 because it is only going to get worse. The State has some responsibility to resolve the problem.
 - * This problem doesn't have to be solved by the City and our intersections do not need to be ruined by I-5 traffic to get drivers to change their driving habits.

Commissioner Hinds:

- Suggested that the Commission's job was not to accommodate growth but plan for development to meet the Comprehensive Plan's requirements for infrastructure to accommodate growth.
- Supported changing LOS "D" to LOS "E".
 - * Hearing Mr. Altman's and Commissioner Juza's comments had changed her mind about changing to LOS "E". Doing so would force driving habits to change like nothing else could.
 - * With or without this plan, the City might end up in a moratorium because growth was happening that fast.
- Commented on the irony of developing a Bicycle and Pedestrian Master Plan while discussing making Wilsonville Road eight lanes wide. Even with a refuge, pedestrians crossing the road would be stranded on islands, with both people and cars waiting for lights to change.
- Suggested that to change driving habits, the eight lanes on Wilsonville Road should not be built and not be part of the PFTS.
 - * Mr. Waffle clarified that the draft Ordinance language in the April 13, 2005 Staff Report, on page 28 of 41, described three construction options:
 - A. Modify the interchange to do the \$3.5 million project already on approved.
 - B. Modify the Boones Ferry/Wilsonville Road intersection to increase capacity, when the capacity is required.
 - C. Conduct an alternative analysis for the future widening in the TSP to determine if other options were available that provided better results with minimal increased impact on the area.

- * This was how the Ordinance came from City Council. City staff is not certain what the \$20 million project should look like, nor its timing; it needs more study.
- * Even if the Commission or the Council approved the language as stated, the City was not committing to the \$20 million project at this time.
- Asked if the \$3.5 million improvements for the Wilsonville Road/I-5 interchange are in the TSP.
 - * Mr. Waffle replied that it was in the design stage and would go to bid this fall.
- Getting people to change their driving habits require making it very hard to use cars in the City. However, there was a good chance that driving habits could change and the use of alternative transportation be increased because bicycle and pedestrian facilities are being planned concurrently.
- Strongly supported reserving trips for small businesses.
 - * One large business could garner all the trips, shutting out smaller businesses that greatly benefit Wilsonville.
 - * She was unsure if 50% was the right percentage, but felt 50% could be used with a clear definition of a small versus a large business/development.
 - * She questioned if these definitions need to be determined this evening.
- Agreed with City staff's recommendation to queue development by the date of Stage II Approval versus the master plan date. Traffic studies were more clear and accurate at the Stage II, and master plans have been known to change. A master plan was not a good indication of what would really transpire or what trips would be generated.
- Agreed with Commissioner Goddard and Commissioner Fairman that essential government trips should ~~not~~ be counted in the future.
 - * It was interesting that no other cities working with DKS Associates exempted those trips. The trips were a reality and impacted traffic. If that resulted in LOS "F", it resulted in LOS "F".
 - * Stated it was unfair to go back to developers with approved Stage II plans and count those trips against their phased developments.
- Agreed with the suggestions in Exhibit 33.

Chair Iguchi:

- Questioned why City staff still recommended that government trips be exempted when it was not done in other cities.
 - * Mr. Johansen answered that he had tried to balance the Level of Service Standard against the development community. The exemption was recommended so that when an essential government service was approved, it would not penalize the development community, locking them completely out of the process.
- Clarified that if the City insisted on counting government trips, it would eliminate projects; they would not be able to move forward.
 - * Mr. Johansen responded that development would slow down, unless the capacity substantially increased.
- Asked what was the impact or problem was with having an approved list of other [traffic] engineers for developers to choose from as suggested by Ball Janik. Mr. Johansen responded:
 - * The City was not staffed with a professional traffic engineer to review the traffic reports.
 - They depend on DKS Associates to do that as well as keep the overall records of each development within the City. As a new development comes in, DKS Associates adds it to the records and a database does not have to be recreated.
 - The City would have to figure out how to coordinate information from several consulting firms.
 - * He offered, as an example for delayed reports, that when working on the PFTS, he had pulled DKS Associates from doing traffic reports to get the PFTS finished. He stood by his decision because if even someone had a completed study, they would have been waiting anyway.

- * Mr. Johansen and Mr. Stone are responsible to a number of people and for a number of projects. Though part of the traffic study delays may have been due to DKS Associates, other projects can take priority when an application comes in for review.
- Asked how many lanes were at Exit 290 to accommodate the Bridgeport mall.
 - * Mr. Waffle was not certain but stated the previous description was accurate. A massive lanes number of lanes were added. The Nyberg Road/I-5 interchange had seven or eight lanes.

Chair Iguchi and Commissioner Guyton shared related stories about how much longer it took to reach I-5 even with the so-called improvements in different areas.

Chair Iguchi:

- Reiterated Commissioner Hinds' comment that master plans do change. Mr. Altman's letter discussed that five to seven lane streets were planned for all the major arterials of the City. Subsequently, the City had found that many lanes are not necessary west on Wilsonville Road, keeping it to three lanes. She believed the issue needed to be reviewed further.
- Was very uncomfortable about moving forward on the PFTS, because there was so much yet to be determined.
- Suggested that the other commissioners were more comfortable about moving forward.
 - * The issue of master plan areas had been fully addressed, which could go either way given old and new master plans.
 - * Where does the individual owner of a master plan fit in.
 - * How does the City account for the fairness? Where do small and large business diverge; and does the allocation of trips begin at the bottom or the top.
- Heard consensus on saving trips for small development and heard testimony that the large developers don't want the small businesses using up all their trips and vice versa. Either way, some one was going to lose.
- Did not believe there was a clear visualization of the Wilsonville community. Since 1995, when the future planning process was done, Wilsonville's population has changed drastically. From all that was heard, there did not seem to be a definitive view of Wilsonville as a community:
 - * One view is where children can go from the west side of town safely over to the Library, or be able to go to the store for ice cream, etc.
 - * Or where people in cars can get as quickly as possible onto the freeway to get to their out-of-town jobs; don't have to sit at lights and can get where they want as quickly as possible.
 - * This had not been clearly defined for the Planning Commission.
 - * Added that these transportation issues needed to be addressed in light of what kind of community is wanted. The choices made are lasting choices, as Commissioner Faiman stated.
- Asked Commissioner Goddard to more clearly clarify his position on the issues of the PFTS.

Commissioner Goddard:

- Stated his comments were not intended to take a position on specific details of either the Staff Report or other proposals heard. He had laid out general principles to guide the Council as they deliberated on the same issues currently before the Planning Commission.
- Supported queuing as a concept and believed there was a place for it in the PFTS.
- Asked Chair Iguchi to clarify which elements of the queuing approach she wanted him to discuss.
 - * Chair Iguchi was uncomfortable simply saying to City Council that queuing should be done. The Planning Commission was charged to determine and make a recommendation about what would be fair and equitable.
- Requested that Chair Iguchi help him understand the queuing elements significant to their decision.
 - * She responded that this was what had been discussed during the hearing; what is a small or large business, should essential government services be included, etc.

- Stated that he had commented that if the level of service was eroded and are the City is willing to accept increased congestion by going to LOS "E" or LOS "F", as a principle, essential government services should be counted because they place a demand on our infrastructure. Not counting them is not appropriate if a fair and transparent process is to be created to:
 1. Account for existing demand or potential future demand, and
 2. To allocate the available capacity that remains.
- Believed that trips should be set aside for small development. He was uncertain about the threshold to define a small or large development, noting that more time would be needed to discuss the details and impact would be in defining small and large businesses.
 - * Chair Iguchi asked if the Commissioners were comfortable moving forward without that clear definition.

Commissioner Faiman:

- Commented that there was no perfect solution, it was a lose/lose proposition. If action were not taken soon, another moratorium would be created through the inaction of the Commission. The Commission should just do the best they could so that development could go forward.

Commissioner Hinds:

- Was not comfortable with the PFTS, but could not offer alternatives.
- A small business was, perhaps, 50 trips.
- Half of the trips available should be for small business. She strongly believed in this because a balance was needed for quality of life, which had not really been discussed. Small businesses sometimes create better jobs and higher paying jobs. Often they offer services that you would have to drive elsewhere for.
- Was not concerned if counting essential services trips slowed development. The alternative was no planning and ending up with a road such as 185th Street and Evergreen. She did not want that for Wilsonville.
- Believed most of the Planning Commission agreed that there should be some counting of trips or trips set aside for essential trips that might be needed in the future.
- Felt the Commission could give Council their best direction and guidance in the form of a recommendation.

Commissioner Goddard:

- Reiterated that discussing the level of service as a standalone issue was not appropriate. It was only one component of a more comprehensive approach to resolving the traffic issues in Wilsonville.
- There are more elements to the approach and City Council needed to recognize that they had a choice to make regarding the appropriate balance between the impact on the community and the required accommodations to support future development. More discussion needs to occur:
 - * About demand management approaches.
 - * Between the City and developers about more appropriate places to develop in the community. Given the circumstances, alternative locations need to be considered to accommodate the demands placed on the infrastructure.
 - * Regarding improved connectivity and access across I-5.
 - * About fair and equitable allocation of available capacity.
 - The set aside and the percentage are all elements of that fair and equitable allocation mechanism.
 - * Additional time could be spent to debate the specifics to make a single recommendation on what the thresholds should be. But absent the time to do it, it was appropriate to pass those principles onto the City Council.
- Hoped that the principles would guide the City Council in making their decision.

Commissioner Fairman:

- Asked if there was a generic right of appeal process available to allow someone to move up in the queue if they had a strong enough case.
 - * Assistant City Attorney, Paul Lee answered that there was one, but the Planning Commission and City Council would, on that recommendation, need to determine meaningful criteria for deciding that appeal, which would need to comport with fairness, equal protection, and rationality.

Chair Iguchi:

- Suggested that the Planning Commission seemed to want to move forward with a lose/lose situation that would result in a Nyberg Road, or 185th because the plans already called for eight lanes.
- Understood from Commissioner Goddard, and she also strongly believed, that the issue needed to be revisited, looking further than just the intersection.
- Looked forward to the update on the master planning process on the Bicycle and Pedestrian Master Plan, Parks and Recreation Master Plan, and Transit Master Plan updates.
 - * Ideas for crossing I-5 had been eliminated from the TSP because of the difficulty of bringing a road across I-5;
 - * Pedestrian and bicycle crossings would allow a safe crossing and avoid an eight lane freeway interchange.
- Strongly believed that the public needed to be involved on the issue since it deeply and strongly affected their daily life.
 - * There should be an opportunity for the Committee for Citizen Involvement (CCI) to convene prior to the PFTS going before City Council, or in conjunction with that process. This would provide a better idea of what citizens really wanted to see in the community.
- Asked if anyone on the Commission supported that position.

Commissioner Juza:

- Quoted the following language on page 7 of 41, Exhibit 11 of the April packet: "1. Planning Commission shall periodically review growth-related data, e.g., the availability of public facilities, schedule capital improvements, need for housing, commercial development and/or industrial development, etc."
 - * Suggested that this issue is to be revisited by the Planning Commission. Nothing is set in stone.
- Suggested the Commission was taking on too much responsibility - making all the micro decisions within the strategy. City Council has a lot of work ahead of them.
- Believed City staff had covered a lot of the bases when writing the draft ordinance and it was well written. She suggested that the Commissioners reread it.
- The Commission still needs to agree upon the exempt government services, but that left room for City Council to weigh in and make a decision.

Commissioner Fairman moved to adopted Resolution No. 04PC03A and Resolution No. 04PC03B with the amendments in Exhibit 33. The motion died for lack of a second.

Commissioner Juza moved to approve Resolution No. 04PC03A and Resolution No. 04PC03B without the amendments in Exhibit 33. The motion died for lack of a second.

The Planning Commission took a short break to review the draft ordinances, resolutions, and staff reports.\

Commissioner Goddard moved to adopt Resolution No. 04PC03A and Resolution No. 04PC03B with amendments to the City staff recommendation as follows:

- **Reserve 50% of the trips for small developments and request that City staff recommend a definition for small developments and forward that recommendation to the City Council.**

- **Eliminate the exemption for essential public services and direct City staff to make conforming changes consistent with that elimination.**

Commissioner Hinds seconded the motion and amendments.

Discussion of the motion included:

Commissioner Faiman:

- Suggested that the language did not work as there needed as essential government services needed to be further addressed in Exhibit 33. He asked for Mr. Johansen's opinion.
 - * Mr. Lee asked the Planning Commission if they understood that de minimis trips are included in the exempted trips, or if they were singling out essential government services.

Commissioner Goddard:

- Believed the motion was to eliminate the exemption for essential government services.
 - * Commissioner Faiman suggested that the government services are to be counted.
 - * Mr. Lee understood the intent of the motion language was to make conforming changes consistent with that elimination, which meant that the section on counting would either go away, or be so worded that essential government trips were counted, per Exhibit 33.
 - * Commissioner Faiman replied that essential government services would still be exempt but they would be counted. Exhibit 33 still allows that a LOS "F" might occur, but it makes it much less likely. If the trips are not counted, LOS "F" becomes a virtual certainty.
- Suggested that the motion allows the City staff to make changes consistent with Exhibit 33, but to the extent that other conforming changes needed to be made. It did not constrain them from making additional changes that were consistent with eliminating the exemption.
 - * Mr. Lee did not want three people's confusion to cause problems later. He encouraged taking the time with drafting the motion language, and suggested that Commissioner Faiman assist with the language.

Commissioner Juza:

- Asked if Commissioner Goddard's motion was exempting traffic generated by development under the subsection, "shall [not] be counted." Was he reiterating Exhibit 33? Are essential government services to be counted?
 - * Commissioner Goddard responded he believed his motion was counting the essential government service trips, and was requesting that City staff make the conforming changes consistent with Exhibit 33.

Commissioner Faiman:

- Responded to Commissioner Juza's request for clarification on his position:
 - * The motion stated that government services would not be exempt, which was completely different.
 - Commissioner Goddard said the result was that they would be counted.
- Suggested that two things were being done in the motion and it should only accomplish one. The trips should be counted for planning purposes, but still needed to be left exempt.
 - * The language in Exhibit 33 is different than what Commissioner Goddard proposed.
- Suggested the motion should approve the applications with Exhibit 33 amendments, and then add the language about small businesses.

Chair Iguchi:

- Asked City staff if Commissioner Faiman's interpretation was correct; that two separate items were being discussed. Government services were still to be exempt, but counted. What was the impact of doing this?
 - * Mr. Lee responded that according to the motion all government service trips would be counted like any other private development.
 - * Commissioner Faiman added that they would no longer be exempt, so a fire station could not be built if needed. Mr. Lee agreed with this interpretation of the motion.

Motion failed 0 to 7.

Commissioner Goddard moved to adopt Resolution No. 04PC03A and Resolution No. 04PC03B with amendments to the City staff recommendation as follows:

- **Reserve 50% of the trips for small developments and request that City staff recommend a definition for small development and forward that recommendation to the City Council.**
- **Retain the exemption for essential government services, but make the trips count for larger, private development, and direct City staff to make conforming changes consistent with that element of Exhibit 33.**

Mr. Lee asked if that included the Exhibit 33's suggested amendment respecting master plans.

The motion died due the lack of a second.

The Commission discussed the intricacies of the language.

Commissioner Goddard moved to adopt Resolution No. 04PC03A and Resolution No. 04PC03B with amendments to the City staff recommendation as follows:

- **Reserve 50% of the trips for small developments and request that City staff recommend a definition for small development and forward that recommendation to the City Council.**
- **Retain the exemption for essential governmental and small projects and services, but make the trips count for larger, private development and direct City staff to make conforming changes consistent with that element of Exhibit 33.**

The motion died due to the lack of a second.

Commissioner Faiman moved to approve Resolution No. 04PC03A and Resolution No. 04PC03B accepting Exhibit 33 with one additional amendment:

- **50% of trips will be reserved for small business developments with a request that City staff recommend a definition for small development to be forward to City Council.**

The motion was seconded by Commissioner Hinds.

Discussion of the motion included:

Commissioner Maybee:

- Asked if 50% of the trips were reserved for small businesses, then do small and large businesses both compete on an equal basis for the remaining 50%; or was it exclusively for large businesses?
 - * Commissioner Hinds replied that it was for everything that was not small.
 - * Suggested that this language was open for different interpretations since it is not explicitly stated.
- Suggested reserving 50% of the trips for small businesses with the balance being reserved for all other businesses with the definitions to be provided.

Commissioner Goddard

- Asked if the last bullet in Exhibit 33 was still relevant; did it still make sense in light of the motion?
 - * Mr. Johansen responded that he had not considered the problem this might create for the Stage I master plan for the Square 76. In fashioning language to address Commissioner Hinds concerns, he had inadvertently created a different problem. He recommended leaving the last portion out.

Chair Iguchi:

- Asserted that she did not feel the Commission was ready to be making motions on this yet.

Commissioner Hinds:

- Reminded the Commission that all of their actions were forwarded to City Council in the form of a recommendation. Laws were not being written here, City Council makes the law. The City Council could handle the definitions and the finer tuning of it.

Commissioner Maybee:

- Suggested that it clearly be stated that small businesses receive 50% of the trips and all other development receive the remaining 50%. Otherwise, small businesses would have a 50% advantage on everyone else and also would compete for the remaining trips.

Commissioner Juza:

- Believed there was still a lot of gray area regarding that that language.
 - * Would a large development who leased to small business owners, not be developed? That seemed to be the case.
- Asked if the City would use a 90% or 100% cap so that all the small businesses up to 50% could develop that first year if trips were available. Or was this irrelevant with the proposed change to the 50% for small businesses and 50% for large businesses.

City Attorney, Mike Kohlhoff responded:

- He recognizes the difficult decision before the Commission.
- He noted that focusing on Stage II approvals is excellent because the City has a real application that could be counted and addressed who was or was not ready to proceed. This creates a first in, fairness situation, which was very defensible for the City.
- If the Planning Commission's position is that 50% of the trips are to be designated for small businesses, the issue of small and large is covered by simply saying that no one development could take more than 50%. This was also an excellent approach, and also defensible. The City did not need to get into arbitrarily defining whether large was 100 or 50 trips.
- The third bullet of Exhibit 33 may not result in the problems anticipated by the Planning Commission. This problem has not come up prior to this and he did not foresee it occurring within the next two years.
 - * Wasn't sure the Commission needed to address that issue since it is addressed with a Stage II application. He summarized the submittal process, noting that developers were already entitled to receive all their trips with a Stage I approval, if they committed to a phasing schedule.
 - * Very few developers do because of the economics. They don't want to commit to a time schedule, knowing they must return for Phase I and adequate public facilities may not be available. As a practical matter he did not see as problem that someone could come in and take all the trips away.
 - * Villebois received all their trips because they had a phasing schedule. The economics for the infrastructure was coordinated with funding and a phasing schedule they submitted.
 - * State statutes allow them to go forward and were also coordinated with the law under the subdivision provisions.

- Believed the Planning Commission was trying to solve a problem that would not be there. He suggested removing the last bulleted item in Exhibit 33.

Commissioner Juza:

- Asked if a certain amount of the essential government services could be exempted so it would not be so broad and exclusionary to developers. She suggested that counting all of the government service trips would limit the potential for commercial and retail development.
- Could a number be agreed upon, or did it have to be all of them?
 - * Commissioner Fairman responded that to be a fair process all numbers needed to be counted as real numbers.
 - * Mr. Waffle replied that there might be variety of ways to count them.
 - They could be set aside at the beginning of the year. The essential government trips could compete and if a Fire Station were needed in April, it would compete for what is left. He asked how Commissioners wanted to count them?
 - * Commissioner Fairman remarked that this just opened up a whole new can of worms.
 - Mr. Waffle responded this was the issue and was why City staff recommended it be left alone.
 - He believed the DKS Associates memo made a distinction between those units of government that dealt with essential government trips for paying impact fees systems development charges.
 - Not many examples that were actually holding up development of fire stations, City Halls, schools, etc. were found.
 - DKS Associates had made a distinction between how other cities were dealing with essential government trips, and concurrency was far different than counting trips for collecting fees.

Commissioner Hinds:

- Strongly supported counting essential government services. Exempting them was how the City got 702 trips, resulting in 400 trips in the hole.
- It seemed unfair to give developers that came after the ordinance the benefit of not counting those, and then start to count the trips for new developments.
- Other cities count those trips for capacity, and no development was denied because they were included. If 1,000 trips are going through the intersection, they impact traffic and should be counted.

Motion failed 0-7.

Commissioner Fairman moved to accept Resolutions 04PC03A and B and accept the portion of Exhibit 33 that addressed paragraph 4.140(.09)J2c:

[Deleted language is struckthrough and added language underscored.]

- **“Traffic generated by development exempted under this subsection...shall ~~not~~ be counted in determining levels of service for any future non-exempt applicant.’ This would continue the exemption for governmental and small projects, but make the trips count for larger, private development.”**

The motion died due the lack of a second.

Commissioner Juza:

- Suggested voting on each application separately. It seemed that the Planning Commission agreed on 04PC03A, but disagreed regarding 04PC03B due to the essential government services issue.

Commissioner Juza moved to accept Resolution No. 04PC03A as written. Commissioner Faiman seconded the motion, which failed 3 to 4 with Commissioner Juza, Commissioner Faiman and Commissioner Maybee voting for the motion and Chair Iguchi, Commissioner Hinds, Commissioner Goddard, and Commissioner Guyton opposing it.

Commissioner Hinds:

- Suggested the Planning Commission was not prepared to act on the applications.

Chair Iguchi moved to continue Application No. 04PC03A and Application No. 04PC03B until the next Planning Commission meeting, June 8, 2005. The motion died due to the lack of a second.

The Commission recessed for discussion and reconvened at 10:29 p.m.

Commissioner Hinds:

- Clarified with City staff that the title of Exhibit 33 should have included both 04PC03A and 04PC03B and that the first bullet applied to 04PC03B.

Commissioner Juza:

- Asked if language about the nonexempt government services applied to Application 04PC03B; could a motion be made to vote on Resolution No. 04PC03A again?

Commissioner Goddard moved to adopt Resolution No. 04PC03A and Resolution No. 04PC03B with amendments to the City staff recommendation as follows:

- **Adopting the language of Exhibit 33, "Traffic generated by development exempted under this subsection...shall not be counted in determining levels of service for any future non-exempt applicant. This would continue the exemption for essential government service trips and small projects, but make the trips count for larger, private development."**
- **Reserve 50% of available trips for small developments and request that City staff recommend a definition for small development and forward that recommendation to the City Council.**

Commissioner Guyton seconded the motion, which carried 6 to 1 with Commissioner Juza opposing.

Commissioner Faiman:

- Explained that during the discussion, some Commissioners felt strongly that something needed to be forwarded to City Council, even if Council rejected it.

Chair Iguchi moved to have a Committee for Citizen Involvement (CCI) meeting prior to or in conjunction with Resolution No. 04PC03A and Resolution No. 04PC03B moving to City Council for public input regarding the Public Facilities Strategy. Commissioner Hinds seconded the motion, which carried 5 to 2 with Commissioner Faiman and Commissioner Juza opposing.

~~~~~

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Distributed at the May 11, 2005 Planning Commission Public Hearing:**

- Exhibit 35: A graphic, "Proposed 1-5/Wilsonville Rd/Boones Ferry Rd Alignment"
- Exhibit 34: A graphic, "Existing 1-5/Wilsonville Rd/Boones Ferry Rd Alignment"
- Exhibit 33: Proposed Changes to the 04PC03A May 11, 2005 PFTS Staff Report.



|                |
|----------------|
| Revision:      |
| Project:       |
| File Location: |

Existing I-5/ Wilsonville Rd/ Boones Ferry Rd Alignment



SCALE: 1/40

Date: 051105

DRAWN BY: jm

Sheet: 1

Of: 2

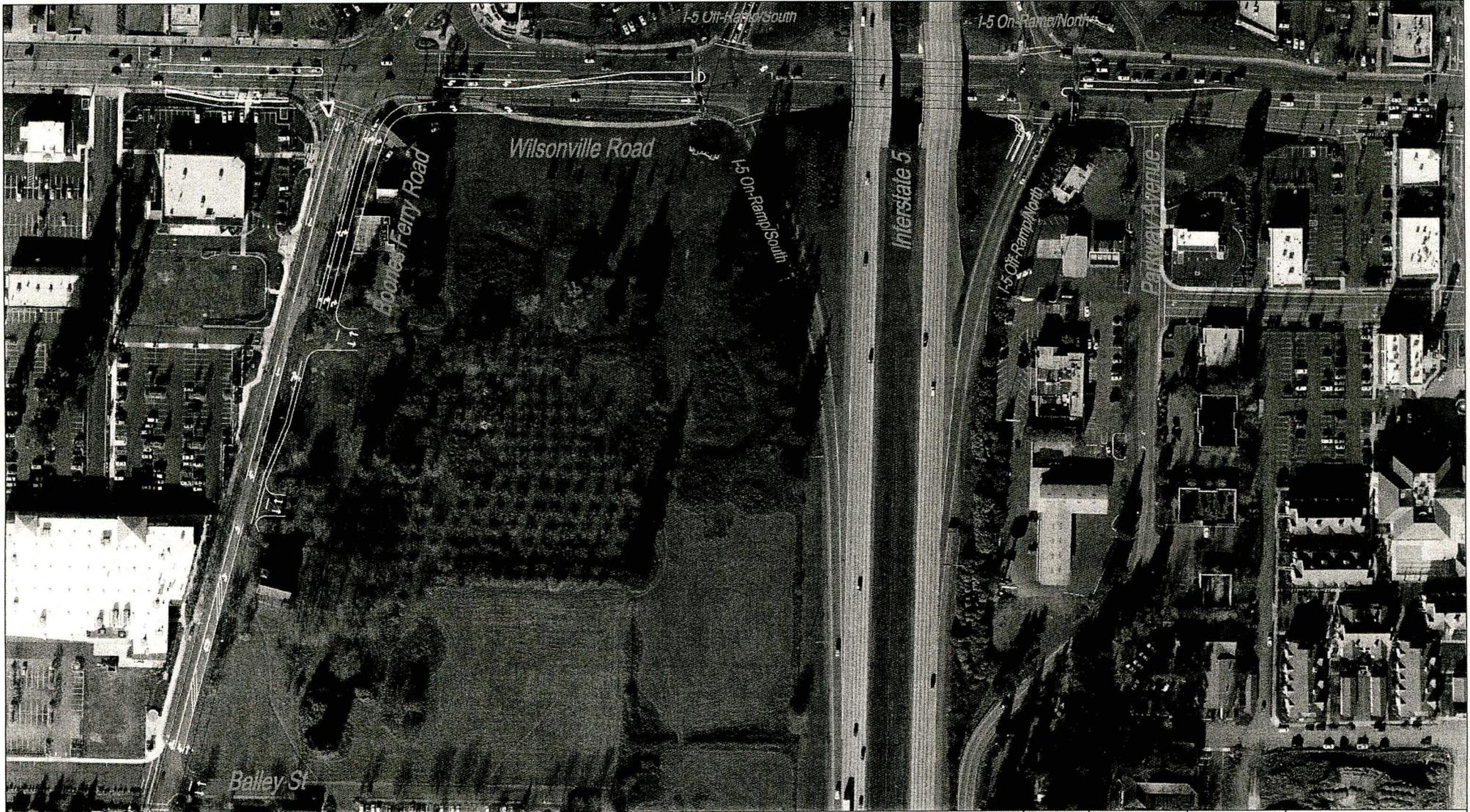
Checked By:

CITY OF  
WILSONVILLE  
Engineering Division



# Exhibit 34

B



|                |
|----------------|
| Revision:      |
| Project:       |
| File Location: |

Proposed I-5/ Wilsonville Rd/ Boones Ferry Rd Improvements



|              |             |
|--------------|-------------|
| SCALE: nts   | Sheet: 2    |
| Date: 051105 | Of: 2       |
| DRAWN BY: jm | Checked By: |

CITY OF WILSONVILLE  
Engineering Division

Exhibit 35

## Exhibit 33

### 04PC03A Public Facilities Transportation Strategy City Staff Proposed Changes to the May 11, 2005 Staff Report

- Reference last paragraph on page 2 of 27.

Instead of deleting paragraph 4.140(.09)J2c, it is recommended that the following language as prepared by Paul Lee is considered.

I recommend we consider language that gets to what I understand is desired, with bracketed deletion and underscored addition to the subject subsection as follows:  
“Traffic generated by development exempted under this subsection . . . shall [not] be counted in determining levels of service for any future non-exempt applicant.” This would continue the exemption for governmental and small projects, but make the trips count for larger, private development.

- The language suggested in paragraph 3. on the top of page 4 is overly broad and confusing. If the Planning Commission desires to take action, the following language is proposed for coordination.
- In addition, the combined total for all Stage II projects within a master plan area shall be limited to 50% of the annual capacity as determined each year per Section 4 of this Ordinance.

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Included in the May 11, 2005 Planning Commission meeting packet:**

Community Development Memorandum dated May 5, 2005; to Debra Iguchi, Chair – Wilsonville Planning Commission, from Dave Waffle, regarding Public Facility Transportation Strategy – Allocation and Queuing Examples; with attached:

- Exhibit 27: A table, "Allocation and Queuing Examples, Revision: Developer FM reduced trips from 318 to 260," dated 5/5/2005.
- Exhibit 28: A table, "Allocation and Queuing Examples, Revision: Developer FM reduced trips to 260 not 318 + Reduction for Essential Gov't Trips" dated 5/5/2005
- Exhibit 29: Community Development Memorandum dated May 5, 2005; to Debra Iguchi, Chair – Wilsonville Planning Commission, from Dave Waffle, regarding Wilsonville Road/Boones Ferry Road, with five attached maps.
- Exhibit 30: An email dated May 4, 2005, to Eldon Johansen, from Reah Beach of DKS Associates, regarding Public Facilities Transportation Strategy, with attached Definition.
- Exhibit 31: A letter dated May 4, 2005, from Dana Krawczuk of Ball Janik LLP, regarding Follow-up Testimony for Public Facilities Transportation Strategy (04PC03A and 04C03B)
- Exhibit 32: A letter dated April 27, 2005, from Ben Altman of Urban Solutions, regarding 04PC03A & B – PFTS Ordinances

PLANNING COMMISSION  
WEDNESDAY  
MAY 11, 2005

**IV. CONTINUED PUBLIC HEARINGS**

**A. APPLICATION NO. 04PC03A**

Applicant: City of Wilsonville

Request: A Proposed Public Facilities Transportation Strategy, a strategy to accommodate future development while maintaining the City's and ODOT's level of service requirements by allocation of p.m. peak hour trips through the intersections of Wilsonville Road with I-5, Boones Ferry Road, and Town Center Loop West together with construction of planned transportation improvements and anticipated changes in driving habits.

**B. Application No. 04PC03B**

Applicant: City of Wilsonville

Request: A proposal to change the Level of Service from "D" to "E" on Wilsonville Road between and including the intersections with I-5, Boones Ferry Road and Town Center Loop West and on portions of Boones Ferry Road adjacent to those intersections as authorized by Wilsonville Transportation Systems Plan Policy 4.1.1, and to exempt "essential government services" from all Level of Service standards.

*The Planning Commission decisions on these matters are in the form of a recommendation to the City Council*

---

**COMMUNITY DEVELOPMENT STAFF REPORT**

Date: May 5, 2005  
To: Chris Neamtzu, Long Range Planning Manager  
From: Eldon R. Johansen, Special Projects  
Subject: Public Facilities Transportation Strategy

At the Planning Commission meeting on April 13, 2005, the Planning Commission continued Application No. 04PC03A and Application No. 04PC03B until May 11, 2005. The purpose of the continuance was to provide time for staff to provide additional information on some topics as requested by the Planning Commission and also to evaluate some of the suggestions that were received either in writing prior to the Planning Commission Hearing or by testimony at the hearing. The purpose of this report is to provide the requested information.

As near as possible the report will be broken down to coincide with the specific subjects as discussed by the Planning Commission and will be covered in the ensuing sections.

Ben Altman representing the Kohl family and KWDS submitted additional information for the Planning Commission in a letter dated April 27, 2005. Dana L. Krawczuk provided written testimony for the Planning Commission hearing on the Public Facilities Transportation Strategy on September 13<sup>th</sup> and also testified at the hearing. Michelle Rudd also representing the Kohl family and Tom Gibbons representing Fred Meyer also testified at the hearing. In ensuing paragraphs I will briefly comment on items that were not previously commented on or for which additional information is available.

A. **Relationship between the Level of Service and the Exemption for Essential Government Services and *Deminimus* Trips**

Some Planning Commissioners were concerned about the existing language in the draft ordinance amending the Wilsonville Code Section 4.140(.09)J2. The current language reflects recent City Council policy on *diminimus* trips to aid small businesses and the provision of essential governmental services.

This reads as follows: "*c. Traffic generated by development exempted under this subsection on or after Ordinance No. 463 was enacted shall not be counted in determining level of service for any future applicant (out of Ordinance No. 561, adopted 12/15/03.)*"



May 5, 2005

Public Facilities Transportation Strategy

Commissioner Goddard asked for additional information on the *deminimus* trips and whether they would become a significant impact on the level of service. We have reviewed the records of trip allocations for the period in which the first Public Facility Transportation Strategy was in effect. Many of the projects that are now described as essential government services were approved when there was capacity available and it was allocated to those projects. It appears that there would have been a total of 262 PM peak hour trips through the Wilsonville Road Interchange area that would have qualified as an exemption under our current ordinance. This would work out to approximately 37 per year. Currently we have 61 exempt and *deminimus* trips for which capacity has not been allocated and project additional requirements for 185 trips over a five year period. In a separate report Dave Waffle will integrate these trips into example projections of the trip allocation and queuing tables.

DKS provides traffic engineering services in most of the other cities and counties in the Portland metropolitan area. We will, as a separate exhibit, include an email from Randy McCourt from DKS that describes how other cities handle the essential government services. Other jurisdictions do require government entities to meet the level of service requirements and routinely include the completion of these requirements as a condition of approval. So far DKS has not worked with any jurisdiction that has what we describe as essential government services that are required in an area with no capability of being upgraded to meet service standards.

Mr. Altman indicates that they oppose adding exempted trips back into the queue because it will undermine the availability of trips for private sector development: There has been testimony on both sides of this issue and staff has nothing further to add.

**Staff had previously recommended that we continue to not include the traffic from exempted trips in determining level of service for any future applicant. Staff still maintains this position; however, if the Planning Commission wants to minimize the extended drop in level of service because of approval for exemptions then Planning Commission should move to delete paragraph 4.140(.09)J2c which reads as previously stated above. Some additional language work may also be necessary to fully reflect the Planning Commissions intent.**

May 5, 2005  
Public Facilities Transportation Strategy

**B. Project Planning**

The Planning Commission asked us to look at the following two paragraphs of the strategy to ensure that property owners in a large master planned area do not creatively figure out a method of dividing ownership or Stage II approvals to capture more than their fair share of capacity.

*"SECTION 2: THE STRATEGY....*

- 2. As an exception to paragraph 4.140(.a)J.2 of the City Code, Council authorize the establishment of a transportation queue on a first approved priority basis for projects which meet all other requirements for Stage II approval except for traffic capacity at the impacted area.*
- 3. Council authorizes projects to advance in the queue on a first approved basis subject to the limitation that no project shall be allocated more than 50% of the annual capacity as determined each year per Section 4 of this ordinance. A project shall be permitted to advance to develop when it is allocated the required capacity for its development and the project shall then be removed from the queue. Those projects listed below in priority to a removed project shall move up in the queue priority in sequence to their position. Allocated capacity shall accrue until a project has sufficient capacity for development."*

Mr. Altman is also concerned about property owners within large master planned areas being able to circumvent the queue by establishing a series of Stage II approvals. The Planning Commissioner concerns were previously discussed with Council and at this time it is unknown whether the suggested language will satisfy this concern without creating other problems.

**Staff has struggled with this particular topic in that we have not come up with a method that will continue to encourage Stage I master plans for a broader area while simultaneously restricting the Stage II approvals to the master plan area.** Our primary concern is that if we overly restrict the Stage II developments within a master plan area we could inadvertently drive the development community to smaller master plans that are less able to provide solid planning for the overall area. If the Planning Commission desires to ensure that projects are not split to the disadvantage of smaller projects, then the following change is suggested in paragraph 3:

May 5, 2005

Public Facilities Transportation Strategy

*"3. Council authorizes projects to advance in the queue on a first approved basis subject to the limitation that no project shall be allocated more than 50% of the annual capacity as determined each year per Section 4 of this ordinance. All projects within a master plan area shall be limited to 50% of the annual capacity as determined each year per Section 4 of this Ordinance. A project shall be permitted to advance to develop when it is allocated the required capacity for its development and the project shall then be removed from the queue. Those projects listed below in priority to a removed project shall move up in the queue priority in sequence to their position. Allocated capacity shall accrue until a project has sufficient capacity for development."*

The other option would be a timing restriction so that a developer could not submit for Stage II approvals with separate applications simultaneously or so close together that it appeared to be a maneuver to avoid trip cap regulations. If the restriction created a gap of at least 60-90 days that might be appropriate yet responsive to market demand for a legitimate second or third phase of a master plan.

**C. Projects with Master Plan Approval but Without Stage II Approval for All of the Master Plan Area**

Mr. Goddard asked how staff would choose to treat projects with existing master plan approvals which had not received Stage II approval. Staff would recommend that these projects receive no special or additional consideration and that they enter the queue and have trips allocated based on the Stage II approval. We have not done a thorough search of all master plan projects to see if there would inadvertently be a contribution by the developer to the City infrastructure for which the developer had not been compensated either in an earlier approval of a Stage II credit against street systems development charges or City payment for the improvement. The typical approach for projects in which the developer is required to provide infrastructure that is beyond the initial phases of development is for execution of a development agreement that clearly spells out the infrastructure requirements and the methods of reimbursement. I know of no open development agreement for which the City is committed to a Stage II approval for a remaining part of a Master Planned area.

Dana Krawczuk has recommended that properties that have existing master plan approvals that have been partially implemented should have priority in the queue. On the other hand Mr. Altman has recommended against this provision for priority. Staff does not want to rule out any situation where somebody could prove that they have a prior commitment from the City for approval in order to develop infrastructure. Thus far we have not run across any circumstances in which the developer has not received credits, approvals or payment for the development or have a development agreement that establishes the methodology for payment. **For this reason staff recommends that there be no priority for the existing master plan approvals.**

**D. Limiting the Number of Trips Available for Large Projects**

Staff has previously recommended that no developer could use over 50% of the available trips in any one year. To change to a system where the number of trips available for large projects is limited would take a fair amount of effort to develop the break between small and large projects and then to separately determine how the trips would be allocated within a small and large categories. Although the idea is not impossible, staff does not think the benefits match the effort involved. Mr. Tom Gibbons, real estate director for Fred Meyer indicated that he strongly believes that 100% of the trips should be vested at the time Stage II approval is received. This would be particularly difficult in a time where the capacity was not available to vest 100%; however it indicates that he does not agree with the concept of limiting the number of trips available for a large project.

**E. Distinguish Between Pass-by Trips and Newly Generated Trips**

I agree with what Dana Kawzczuk is trying to accomplish in this case but the existing methodology does a better job of determining the impact on the impacted intersections. For each development DKS determines the net new trips through the interchange area as a result of the development. In this way, we account for trip generation at the project site, the percent of trips that go through the interchange area, the linked trips and the pass-by trips. To try to simplify to only newly generated trips and pass-by trips and differentiate between the two would not necessarily develop the data needed to determine the impact on the system.

**F. Expansion of De Minimis Exception to Level of Service Criterion**

Ms. Krawczuk recommends that it be changed to 10 new PM peak hour trips as opposed to 3. This was previously discussed by the Planning Commission and there appears to be no strong consensus to increase the exception.

**Issues to Consider at a Later Time**

There have been a number of comments and suggestions that may deserve additional study. It is recommended that these items be separated from consideration of the Public Facilities Strategy and considered as subsequent additions to the work program for the Planning Commission, if desired.

May 5, 2005

Public Facilities Transportation Strategy

Traffic Engineering

Commissioners Juza and Hinds had a number of questions and comments on the City use of DKS as a "sole source" traffic engineer on traffic impact studies. One question that was a concern was whether staff would skew the results and the question of how to ensure that we get unbiased results. Staff provides overall guidance to the scope of the Traffic Impact Study and the standards that are required to be met. We do not provide any quantitative guidance in that the calculation of the impacts is something we have always felt was within the purview of the traffic engineer that will provide their professional engineer's stamp on the completed report. The test of whether we have provided the correct guidance is whether the DRB or in some cases, the Planning Commission or Council has sufficient and accurate information to reach an overall decision on the applicable project.

As to whether we should have more than one traffic engineer developing traffic impact studies; it is felt that this is a subject that should be addressed as a separate topic and should not interfere with the Planning Commission action on the Public Facility Transportation Strategy. The current system of using a traffic engineer that was selected by the City in a competitive selection process was at the strong guidance of the Transportation Advisory Committee in the 1992 timeframe and was based on their discomfort with the traffic reports that they were seeing at that time.

Ms. Krawczuk recommends that the City provide a list of acceptable traffic engineers from which the applicant can choose. This is not necessary to develop the Public Facilities Transportation Strategy and staff recommends it not be evaluated at this time. Our existing system is based on the traffic engineer maintaining the current traffic data for the City. If we are going to a system whereby the developer chooses the traffic engineer then we need to first determine how the traffic data is maintained and for that matter, who will accomplish the detailed review of the traffic report.

May 5, 2005

## Public Facilities Transportation Strategy

Ms. Rudd also testified that only having DKS Associates available to do traffic studies for the City causes problems in terms of their backlog and their ability to turn things over quickly. This again is not something that need be resolved in order to adopt a Public Facilities Transportation Strategy and should be deferred for consideration as a separate work item by the Planning Commission.

Mr. Altman is also concerned with the use of one traffic engineer by the City and staff is of the opinion that this should be separately addressed so we can proceed to obtain planning commission and Council approval of the Public Facilities Transportation Strategy. Staff does not have a problem with including this topic on the work list for the Planning Commission if desired.

### The Band-Aid Approach

Chair Iguchi expressed concern that the Public Facilities Transportation Strategy seems to be like a band-aid and will move us forward just a little bit. The last Public Facilities Transportation Strategy was also a temporary solution. It was designed to provide for limited continued development while the City worked out a solution in the Transportation Systems Plan. This plan ultimately provides a system which would meet all the City level of service requirements but does not provide the method of phasing development to maintain level of service levels during continued development and construction of the transportation infrastructure. It may be a valid item for addition to the Planning Commission workload to look at a comprehensive solution to the overall development of a comprehensive transportation system that meets level of service standards as the City develops. It is staff's recommendation that this be accomplished as a separate task if desired and that the Public Facility Transportation Strategy be moved forward to Council.

The problem with not moving the Public Facility Transportation Strategy forward is that we are in a situation where we cannot approve additional development. In the absence of the Public Facility Transportation Strategy we could be pushed into a moratorium.

### Scope of Traffic Impact Analysis

Ms. Krawczuk recommends that we clarify Section 4.140(.09).J.2.a.ii to clarify that the scope of the intersection studied is being directly related to the impact of use. We have asked DKS to provide a summary of how other jurisdictions look at this scope. We will attach that as a separate exhibit. My primary concern is that

May 5, 2005

Public Facilities Transportation Strategy

prior to the City selecting the traffic consultant we had a number of traffic reports that did not affect any one intersection to a significant amount; however, the accumulation of trips from several different projects caused an unanticipated failure.

Level of Service Failure

Michelle Rudd representing the Kohl property spoke in favor of the change from level of service D to E and appeared to favor considers allowing failure to occur because of the long run benefits. This is a recommendation that would require a change in the Comp Plan, the Code and the Transportation Systems Plan and would essentially derail the Public Facilities Transportation Strategy if we would go off in that direction at this time. For this reason it should not be considered for the Public Facilities Transportation Strategy.

High Trip Projections

Mr. Altman is concerned that the computer model used by DKS tends to count existing trips as new trips. I have not seen any indication of this based on the methodology in which first we determine the existing traffic counts at the intersections that are being analyzed, and then consider the existing plus the new project by the procedure, we are not counting existing trips twice.

Diverted Trips

Mr. Altman is concerned that the computer models are not properly determining the effect of congestion on the road and network causing trips to be diverted to less crowded streets. I agree that determining this degree of diversion is one of the key factors in putting together a Public Facilities Transportation Strategy. The approach that we have taken in the draft strategy is to recognize that these diversions will take place for some of the same reasons that Mr. Altman suggests and others as stated in the strategy. Our difference in the approach is to do an annual traffic count of the impacted intersections and use this count as a basis for readjusting the availability of capacity for development.

Capital Improvements Plan

Mr. Altman gives a summary of the overall situation with regards to the Capital Improvements Plan in the relationship of this plan to future development. Staff is separately working an update of the street systems development charges and as part of that update are looking at the funding of projects for the next few years. The overall priorities were established in the Transportation Systems Plan

May 5, 2005

Public Facilities Transportation Strategy

and thus far staff has not seen any reason to divert from this plan. Mr. Altman suggests that we may want to put higher priority on connectivity and additional I-5 crossings and again, staff does not have any objections to reviewing this approach; however, it is suggested that we continue to complete the Public Facilities Transportation Strategy and conclude any updates of the Transportation Systems Plan as a separate item. The staff is also working on a rolling five-year capital improvement program.

Interchange Failure

Mr. Altman recommends that we allow interchanges to go to level of service E and then to F to maintain level of service D elsewhere in the city. This would require a change to the Comp Plan, the City Code and is beyond the scope of the Public Facilities Strategy. This is something that could be discussed by the Planning Commission as a separate work item if they so desire.

ERJ:bgs

cc: Subject File  
IOC-CD

Attachments:

- Community Development Memorandum dated May 5, 2005; to Debra Iguchi, Chair – Wilsonville Planning Commission, from Dave Waffle, regarding Public Facility Transportation Strategy – Allocation and Queuing Examples; with attached:
  - Exhibit 27: A table, "Allocation and Queuing Examples, Revision: Developer FM reduced trips from 318 to 260," dated 5/5/2005.
  - Exhibit 28: A table, "Allocation and Queuing Examples, Revision: Developer FM reduced trips to 260 not 318 + Reduction for Essential Gov't Trips" dated 5/5/2005
- Exhibit 29: Community Development Memorandum dated May 5, 2005; to Debra Iguchi, Chair – Wilsonville Planning Commission, from Dave Waffle, regarding Wilsonville Road/Boones Ferry Road, with five attached maps.
- Exhibit 30: An email dated May 4, 2005, to Eldon Johansen, from Reah Beach of DKS Associates, regarding Public Facilities Transportation Strategy, with attached Definition.
- Exhibit 31: A letter dated May 4, 2005, from Dana Krawczuk of Ball Janik LLP, regarding Follow-up Testimony for Public Facilities Transportation Strategy (04PC03A and 04C03B)

# Wilsonville Community Development

## - interoffice memo -



**Date:** May 5, 2005

**To:** Debra Iguchi, Chair – Wilsonville Planning  
Commission

**From:** Dave Waffle, Community Development Director

**RE:** Public Facility Transportation Strategy – Allocation and Queuing Examples

---

One of the critical questions before the Planning Commission in their consideration of the Public Facility Transportation Strategy (PFTS) is selection of an allocation and queuing formula and policy. This policy will apply during the two to five year lifetime of the PFTS. The proposed ordinance places a cap on the amount of trips that any one development can receive during a year at 50%. Planning Commission members have heard testimony as to whether this is a correct number. It is an arbitrary value. The Commission has seen examples of how variations in the amount affect fictitious and semi-fictitious developers over a three year scenario in an exhibit that was distributed at the April Planning Commission meeting (Exhibit 21).

Wherever the Planning Commission and City Council set the cap, or if there is no cap, there will be winners and losers. The effect of the cap is to possibly defer some large scale development over two or more years before they would accumulate sufficient trips to receive development approval. It may cause a developer to modify the size or scale of the project to fit into the queue in a more advantageous position. The staff was requested to prepare language that would restrict a developer from manipulating a project to gain an advantage but there are realistic timing and phasing scenarios that may apply to a given site. There appears to be an advantage to receiving trip allocations as early in the year as possible.

Enclosed are two alternative versions of the Allocation and Queuing Examples tables for your consideration. These are updated from Exhibit 21. Exhibit 27 concerns only developer FM. The data has been modified to reflect a request from the Fred Meyer staff that their weekday P.M. peak hour trips be modified to show the effect of acquiring and removing the gas station and bank that abut their property. This has the affect of reducing the peak hour trips from 318 to 260. This change affects other developers or the amount of trips carried forward year to year in the examples.

Exhibit 28 shows the impact of setting aside trips for "essential governmental services". Staff can testify as to how these trips may have affected the availability of trips in past years for private development. For the exhibit we are using this scenario:

Year 1 – high school addition – 58 trips and 23 *deminimus* trips = 81 set aside

Year 2 – city hall – 16 trips and 20 *deminimus* trips = 36 set aside

Year 3 – SMART/Commuter Rail – 69 trips and 20 *deminimus* trips = 89 set aside

Leaving all other assumptions the same the set aside of exempt and *deminimus* trips has a dramatic effect on the prospective developers and causes delays in the time that these developers can obtain sufficient trips. The "grayed-out" rows in the spreadsheet are those developments that need multiple years.

Enc:

Exhibit 27: A table, "Allocation and Queuing Examples, Revision: Developer FM reduced trips from 318 to 260," dated 5/5/2005.

Exhibit 28: A table, "Allocation and Queuing Examples, Revision: Developer FM reduced trips to 260 not 318 + Reduction for Essential Gov't Trips" dated 5/5/2005

drw/pfts 050405

|                           | Year 1 | Year 2 | Year 3 | Total Trips |
|---------------------------|--------|--------|--------|-------------|
| Est. New Trips            | 480    | 290    | 139    |             |
| Carry Over                |        | 35     | 114    |             |
| Est. Total Trips          | 480    | 325    | 253    |             |
| Max Trips per project 90% | 432    | 293    | 228    | <b>90%</b>  |
| Develop FM (260 trips)    | -260   | 0      | 0      | -260        |
| Develop VB (124)          | 0      | -124   | 0      | -124        |
| Develop B (25)            | -25    | 0      | 0      | -25         |
| Develop C (160)           | -160   | 0      | 0      | -160        |
| Develop D (60)            |        | -60    | 0      | -60         |
| Develop E (27)            |        | -27    | 0      | -27         |
| Develop F (90)            |        |        | -90    | -90         |
| Trip Balance              | 35     | 114    | 163    |             |

|                           | Year 1 | Year 2 | Year 3 | Total Trips |
|---------------------------|--------|--------|--------|-------------|
| Est. New Trips            | 480    | 290    | 139    |             |
| Carry Over                |        | 35     | 114    |             |
| Est. Total Trips          | 480    | 325    | 253    |             |
| Max Trips per project 75% | 360    | 217    | 146    | <b>75%</b>  |
| Develop FM (260 trips)    | -260   | 0      | 0      | -260        |
| Develop VB (124)          | 0      | -124   | 0      | -124        |
| Develop B (25)            | -25    | 0      | 0      | -25         |
| Develop C (160)           | -160   | 0      | 0      | -160        |
| Develop D (60)            |        | -60    | 0      | -60         |
| Develop E (27)            |        | -27    | 0      | -27         |
| Develop F (90)            |        |        | -90    | -90         |
| Trip Balance              | 35     | 114    | 163    |             |

|                           | Year 1 | Year 2 | Year 3 | Total Trips |
|---------------------------|--------|--------|--------|-------------|
| Est. New Trips            | 480    | 290    | 139    |             |
| Carry Over                |        | 55     | 114    |             |
| Est. Total Trips          | 480    | 345    | 253    |             |
| Max Trips per project 50% | 240    | 173    | 127    | <b>50%</b>  |
| Develop FM (260 trips)    | -240   | -20    | 0      | -260        |
| Develop VB (124)          | 0      | -124   | 0      | -124        |
| Develop B (25)            | -25    | 0      | 0      | -25         |
| Develop C (160)           | -160   | 0      | 0      | -160        |
| Develop D (60)            |        | -60    | 0      | -60         |
| Develop E (27)            |        | -27    | 0      | -27         |
| Develop F (90)            |        |        | -90    | -90         |
| Trip Balance              | 55     | 114    | 163    |             |

|                           | Year 1 | Year 2 | Year 3 | Total Trips |
|---------------------------|--------|--------|--------|-------------|
| Est. New Trips            | 480    | 290    | 139    |             |
| Carry Over                |        | 215    | 128    |             |
| Est. Total Trips          | 480    | 505    | 267    |             |
| Max Trips per project 25% | 120    | 126    | 67     | <b>25%</b>  |
| Develop FM (260 trips)    | -120   | -126   | 14     | -260        |
| Develop VB (124)          | 0      | -124   | 0      | -124        |
| Develop B (25)            | -25    | 0      | 0      | -25         |
| Develop C (160)           | -120   | -40    | 0      | -160        |
| Develop D (60)            |        | -60    | 0      | -60         |
| Develop E (27)            |        | -27    | 0      | -27         |
| Develop F (90)            |        |        | -90    | -90         |
| Trip Balance              | 215    | 128    | 163    |             |

Projects that require more than one year in queue due to allocation maximum limits or end of queue

drw/pfts 030905

REVISION: Developer FM reduced trips from 318 to 260

|                           | Year 1 | Year 2 | Year 3 | Total Trips |
|---------------------------|--------|--------|--------|-------------|
| Est. New Trips            | 480    | 290    | 139    |             |
| EXEMPT TRIP SET ASIDE     | -81    | -36    | -89    |             |
| Carry Over                |        | 0      | 0      |             |
| Est. Total Trips          | 399    | 254    | 50     |             |
| Max Trips per project 90% | 359    | 229    | 45     | 90%         |
| Develop FM (260 trips)    | -260   | 0      | 0      | -260        |
| Develop VB (124)          | 0      | -124   | 0      | -124        |
| Develop B (25)            | -25    | 0      | 0      | -25         |
| Develop C (160)           | -114   | -46    | 0      | -160        |
| Develop D (60)            |        | -60    | 0      | -60         |
| Develop E (27)            |        | -27    | 0      | -27         |
| Develop F (90)            |        |        | -90    | -90         |
| Trip Balance              | 0      | 0      | 0      |             |

|                           | Year 1 | Year 2 | Year 3 | Total Trips |
|---------------------------|--------|--------|--------|-------------|
| Est. New Trips            | 480    | 290    | 139    |             |
| EXEMPT TRIP SET ASIDE     | -81    | -36    | -89    |             |
| Carry Over                |        | 0      | 0      |             |
| Est. Total Trips          | 399    | 254    | 50     |             |
| Max Trips per project 75% | 299    | 191    | 38     | 75%         |
| Develop FM (260 trips)    | -260   | 0      | 0      | -260        |
| Develop VB (124)          | 0      | -124   | 0      | -124        |
| Develop B (25)            | -25    | 0      | 0      | -25         |
| Develop C (160)           | -114   | -46    | 0      | -160        |
| Develop D (60)            |        | -60    | 0      | -60         |
| Develop E (27)            |        | -27    | 0      | -27         |
| Develop F (90)            |        |        | -90    | -90         |
| Trip Balance              | 0      | 0      | 0      |             |

|                           | Year 1 | Year 2 | Year 3 | Total Trips |
|---------------------------|--------|--------|--------|-------------|
| Est. New Trips            | 480    | 290    | 139    |             |
| EXEMPT TRIP SET ASIDE     | -81    | -36    | -89    |             |
| Carry Over                |        | 14     | 0      |             |
| Est. Total Trips          | 399    | 268    | 50     |             |
| Max Trips per project 50% | 200    | 134    | 25     | 50%         |
| Develop FM (260 trips)    | -260   | -60    | 0      | -260        |
| Develop VB (124)          | 0      | -124   | 0      | -124        |
| Develop B (25)            | -25    | 0      | 0      | -25         |
| Develop C (160)           | -160   | 0      | 0      | -160        |
| Develop D (60)            |        | -60    | 0      | -60         |
| Develop E (27)            |        | -27    | 0      | -27         |
| Develop F (90)            |        |        | -25    | -25         |
| Trip Balance              | 14     | 0      | 22     |             |

|                           | Year 1 | Year 2 | Year 3 | Total Trips |
|---------------------------|--------|--------|--------|-------------|
| Est. New Trips            | 480    | 290    | 139    |             |
| EXEMPT TRIP SET ASIDE     | -81    | -36    | -89    |             |
| Carry Over                |        | 174    | 67     |             |
| Est. Total Trips          | 399    | 428    | 117    |             |
| Max Trips per project 25% | 100    | 107    | -29    | 25%         |
| Develop FM (260 trips)    | -100   | -107   | -29    | -236        |
| Develop VB (124)          | 0      | -107   | -17    | -124        |
| Develop B (25)            | -25    | 0      | 0      | -25         |
| Develop C (160)           | -100   | -60    | 0      | -160        |
| Develop D (60)            |        | -60    | 0      | -60         |
| Develop E (27)            |        | -27    | 0      | -27         |
| Develop F (90)            |        |        | -29    | -29         |
| Trip Balance              | 174    | 67     | 42     |             |

Projects that require more than one year in queue due to allocation maximum limits or end of queue

drw/pits 050405

REVISION: Developer FM reduced trips to 260 not 318 + REDUCTION FOR ESSENTIAL GOV'T TRIPS

# Wilsonville Community Development

## - interoffice memo -



**Date:** May 5, 2005

**To:** Debra Iguchi, Chair – Wilsonville Planning  
Commission

**From:** Dave Waffle, Community Development Director

**RE:** Wilsonville Road/Boones Ferry Road

---

Enclosed are several aerial photographs of street configurations that will be used as exhibits at the Planning Commission meeting on May 11<sup>th</sup>. These include:

- current conditions of Wilsonville Road and Boones Ferry Road
- expanded future lane configurations of Wilsonville Road and Boones Ferry Road
- current conditions on a wide multi-lane intersections elsewhere in the Portland metropolitan area

The lanes overlaid on Wilsonville Road and Boones Ferry Road represent one version of what those streets may look like with more development in the vicinity and other growth in the corridor. Of course there may be some alternatives that are not as expansive.

Enc.  
drw/ pfts 050505



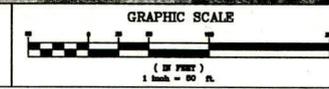
*Boones Ferry Road*

*Wilsonville Road*

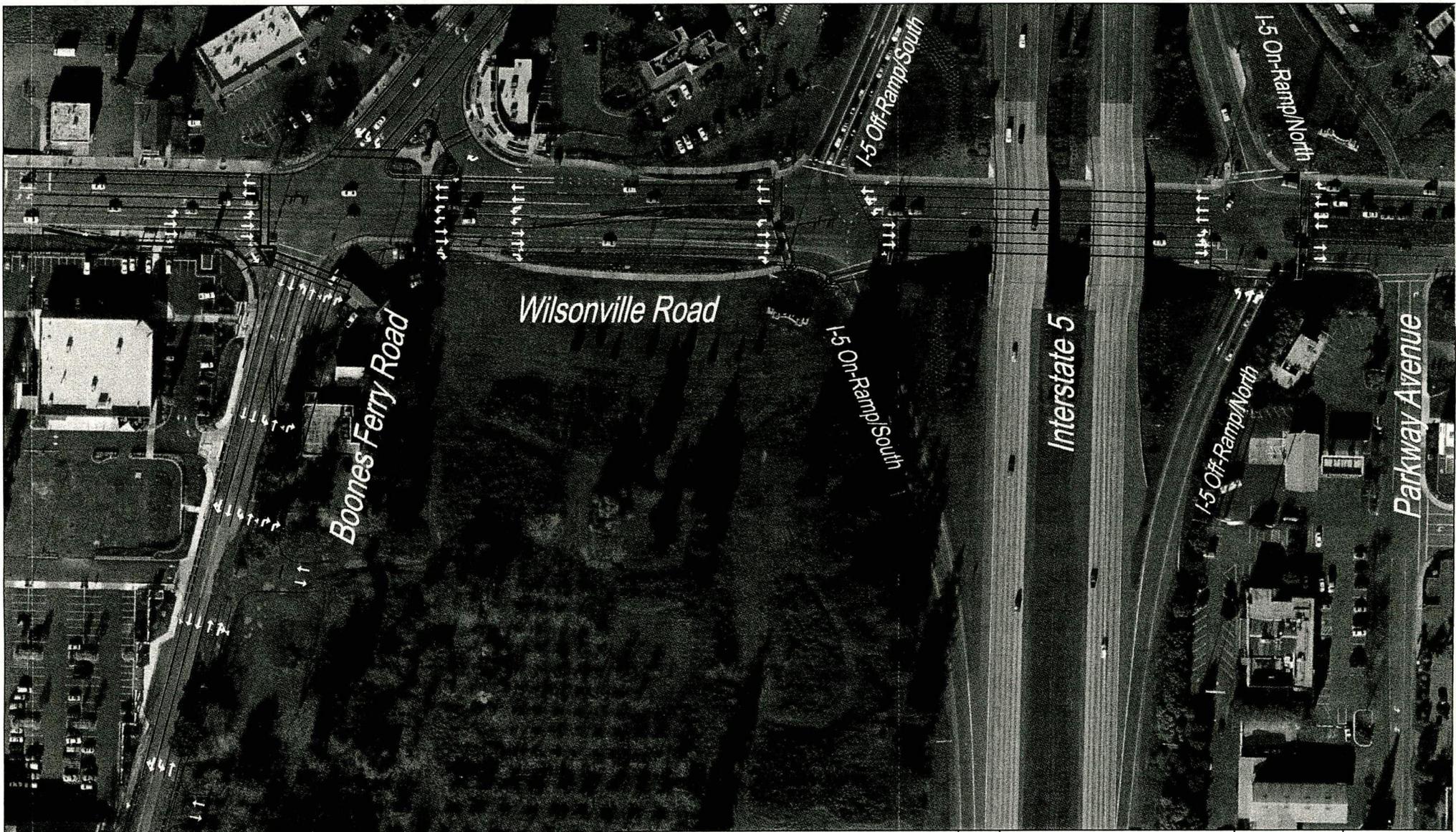
*Interstate 5*

*Parkway Avenue*

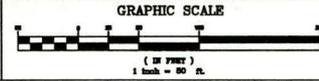
*Existing I-5/ Wilsonville Road/  
Boones Ferry Road*



|             |     |              |         |
|-------------|-----|--------------|---------|
| DRAWN BY:   | J71 | DATE:        | 4/18/05 |
| CHECKED BY: |     | DRAWING NO.: | 2       |
| JOB NO.:    |     | SHEET        | 2 OF 2  |



Proposed I-5/ Wilsonville Road/  
Boones Ferry Road Improvements



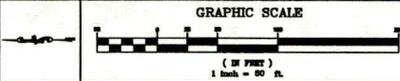
|             |           |              |         |
|-------------|-----------|--------------|---------|
| DRAWN BY:   | <i>Jm</i> | DATE:        | 4/18/05 |
| CHECKED BY: |           | DRAWING NO.: | 1       |
| JOB NO.:    |           | SHEET        | 1 of 2  |



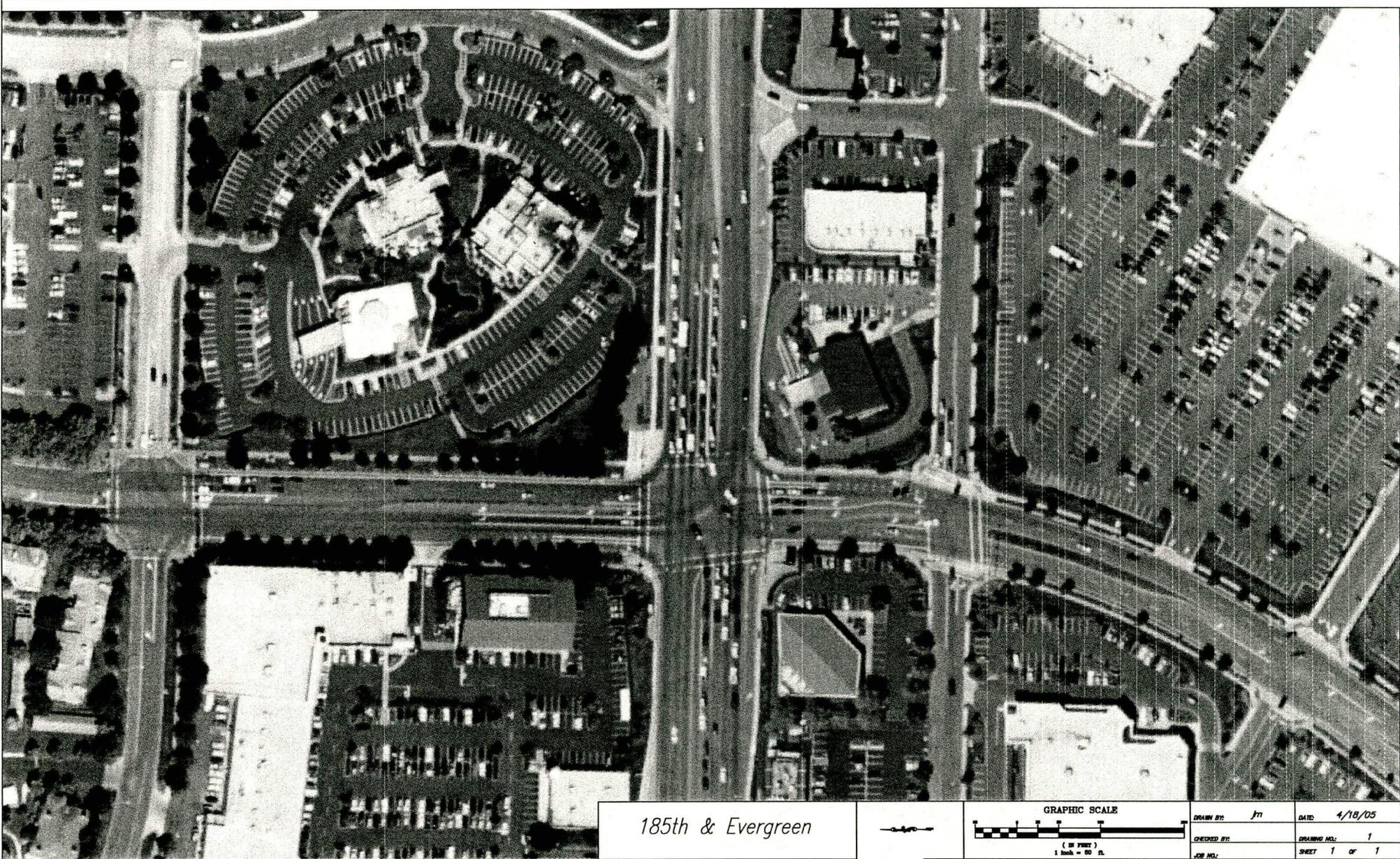
Wilsonville Road

Boones Ferry Road

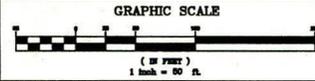
Proposed Wilsonville Road/  
Boones Ferry Road Improvements



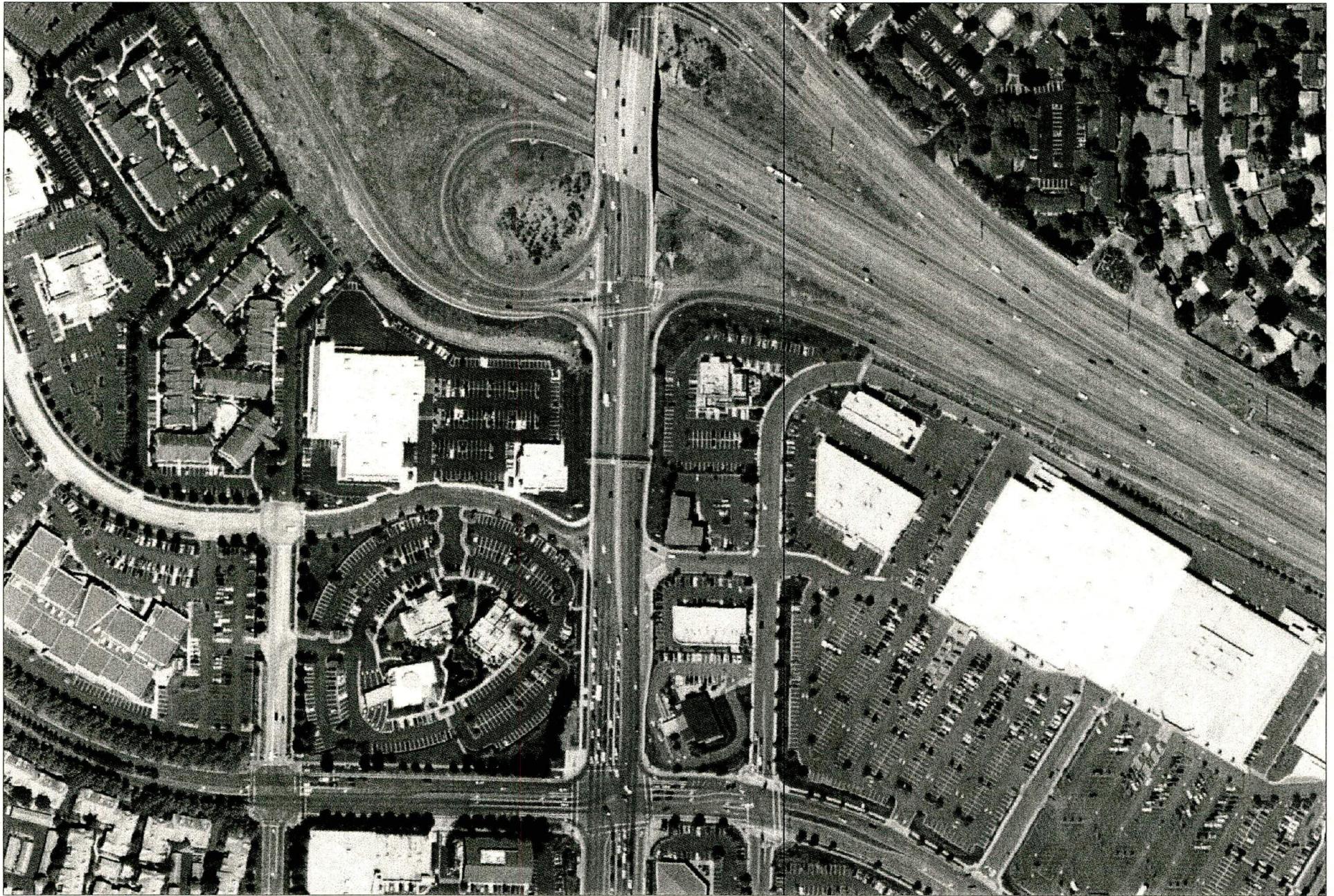
|                     |                |
|---------------------|----------------|
| DRAWN BY: <i>JM</i> | DATE: 4/18/05  |
| CHECKED BY:         | DRAWING NO.: 3 |
| JOB NO.:            | SHEET 3 OF 3   |



185th & Evergreen



|                     |                |
|---------------------|----------------|
| DRAWN BY: <i>Jm</i> | DATE: 4/18/05  |
| CHECKED BY:         | DRAWING NO.: 1 |
| JOB NO.:            | SHEET 1 of 1   |



185th & Evergreen  
overview

---

## Exhibit 30

---

**From:** Reah Beach [mailto:rlb@dkspdx.com]  
**Sent:** Wednesday, May 04, 2005 3:55 PM  
**To:** Johansen, Eldon  
**Cc:** Stone, Mike; Waffle, Dave; Straessle, Linda  
**Subject:** RE: Public Facilities Transportation Strategy

Eldon,

We work with most of the local jurisdictions in the region and generally observed that applications for private and public development are treated the same. These include school district projects, county jail, library, parks, city halls, maintenance facilities, park-and-ride, fire stations, airport, ports and recycling centers. They typically have required a transportation impact study, the agencies that have development charges generally apply them (although in some cases exception are made) and conditions of approval based on the TIS findings are made. Special treatment or exceptions for essential government services is not common. Based upon recent discussions this would be the case in Beaverton, Tigard, Lake Oswego, West Linn, Tigard and Washington County (this is a limited list only).

We are not aware of any local jurisdiction's policy on approving or denying essential government services during a period of moratorium. At this point, Clark County and Clackamas CountyPag are the only near by jurisdictions we are aware of that have ordinances that apply concurrency to traffic performance.

Some local jurisdictions do not include state facilities (ODOT) in transportation operations analysis. Clark County focuses on City and/or County facilities. However, Beaverton and Washington County do include state facilities in transportation operations analysis.

The basis for selecting study intersections for a transportation impact study vary by jurisdiction. Study locations are typically selected based on a minimum percentage of project trips traveling through intersections of a certain functional classification. As one example, the Beaverton study intersection requirements or "Area of Influence" are described in the attached document.

Randy and Reah

---

**From:** Johansen, Eldon [mailto:johansen@ci.wilsonville.or.us]  
**Sent:** Wednesday, April 27, 2005 9:52 AM  
**To:** Randy McCourt; Reah Beach  
**Subject:** FW: Public Facilities Transportation Strategy

Randy, do you have any info on this? I need so I can provide to Planning for the PC packet next Wednesday if possible.

---

**From:** Somerville, Bobbie  
**Sent:** Wednesday, April 20, 2005 3:49 PM  
**To:** rsm@dksassociates.com; rsm@dksassociates.com; rl@dksassociates.com  
**Cc:** Johansen, Eldon; Somerville, Bobbie  
**Subject:** Public Facilities Transportation Strategy

Sent on behalf of Eldon Johansen:

Staff is still working to provide the necessary information to the Planning Commission so they will be able to adopt recommendations concerning a new Public Facilities Transportation Strategy.

Our existing City Code and the recommended Public Facilities Transportation Strategy both include an exception to the level of service standards for essential government services. Our present requirement is for level of service D and we allow an exception provided that the overall level service does not to level of service F. With the Public Facilities Transportation Strategy we are proposing that the standard for the level of service on Wilsonville Road be changed from D to E for the section between Boones Ferry Road and Town Center

#### Loop

West and that the restriction on not going to level of service F for the exempt trips be removed. The Planning Commission has asked that we determine how other agencies accommodate the requirement to construct government facilities in areas where the level of service does not meet the standards. It is requested that you provide an additional scope of work to the work that you are presently doing on the alternatives analysis to conduct a survey of other agencies to determine how essential government services are accommodated.

Currently our requirements for traffic analysis focus on the most probable used intersections and we frequently require an analysis from the development to the most probable used interchange. It has been suggested that this approach is needlessly expensive and that we should either limit the analysis to so many trips through an intersection or more, or to perhaps some percentage of the intersection capacity. It would also be appreciated if you would review your information and, if necessary, ask how other cities handle their selection of intersections for analysis.

We are presently scheduled to take the follow-up information to the Planning Commission on May 11th and if possible, would appreciate a response at least a week prior to that date.

City of Beaverton

Definitions

04PC03A & B

Page 22 of 27

**Area of Influence.** [ORD 4013; April 2000] For purposes of fulfilling Section 60.55.10. Traffic Impact Analysis requirements, "area of influence" is defined as, at a minimum, all points of access onto the public street system, all intersections of regional significance (arterials, collectors, and neighborhood routes) within 1000 linear feet from all points of access onto the public street system, and all intersections where the traffic generated by the proposed development exceeds five (5) percent of existing a.m. or p.m. peak hour total intersection traffic volumes based on City-approved trip generation, assignment, and distribution calculations.

BALL JANIK LLP

A T T O R N E Y S

Exhibit 31

101 SOUTHWEST MAIN STREET, SUITE 1100  
PORTLAND, OREGON 97204-3219

www.balljanik.com

TELEPHONE 503-228-2525

FACSIMILE 503-295-1058

DANA L. KRAWCZUK

dkrawczuk@bjllp.com

May 4, 2005

Wilsonville Planning Commission  
30000 Town Center Loop E.  
Wilsonville, OR 97070

Re: Follow Up Testimony for Public Facilities Transportation Strategy  
(04PC03A and 04PC03B)

Dear Members of the Wilsonville Planning Commission:

Mr. Angel is participating in the Public Facilities Transportation Strategy (PFTS) process because despite the city's efforts to add capacity to the Wilsonville Road interchange area, there will not be enough capacity created to allow all of the anticipated development to proceed. As a result, it is essential that the queuing priority is fair because it determines the allocation of trips and which property owners will be prohibited from developing their property. Several issues must be considered when creating a queuing system that is fair, including:

1. Recognizing partially developed master plans as having priority over new development;
2. Ensuring that large projects do not absorb all available capacity;
3. Recognizing that development that relies on pass-by trips, rather than adding new trips to the system, has no new impact on the system; and
4. The ability to provide applicants a choice in hiring a traffic engineer on behalf of the city.

All of these issues were discussed at the April 13, 2005 Planning Commission hearing. Because the issues were not resolved, the Planning Commission directed staff to provide alternatives for addressing each issue.

1. Properties that have existing master plan approvals that have been partially implemented should have priority in the queue.

Our primary concern is an equitable allocation of available trips and how queue priority is established. The proposed approach of having a developer's place in the queue determined at the time that they receive Stage II approvals for a project is a "one size fits all" approach that is not fair because it does not recognize the two unique properties in the

**BALL JANIK LLP**

Wilsonville Planning Commission

May 4, 2005

Page 2

Wilsonville Road interchange area that have partially developed master plans and properties who have already donated property to the system.

As you know, Mr. Angel is a long time property owner in Wilsonville that has an approved master plan that has been partially developed. The first two phases of the approved master plan (Burger King on Wilsonville Road and Chili's on Boones Ferry Road) have been developed, with one phase remaining. As part of the development of the first two phases, Mr. Angel financed improvements and also dedicated sections of right of way adjacent to his site in excess of what was needed to serve just the development. However, Mr. Angel has not been able to develop the third phase of the master plan, in part because of the lack of available transportation capacity in the Wilsonville Road interchange area.

Properties that have existing master plan approvals that have been partially implemented should be recognized and given priority within the queue. These properties have gone through the master plan process and have had some phases of the master plan fully built out. In Mr. Angel's case, the initial master planning and phasing was done in 1984. So that his master plan can be complete and his investment-backed development expectations can be recognized, it is appropriate to have Mr. Angel's placement in the queue revert back to the date of when the master plan was approved and partially developed. It is also reasonable to allow partially developed projects precedence over completely new development because partially developed properties have services readily available on site and have made some or all of the necessary offsite improvements. Specifically, Mr. Angel has already contributed to the improvement of the transportation system by financing improvements and by dedicating right-of-way that was needed to serve not only that phase of the master plan but improvements that were needed to improve the whole system – i.e., the dedication of an entire lane on Boones Ferry Road as part of the development of the Burger King and Chili's.

At the April 13, 2005 Planning Commission hearing, staff raised the issue that it may be problematic to provide partially developed master plans priority in the queue because (1) there may not be enough detail in the master plan approval about the remaining phase to determine how many trips are needed; and (2) providing partially developed master plans with priority may result in allocated trips not being used.

To ensure fairness for owners that have partially implemented master plan approvals, there should be options for determining the number of trips needed, other than going through a Stage II process. In order to receive Stage I approval, the developer must provide the city with a conceptual and quantitatively accurate representation of the entire development so

---

<sup>1</sup> Based on the staff reports provided, it appears as if only two development projects in Table 1 (Anticipated Development Projects Through 2009) have received master plan approval but not final Stage II approval to finish their developments – Mr. Angel's property (ID 15, 0.69 acres of retail development) and the Kohl property (ID 19, 2.93 acres of commercial development).

03/04/2005 10:12 AM 300 200 1000

CALL CENTER

03/04/2005

# BALL JANIK LLP

Wilsonville Planning Commission  
May 4, 2005  
Page 3

that the impact on the community can be determined. Section 4.140(.07). In other words, property owners that hold a Stage I approval have already told the city how many trips their development is expected to create. Despite this requirement, if the city needs more specific information about the number of trips needed, it could simply ask the owner of a partially developed master plan to provide that number. Once the number of needed trips was determined, the undeveloped phase's placement in the queue reverts back to the date of when the master plan was approved and partially developed.

Because there has been a shortage of capacity in the Wilsonville Road interchange area that has prevented development, we think that it is very unlikely that any property owner will not utilize trips allocated to their project. This is especially true for owners of partially developed master plans that have already contributed to the improvement of the transportation system through financial contribution and roadway dedications. Nonetheless, to avoid any concern about allocated trips not being used, the city could require these unique properties to apply for final Stage II approval within three years of the adoption of the PFTS. If an application for Stage II final approvals is not filed within three years, then the property's priority in the queue would be based upon the date of Stage II approval.

If the city strives to make the allocation of the limited trips as equitable as possible, it must give the undeveloped phases of partially developed master plans priority in the queue. Priority is appropriate and fair, when the private contribution to public facilities next to these developments, the road improvements made, the development history and the small number of projects that are in the unique situation of having partially developed master plans are considered.

2. Protect opportunities for small projects to develop by limiting the number of trips available to large projects.

We agree that a large project (or projects) should not absorb all of the available trips, and support the city's effort to achieve a balance when allocating trips between small businesses and large developers. We suggested that rather than limiting the percentage of trips that a larger developer can absorb in a year (i.e. 50%), a percentage of the available trips should be persevered for smaller projects.<sup>2</sup> In other words, rather than allowing a large developer such as Fred Meyer to have 50% of the trips each year, the city should begin the allocation process by distributing up to 50% of the trips to smaller projects based upon their priority date. Larger projects would then compete for the remaining 50% (or more, if in the subject year the smaller projects do not absorb the percentage of trips available) based upon their priority in the queue. For example, in the first year following the adoption of the PFTS, it is anticipated that 480 new

---

<sup>2</sup> "Smaller projects" should be defined based upon the number of new trips added to the transportation system during the p.m. peak hours. For example, projects that add no more than 150 new trips to the transportation system during the p.m. peak hours are "smaller projects."

# BALL JANIK LLP

Wilsonville Planning Commission  
May 4, 2005  
Page 4

trips will be created. Under our approach, 240 of those trips would be preserved for smaller projects – development that adds 150 or less new trips to the transportation system during the p.m. peak hours. Smaller projects would compete for the 240 trips based upon their priority in the queue, and the priority date for partially developed master plans would revert back to the date of when the master plan was approved and partially developed. Larger projects would compete for the remaining 240 trips based upon their priority in the queue. In the event that the smaller projects proposed for development in the first year did not absorb the 240 trips preserved, then any excess trips would be available for larger development. For example, if only 190 trips were needed by smaller projects in the first year, then 290 trips would be available for larger development.

Our proposed approach fosters small business and will allow developments that rely on pass-by trips and do not add significant amounts of new trips to the system to proceed. It also prevents a situation where many projects are delayed for years if two large developments took place in a single year.

3. Development that relies on pass-by trips rather than newly generated trips should be encouraged.

Uses that rely on trips that are already in the transportation system, as opposed to uses that generate and add new trips to the system, have little impact on the transportation system. So that the limited number of new trips created by the PFTS can be utilized by many property owners, uses that rely on pass-by trips should be encouraged. Because pass-by trips are not counted as end trips, the proposal to preserve 50% of the available capacity to smaller projects (described above) encourages the development of many uses that do not add significant numbers of new trips to the system.

4. Providing the applicant a choice in hiring a traffic engineer on behalf of the city.

When reviewing a proposed planned development, the city has historically selected and hired a traffic engineer at the applicant's expense for the purpose of analyzing the project's impact on the transportation system. See Section 4.140(.09)J.2.a. In our previous testimony, we suggested that the city provide a list of acceptable traffic engineers from which the applicant can choose so that the developer has some control over managing the costs of a project. We are not questioning the competency of DKS, the city's designated traffic engineering firm. Our concern is based only on the inability to control costs and schedules in the absence of a competitive market.

At the April 13, 2005 hearing, other property owners testified in support of our idea, in part because of their frustration with the lack of responsiveness of DKS and the related delay to development applications. Staff explained that relying on DKS for all transportation analyses was preferable because (1) the resulting traffic study was in a uniform format that was easily interpreted and (2) because DKS has assumed much of staff's transportation record

\\ODMA\PCDOCS\PORTLAND\462820\3

04PC03A + B  
26 of 27

BALL JANIK LLP

Wilsonville Planning Commission  
May 4, 2005  
Page 5

keeping tasks, if firms other than DKS were utilized it may become an administrative burden on staff.

The benefits to staff of relying only on DKS are outweighed by the burden the exclusive arrangement places on applicants. Uniformity in methodology and traffic report format can be ensured by providing specific guidelines to traffic engineers. For added control over the traffic analyses, the city could provide a list of acceptable engineers. The bottom line is that requiring applicants to rely on a single traffic engineering firm in order to develop in Wilsonville discourages efficiency and competition, which leads to increased delay and costs, and is an unfair restraint of trade and free market. The burdens of the exclusive traffic engineer arrangement will be exacerbated once the PFTS is adopted. Once capacity is created, it is likely that there will be a rush of Stage II applicants because property owners will be eager to finally develop their property. All of these applications will be funneled to one traffic engineering firm. Because priority in the queue is based upon Stage II approval, and Stage II approval is dependant upon a traffic analysis, an applicant's priority relies entirely on when DKS completes its analysis. In other words, an applicant's ability to develop their property (due to their priority in the queue) may turn on the work load of the city-endorsed traffic engineer.

Thank you for the opportunity to participate in the city's efforts to fairly allocate the limited traffic capacity created by the public facilities transpiration strategy. We look forward to participating at the May 11, 2005 public hearing.

Sincerely,



Dana L. Krawczuk

cc: Joseph Angel  
Peter Finley Fry

# Urban Solutions

---

△△△ Delivering Desired Futures  
PO Box 4063 △ Wilsonville, OR 97070 △ 503-682-9361  
Fax 503-682-9365 △ Email: urban.solutions@verizon.net

---

April 27, 2005

David Waffle, Community Development Director  
City of Wilsonville  
30000 SW Town Center Loop E.  
Wilsonville, OR 97070

## Exhibit 32

**RE: 04PC03A & B - PFTS Ordinances**

This letter is being submitted on behalf of the Kohl Family and KWDS, LLC.

The Staff and Planning Commission have struggled long and hard in developing the recommendation now before the Commission regarding the proposed Public Facilities Transportation Strategy. We appreciate all their work. We also appreciate the Council's commitment to public facilities planning and implementation. We believe that this is the City's primary purpose, and an essential function in support of continued growth. And, we appreciate your taking your jobs and responsibilities seriously.

We believe that part of the Commission's struggle is simply due to the overall complexity of the concurrency policy and of developing a workable implementing strategy. But, it also occurs to us that part of their struggle has to do with trying to justify, in their minds, an honest, factually based, and equitable package, when this strategy clearly is not all of that. As we see it the PFTS is at best a stop gap measure.

Understandably, the Commission wants precise, linear, and consistent long-term solutions. And, they clearly struggle with inconsistencies, leaps in logic, levels of inconsistency, and an underlying inequity and arbitrariness.

We believe the Commission gets stuck between developing specific standards and the more vague formulation of Policy and somewhat flexible strategy, which is clearly a band-aid fix to get us through the next couple of years. Some of their concerns, while legitimate, are clearly beyond the short time frame of this Strategy.

We testified in general support of the staff recommendations. But during the hearing, the Commission, ask staff for revisions, which we do not support. We have some specific

concerns with the direction the Commission appears to be heading. Our concerns are addressed below.

But first, we were also struck by the reality of the players now involved in this process, from both the city and the private sector. Of all the people now participating, only Jack Kohl, Mike Kohlhoff, and Ben Altman were actually present and participating when this whole concurrency policy was originally developed (1978-1980). For this reason, we thought it might be useful to put a little historical perspective on growth management in Wilsonville.

Back in 1978, the city was less than 10 years old, had a small staff, and a fairly large group of involved citizens. Besides the Planning Commission, there was an organized Citizen Involvement Committee, called WIN. WIN stood for Wilsonville Interested Neighbors, which was comprised of residential representatives from the four quadrants of the city, created by Boekman Road and I-5. The business community was also represented.

The initial Comprehensive Plan was developed by WIN and the Planning Commission, with technical support from staff, which at that time was limited to one planner (Ben Altman) and the City Administrator (Ed Davis), who also had a planning background.

At that time, the city was facing a lack of sanitary sewer treatment capacity. And, it was actually WIN and the Planning Commission, who developed the framework for the City's first "Public Facilities Strategy", although it was not called that at the time.

The strategy was a simple annual allocation system, limiting the rate of connections to the sewer system. This strategy was in place for a little over 2 years, until funding was secured and construction of the expanded treatment plant was completed.

Because of the sewer capacity problem, everyone was very sensitive to growth management as the Comprehensive Plan was being formulated. Everyone knew water was next on the concern list, and that eventually transportation system would need attention.

However, at that time, every street in town was operating at "A" LOS, so roads were not a big concern. In fact, many felt they could simply rely upon development to deliver the necessary road system.

It is important to understand that initially the "D" LOS criterion was not developed as a permitting standard. It was originally envisioned as a triggering mechanism for when to place road improvements on the Capital Improvements Plan. However, as the city moved through the adoption process, case law and subsequent changes in state law forced the City to adopt "clear and objective" standards for permit approvals. And, since the "D" LOS was there and generally understood by everyone involved, it was moved from a CIP trigger to a permit standard.

While the Planning Commission is now concerned about the change from "D" to "E", you can only imagine that moving from "A" LOS, to "D" was drastic. But, it was also recognized that with growth comes congestion, and the intent was simply to stall it and soften it over time, as much as possible. Also, everyone recognized that the gap between "A" and "D" would accommodate significant growth, and there was a since that we had 20 years to make it all work. Probably no one involved at that time ever expected that the city would be struggling with maintaining "D" LOS 30 years later.

Well that original 20-year horizon has come and gone, and we are still trying to make it work. So, many might wonder what went wrong.

You should know that coupled with the "D" LOS was a Capital Improvements Plan (CIP). The CIP was designed to stay in front of the public facilities demand and traffic congestion curve. You may also be interested to know that the initial Transportation Master Plan included a \$20 million CIP list, to upgrade all arterials and major collectors to 3-5 lanes, over the 20-year planning period. And, many may not be aware that in 1982 the City received a League of Oregon City's Excellence Award for its CIP/Growth Management program.

Today, that \$20 million figure only covers interchange improvements at Wilsonville Road, not the entire system. And, overall much more has already been spent making various road improvements. But, what many now involved may not know is that part of the current problems stem from the fact that the City failed to consistently and continually implement the CIP.

Unfortunately, as it turned out, only the first two years of the initial CIP were actually fully funded. After that, for a period of about 10 years, the only system improvements made were those specifically conditioned upon approved development projects. It was not until 1990 that the, then City Council, took public facilities and transportation planning seriously and began to work towards long-term solutions. But, it took 2 years to get things moving, including adopting the Urban Renewal Program. And, by then, there was a pending water supply problem and congestion beginning to occur at various intersections, particularly on Wilsonville Road.

Unfortunately, that 12 year gap in implementation has placed the City in a catch-up mode, and we will likely never actually catch-up. In addition, that delay had significant cost implications due to inflation. And, the City has annexed 500 acres, which just adds to the puzzle.

In addition, we submit that part of the added costs, over time, stems from the application of the "D" LOS. The original Transportation Master Plan envisioned building a specific road network. But, as development has occurred and the "D" LOS has been applied, many street and intersection designs have been modified, adding additional capacity, and of course costs. The reality is that under the LOS standard, the road system will never actually be complete. We will always be considering adding lanes.

As another flashback, you may be interested to know that the very first 1975 Comprehensive Plan for Wilsonville envisioned all major roads as 5-7 lanes. In subsequent refinements to meet state goals and objectives, it was decided that, from an urban design standpoint 5 lanes was the maximum desired. But, based on current practices, that original plan may have been a more accurate vision.

The bottom line is that growth management, particularly as envisioned by Wilsonville, is a life-time program. It is not one that has a start and a finish. And, as we are all well aware, the whole government decision-making process just takes a lot of time... and often compromises from an "ideal program" must be made just to make things work.

**NOTE:** The following comments are based on the Commission's discussion and direction to staff at the April 13th hearing. We have not, yet, seen staff's response and recommendations, but have serious concerns about the directions given by the Commission. Since the Commission altered the recommendations, after public testimony was closed, we believe it appropriate for them to reopen the hearing for additional testimony.

With the above background perspective, here are our concerns regarding the Commission's recommendations:

1. We **OPPOSE** adding "Exempted Trips" back into the Queue. This change will further undermine the availability of trips for private sector development, which is counter to the basic purpose of the PFTS. We see this recommendation as a sneaky left-handed strategy to simply limit growth. It ignores the fact that the only reason we are considering the PFTS is to accommodate more growth and avoid a moratorium.

The Council has previously and appropriately concluded that "essential government services" are necessary for the health and safety of the community. These services, while generating PM trips and adding to congestion, are generally needed to support or compliment private sector development. Therefore, while not ideal, it is logical to exempt them from the LOS standard, and also to not further penalize or restrict other needed housing and economic development by counting these exempted trips.

We agree with Commissioner Juza, who acknowledged that "quality of life" is not limited to congestion concerns. It also includes having goods and services available locally, so people don't have to leave town just to get what they need. She also appropriately noted that a stagnant economy is not healthy, and that continued growth is necessary to sustain a strong and vital community.

2. While we understand the concern of existing businesses regarding the ability to expand, we do not believe their needs are any different than those of new businesses. Therefore we do not support any special treatment or priority in the queue for existing development.

We already have an inequitable benefit for properties north of Boeckman Road. It would further compound the inequities to also grant special treatment for existing developments. It would also tend to limit vital competition, which would negatively impact the public. This is simply a situation where we believe the limitations and suffering should be as equally spread as possible.

3. While somewhat arbitrary, we are not opposed to the 50% limit of available trips for any one development. A percentage of available trips is probably preferable to a set maximum number of trips, as it would stay proportional to availability.

But, we are opposed to any mechanism that would allow large master planned areas to circumvent this limit by applying for a series of Stage II approvals. Villebois is an obvious existing exception, as special consideration has already been granted. But we should not extend this special treatment.

Any development, large enough to be phased, will have a large trip count. We do not believe it would be equitable to allow the total trip count to be divided up in a manner that would allow staking the queue. We do not see any difference in one large trip generator versus another, regardless of ownership patterns. The whole purpose of creating the 50% limit is to protect trips for smaller development, and in a way force a phasing of delay in large development, which are forced to accumulate trips in the queue over multiple years.

4. While not specifically related to the PFTS and queuing, we do share a concern with other developers regarding the apparent monopoly DKS has over traffic impact reports. Our concerns relate to the delays experienced in getting a scope of services approved, and then the report actually prepared. We are also concerned that there does not appear to be any control over the cost they determine.

In our experience, just related to Old Town, we participated in a multi-owner study, including Fred Meyer, a few years ago, during development of the TSP. That study, which included several alternatives, was priced at \$7,500. Now we have recently requested a site-specific study for our pending Stage II application, and that study was priced at \$12,000. We do not see the justification for such a cost discrepancy, but, without an option, were forced to pay.

Not only was the cost extremely high, but we also experienced significant delays. From the date of our original request for cost of services to the date of delivery of the report it took 5 months. This type of delay and uncontrolled cost escalation is a serious problem.

We also have concerns about the accuracy of trip generation projections DKS makes. We believe their trip projections tend to be high, and that the computer model tends to count existing trips as new trips.

Generally, we feel the city is relying too heavily on computer modeling, which costs everyone lots of money. And, we are concerned that it will just keep costing more...

5. The recommended strategy specifically includes "Investing in Wilsonville Road". While this may be appropriate, we believe the strategy should also include a continued commitment to invest in promoting connectivity alternatives. Connectivity alternatives should also be factored into the determination of "LOS", not just PM trips.

It can be argued that, while there have been problems and delayed construction, the city's general concurrency policies and public facilities strategies have worked up to this point. What the city has been able to accomplish, to date, is to slow development, and more importantly, to secure significant funding for major westside and interchange system improvements through the Master Planning and financial package of Villebois.

Relying upon Villebois, as a "Transportation Friendly Development", the city has also been successful in securing state funding, combined with local urban renewal and SDC funding to help complete essential connectivity links. When completed, these links will provide critical alternative routes to the Wilsonville Road/I-5 connection, particularly for cross-town trips.

With these, mostly westside, road links in place, all areas of the city will have alternative routes available when traffic backs-up at Wilsonville Rd./I-5, and subsequently at Boones Ferry Road. These alternate routes make it possible to consider other options in addressing congestion through the Wilsonville Road weak link segment. People must have chooses, not just one route.

But, again, we are concerned the computer modeling does not appropriately account for diversion of trips to alternate routes when congestion occurs. It seems that the model only tended to divert 2-5% of trips, even when "E" to "F" LOS was reached. This is not consistent with actually driver practices, as we observed just during the construction on Wilsonville Road. People were taking alternate routes, and probably changing driving habits, and that was without very good alternative routes being available.

With more route options, we believe there would be a much higher percentage of diverted trips than the model tends to show. Therefore, we believe there needs to be some room allowed for pure logic to be applied, and not simply rely upon a computer model. Or at the very least, the model needs to be adjusted to be more sensitive to diversion due to congestion.

6. The interchanges at I-5 are clearly a weak link in the local system. Currently Wilsonville Road is the focus, but we can envision soon, that the Stafford interchange will also become a major concern. Therefore, we suggest that this weak link (Wilsonville/I-5 or interchanges generally) be allowed to fail, or drop to "E" to "F" LOS, while maintaining the "D" standard elsewhere in town. While this sounds counter to managing congestions, we would submit that it actually could be supportive of the concept.

Part of the overall strategy to manage congestion is to reduce trips through the critical weak link segment through diverted trips to other streets and increased use of transit and other mode options. Integral components of these alternatives include:

- Having alternative routes available;
- Having land use patterns that provide needed goods, services, and jobs available locally, thus minimizing out of city commuter trips.
- Having choices for goods and services on both sides of the Freeway, thus minimizing the need for cross-town trips.
- And, it could be argued, that allowing failure at I-5 would increase the probability of travelers using alternative routes and modes.

In contrast, we argue that as long as good capacity ("D" or better) is maintained through the I-5 weak link, there is no real incentive for modified driving patterns. Therefore allowing congestion in excess of "D" at this limited location can be found consistent with the overall TSP and traffic management strategy. Since essentially everyone in town contributes to the total congestion at Wilsonville Road/I-5 it is appropriate that everyone shares the discomfort and disadvantages.

Contrary to Commissioner Faiman's opinion, we submit that existing residents contribute to the PM Peak congestion, as new developments are completed. It is not just new development that creates congestion. For example, when Albertson's and Wallgreens opened existing residents began to shop there, instead of somewhere else. The fact is they were already making trips to somewhere to get the goods and services now available at Lowries Market Place. This is actually another concern we have, see 7 below. Again, this is where we loose faith in the computer model.

Nothing in this approach discards the general concurrency policies nor undermines the city's intent and efforts to secure funding for the needed improvements at Boones Ferry and I-5. But, at the same time it opens the system to additional SDC revenues and in some cases Urban Renewal Tax increment, from development that is otherwise restricted from participation.

This approach also eliminates the need to count every trip, other than as a method to define the obligation for SDC's and Supplemental SDC's. But, the city could

also opt to impose an artificial annual trip allocation, as a method of continued management over the rate of traffic impacts.

Our main point here, however, is that the city must continue to develop alternative crossing of I-5 and to promote connectivity as a priority. We cannot afford to only invest in the Wilsonville Interchange.

7. We do not believe the current method of traffic analysis and the model used accurately accounts for diversion of existing trips to new developments. As noted above, it also does not appear to be sensitive enough to the availability of alternate routes.

Similar to the Albertson's case discussed above, when you look at develop of Fred Meyer or the Kohl property in Old Town, every PM trip that occurs at the driveways of these new development is not a new trip. We argue that the majority of these trips are pass-by or diverted trips. It appears to us that somehow DKS is counting the same trips multiple times.

The fact is, if Fred Meyer (or any other retail development) open tomorrow, there is no way this would all of a sudden generate 600+ trips that are not already going somewhere. It should be obvious to anyone, if they pay attention to their own driving and shopping patterns, that they don't shop more just because there is a new store. People have may make a few convenience trips, but they generally have a set demand for food, etc.

We understand that the trips assigned to Fred Meyer or any other development will change the pattern of trips, and thus cause different impacts at given intersections. What we don't understand is how we get all these new trips.

Of all the trips assigned to Villebois, for example, some would go to Fred Meyer, some to Albertson's, and still others to Lamb's Thriftway. And, some may go to all three locations in sequence. The point here is that these residential trips are actually the new trips, that then get counted again against Fred Meyer or whoever. The numbers just don't make sense.

8. With regard to alternate routes, we believe it is unfair and unreasonable to disproportionately burden a limited number of properties, such as those in Old Town, for the general benefit of others, including the public in general. Old Town is currently limited to one access point, because of the dead-end of Boones Ferry Road. Because there is no alternate route available, any development in Old Town is forced to use and thus impact the Boones Ferry/ Wilsonville intersection.

In this regard, we believe the Old Town access situation is akin to the once critical "Day Dream Escape". The city elected to relieve the Day Dream Ranch problem with the construction of Memorial Drive, which intersects Wilsonville Road at

Town Center Loop E. We argue that construction of the 5<sup>th</sup> Street to Brown Road extension is similarly warranted, as a vent for Old Town.

In additions, we are supportive of staff's recommendation for allowing special consideration for unusual circumstances, where no alternative route is available, like in Old Town.

Thank you for your consideration of our concerns.

Respectfully Submitted,

A handwritten signature in cursive script that reads "Ben Altman".

Ben Altman

cc: Planning Commission  
City Council

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Minutes from the April 13, 2005 Planning Commission Public Hearing**

Wilsonville Community Development Annex  
8445 SW Elligsen Road  
Wilsonville, Oregon

**PLANNING COMMISSION**  
**Wednesday, April 13, 2005**  
**6:30 PM**

Approved 5/11/05  
with one amendment  
on page 12

---

**MINUTES**

---

**I. CALL TO ORDER-ROLL CALL**

Chair Debra Iguchi called the meeting to order at 6:30 p.m. Those present:

Planning Commission: Debra Iguchi, Richard Goddard, Craig Faiman, Mary Hinds, Heidi Juza, and City Council Liaison Sandra Scott-Tabb. Joe Maybee and Susan Guyton were not present.

Staff present were Sandi Young, Dave Waffle, Eldon Johansen, Paul Lee and Sharon Zimmerman.

---

**IV. CONTINUED PUBLIC HEARINGS**

**A. Application No. 04PC03A**

Applicant: City of Wilsonville

Request: A Proposed Public Facilities Transportation Strategy, a strategy to accommodate future development while maintaining the City's and ODOT's level of service requirements by allocation of p.m. peak hour trips through the intersections of Wilsonville Road with I-5, Boones Ferry Road, and Town Center Loop West together with construction of planned transportation improvements and anticipated changes in driving habits.

**B. Application No. 04PC03B**

Applicant: City of Wilsonville

Request: A proposal to change the Level of Service from "D" to "E" on Wilsonville Road between and including the intersections with I-5, Boones Ferry Road and Town Center Loop West and on portions of Boones Ferry Road adjacent to those intersections as authorized by Wilsonville Transportation Systems Plan Policy 4.1.1, and to exempt "essential government services" from all Level of Service standards.

The following was distributed at the beginning of the meeting:

- Exhibit 22: A letter dated April 12, 2005, from Dana L. Krawczuk of Ball Janik LLP, regarding Testimony for Public Facilities Transportation Strategy (04PC03A and 04PC03B).
- Exhibit 21: A table, Allocation and Queuing Examples. (distributed at the March 9, 2005 meeting). (This table was updated after the meeting and an updated copy was emailed to the Planning Commission)
- Exhibit 20: A aerial photograph, Public Facilities Strategy Impacted Intersections (distributed at the March 9, 2005 meeting).

- Exhibit 19: Draft Ordinance for PFTS included in the March 9, 2005 meeting packet, combining PFTS and LOS language (04PC03A & 04PC03B)
- Exhibit 18: A Community Development Memorandum dated March 2, 2005, to Sandi Young, from Eldon Johansen, regarding PFTS.
- Exhibit 17: An Interoffice Memorandum dated March 3, 2005 for the March 9, 2005 Planning Commission Work Session, to Arlene Loble, from Dave Waffle and Mike Kohlhoff, regarding the Public Facility Transportation Strategy.
- Exhibit 16: An Interoffice Memorandum dated March 3, 2005 for the March 9, 2005 Planning Commission Work Session, to Debra Iguchi and Members of the Planning Commission, from Dave Waffle, regarding the Public Facility Transportation Strategy.

The conduct of hearing format was read into the record. Chair Iguchi stated that public testimony would initially be limited to three minutes per person.

Chair Iguchi opened the public hearings for **Applications 04PC03A** and **04PC03B** at 6:34 p.m.

### Staff Report

**Dave Waffle, Community Development Director**, outlined the six components of the Public Facilities Transportation Strategy (PFTS) (Exhibit 23).

- Mr. Waffle stated that the PFTS involved two main issues:
  - \* Congestion and the problems in the Wilsonville Road Interchange area.
  - \* Moratorium: how to avoid a moratorium or a de facto moratorium situation where the Development Review Board (DRB) may deny multiple applications.
- In looking at long-term community development, the Planning Commission is to consider this issue against the goals of Comprehensive Plan and the specific goals of the Transportation Systems Plan (TSP). He briefly reviewed the "Strategy Outline Summary" on page 5 of 51, of his memorandum to the Planning Commission (Exhibit 16), with the following additional comments:
  1. **Change of Level of Service 'D' of Level of Service (LOS) 'E' at the impacted intersections (of Wilsonville Road and Boones Ferry Road, and Wilsonville Road and Town Center Loop West) and Volume to Capacity Ratio (V/c) at the( northbound and southbound) I-5 ramps.** This allows development to occur as long as the traffic impact for weekday peak PM trips in those intersections does not exceed LOS "E". The LOS "D" would not change in any other part of the community.
  2. **Continue to exempt "essential government services" from LOS restraints.** Counting these trips may stop other development.
  3. **Develop a process to allow queuing of trips and allocating them at Stage II of the development approval process.** City Council was definite about the allocation occurring with Stage II approval. The question then is how to allocate the trips. This is where City Council is seeking the Commission's guidance.
  4. **Develop new SSDC's to pay for transportation system improvements.** After the PFTS is implemented, adjustments may be needed in street or supplemental system development charges.
  5. **Invest in facilities on Wilsonville Road and I-5.** City Staff notes described the \$3.5 million option, which was approved for this year. The scope of it has changed however; major physical reconstruction has been removed. Now, minor reconstruction will be done and lane re-striping to accommodate lane changes.
    - \* Other elements of \$3.5 million option including the work on Boones Ferry Road/Wilsonville Road intersection would be delayed until the large commercial properties south of Wilsonville Road are ready.

- \* On the horizon, the \$20 million option involved further widening of Wilsonville Road, some ramp work, etc. The City is not ready to move ahead on those items because more study is needed to determine the most appropriate improvements.
6. **Adopt means of inducing changes in driving behavior and monitoring traffic to “capture” changes in driving habits.** Improvements in parallel streets, such as Boeckman Road are projected to cause a change in driving habits, allowing cars and trucks to use alternative routes other than the impacted intersection(s). Commute reduction programs provide other alternatives. The use of available intelligent transportation options is another element for consideration. The City also envisions reporting traffic changes annually to City Council. This would reveal whether more trips were available, and if so, they could be reallocated.

Mr. Waffle commented that the strategy outline is also on page 23 of Exhibit 11, the proposed PFTS Draft Ordinance.

**Eldon Johansen, Special Projects Engineer**, overviewed the following four items:

- Exhibit 11, page 27, Item 4. This item was not previously discussed with the Commission. In reviewing some proposed developments, it became apparent that the normal method of analyzing traffic going through the Boones Ferry Road or Town Center Loop West intersections as a basis for determining the impact on the system, does not work for those developments on Boones Ferry Road south of Wilsonville Road, which is a dead end street. Mr. Johansen recommended that the DRB be allowed to approve modifications to the number of trips allocated to a project for its position in the queue when the impact of an individual development presents a special or unique situation. This would ensure that someone would not be required to provide capacity that would never be used by that particular development. Resolving this through DRB approval is a normal part of the Stage II approval process.
- Exhibit 11, page 29, Item 8. This was classified as a housekeeping item. The City now has a two-year time period for the approval of Stage II before the developer is required to build or lose approval. When approved subject to obtaining trips, City staff recommends tolling the days between Stage II approval and when they are notified that their trips are available. This was the same procedure as was done for the Water Public Facilities Strategy.
- Exhibit 11, page 29, Item 9. The Development Code’s current procedure for the vesting of trips is based on a Master Plan approval, which does not work with the PFTS. Staff recommends that the vesting procedure be replaced by what is in the PFTS ordinance to avoid conflicting requirements.

**Mr. Johansen** distributed the ‘Comparison of Transportation System Plan and Freeway Access Study (Exhibit 24).

- The fourth item he addressed was in response to Commissioner Hind’s request to review the projected changes in driving habits. City staff recognized this need when the growth in jobs and population north of the Willamette was compared with the (TSP) and the Freeway Access Study (FAS). Wilsonville had far higher jobs and population growth than traffic projections indicated. Essentially, there was a growth in jobs and population, but not growth in traffic at these locations. The only thing to account for this difference was a change in driving habits.
  - \* **Page 2 of Exhibit 24** provides a more detailed breakdown of the projected impact. Mr. Johansen believed that with a 3% reduction per year in driving habits, development could continue and the City could proceed with what is specified in the TSP and the FAS.
    - Over the last 12 years, the access to traffic going north and coming from the north on I-5 had held relatively steady. There had been a 5% growth in that time.
    - There had been a 65% growth in traffic coming from and going to the south on I-5. The traffic was definitely changing its patterns in terms of where it was accessing I-5.
    - The growth in the city had also changed very substantially. In the last 12 years, most of the traffic growth was on the east side of I-5 with the Village at Main Street, Town Center and the

surrounding area. Projections for the future will reverse that with the growth projected to occur on the west side.

- Recent traffic reports are showing lower projections than previous expected. At this stage, it was uncertain whether the difference was because of a change in driving habits, an initial overestimation, or if the work being done on Wilsonville Road on the west side had caused people to take alternative routes. Staff hoped the difference was due to a change in driving habits, but traffic would have to return to normal before the true reason could be determined.

**Mr. Waffle** repeated that the primary issue on which the City Council was seeking direction from the Planning Commission was the allocation of trips issue and whether there should be a cap as to how many of one year's trips any one developer could receive.

- He referenced pages 19 of 41 and 27 of 41 of the PFTS Ordinance (Exhibit 11), stating "no applicant would receive more than 50% of the available capacity."
- Exhibit 21, "Allocation and Queuing Examples" was distributed to assist the Planning Commission in understanding how caps might affect allocation and queuing. He described the examples given on the spreadsheet. Staff was fairly certain about the 480 new trips in Year 1 and 290 new trips in Year 2 due to the Boeckman Road extension. The examples indicated what would happen to allocation and queuing given 90%, 75%, 50% and 25% caps on the maximum trips per project. The examples showed that these caps impacted developers differently, including who could move forward and in what time period.
- He concluded his report by distributing two large aerial photos of the intersections of Wilsonville Road with I-5 and Boones Ferry Road. The first photo showed what Wilsonville Road and Boones Ferry Road could become with the TSP. This was one of many possible scenarios of investing in Wilsonville Road. He described some of the scenarios for the intersections. The second photo showed the current conditions. (Exhibit 25)

**Commissioner Faiman** suggested that Section 2 The Strategy of the PFTS (page 27 of 41) should read "change LOS "E" to LOS "F" for the four impacted intersections." Estimates were available for the number of trips for the high school, park and ride, and new City Hall; so why not use them?

**Mr. Johansen** responded that they could be used. So far there was no difference between the level of service with or without the essential government services. If there were a major expansion, perhaps some of the capacity could be used to satisfy the previous commitments for the essential government services, such as the school. The primary goal was to keep from penalizing private developments while accommodating other essential governmental functions. The side effect could be that the level of service would drop periodically to LOS "F", temporarily.

**Commissioner Faiman** differed with City staff stating that dropping to LOS "F" was clearly not part of the plan and was unacceptable. The Adjunct Transportation Planning Committee struggled with the issue of going from LOS "D" to LOS "E"; and now there is discussion about going from LOS "E" to LOS "F". It is not any harder to put numbers in the pipeline for government services than for any private development.

- He was sympathetic to landowners wanting to develop. There are huge areas in Wilsonville still undeveloped, even south of Boeckman Road. The numbers needed to be plugged in and if it stops development, it stops development. All the landowners south of Boeckman were in the same boat; they are all stuck. It is a horrible situation but it won't improve by going to LOS "F" versus LOS "E".

**Commissioner Goddard** asked whether the tables on page 5 of 51 (Exhibit 16) reflected the existing committed uses or the current and projected capacity available.

**Mr. Johansen** replied that the top table was the capacity at LOS "D", without progression. It reflected the isolated intersection analysis. The second table reflected the effect of the \$3.5 million project.

**Commissioner Goddard** noted that \$3.5 million improvements to the Wilsonville Road/I-5 interchange resulted in 404 trips. Were any trips available based on the capacity numbers of the first table?

**Mr. Johansen** stated that the difference in trips had been allocated. He commented that the chart was not correct; 480 would be available with the change from LOS "D" to LOS "E". The system was fully allocated; there were no available trips.

**Mr. Waffle** responded to Commissioner Goddard's question regarding the actual numbers in Exhibit 21.

- Villebois had already been allocated a large number of their trips, and 124 additional trips have not been allocated to them, yet. Though the trips could come at any time, Staff put them in Year 2 for purposes of illustration. They do not need them for their immediate development plans.
- A study by DKS Associates showed the net PM weekday trips for Fred Meyer (FM in Exhibit 21) is 318. Those are real numbers. The rest of them are only for illustration.

**Mr. Johansen** replied that the gross number of 657 trips was derived from special circumstances. The difference between the 318 and the 657 were the trips that only go through the Boones Ferry Road/Wilsonville Road intersection, but do not continue east. This is because of the length, bypass trips and the isolated intersection. If this resolution is approved, [Fred Meyer] would have to show how the 657 trips would be handled at the Boones Ferry Road/Wilsonville Road intersection, but they would be allocated 318 for the PFTS in the queue and the allocation of trips to meet the requirement.

**Mr. Waffle** added that the process of reviewing trips that pass by is not unique to Fred Meyer. It would apply to any other similarly situated business in that area.

**Commissioner Goddard** asked if the queuing process was specific to an intersection or for an aggregate of the four areas identified as being constrained.

**Mr. Johansen** answered that it would be a queue for the overall interchange area. Any development that uses that area for the most probable used intersections would be subject to the queue unless they are essential government services or de minimus.

**Commissioner Hinds** suggested that Washington County plans a 450-space parking lot at the commuter rail terminus, for a total of 700 trips. The 250 trips were shown from SMART, but not the 450 trips from Washington County. Why weren't those part of the count in Table 1 on page 5 of 41? (Exhibit 11)

**Mr. Waffle** believed the entire commuter rail station was considered within the essential government services exemption.

**Commissioner Hinds** suggested that the 700 trips are not being counted then. She asked why parking spaces for commuter rail are being considered as essential government service trips. The schools are all exempt, including trips for the community college, high school, buses, and people taking their children to school. How many school and park trips are exempt because they are considered an essential government service?

**Mr. Johansen** replied that the parking spaces for commuter rail became essential government services when the ordinance was adopted that established the exception. Since the exemption was established after the adoption of the last ordinance, projects such as high schools that were developed or approved

prior to the adoption, were not included in the exemption, so those trips would have to be recalculated.

**Commissioner Hinds** pointed out what seemed to be a conflict in the City staff's recommendations. On page 8 of 51 (Exhibit 17), #5 recommends making the additional improvements as funds become available; in the middle paragraph of page 9 of 51, City staff asked City Council not to commit to "c" and "d" until further analysis.

**Dave Waffle** directed her to page 28 of 41 (in the meeting packet) of the Ordinance (Exhibit 11). The last section stated that if the Ordinance is adopted "**The Council shall continue to improve capacity...subject to fund availability.**" Then at the top of page 29, it reads "**...the City will complete an alternatives analysis to determine if there is an alternative which provides better results with minimal increased impact on the local area.**" That was the 'out' from the funding commitment and from the specifics of the improvements themselves.

**Commissioner Hinds** added that in not adopting this ordinance, the City would complete an alternative analysis for the 'invest in Wilsonville Road' proposal. She added that there could be other possibilities, such as the split diamond recommended in the TSP that would keep the intersections at a lower level of service.

**Mr. Waffle** replied that was correct. The ordinance would include the 'investment in Wilsonville Road' option. He agreed that there might be alternatives.

**Commissioner Hinds** wanted City staff to clarify if the \$3.5 million improvements to the Wilsonville Road/I-5 interchange area would delay improvements at Boones Ferry Road and Wilsonville Road until projects south of the intersection called for it.

**Mr. Johansen** replied that traffic projections showed there was capacity for some growth at the Boones Ferry Road/Wilsonville Road intersection with the change from LOS "D" to LOS "E". It would handle a small amount of growth within the overall 480 trips. If a development project with a fairly substantial requirement were built south of Wilsonville Road on Boones Ferry Road, then the Boones Ferry Road improvements would be required. Staff is recommending the \$3.5 million improvements to the Wilsonville Road/I-5 interchange area without any improvements to Boones Ferry Road at this time as part of the Strategy.

**Chair Iguchi** asked Mr. Johansen for clarification regarding which trips were disproportionate to the actual impact on a development in #4 on page 27 of 41 (of Exhibit 11). Were these pass-through trips versus unique, or new trips?

**Mr. Johansen** responded typically for projects on the west side that create trips going eastbound to the Wilsonville Road/I-5 interchange area; 20% will turn off before reaching the Wilsonville Road/I-5 interchange area, 20% of the total traffic traveling east will access the southbound ramp, 20% of the total traffic will access the northbound ramp, and maybe 30% of the total traffic will reach Town Center Loop West. Those are the standard percentages that have been used in all capacity calculations.

- A project on Boones Ferry Road, south of Wilsonville Road, where no alternative routes exist would not have near the 80% of trips going east. The 657 trips from a large commercial development would have about 270 trips going to the south ramps. A large project on Boones Ferry Road, south of Wilsonville Road, would pose a problem with the Boones Ferry Road/Wilsonville Road intersection but would not impact the rest of the area as much as at

Boones Ferry Road. This was why it was important to stay proportional to everything else and why the last sentence would allow the DRB to recognize that difference.

**Mr. Waffle** added this was something that could occur during traffic analysis. The Planning Commission must recognize and consider unique situations and give authority to DRB.

**Chair Iguchi** asked what the difference was between what was projected and what traffic reports showed regarding lower trips.

**Mr. Johansen** reported that the first calculation of the City's Supplemental Street Systems Development Charge was done in August of 2003, and 732 p.m. peak hour trips were determined available. When the traffic studies were done for the Fred Meyer and Kohl projects, both studies showed about 100 to 200 fewer trips than projected. It is unclear if the projection was too high, or if there had been a change in driving habits or if it was due to the construction on Wilsonville Road. The extra trips had not been included yet, but should be allocated when the counts are done next spring. Then, those trips would be available.

**Chair Iguchi** asked for clarification regarding the examples in Exhibit 21 since the Boeckman Road extension would not be completed until 2007.

**Mr. Waffle** stated that the City was obligated to complete the Boeckman Road extension no later than December 2006. It would be considered fully funded when the budget took effect July 1, 2006 and available to count in the concurrency requirements.

**Chair Iguchi** suggested adding a percentage of essential government services to each application to account for them. She agreed with Commissioner Faiman's comments that once those services were exempt then the City would be at LOS "F". This needed to be addressed and probably would be by the public. Has this idea been considered?

**Mr. Johansen** replied that he had not considered it, but believed there were options. As changed driving habits free up more trips, they could be used for replacing trips used by essential government services.

**Mr. Lee** stated that unless a relationship could be shown between a development and an impact on the growth of governmental trips, it is hard to justify tagging the traffic allocation of a private development with public trips.

- He added that there was no problem including known numbers. However, the obvious must also be addressed. The only way to resolve it within the boundaries of the law was to accommodate and suffer more congestion.

Chair Iguchi opened the hearing to public testimony, which was limited to 3 minutes per person.

**Dana Krawczuk, Ball Janik LLP, 101 SW Main Street, Suite 1100, Portland, OR 97204,** representing Joe Angel. Ms. Krawczuk reviewed the four concerns listed in her letter (Exhibit 22 distributed at the beginning of the meeting with these additional comments:

1. Inequitable allocation of the queue. City Council stated that Stage I was not an appropriate time to assign a place in the queue. She further described the unique circumstances listed in her letter for Mr. Angel's properties, Burger King and Chili's Restaurant. She noted that Mr. Angel's and Jack Kohl's property had approved master plans with Stage I approval with some phases of the master plan already developed. Mr. Angel's properties have services available, a dedicated right-of-way,

and funded transportation improvements all in anticipation of the Phase III. This was different than someone who had come in with only a Stage I. This Master Plan component was unique.

- \* Keeping track of these unique pieces would not be a burden administratively since there are only two properties, Joe Angel's and the Kohl property.
  - \* Speculation was another concern. These trips are a precious commodity. Ms. Krawczuk suggested a sunset date. If final phases were not developed and a Stage II approval received within three years, then applicants go to end of the line as with anyone getting a Stage II approval. This was a fair way to recognize those who had been in the system and planning for quite sometime.
2. How many trips can one user receive? Page 15 of the March 9, 2005 Staff report showed Joe Angel as the smallest developer with less than an acre versus other developers being considered. She suggested the Commission preserve a certain percentage of trips for smaller developers rather than focusing on how many trips one large user could receive. The fear is that the trips may be used immediately with the expected essential government services and the two large users being considered. No trips would be preserved for smaller developers. A small developer could be defined as one who produced less X number of trips, then preserve a certain percentage of each year's allocation accordingly.

Ms. Krawczuk distributed revisions to the Commission's Ordinance implementing the points she addressed. (Exhibit 26)

**Michelle Rudd, 900 SW 5<sup>th</sup> Avenue, Suite 2600, Portland, OR 97204** representing the Kohl family.

- As the Staff Report recognized, the Kohl family has owned property within Wilsonville for decades. They are frustrated in their efforts to realize the reasonable investment expectations of their property. Numerous buyers interested in developing the Kohl property commercially have been frustrated to learn that the property could not be developed due to various infrastructural restraints, such as water, and now trips.
- They appreciated City staff and the City recognizing their concern and including a mechanism to preserve trips for smaller developers within the proposal.
- They support the level of service standard change from LOS "D" to LOS "E" and believe it is an important part of the PFTS because more trips are needed. They recognized that some essential government services trips are not being counted as well as other trips in the City. Any new development within the City, is, in reality, adding trips to these intersections, yet they are allowed to go forward. By allowing failure to occur; if the City ends up at LOS "F", there will be benefits in the long run. Development would occur and more SDCs would be collected to fund the needed improvements. There would be greater consumer choice within the City so people would not have to drive as far. Drivers would also find alternative routes, as mentioned by City staff.
- It was reasonable to say that circumstances might result in LOS "F", but they believed that was fine. It was appropriate to recognize that the City had previously made a policy choice to not count essential government services and could make the policy choice now to go from LOS "D" to LOS "E" in this location.
- Ms. Rudd requested clarification in how the allocation would work. The current proposal referred to an applicant not being able to take more than 50% of the trips. If a large development had numerous developers, could the one development receive all the trips, by splitting up the application submittal? That was a concern.
- She would like to see other concerns addressed as mentioned in the letter from Ball Janik.
- Only using DKS Associates for the traffic engineering services causes problems in terms of their backlog and their ability to turn things over quickly.

**Tom Gibbons, Real Estate Director, Fred Meyer, 3800 SE 22<sup>nd</sup> Avenue, Portland, OR 97242.** He supported Mr. Johansen's plan, except for the allocation of trips. He strongly believed that 100% of

the trips should be vested at the time Stage II approval is received. Fred Meyer had been in this project for a long time and had been patiently waiting to develop, stepping aside on a couple occasions to allow other developments to precede them. It was important that Fred Meyer receive the majority of trips, as they became available to get started. There were many benefits of Fred Meyer's development, including creating 200 jobs and doing improvements to Boones Ferry Road.

**Commissioner Faiman** noted that there were other opportunities for Fred Meyer to develop in other areas, such as in Argyle Square. He asked why they continued to persevere through the difficult issues surrounding this particular site.

**Mr. Gibbons** responded that Fred Meyer owns the real estate they currently want to develop. Other factors included the proximity to their other store in Tualatin. The sister store impact was severe at the closer interchange.

The Commissioners agreed to allot more time to the first two speakers.

**Dana Krawczuk** finished her testimony by adding the last two points:

3. Be clear in distinguishing between pass-through trips and newly created trips. In the revised ordinance language she had distributed, language was inserted to clarify that concern. She understood that was how DKS and the City handled those trips, but it wouldn't hurt to make the points as clear as possible.
4. She offered three suggested amendments to modify the development process and transportation issues:
  - a. Let the City choose three or four acceptable engineers to allow the developer some control over costs and scheduling rather than relying on only one traffic engineer.
  - b. Clarify the scope of the traffic impact analysis. Some jurisdictions only study an impacted intersection, which is defined, for example as an intersection that experiences X number of trips from the development.
  - c. Increase the de minimis exception to the LOS standard from three new trips to ten new trips. Again, this is new trips not pass-by trips.

**Ms. Krawczuk** responded to questions from the Commission:

- Neither she nor her client have projected the number of trips requested as part of the Stage II application.
- She clarified her distinction between pass-through and newly created trips. A pass-through trip was already there for an existing use, such as turning into a new development on the way to an ultimate destination. If someone stops at Burger King on the way home from work, a new trip is not added to the system. Compare this to people leaving their home to go to the movie theatre. This would add new trips to the system as they go to their destination. That was the distinction being sought.
- She had not discussed the 318 trip calculation for the post-Fred Meyer development with her client, so could offer no input as to his opinion.
- Going from three to ten de minimis trips would simply make more trips available and expand the scope. There was no significant reason behind suggesting 'ten' trips.

**Michelle Rudd** added that she and her client were very excited to see the PFTS advancing. Their property was very limited geographically and without the advancements, they were stuck regarding development. They understood Fred Meyer's patience, but the Kohl's have had an approved master plan since 1976 and believed they have been patient. They want to move their development forward and contribute to the City.

**Ben Altman, Urban Solutions, PO Box 4063, Wilsonville**, stated that the Kohl property was located immediately south of the Fred Meyer site, between the apartments and the freeway.

Chair Iguchi closed public testimony at 7:45 p.m.

Commissioner discussion of the issues presented included the following questions, responses and comments:

**Commissioner Juza:**

- Asked if Staff was opposed to hiring another engineer and was there a reason for only using DKS Associates.
  - \* Mr. Johansen responded that the City selected their own traffic engineer after a number of reports, though factual, were very complicated and difficult to understand. The City needed reports that were consistent as well. Essentially, DKS Associates are used as an extension of City Staff. They keep detailed records on each of the intersections, developments and the overall model at work. Community development would need to determine the requirements needed to continue doing that work, as well as updating traffic engineers and coordinating with them as several projects are in process. There are other good traffic engineer consultants available. He wasn't opposed to using them, but wanted to be sure they were available to everyone.
  - \* Mr. Waffle added that other considerations include possible conflict of interest issue and confusion. On one application before the DRB, there might be one traffic engineering firm representing the City on one issue, and then the applicant on the next agenda item. There are only so many traffic-engineering firms.
    - Mr. Johansen explained that DKS Associates are the traffic-engineers for the City. If there is a conflict, they must turn down the other work.
- Why is there controversy regarding the traffic engineer; are there discrepancies in the reports?
  - \* Mr. Johansen believed that traffic engineers receiving direction from a developer would give far different results than one being directed by Staff.
- If the results could be skewed toward what Staff wanted versus what a developer wanted. An unbiased picture needed to be presented; so how could unbiased results be achieved.
  - \* Mr. Johansen described the two ways traffic engineers are used as developers begin the application process.
    - Either the traffic engineer could use the Standard Institute of Traffic Engineers guidance to determine trips or if a similar development or project was in the area, those trips could be counted to determine what the difference was.
    - Often, traffic is different in the northwest than standard traffic, so the counts and adjustments are made. Much of it involved understanding what is being built, specifically.
  - \* Mr. Waffle added that occasionally the City has access to a traffic impact analysis prepared on the developer's behalf, which served as a check against any bias of the City's engineer. There might be a range of discrepancies, but if something were flagrantly different, the situation would be reexamined.
  - \* Commissioner Hinds suggested that the testimony referred to the backlog and the time it takes DKS Associates to provide the reports. If the City could have another traffic engineer available as City consultants, it might alleviate time spent in the queue, or having the trips determined.

**Commissioner Goddard:**

- Asked how many trips a small development might generate. There had been discussion regarding equity between large and small developments and trying to reserve a number of trips for small developments. Do small developments have a defined number of trips?
- He believed increasing the number of de minimus trips could preserve the needs of small developers. He wasn't certain what the number of trips should be, and suggested reviewing historical data to determine how many trips a typical small development generated. Perhaps some effort should be

made to define small developments in terms of number of trips generated and establish a de minimis amount to accommodate them.

- Allocating the number of trips to preserve trips for small developers had also been discussed, but there were also equity issues with that approach.
  - \* Mr. Johansen replied that the more build-out there was, the smaller that number would be. The overall average would need to be reviewed to determine a meaningful figure of what had been approved over the last few years.
  - \* Mr. Waffle explained that adjusting the number of de minimis trips was suggested as an alternative at the City Council's work session. The de minimis trip number had served some other purposes, however, such as developers adjusting the size of their building, or a building owner adjusting how the building was used in terms of shifts and when traffic came and went. There was also a financial implication in the number of p.m. peak hour trips created.
- Commissioner Goddard supposed that de minimis amounts add up significantly over time. Is there a way to determine how many proposed developments could be accommodated given a di minimis amount?
  - \* Mr. Johansen noted that the projects listed would all be too large to list as di minimis. Many of the di minimis trips were simply a change in use, where a building had been used as one type of office and a slight change was made so two or three more trips are needed. Or, there is a very small project.

**Commissioner Faiman:**

- Two applications were being addressed at the same time. He asked to separate them momentarily. All the issues discussed in Wilsonville are related to growth. The test was always the same. After this decision is made, how would it affect the livability, the quality of life, in Wilsonville? Would it be the same, better, or worse?
- The pressure is coming from developers and potential lawsuits if there were a moratorium. Susan Myer of Capital Realty Corp. (property owner of the Wilsonville Town Center) are in the same position as those who testified tonight. They have undeveloped land; the streets seemed to be there, but intersections that are some distance away are the problem. However, Ms. Myer, at an earlier meeting, said they were opposed to changing LOS "D" to LOS "E" because their customers are complaining.
- Many of the Commissioners lived on the south end of Wilsonville, where traffic is an issue. His neighbors always mention traffic as an issue that concerns them regarding how Wilsonville is being managed. This is a big issue related to quality of life in Wilsonville.
- Even though Wilsonville has been one of the fastest growing cities in Oregon, so far it has also been a very pro-growth community. He cited the Urban Renewal measure approving a huge new development as evidence of that in the last election. It passed more than 70% to 20%. West Linn seemed to curtail growth because of the way their growth had been managed. It would be very hard to address these issues if the citizens of Wilsonville shared the same views of anti-growth as those in West Linn.
- Perhaps the reason the people of Wilsonville are pro-growth is because growth has been managed well here—up until now. Two things have been requested that have never been done before—going from LOS "D" to LOS "E" which could result in LOS "F". While he understands and agrees with the reasons for changing from LOS "D" to LOS "E" he could not agree with a (de facto) LOS "F".
  - \* Real numbers need to be used. Essential government services need to be included in the equation and respect for the process must be retained. Growth would not be supported if it becomes a guessing game.
  - \* He wants to represent how the people who live along Wilsonville Road feel.
  - \* Chair Iguchi appreciated Commissioner Faiman's comments. She remembered west side businesses coming forward and complaining about traffic not being able to access their projects.

If the level of service is changed to LOS "F", they still would not be able to continue profitable businesses.

**Commissioner Juza** asked if it was appropriate to decide on the issues with two absent Commissioners. Chair Iguchi responded that there was a quorum, so it was legal. These issues had been pressing for some time and people needed answers. However, if the Commission was not prepared to render a decision tonight, they didn't have to.

As numerous exhibits had been distributed, the Planning Commission took a short break to review them.

Commissioner discussion of the issues continued:

**Commissioner Hinds:**

- Asked if an applicant with a large project would be able to take more than 50% of the trips if there were more than one owner. For example, Villebois has several landowners and separate developments under one Master Plan.
  - \* Mr. Johansen suggested that Villebois was not the best example, because they are already vested for 410 trips and had Preliminary Development Plan (PDP) approval for 35 additional trips. They have 124 trips left. His non-legal interpretation would be that Villebois would be first in line due to their previous vesting agreement.
  - \* On Master Plans, it would be decided at the Stage II application level. For separate Stage IIs being submitted, the applicants could 'pool the resource'.
  - \* He was not aware of any large properties that would have a split application. Fred Meyer is the only one with a Stage II application, so it would not apply there.
- Would the DRB have authority to consider a large project with multiple owners in a unique or special situation, therefore, approving modifications according to #4 under Section 2 on page 27 of 41?
  - \* Mr. Johansen recommended amending the ordinance if that was a concern. Typically the DRB follows what is in the Development Code. If there are no restrictions in the Development Code, they would not create their own rules.
- **Commissioner Hinds** summarized her position on the components of the PFTS:
  - \* She liked the idea of a cap so one large developer would not get all the trips and was intrigued about reserving trips for smaller developments.
  - \* She struggles with the essential government services exemption. Not counting 700 trips for commuter rail, most of which are by those outside Wilsonville, will have a great impact on traffic. Add the schools and there are about 2,000 trips that are not counted. These are still real trips; traffic sitting at the light. She had a problem exempting that many.
  - \* Going from LOS "D" to LOS "E" to LOS "F" would have a very detrimental effect on existing businesses. An official policy of LOS "F" would really impact the quality of life in Wilsonville. The TSP definition of LOS "F", was not what those living on Wilsonville Road wanted.
  - \* She was torn about being fair to those in queue, the patiently waiting developers and the existing businesses and citizens of Wilsonville who are already impacted by traffic.

**Commissioner Juza** stood by the comments she shared at last month's meeting.

- Competition is good for Wilsonville. Fred Meyer would be good for the community while creating jobs. Other stores are also needed and Wilsonville could really benefit from that growth. Traffic is just a side effect.
- Growth should *not* be halted because a stagnant economy was not good either.
- She understood that there were traffic problems, but they are everywhere. Traffic is a fact of life. She has lived in the area for 18 years and has watched traffic worsen. Traffic improved on Elligsen Road at the North Wilsonville exit after Argyle Square was developed. One might believe the opposite would be true. If improvements were made at the next exit, people might decide it is quicker

to use alternate routes. Those living here know what routes to take. She doesn't believe it would be as bad as everyone seemed to expect.

- She struggled with how to make the queuing system fair. She believed that a mix of large and small businesses are needed. Small businesses should not be hindered because a larger business took all the trips. On the other hand, some of the larger businesses have waited for a long time. Fred Meyer stepped aside to allow Villebois to use some of the trips. It would be unfair not to give Fred Meyer the trips they had released.
- If any businesses have been waiting, they should get the trips. New businesses that come in would have to wait in the queue. She was not sure what the cap percentage should be.

### **Commissioner Goddard**

- Asked how City staff would choose to treat projects with existing master plan approvals but had not yet received Stage II approval. Should they be provided a priority in the queue?
  - \* Mr. Johansen stated that the recommended policy is that they receive the trips with their Stage II approval. Some projects get part of their master plan and if they do a Stage II, the City recognizes the Master Plan for longer period of time.
- Is there was any mechanism in place establishing queue position, absent of the Stage II approval or the date the master plan was approved. Did the applicant need to meet specific conditions to receive a place in the queue?
  - \* **Assistant City Attorney Paul Lee** responded that the Commission should review the following considerations since this was a policy choice:
    - The amount of detail that occurs at Stage I. The master plan level is just conceptual. The details necessary to determine the traffic figures and generated trips are not known.
    - Should trips be given on portions of the development as it is submitted, or on the whole development?
    - Historically, Staff and the DRB have allocated trips at Stage II level where the Development Code requires the level of planning to clearly identify the exact traffic impacts. The Development Code would need to be substantially changed to require more detail at Stage I, essentially eliminating the two stage approach.
    - Allowing vesting at Stage I opens the door to a lot of speculation. Given the commodity aspect and rarity of trips, speculation is a realistic expectation. People could throw an application together and get trips, but not follow through with them or even sell them.
- Commissioner Goddard asked about monetizing the trips so developers could choose what value to place on their trips.
  - \* Mr. Lee answered that had been discussed internally, but nothing could be done unless the City allowed it. Monetizing trips would also add another layer of complication; growth would be market driven, not planning driven.
  - \* Mr. Johansen responded that as the ordinance was written, just about all government services were considered 'essential'. He mentioned that though the commuter rail station has 700 parking places, the p.m. peak hour trips through the Boones Ferry Road/Wilsonville Road intersection would only be 67 trips.
  - \* Mr. Waffle added that the commuter rail would be run by Tri-Met with the transit station operated by SMART. The analysis of the trip calculations reflected that there was already a commuter park and ride lot near the theatre, which would move to the other side of the freeway. The impact of the riders on the rail would subtract trips coming into Wilsonville via the freeway or other routes and traveling on Wilsonville Road. A change would also be seen in the bus routes. Commuter rail changes the dynamics of an area significantly. He did not know if Tri-Met park and ride lots received an exemption when calculating traffic impacts in other communities or if they were considered 'essential government services' elsewhere.
- Commissioner Goddard asked what the impact would be if essential government services were nonexempt in calculating traffic impact. What total number of trips did these services represent?

- \* Mr. Johansen responded that traffic reports were run with and without the trips reserved for essential government services. So far there have been no instances where the reservation for essential government services would have changed the level of service from LOS "D" to LOS "E". He did not have a specific number of trips.
  - Including the essential government service trips would depend on whether citizens would be willing to periodically stop the development of schools, city halls, etc. Given a choice between supporting further expansion of schools, commuter rail and such services versus supporting private development, the City would choose to support the essential government services. Private developers would suffer in the long run without government facilities to complement their projects.
- \* Commissioner Goddard suggested that recommending that those services be exempt is essentially making the choice or delaying the choice until sometime in the future. Unless there was an increase in capacity, a choice would still have to be made.
  - Mr. Johansen replied that the way it was worded now, an increase in capacity would not also increase the capacity allotted to essential government services. In other words, when Staff came up with 480 trips, the previously approved essential government services trips were not deducted.

**Commissioner Faiman** clarified that he was not proposing to exempt government services, but to prioritize them instead, by putting real numbers in the trip queue. Then, exempt them if a mistake has been made. It is ridiculous to discuss development without schools, fire stations and even the park and ride, though it may serve people outside Wilsonville, it is reducing traffic somewhere. As exempting government service trips is helping development overall, they need to be prioritized ahead of private development.

- He was happy to leave the issue of trip allocation for City staff to decide since they had been struggling with its many difficult issues for a long period of time.
- When there was no water, proceeding with the Willamette River Water Treatment Plant was the least expensive solution. Residents of Morey's Landing objected to the Water Treatment Plant being located next to their neighborhood and are still angry with the City. He suggested that Morey's Landing's residents will vote no on any ballot measures the City, or even the school district, puts before them because they don't trust government anymore. How long will it take for that neighborhood to vote yes with the rest of the City? The decision made today is for Wilsonville's future and we must not antagonize anyone else.
- Traffic is a big issue for those along Wilsonville Road on both sides of the freeway. Going from LOS "D" to LOS "E" will worsen traffic there. He strongly disagreed with taking the risk of going to LOS "F". Wilsonville is pro-growth and he would like to see it stay that way. Creating a process that was respected was the best way to keep Wilsonville pro-growth.
- He concluded by asking if 04PC03A and 04PC03B could be divided because he wanted to vote differently on them.
  - \* Chair Iguchi verified that the Commission would be voting on 04PC03A and 04PC03B separately. However, the proposal to go from LOS "D" to LOS "E" and to exempt essential government services were both contained in 04PC03B, which could not be split.

The Commissioners discussed the issues raised by Commissioner Faiman:

- Commissioner Goddard asked what changes Commissioner Faiman would make to the proposal to preserve his principle. Should government services not be exempted?
  - \* Commissioner Faiman answered that the known numbers for essential government services should be put in the queue and given a priority over private development. If the queue is full; no more private development. He would exempt them if an error were made. As an example, a new fire station, as a government service, would create trips not planned for. The City should

anticipate trips as much as possible and put numbers on them and put them in the queue with all the other numbers.

- Commissioner Hinds suggested Commissioner Faiman was disagreeing with the ability of City Council to remove the limitations that "In no case will development be permitted that creates an aggregate level of traffic at LOS "F"." (Item #5, page 28 of 41, Exhibit 11.)
- Commissioner Goddard suggested that the approach was to either exempt essential government services from level of service standards or not exempt essential government services and permit them to create an aggregate level of service at LOS "F". How could essential government services be exempted and also considered for purposes of calculating available trips?
- Commissioner Faiman agreed to the latter. He had mentioned that he would permit essential government services to push the City to an aggregate traffic level of service, but only if there was a huge mistake.
- Commissioner Goddard clarified that the ordinance was drafted that in no case would development be permitted that created an aggregate level of traffic at LOS "F". He asked Commissioner Faiman if he would change that provision.
  - \* Commissioner Faiman did not understand the ordinance to read that way from the Planning Commission's discussions.
  - \* Commissioner Hinds understood the ordinance to say that an aggregate LOS "F" could be created because of essential government services. Commissioner Goddard added the LOS "F" could happen because essential government services are exempt from the traffic service standards.
    - Commissioner Faiman said those would be subtracted when in the calculation so the level of service would really be LOS "E", especially for those in traffic.
- Mr. Waffle explained that Exhibit 11 said that the Council would contemporaneously adopt a separate ordinance dealing with the level of service change and the exemption of the government essential trips. The specific language was in Exhibit 12, a separate ordinance that would also affect the resolution.
- **Commissioner Faiman** read his proposed language for Resolution No. 04PC03B for the record.
  - Second paragraph, third line down would read, **"...a proposed ordinance for revising the level of service at specific intersections, exempting essential government services from level of service constraints, and..."**
  - Fifth paragraph, third line down would read, **"...therein and, further save for the amendment concerning W.C. 4.140(J)(2.e) recommends that the Wilsonville City Council approve and adopt an ordinance revising the level of service at specific intersections, exempting essential government services from level of service constraints, as reviewed by the Planning Commission; and..."**
- Mr. Lee explained that currently essential government service trips were exempt and were counted toward LOS "F". The City can never reach LOS "F". City staff proposes that essential government services not be counted and that the City could get to traffic LOS "F". If the Commission did not agree, he had crafted language to amend Development Code Section 4.140(.09)(J)(2)(e) as listed on page 4 of 5 of the amended Exhibit 12 that kept a floor on the level of service by counting essential government vehicle trips.
  - \* The word "non-exempt" is to be added not allow an aggregate level of traffic at LOS "F".
  - \* This could be incorporated for a decision tonight.
- Commissioner Goddard suggested that other changes were needed for the ordinance to be consistent with the proposed amendment. Language in the whereases that seemed to support the conclusion that essential government services ought to be exempt for the LOS standards.
  - \* Mr. Lee assured the Commission that whereases were not as crucial to City staff. What mattered was that if the Commission continues with this approach, the substantive change does not appear. City staff would take whatever direction given from the Commission to reformat the proposed ordinance and forward it to Council accordingly.
  - \* Commissioner Hinds agreed with the changes.

- \* Chair Iguchi stated that as she understood the proposed changes, the City would still be able to go to LOS "F" with exempt services.
  - Mr. Lee responded no. We cannot reach LOS "F" even when all the exempt and nonexempt trips are counted. LOS "F" just cannot be reached.
- \* Commissioner Goddard asked if the proposed change would eliminate Section 4.140(.09)(J)(2)(b)(ii) "A planned development or expansion thereof which provides an essential governmental service" on page 4 of 5, of amended Exhibit 12.
  - Mr. Lee clarified that his proposed language would not allow a LOS "F". It would not remove the exemption for essential government services. That was a current exemption.
- Commissioner Juza was concerned that this would return to the Commission in a few years when all these new trips were taken; when LOS "E" was reached and the City could not move forward unless it went to LOS "F".
  - \* Mr. Johansen answered that if the City could not go to LOS "F" and no trips were left, then he did not believe an exemption could be approved. If a change were to be made, he favored what Commissioner Faiman had suggested. If the City cannot go to LOS "F" and there is no exemption and the trips are allocated under LOS "E", a certain number of the trips would need to be set aside for essential government services to avoid LOS "F". Then if there had been an error, go to LOS "F".
  - \* Commissioner Faiman agreed that was what he had proposed. He suggested that the language proposed by Mr. Lee was not the same thing.
  - \* Mr. Johansen asked that the Commission allow City staff time to develop the right language.
- Commissioner Juza believed that the proposal would only postpone traffic problems for a few years. It was probably fine to take small steps as long as those who have been waiting in the queue for many years to develop are allowed to do so. Perhaps Wilsonville would get the reputation that nothing could be built here and development would shift to another area. She supported the original version of the resolution, but felt she was probably in minority.
- Chair Iguchi agreed saying that the proposal only seemed like a Band-Aid to move forward just a little bit. In reviewing Table 1, (page 5 of 41, Exhibit 11) she commented that it would be easier to have the number of trips rather than size. There were 26 anticipated development projects without the land studies requested in the past. The necessary information was not available to determine what was needed. Land use changes might be needed to facilitate the traffic problems. The Commission was charged with fixing a past problem and to move forward simultaneously. It was a catch 22.
  - \* None of the anticipated developments represented fewer than 20 trips; in fact some represented 200-300 trips. There were simply not enough trips in the entire PFTS and options were running out. She had difficulty moving forward, knowing that the problem would not be fixed.
  - \* She agreed with changing from LOS "D" to LOS "E".
  - \* She is concerned about exempting essential government services for the same reasons stated. She understood that the commuter rail station is not just a Wilsonville fix. It is important to consider that it would affect the whole region.
  - \* She did not believe a good solution had been found for allocating and queuing trips. A few ideas had been circulated, but the problem needed to be explored further.
  - \* Adjusting the SDC's had not even been addressed yet, but needed to be.
  - \* Investing in Wilsonville Road and capturing changes in driving habits could be addressed at another time.
  - \* There were a lot of unknowns, particularly with the question about multiple owners. Some sort of structure needs to be in place to address that.
  - \* Her biggest concern was that a good priority system had not been developed and there did not seem to be consensus by the Commission in how to prioritize those trips.

**Commissioner Goddard** asked about the two year time window that was implied to complete development after Stage II approval. Otherwise the applicant forfeits the approval. He did not explicitly see that the applicant would also forfeit the trips that had been vested as well.

- Mr. Lee replied that there was no loss of the approval or trips, City staff proposed that the application be suspended as long as they are in the queue. If the development was not completed within two years of the Stage II approval and the applicant was in the queue, the two-year provision would not apply.

**MOTION:**

**Commissioner Faiman moved to send the Application No 04PC03A and Application No. 04PC03B back to City staff specifically for revisions to include counts for government services, and also to exempt government services in the event that the estimates were incorrect.**

**The motion died due to no second.**

**Commissioner Goddard** asked if the estimates Commissioner Faiman referred to were the estimates for trips consumed by essential government services or for the trips consumed by applicants for proposed development.

- Commissioner Faiman restated that essential government service trips needed to be added to the queue.
- Mr. Johansen suggested that City staff should discuss it further, but the best way to determine the estimates might be to set a certain percent for essential government services and then readjust it annually based on the following year's anticipated growth.
- Commissioner Goddard suggested developing the intended language tonight, then allow City staff to revise the ordinance in addition to the Planning Commission resolution. In the interest of time, it might be best to draft that language off line and then revisit it at the next meeting or sooner.
- Mr. Johansen suggested that it be completed in one month, since people were awaiting a decision.

**Chair Iguchi** stated that the phrase "in the event that we find the estimations are incorrect" was too subjective. She asked Commissioner Faiman to clarify his intent.

- Commissioner Faiman explained that he used the previous example of the unexpected plan to build a fire station. Because it had never been previously discussed, there would be no trips in the queue for it. The fire station would still be needed and it would still be exempt, but the trips would not be estimated.
- Chair Iguchi added that if the station were built, the traffic standard would go to LOS "F".
- Commissioner Goddard did not view that as an incorrect estimate, but an unplanned use that needed to be accounted for. There should be a mechanism in place for dealing with trips for future essential government services.

**Chair Iguchi** asked the Planning Commission to give Staff more direction in revising the ordinance, beginning with the proposal to change de minimis numbers.

- Commissioner Juza believed the de minimis numbers were fine, especially since the commercial allotment in industrial buildings had been reduced.

**Chair Iguchi** asked if a consensus had been reached on the 50% cap and if it applied to large or small businesses.

- Commissioner Hinds asked how a large development with multiple owners would receive trips out of the 50% cap. She felt that a 50% cap was a good place to begin saving trips for smaller and larger developments, so there was a mix. This would allow small businesses an opportunity to develop.

- \* She added to Chair Iguchi and Commissioner Juza's comments about returning with the same problem in 2-3 years. She understood the PFTS to sunset in 2 years and the City Council could extend it. As a PFTS plan, the ordinance was written to revisit again anyway.
- \* Mr. Waffle concurred stating City staff would probably return in two years for an extension. At that time more information would be available regarding element #5, 'Investing in Wilsonville Road,' which the City wished to proceed on.

**Commissioner Hinds** suggested that there were other alternatives to lower traffic, not included in this PFTS. There might also be changes in driving habits in two years. With growth the City has to readdress this time and again, it is a very crucial issue.

- **Chair Iguchi** clarified that by law this ordinance must sunset in 5 years and the TSP was not expected to make any huge changes, like building another interchange, for another 15 years or so. There was a gap between the proposed PFTS and the solution, if one became available.

**Mr. Waffle** replied to Commissioner Goddard that developments B, C, D, E and F were fictitious in Exhibit 21. The spreadsheet reflected a "first come, first serve" basis, and no one could receive more than 90%, 75% or whatever the percentage was. Imagine Developer B coming in for Stage II Approval in March, needing only 25 trips. They would receive the trips and continue with their development. Developer C, however, did not get Stage II Approval until October. By that time, there would not be enough trips left in the queue for that year, so they would wait. He clarified an earlier remark regarding additional criteria for allocating trips. Currently, the system is set up first come, first serve. There had not been further discussion about what other criteria might be applied as to type of business, location, etc.

- Commissioner Goddard asked for information on the number of projects that would be impacted with a 100% cap; a no limit approach to allocating trips in the queue. If Developments FM and VB of Exhibit 21 were allocated 100% of their required trips in Year 1, how many developments would be delayed and for how long?
  - \* Mr. Waffle walked through the example given by Commissioner Goddard. Developers FM and VB would get their trips in the first year with some left for Developer B, and Developer C would receive hardly any that first year.
- Mr. Johansen added that currently there is no system for a queue. When developers approach the City and no capacity was available, City staff suggests to the developer that they do a traffic report and receive a denial, or wait until the PFTS is established. No one has submitted a Stage II application at this time, though a traffic report has been requested. The City probably has four or five people a week asking questions. He didn't know if they were serious about pursuing development or just comparing Wilsonville with other areas.
- Commissioner Goddard could not agree to any particular percentage using hypothetical numbers. Equitability could be debated either way. First come, first serve, could be argued as the most equitable way to allocate trips, provided there is a fair and uniform mechanism establishing when the person entered the queue. Establishing a percentage could also be argued due to Wilsonville's unique situation where one desired use is overwhelming the system, which would not leave enough trips for other desired uses. He understood the need for balancing the interests of large and small developments. He could not see how to establish a percentage for capping trips by any one development. Some evaluation should be used to determine that impact upon other planned developments.
- Chair Iguchi appreciated Exhibit 21, which indicated that 50% was where a change occurred. There didn't seem to be much of an impact on 90% to 75%. She asked if a system could be developed that weighted certain properties, perhaps according to size, rather than on a first come first serve basis.
  - \* Mr. Waffle believed other systems could be developed. Staff had tried to keep the PFTS fairly simple. As much debate as there was about the percentage, the debate regarding weighting of various criteria would also be quite time consuming, but it was possible.

- \* Chair Iguchi asked how the City would determine who is first for the first come, first serve system. Would properties such as the Kohl property, that have waited for so long, automatically be placed in the number one position? What if a particular development had not applied for a Stage II approval; must they wait until it is approved? Parameters needed to be established if first come, first serve was the determined to be the best system.
- \* Mr. Johansen confirmed that according to the ordinance, developers would enter the queue when they received their Stage II approval. This indicated that they have gone through the process and knew what trips they required.

There was a brief discussion regarding how to proceed with the applications. The applications could be continued since the Commission had requested Staff to return with revised language addressing the debated issues. The Planning Commission and Staff clarified what was needed revised in the PFTS draft according to the discussion:

- Make the conforming changes to eliminate the exemption for essential government services.
- Determine how to handle the capacity to serve the essential government services.
- Review how multiple owners of a development would be addressed.
- Staff intended to leave the 50% cap unless further direction was given..

**Planning Director Sandi Young** suggested that compiling data using real numbers from the last two years of development would allow the Commission to see what impact different cap percentages would have had. This would not be theoretical data, but would show what would have happened using real numbers given the proposed scenarios.

- Commissioner Goddard suggested that it would not be particularly relevant for the issue before the Commission. He did not feel the past could guide the decisions moving forward.
- Commissioner Hinds was satisfied with the fictitious numbers showing where the breakpoint was with the different percentages.

**Commissioner Juza** asked the Commission what the motive was for sending the ordinance back to Staff. Was it to decrease the number of available trips if the level of service was lowered by not exempting government services? Or, was it being returned because the City would go to LOS "E", and still have additional trips available, but prevent the traffic standard from ever reaching LOS "F"?

- Commissioner Faiman responded that the changes would greatly reduce the chances of reaching LOS "F", but would not eliminate it.
- Commissioner Juza asked Commissioner Faiman to clarify his position. He was not opposed to allowing new trips now, so developers that had been waiting could proceed, but he did not want it to become so out of control that LOS "F" was reached.
  - \* Commissioner Faiman repeated that there is a need to have a process that could be respected. All the known trips should be included using honest numbers. He understood that there might be trips that were unexpected.
  - \* Commissioner Goddard understood the net effect would then be fewer available trips if essential government services were counted for purposes of determining the level of service. There would be fewer trips available to grant to applicants.
  - \* Chair Iguchi clarified that Commissioner Faiman wanted LOS "F" to be recognized on the road, as well as on paper.

It was suggested that City staff research how other cities addressed the issue of essential government services. Tri-met had already been specifically mentioned, but other components of government services should be inquired about as well. For example, were government services exempted in Tualatin or Lake Oswego in order to proceed with development of Bridgeport Village?

- Mr. Johansen offered that a survey could be done, though Wilsonville might be more rigorous in enforcing LOS "D" or LOS "E" standards than other cities. He said City staff would return with new numbers for the trips available after the essential government services were accounted for.

**Commissioner Hinds** asked if there was any consensus on proposed language from Mr. Lee. Commissioner Faiman suggested = that it didn't cover all the bases.

**Commissioner Faiman moved to continue Application No. 04PC03A and Application No. 04PC03B to date and time certain of May 11, 2005. The motion was seconded by Commissioner Hinds, which passed 4 to 1 with Commissioner Juza opposing.**

---

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Distributed at the April 13, 2005 Planning Commission Public Hearing:**

- Exhibit 12: Draft Level of Service Ordinance dated 4/6/05 and amended 4/11/05.
- Exhibit 26: Large photos showing the Wilsonville Road/I-5 interchange as it currently configured and proposed improvements. (This item was resubmitted as smaller maps. See Exhibits 33 and 34).
- Exhibit 25: Suggested revisions to the draft Public Facilities Transportation Strategy ordinance submitted by Dana Krawczuk of Ball Janik LLP
- Exhibit 24: A table, "Comparison of Transportation Systems Plan & Wilsonville Freeway Access Study Growth Projections," with attached "Public Facilities Transportation Strategy Projected Growth from 2000 to 2020."
- Exhibit 23: Review Issues of the Public Facilities Transportation Strategy.
- Exhibit 22: A letter dated April 12, 2005, from Dana L. Krawczuk of Ball Janik LLP, regarding Testimony for Public Facilities Transportation Strategy (04PC03A and 04PC03B).

# Exhibit 12

Amended 4/11/05

ORDINANCE NO. \_\_\_\_\_

**AN ORDINANCE AMENDING WILSONVILLE CODE SECTION 4.140(J.) CONCERNING THE LEVEL OF SERVICE AT THE SEVERAL INTERSECTIONS ASSOCIATED WITH WILSONVILLE ROAD/I-5 INTERCHANGE AREA DUE TO LACK OF TRANSPORTATION CAPACITY AND EXEMPTING ESSENTIAL GOVERNMENT SERVICES FROM LEVEL OF SERVICE CONSTRAINTS.**

WHEREAS, the City Council of the City of Wilsonville finds that the Wilsonville Road Corridor is a specific geographic area which has experienced a rapid and unanticipated increase in total development and within which the total land development would exceed the planned or existing capacity of public transportation facilities. Within the Wilsonville road Corridor, specific intersections have been identified as operating at greater than Level of Service "D" during the p.m. peak hour. Those intersections are I-5/Wilsonville Road Southbound, I-5/Wilsonville Road Northbound, Boones Ferry Road/Wilsonville Road, and Town Center Loop West/Wilsonville Road. These intersections shall be designated the "impacted intersections"; and

WHEREAS, the purpose of this ordinance is to modify the level of service (LOS) at the impacted intersections from LOS "D" to LOS "E" as provided by the City's Comprehensive Plan and Transportation Systems Plan without unreasonably restricting the necessary supply of housing and of commercial and industrial facilities as provided for in the City's Comprehensive Plan; and

WHEREAS, the City has determined, as described in the staff report attached hereto as Exhibit "A", that total anticipated land development which will impact the Wilsonville Road/I-5 Interchange Area will exceed the existing capacity of transportation facilities in the area at LOS "D"; and

WHEREAS, the City Council finds that the previously approved p.m. peak trip capacity through the impacted intersections has been fully allocated either to existing developments or reserved under prior vesting ordinances for as yet un-built projects; and

WHEREAS, the City has determined that allocation of trips is necessary to avoid a pattern of development permit denials and to keep development to a scale and pace

ORDINANCE NO. \_\_\_\_\_

PAGE 1 OF 5

consistent with the planned provision of public facilities so that the supply of housing and of commercial and industrial facilities impacted by the transportation deficiencies in the Wilsonville Road/I-5 Interchange Area will not be unreasonably restricted; and

WHEREAS, the City Council further finds that the completion of the planned Phase 2 and 3 improvements to the I-5/Wilsonville Road Interchange and the improvements at the Boones Ferry Road/Wilsonville Road intersections, together with a planned change in driving habits as described in "Exhibit "A", will not reasonably accommodate future development without a change from LOS "D" to LOS "E" through the impacted intersections; and

WHEREAS, the City Council has determined that essential government services, including, but not limited to, public safety, public schools and public transportation services are 1) necessary for the health and well-being of the citizens of Wilsonville, 2) serve existing and proposed development near the impacted intersections, and 3) involve trips which, if counted in the calculation of LOS "E" or "F", would overly restrict private development; and

WHEREAS, the City provided the Department of Land Conservation and Development with the required 45-day written notice prior to the first evidentiary hearing to consider this amendment. Notice was sent on March 26, 2004 for a hearing before the Planning Commission on May 12, 2004. That hearing was continued to September 8, 2004, October 13, 2004, December 8, 2004, February 9, 2005, and April 13, 2005. The Planning Commission has recommended approval as contained in Resolution No. 04PC03B, and

WHEREAS, the City Council held a properly noticed public hearing on \_\_\_\_\_, 2005 to hear testimony and consider the evidence in the record, and determined that the change in level of service from LOS "D" to LOS "E" is necessary in order that the supply of housing and of commercial and industrial facilities impacted by the transportation deficiencies in the Wilsonville Road/I-5 Interchange Area will not be unreasonably restricted, and has also determined that the public interest supports the need to continue to exempt essential governmental services, and the trips associated with such uses, from level of service requirements "E" and "F".

NOW THEREFORE, THE CITY OF WILSONVILLE ORDAINS AS  
FOLLOWS:

Section 1. Wilsonville Code Section 4.140 J. is amended to read as follows:

- J. A planned development permit may be granted by the Development Review Board only if it is found that the development conforms to all the following criteria, as well as to the Planned Development Regulations in Section 4.140:
1. The location, design, size and uses, both separately and as a whole, are consistent with the Comprehensive Plan, and with any other applicable plan, development map or Ordinance adopted by the City Council.
  2. That the location, design, size and uses are such that traffic generated by the development at the most probable used intersection(s) can be accommodated safely and without congestion in excess of Level of Service D, **or Level of Service E for the intersections of Wilsonville Road/Boones Ferry Road/Town Center Loop West, I-5 Southbound ramps, and I-5 Northbound ramps**, as defined in the Highway Capacity Manual published by the National Highway Research Board, on existing or immediately planned arterial or collector streets and will, in the case of commercial or industrial developments, avoid traversing local streets. Immediately planned arterial and collector streets are those listed in the City's adopted Capital Improvement Program, for which funding has been approved or committed, and that are scheduled for completion within two years of occupancy of the development or four years if they are an associated crossing, interchange, or approach street improvement to Interstate 5.
    - a. In determining Levels of Service-~~D~~, the City shall hire a traffic engineer at the applicant's expense who shall prepare a written report containing the following minimum information for consideration by the Development Review Board:
      - i. An estimate of the amount of traffic generated by the proposed development, the likely routes of travel of the estimated generated traffic, and the sources(s) of information of the estimate of the traffic generated and the likely routes of travel; (Amended by Ord 561, adopted 12/15/03.)
      - ii. What impact the estimate generated traffic will have on existing level of service including traffic generated by (1) the development itself, (2) all existing developments, (3) Stage II developments approved but not yet built, and (4) all developments that have vested traffic generation rights under section 4.140(.10), through the most probable used intersection(s), including state and county intersections, at

the time of peak level of traffic. This analysis shall be conducted for each direction of travel if backup from other intersections will interfere with intersection operations. (Amended by Ord 561, adopted 12/15/03.)

- b. The following are exempt from meeting the Level of Service D criteria standard **and Level of Service E standard for the intersections of Wilsonville Road/Boones Ferry Road/Town Center Loop West, I-5 Southbound ramps, and I-5 Northbound ramps:**
    - i. A planned development or expansion thereof which generates three (3) new p.m. peak hour traffic trips or less;
    - ii. A planned development or expansion thereof which provides an essential governmental service.
  - c. Traffic generated by development exempted under this subsection on or after Ordinance No. 463 was enacted shall not be counted in determining levels of service for any future applicant. (Added by Ord 561, adopted 12/15/03.)
  - d. Exemptions under 'b' of this subsection shall not exempt the development or expansion from payment of system development charges or other applicable regulations. (Added by Ord 561, adopted 12/15/03.)
  - e. In no case will **non-exempt** development be permitted that creates an aggregate level of traffic at LOS "F". (Added by Ord 561, adopted 12/15/03.)
3. That the location, design, size and uses are such that the residents or establishments to be accommodated will be adequately served by existing or immediately planned facilities and services.

SUBMITTED to the Wilsonville City Council and read for the first and second time at a regular meeting thereof on the \_\_\_\_ day of \_\_\_\_\_, 2005, commencing at the hour of 7:00 p.m. at the Wilsonville Community Center, 7965 SW Wilsonville Road, Wilsonville, OR.

---

SANDRA C. KING, CMC, City Recorder

Enacted by the City Council on the \_\_\_\_\_ day of \_\_\_\_\_, 2005, by the following votes:

YEAS: \_\_\_ NAYS: \_\_\_ ABSTAIN: \_\_\_

\_\_\_\_\_  
SANDRA C. KING, CMC, City Recorder

DATED and signed by the Mayor this \_\_\_\_\_ day of \_\_\_\_\_, 2005.

\_\_\_\_\_  
CHARLOTTE LEHAN, Mayor

SUMMARY OF VOTES:

|                      |       |
|----------------------|-------|
| Mayor Lehan          | _____ |
| Councilor Kirk       | _____ |
| Councilor Holt       | _____ |
| Councilor Scott-Tabb | _____ |
| Councilor Knapp      | _____ |

# Exhibit 25

## Suggested Revisions

Ordinance No. \_\_\_\_: AN ORDINANCE ADOPTING A PUBLIC FACILITIES TRANSPORTATION STRATEGY FOR DEVELOPMENT IN THE CITY OF WILSONVILLE DUE TO THE LACK OF STREET CAPACITY IN THE WILSONVILLE ROAD 1-5 INTERCHANGE AREA.

### Revised SECTION 2: THE STRATEGY

2. As an exception to paragraph 4.140(.09)J.2 of the City Code, Council authorize the establishment of a transportation queue on a first approved priority basis for projects which meet all other requirements for Stage II approval except for traffic capacity at the impacted area.

Projects that are a part of a Master Plan that has had substantial development, including but not limited to the construction of one or more phases of the Master Plan, shall be placed in the transportation queue based upon the date of Master Plan approval. Priority for such Master Plan projects shall expire within three years of the date of Ordinance No. \_\_\_\_ if an application for a Stage II final plan has not been filed. If Master Plan priority expires, then the project's priority in the queue is based upon the date of Stage II approval.

3. Council authorizes projects to advance in the queue on a first approved basis in Section 2 of this ordinance subject to the limitation that ~~no project shall be allocated more than~~ at least 50% of the annual capacity as determined each year per Section 4 of this ordinance shall be available to projects that add no more than 150 new end trips to the transportation system during the p.m. peak hours. A project shall then be removed from the queue. Those projects listed below in priority to a removed project shall move up in the queue priority in sequence to their position. Allocated capacity shall accrue until a project has sufficient capacity for development.

4. Notwithstanding any other City requirements to the contrary, project traffic capacity for the impacted area will be determined based on location in the queue and end trip allocation. The impact of end trips on the impacted area is based on averages and typical conditions. Whenever the impact of individual developments present special or unique situations such that the trips through the impacted area are disproportionate to the actual impact of the development, the DRB may approve modifications to the number of the project's trips to be allocated to the project for its position in the queue. Situations in which the trips through the impacted area are disproportionate to the actual impact of the development include projects that rely on trips that already in the transportation system (i.e., pass-by trips) as opposed to generating new trips. In this case, it would be appropriate for the DRB to count only the number of end trips that needed to be allocated to the project.

\*\*\* \*\*

10. To provide applicants with some control over the schedule and costs associated with developing in the City and to allow projects that have only a de minimis impact on the transportation system to proceed, Section 4.140(.09)J.2. shall be amended to read:

2. That the location, design, size and uses are such that traffic generated by the development at impacted intersection(s) ~~the most probable used intersection(s)~~ can be accommodated safely and without congestion in excess of Level of Service DE, as defined in the Highway Capacity manual published by the National Highway Research Board, on existing or immediately planned arterial or collector streets and will, in the case of commercial or industrial developments, avoid traversing local streets. An "impacted intersection" is any intersection where the proposed development can be expected to contribute 40 or more trips during the p.m. peak period. Immediately planned arterial and collector streets are those listed in the City's adopted Capital Improvement Program, for which funding has been approved or committed, and that are scheduled for completion within two years of occupancy of the development or four year if they are an associated crossing, interchange, or approach street improvement to Interstate 5.

a. In determining levels of Service DE, the City applicant shall hire a traffic engineer that is on the City's list of approved traffic engineers at the applicant's expense who shall prepare a written report containing the following minimum information for consideration by the Development Review Board:

i. An estimate of the amount of traffic generated by the proposed development, the likely routes of travel of the estimated generated traffic, and the source(s) of information of the estimate of the traffic generated and the likely routes of travel;

ii. What impact the estimate generated traffic will have on existing level of service including traffic generated by (1) the development itself, (2) all existing developments, (3) Stage II developments approved but not yet built, and (4) all developments that have vested traffic generation rights under section 4.140(.10), through the most probable used intersection(s), including state and county intersections, at the time of peak level of traffic. Only impacted intersections must be analyzed. This analysis shall be conducted for each direction of travel if backup from other intersections will interfere with intersection operations.

b. The following are exempt from meeting the Level of Service DE criteria standard:

i. A planned development or expansion thereof which generates ~~three-ten (310)~~ new p.m. peak hour traffic trips or less;

ii. A planned development or expansion thereof which provides an essential governmental service.

# Exhibit 24

## Comparison of Transportation Systems Plan & Wilsonville Freeway Access Study Growth Projections

| 3/4/2002                                                                                                                                     | 2000/2001<br>Data | 2020<br>Projections | Percent<br>Increase |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------|---------------------|
| Total population north of Willamette                                                                                                         | 11,144            | 21,885              | 96%                 |
| Jobs north of Willamette                                                                                                                     | 13,187            | 32,115              | 144%                |
| Projected trip generation without<br>Charbonneau                                                                                             | 14,182            | 29,486              | 108%                |
| Entranco traffic entering & leaving I-5 at<br>Stafford & Wilsonville Road<br>Interchanges in PM peak hour per<br>Transportation Systems Plan | 7,392             | 13,083              | 77%                 |
| DKS traffic entering & leaving I-5 at<br>Stafford & Wilsonville Road<br>Interchanges in PM peak hour per<br>Freeway Access Study             | 6,358             | 10,140              | 59%                 |

**Public Facilities Transportation Strategy**  
**Projected growth from 2000 to 2020**

|                                                                                                                                             | 3/15/2004 | 2000  | 2020  | Increase | Change<br>by<br>percent |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|-------|----------|-------------------------|
| Total households (from TSP)                                                                                                                 |           | 8209  | 14809 | 6600     | 80%                     |
| Total jobs (from TSP)                                                                                                                       |           | 17653 | 35143 | 17490    | 99%                     |
| Households between Boeckman & the river<br>(from TSP)                                                                                       |           | 4828  | 8542  | 3714     | 77%                     |
| Jobs between Boeckman and the river (from<br>TSP)                                                                                           |           | 5061  | 12978 | 7917     | 156%                    |
| WV Rd/I-5 south bound off ramps (from WV<br>Freeway Access Study)                                                                           |           | 1050  | 743   | -307     | -29%                    |
| WV Rd/I-5 south bound on ramps (from WV<br>Freeway Access Study)                                                                            |           | 950   | 1590  | 640      | 67%                     |
| WV Rd/I-5 north bound off ramps (from WV<br>Freeway Access Study)                                                                           |           | 570   | 1070  | 500      | 88%                     |
| WV Rd/I-5 north bound on ramps (from WV<br>Freeway Access Study)                                                                            |           | 810   | 760   | -50      | -6%                     |
| WV Rd/I-5 south bound ramp intersection total<br>count (from WV Freeway Access Study)                                                       |           | 3530  | 4763  | 1233     | 35%                     |
| WV Rd/I-5 north bound ramp intersection total<br>count (from WV Freeway Access Study)                                                       |           | 3320  | 4410  | 1090     | 33%                     |
| WV Rd/I-5 south bound ramp intersection total<br>projected count if traffic grows at the same rate<br>as the average of households and jobs |           | 3530  | 6707  | 3177     | 90%                     |
| WV Rd/I-5 north bound ramp intersection total<br>projected count if traffic grows at the same rate<br>as the average of households and jobs |           | 3320  | 6308  | 2988     | 90%                     |
| Estimated annual reduction because of change<br>in driving habits                                                                           |           |       |       | 96       | 3%                      |

## **Public Facilities Transportation Strategy**

1. Change LOS D to E
2. Exempt “essential government services”
3. Allocate and queue trips
4. Adjust SDC’s
5. Invest in Wilsonville Road
6. Capture changes in driving habits

**BALL JANIK LLP**

A T T O R N E Y S

101 SOUTHWEST MAIN STREET, SUITE 1100  
PORTLAND, OREGON 97204-3219

www.balljanik.com

TELEPHONE 503-228-2525

FACSIMILE 503-295-1058

DANA L. KRAWCZUK

dkrawczuk@bjllp.com

April 12, 2005

VIA FACSIMILE

**Exhibit 22**Wilsonville Planning Commission  
30000 Town Center Loop E.  
Wilsonville, OR 97070Re: Testimony for Public Facilities Transportation Strategy  
(04PC03A and 04PC03B)

Dear Members of the Wilsonville Planning Commission:

This firm represents Joe Angel, a long time property owner in Wilsonville that has an approved master plan that has been partially developed. The first two phases of the approved master plan (Burger King on Wilsonville Road and Chili's on Boones Ferry Road) have been developed, with one phase remaining. As part of the development of the first two phases, Mr. Angel financed improvements and dedicated sections of right of way adjacent to his site in excess of what was needed to serve the development. However, Mr. Angel has not been able to develop the third phase of the master plan, in part because of the lack of available transportation capacity in the Wilsonville Road interchange area. So that Mr. Angel and other property owners in the area can proceed with development, we generally support the city's effort to create and allocate transportation capacity in the Wilsonville Road interchange area. We have the following 4 concerns:

1. Properties that have Existing Master Plan Approvals that have been Partially Implemented Should Have Priority in the Queue. Our primary concern is an equitable allocation of available trips and how queue priority is established. We continue to advocate for the city to provide properties with long standing and partially developed master plans to have priority to traffic capacity over new or recent development proposals. We think this is equitable and fair considering the private contribution to public facilities next to these developments, the road improvements made, the development history and the small number of projects that are in the unique situation of having partially developed master plans.
2. Protect Opportunities for Small Projects to Develop by Limiting the Number of Trips Available to Large Projects. We support the city's effort to strive for a balance between allocating trips between small businesses and large developers. At a minimum, 50% of the available trips should be allocated to small projects.

Wilsonville Planning Commission  
April 12, 2005  
Page 2

3. For the Purposes of Allocating Trips, Clearly Distinguish Between Pass-by Trips and Newly Generated Trips. Uses that rely upon trips that already in the transportation system, as opposed to uses that generate and add new trips to the system, have less of an impact on the transportation system. Accordingly, these "pass-by" trips should not be counted as end trips that must be allocated from the queue.
4. Suggested Supplemental Code Amendments. While the city is considering amendments to address transportation issues, we have a few suggestions to streamline the development process.

Each issue is discussed in more detail below. We will provide draft amendments to the ordinance adopting a public facilities transportation strategy at the public hearing on April 13, 2005.

1. Properties that have Existing Master Plan Approvals that have been Partially Implemented Should Have Priority in the Queue.

We support the idea of providing developers with certainty about the capacity of the transportation system early in the development process. However, the proposed approach of having a developer's place in the queue determined at the time that they receive Stage II approvals for a project does not recognize the few unique properties in the Wilsonville Road interchange area that have partially developed mater plans. It is appropriate for recent development projects, such as those that have been proposed since the city's TSP was adopted (June 2, 2003), to be placed in the allocation queue based solely upon the date of Stage II approval. However, properties that have existing master plan approvals that have been partially implemented should be recognized and given priority within the queue. These properties have gone through the master plan process and have had some phases of the master plan fully built out. In Mr. Angel's case, the initial master planning and phasing was done in the early 1980s. So that his master plan can be complete and his investment-backed development expectations can be recognized, it is appropriate to have Mr. Angel's placement in the queue revert back to the date of when the master plan was approved and partially developed. It is also reasonable to allow partially developed projects precedence over completely new development because partially developed properties have services readily available on site and have made some or all of the necessary offsite improvements. Specifically, Mr. Angel has already contributed to the improvement of the transportation system by financing improvements and by dedicating of right-of-way that was needed to serve not only that phase of the master plan but improvements that were needed to improve the whole system – i.e., the dedication of an entire lane on Wilsonville Road and Boones Ferry Road as part of the development of the Burger King and Chili's.

Based on the staff reports provided, it appears as if only two development projects in Table 1 (Anticipated Development Projects Through 2009) have received master plan approval but not final Stage II approval to finish their developments – Mr. Angel's property (ID

Wilsonville Planning Commission

April 12, 2005

Page 3

15, 0.69 acres of retail development) and the Kohl property (ID 19, 2.93 acres of commercial development). To avoid any concern about allocated trips not being used, the city could require that properties that enjoy priority in the queue due to previous master plan development have three years from the date the public facilities system plan is adopted to apply for final Stage II approvals. If an application for Stage II final approvals is not filed within three years, then the property's priority in the queue would be based upon the date of Stage II approval.

2. Protect Opportunities for Small Projects to Develop by Limiting the Number of Trips Available to Large Projects.

We appreciate the city's effort to balance the traffic capacity needs of large projects such as Fred Meyer and Villebois with those of smaller scale projects. As the city has recognized, in order to have a well functioning and diverse economic base, projects of various sizes must be able to proceed. We understand that Fred Meyer has been patient with its development plans and are eager to construct their shopping center. However, other property owners such as Mr. Angel have also been patient with the lack of transportation capacity and it is unfair to have one or two development absorb all of the capacity that is being created. This is particularly true in Mr. Angel's case because of the improvements to the transportation system that he has already made.

The city's proposed allocation that no applicant can receive more than 50% of the available capacity in any year is a reasonable starting point for a debate of this issue. However, because it is expected that essential government services will be built in the near term, and that these services are not subject to the allocation queue, even if large developments are limited to 50% of the available capacity, smaller scale developments will be stymied for years to come. Further, the city must consider what would happen if two large developments took place in the same year. As the smallest developer listed on Table 1 (Anticipated Development Projects Through 2009), we are concerned that even with the proposed 50% allocation to a single project, the city's goal to allocate trips equitably between large and small projects will not be achieved. To ensure that there is capacity for smaller projects, we suggest that rather than limiting the number of trips available to a single applicant, the city should preserve a percentage of the available trips (i.e., 50%) for smaller projects. We can discuss how "smaller projects" should be defined, but one approach would be to allocate at least 50% of the available trips to projects that add no more than 150 new trips to the transportation system during the p.m. peak hours.

3. For the Purposes of Allocating Trips, Clearly Distinguish Between Pass-by Trips and Newly Generated Trips.

The code and the approach taken in the draft public facilities transportation strategy seem to recognize that uses that rely on trips that are already in the transportation system, as opposed to uses that generate and add new trips to the system, have less of an impact on the transportation system. Accordingly, these "pass-by" trips should not be counted as end

**BALL JANIK LLP**

Wilsonville Planning Commission

April 12, 2005

Page 4

trips. The proposed ordinance should be revised so that this concept is very clear and that the impacts of end trips are what are being calculated in any traffic study.

4. Suggested Supplemental Code Amendments.

While the city is reviewing development and transportation issues, we thought it would be appropriate to suggest related amendments to the code that would streamline the development review process.

A. Choice in Traffic Engineer Hired By the City

When reviewing a proposed planned development, the city has historically selected and hired a traffic engineer at the applicant's expense for the purpose of analyzing the project's impact on the transportation system. See Section 4.140(.09).J.2.a. So that the developer has some control over managing the costs of a project, we request that the city provide a list of acceptable traffic engineers from which the applicant can choose.

B. Clarification of Scope of Traffic Impact Analysis

Language should be inserted in Section 4.140(.09).J.2.a.ii that clarifies the scope of the intersection(s) studied as being directly related to the impact of the use. For example, a large traffic generator that draws trips from around the region would need to study more intersections than a use that relies primarily on pass by traffic, which may need to study only one intersection. Some jurisdictions address this issue by requiring that only "impacted intersections" need to be studied in a traffic impact analysis, and then define what constitutes an "impacted intersection" in terms of the number of trips added by a use during peak hours (i.e., 40 trips).

C. Expansion of De Minimis Exception to LOS Criterion

To stimulate economic development for small businesses, the exception for de minimis traffic generators in Section 4.140(.09).J.2.b.i. should be amended so that planned development or expansions which generate only ten new p.m. peak hour traffic trips or less (as opposed to three) are exempt from the LOS requirement.

04/12/2005 10:01 AM 000 000 1000 BILL SMITH 00000000

**BALL JANIK LLP**

**Wilsonville Planning Commission**  
**April 12, 2005**  
**Page 5**

Thank you for the opportunity to participate in the city's efforts to fairly allocate the limited traffic capacity created by the public facilities transportation strategy. We look forward to participating at the April 13, 2005 public hearing. At that hearing we will provide draft language that implements our comments.

Sincerely,



Dana L. Krawczuk

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Items previously distributed at Planning Commission Work Sessions entered into the 04PC03A and 04PC03B record on April 13, 2005. .**

- Exhibit 16: An Interoffice Memorandum dated March 3, 2005 for the March 9, 2005 Planning Commission Work Session, to Debra Iguchi and Members of the Planning Commission, from Dave Waffle, regarding the Public Facility Transportation Strategy.
- Exhibit 17: An Interoffice Memorandum dated March 3, 2005 for the March 9, 2005 Planning Commission Work Session, to Arlene Loble, from Dave Waffle and Mike Kohlhoff, regarding the Public Facility Transportation Strategy.
- Exhibit 18: A Community Development Memorandum dated March 2, 2005, to Sandi Young, from Eldon Johansen, regarding PFTS.
- Exhibit 19: Draft Ordinance for PFTS included in the March 9, 2005 meeting packet, combining PFTS and LOS language (04PC03A & 04PC03B)
- Exhibit 20: A aerial photograph, Public Facilities Strategy Impacted Intersections (distributed at the March 9, 2005 meeting).
- Exhibit 21: A table, Allocation and Queuing Examples. (distributed at the March 9, 2005 meeting). (This table was updated after the meeting and an updated copy was emailed to the Planning Commission)

# Wilsonville Community Development

## - interoffice memo -

**Date:** March 3, 2005

**To:** Debra Iguchi and Members of the Planning Commission

**From:** Dave Waffle, Community Development Director

**RE:** Public Facility Transportation Strategy

---

The Wilsonville City Council at its regular meeting on February 22<sup>nd</sup> reviewed materials related to the proposed Public Facilities Transportation Strategy (PFTS). The Mayor and City Council request that the Planning Commission renew their consideration of the strategy and related matters.

The PFTS is needed to respond to increasing congestion conditions with traffic during the peak P.M. weekday commuting period of 4-6 p.m. The area most affected by the congestion is on Wilsonville Road between Town Center Loop West and the intersection of Boones Ferry Road. The four signalized intersections are referred to as the "interconnected Wilsonville Road interchange area" or the "impacted area".

The strategy is more clearly detailed in the accompanying pages. There are some issues on which the Mayor and City Council have provided clear direction. On matters such as how to allocate trips and allow queuing they "struggled mightily" and are looking for recommendations. The basic elements are these:

1. Change the Level of Service (LOS) from D to E at the impacted intersections and to the Volume to Capacity Ratio (V/c) at the I-5 ramps.
2. Continue to exempt "essential government service" from LOS restraints.
3. Develop a process to allow the queuing of trips and allocating them at Stage II of the development process.
4. Develop new System Development Charges (SDC's) to pay for transportation improvements.
5. Invest in facilities on Wilsonville Road and I-5.
6. Adopt means of inducing changes in driver behavior and monitor traffic to "capture" changes in driving habits.

*Interoffice Memo - Wilsonville Community Development*

It is the intent of the Mayor and City Council to proceed quickly with items 1-4. The Community Development Department wishes to study the alternatives for long-range improvements at the I-5 interchange before committing to a specific design (strategy #5). As there are pending development proposals on adjacent property, the staff feels we need a clear understanding of the amount of r.o.w required.

Many aspects of strategy #6 were the subject of Planning Commission discussion last fall (such as the TDM and Commute Reduction Program) and should continue.

Enc.

drw/pfts 022305

This is a revised version of a memorandum that was delivered to the City Council on 2/3/05. It has been amended to reflect decisions of the Mayor and Council and contains updated data where appropriate.

# Wilsonville Community Development

## - interoffice memo -

**Date:** March 3, 2005  
**To:** Arlene Loble, City Manager  
**From:** Dave Waffle, Community Development Director  
& Mike Kohlhoff, City Attorney  
**RE:** Public Facilities Transportation Strategy

---

The following information is a collaborative work done by several members of the city staff regarding development of a Public Facilities Transportation Strategy (PFTS). Contributions are from Special Projects Coordinator Eldon Johansen, Planning Director Sandi Young, City Engineer Mike Stone and Public Affairs Director Danielle Cowan. DKS Associates provided the traffic projections upon which we base our analysis to provide policy alternatives to the City Council.

This report is divided into six parts:

- Legal Requirements of a Public Facility Strategy
- Current Transportation System Situation
- Strategy Outline Summary
- Recommendations and Rationale
- Future Perspectives
- Appendix: Queuing and Trip Allocation Examples, Trip Projection Data and Cost Estimates, Map, PFS Primer and Statutes

### Legal Requirements

This is not the first Public Facilities Strategy (PFS) that the City has adopted. The City Council approved a strategy in 1996 regarding the same subject (Ordinance #463) and a strategy regarding the water system in 2000 while the water treatment plant was being designed and built.

The requirements for a Public Facility Strategy are in ORS 197.768 (Appendix 1). The ORS criteria prevent a municipality from creating a *de facto* moratorium on

development and then ignoring the problem. Instead the city must have a specific solution to the development constraint within a two-year period. A public facilities strategy may be extended one-year at a time for as many as three successive years, therefore the strategy can cover a five-year period. City Attorney Kohlhoff has also prepared a primer regarding Public Facility Strategies (Appendix 2).

The PFS adoption process includes reasonable notice to affected property owners, a public hearing and findings of fact to support the strategy. The Wilsonville Planning Commission began considering the transportation strategy in September 2004 but has withheld completion of the process pending policy guidance from the City Council.

### **Current Transportation System Situation**

Eldon Johansen described the historical and current traffic situation in his September 2004 staff report (04PC03A/04PC03B) to the Planning Commission. He noted that the 1982 Comprehensive Plan projected over-capacity problems at the Wilsonville Road interchange with I-5 (Exit 283). By 1994 traffic was exceeding the LOS D (Level-of-Service) standard along Wilsonville Road between Boones Ferry Road and Town Center Loop West (TCLW). This is commonly referred to as the "interconnected Wilsonville Road interchange area" (a.k.a. the "impacted area") and consists of four signalized intersections. See the aerial photograph in Appendix 3.

The City's response to the traffic problem (Ordinance No. 428, 1993) was declared to be a moratorium by the Land Use Board of Appeals (LUBA) and the matter was sent back to the City to resolve in some other manner. As a result the City adopted Ordinance No. 463 to create the first Public Facilities Transportation Strategy. This strategy sunset upon adoption of the Transportation Systems Plan (TSP) in 2003.

The City's Development Code requires that the Development Review Board (DRB) approve planned development permits only when there is sufficient traffic capacity (LOS D standard) for the intersections likely to be used by the proposed development. Capacity must be attained within two years of the application.

In 2002, the Freeway Access Study (FAS) was completed. It evaluated two basic freeway access scenarios, one being improvements to the Wilsonville Road/I-5 Interchange and the other being construction of a new interchange at Boeckman Road and I-5. The FAS outlined a series of recommended improvements within the "impacted area" that would result in greater "trip" capacity.

The principal critical time period for allocating trips through the area is the afternoon or P.M. commute between 4 and 6 p.m. The most critical facility within the "impacted area" is the set of southbound ramps on I-5 immediately west of the interchange bridge over Wilsonville Road.

The existing P.M. peak hour capacity for existing, approved and vested trips is as follows. This is based on V/c analysis and LOS D without progression.

| Boones Ferry | SB Ramps | NB Ramps | Town Center Loop West (TCLW) | Total Entering Vehicles |
|--------------|----------|----------|------------------------------|-------------------------|
| 3711         | 4561     | 4645     | 3845                         | 6506                    |

Consistent with the City's concurrency policy and the TSP, plans for improving Wilsonville Road are designed and intended to be bid in 2005. This was called the \$3.5 million dollar plan (\$3.5MM) and it features the creation of a left turn lane, a through + left turn lane and a through lane in each direction beneath the I-5 overpass to accommodate late afternoon drivers heading north or southbound. The scope and cost of the \$3.5MM plan has been reduced to \$2.1 million.

Based on the \$3.5MM plan the City allocated trips to a number of developments including Villebois based on a planned completion date of those improvements within a two year period. With consideration of existing trips, "vested" trips and those otherwise reserved the number of trips has reached the maximum allowable once again. This table represents trips based on the \$3.5MM plan and uses a volume to capacity ratio on the ramps and LOS D with progression analysis at TCLW and Boones Ferry Road intersections.

| Boones Ferry | SB Ramps | NB Ramps | TCLW | Total Entering Vehicles |
|--------------|----------|----------|------|-------------------------|
| 3605         | 4544     | 4755     | 3974 | 6910                    |

With all trips allocated, several developments that would impact this area are sitting on the sidelines waiting to be considered. For any development south of Boeckman Road the only new construction projects being approved are those generating what is considered *de minimis* P.M. trips or those classified as "essential government services". Therefore a Public Facilities Transportation Strategy is in order.

#### Strategy Outline Summary

The six strategies outlined in the September Planning Commission staff notes are still viable with some amendments. These are:

1. **Change in Level of Service for LOS D to LOS E at the impacted intersections and Volume to Capacity Ration (V/c) at the I-5 ramps.** The current standard is LOS D with progression. Progression analysis represents the movement of vehicles through a series of intersections. The TSP provided for the option for the City Council to amend the development code to go to LOS E with progression. If the change only exists within the PFTS it is

considered a temporary measure and it sunsets. When ODOT V/c is used to measure capacity, the V/c ratio approximates the capacity as measured by the LOS E with progression method.

2. **Continue to exempt "essential government services" from LOS restraints.** Included in this consideration are schools and the proposed commuter rail station as well as city hall.
3. **Develop a process to allow queuing of trips and allocating them at Stage II of the development approval process.** First come, first served? Shall we set aside a certain percentage for small businesses? Is there a limit as to how many trips a large development could secure or vest in a year? See the discussion below and the examples in Appendix 4.
4. **Develop new SSDC's to pay for transportation system improvements.** We may need to review the rate and adjust accordingly. Some improvements may be made as a reasonable condition of approval and will generate credits.
5. **Invest in facilities on Wilsonville Road and I-5.** Street and highway improvements are described below. Appendix 5 contains projections as to the trips generated by each investment option.
6. **Adopt means of inducing changes in driver behavior and monitor traffic to "capture" changes in driving habits.** This strategy includes consideration of the proposed Transit Demand Management program described in the 2003 Transportation Systems Plan, the DEQ Commute Reduction program, ITS improvements and regular traffic surveys.

#### **Recommendations**

- 1) **Staff recommends using V/c ratio capacity standard for South Bound (SB) and North Bound (NB) I-5 intersection ramps and amending the development code to allow a LOS E with progression capacity standard for Boones Ferry and Town Center Loop West (TCLW) intersections with Wilsonville Road.**

In regards to the Public Facilities Transportation Strategy (PFTS), the City is initially faced with determining what standards to apply. This is complicated by several factors:

- (a) The current code standard was changed for PM peak hour trips for traffic generated by a development from Level of Service D (LOS D) without progression analysis (without back-up) to LOS D with progression analysis (with back-up) through the most probably used intersections. However the TSP recognized the need to go to the LOS E standard for the Wilsonville Road interchange area.

- (b) The State of Oregon uses a volume to capacity standard (V/c) for the intersections created by the ramps on and off an interchange.
- (c) Thus, the capacity created from the \$3.5 million project was calculated using the V/c standard for the South Bound (SB) ramp and the North Bound (NB) ramp with Wilsonville Road and the standard applicable at that time, LOS D without progression, for the Boones Ferry Road and Town Center Loop West (TCLW) intersection with Wilsonville Road.

The City is seeking funding for the #283 Interchange improvements from the Oregon Department of Transportation (ODOT) and ODOT only recognizes a V/c standard for its interchange ramp intersections. According to Eldon Johansen, since V/c is the controlling capacity standard, the only city standard which comes close to mirroring the V/c ratio is LOS E with progression.

**2. Staff recommends continuance of the essential services exemption from the level of service standard adopted by the PFTS.**

This exemption for LOS D already exists in the code. If not removed from any LOS category then the city could be obligated to reserve trips for the schools and city vehicles within the trip allocation even at these more gridlocked states. By removing any restriction it may cause actual traffic levels to occasionally fall to LOS F. This change removes any ambiguity from the City code.

**3. The amount of trips should be allocated under the PFTS at Stage II of the development approval process and the policy should allow an equitable queuing of trips.**

Staff has obtained a traffic impact report regarding the proposed Fred Meyer development on Boones Ferry Road south of the intersection. Its impact is 657 gross trips. Improvements to Boones Ferry Road which have been packaged with the \$20 million improvement phase could reduce the impact through "linked" trips. These are trips that are in the intersection but divert to go to Fred Meyer (new trips for Fred Meyer, but not for this intersection). Fred Meyer has a pending application that it has agreed to hold in abeyance until the PFTS can be worked out. With these improvements the standard distribution of net new P.M. peak hour trips through the interchange area is 318.

Staff is sensitive to the equity issue that could be created by a queuing strategy. For example, Fred Meyer could have competed with Villebois for development trips having held its land before Villebois came into being. However Fred Meyer worked with the Villebois Master Planner (Costa Pacific) and the City. They agreed to take a second development position behind the Villebois Village Development.

Likewise, staff is sensitive to the fact that there have been other developments with prior ownership that also have been patient, such as the Kohl Family Trust, and

whose traffic impacts would be significantly less than that of Fred Meyer. The issue of balancing of equity among developers within the limited trip capacity under a PFTS becomes very important when the limited capacity could be used entirely by a large development or the same capacity could serve several small developments.

The City's concurrency standard involves an offset of two years for local street improvements and four years for interchange improvements from date of development. The statutory requirement for sun-setting a PFTS is 24 months, but may be extended for cause up to three one-year extensions, which could provide for five years of rationing trips. Thus, staff looked initially at capacity analysis based on five years of potential road capacity improvements and the intangibles of estimating for changed driving habits away from the intersection as congestion increases and compliance with the State's required commute reduction program improves.

The table in Appendix 5 is a summary of the analysis conducted by city staff and DKS Associates to project the number of new "trips" that may be available to the allocated in future years. The table also provides an estimate of the source and amount of funding from Federal, state and local resources.

Finally, there is the matter of queuing development so that the method for acquiring trips in an orderly sequence is easily understandable. Appendix 4 contains an example of a method for queuing trips so that large developers can accumulate the required number of trips for approval over one or more annual allocation cycles. Smaller developers requiring fewer trips have the opportunity to move up in the queue and obtain trip allocations.

Appendix 4 also contains examples of how to accommodate a pending commitment to Villebois as well as handle the net affect of possible development of the Fred Meyer complex after Stage II approval is granted.

Based on the trip estimates now available the City Council intends to allocate 480 trips the first year and 290 in the second year of the PFTS. These estimates may change.

- 4. Staff recommends new or updated Systems Development Charges (SDC's) be developed after adoption of the PFTS.**

SDC's are the one of the principal means of financing capital improvements. Based upon the PFTS the cost recovery mechanism available from systems development charges needs to be adjusted to reflect local costs of the improvements net of any state or Federal grants or other expected sources of funding.

- 5. Staff recommends construction of the \$3.5MM (now \$2.1 MM) plan in 2005, proceed with plans for improvements to Boones Ferry Road intersection and the additional improvements to the I-5 interchange (\$20MM is now \$14MM project) as funds may be available from private development and ODOT**

**appropriations. The projects should appear in the next five-year capital improvement (CIP) program.**

PFTS related improvements in the "impacted area" include:

- a) Change the existing roadway to a left, a through/left and a through lane in each direction on Wilsonville Rd.- **\$2.1 million** Correction of the vertical curve problem beneath the overpass has been shifted to another, subsequent project.
- b) Reconstruct the Boones Ferry Rd./ Wilsonville Rd. intersection to include westbound double left-turn lanes and additional lanes on Boones Ferry Rd. south of Wilsonville Rd., plus additional eastbound lanes on Wilsonville Rd. from the railroad tracks to Boones Ferry Rd. - **\$6.95 million**
- c) Construct the ramp and safety improvements that were part of the original \$20MM project at the interchange - **\$5.4 million**
- d) Construct the capacity improvement portions of the original \$20MM project including double through lanes and vertical curve modification on Wilsonville Rd. - **\$9.5 million**

The staff asked the City Council to not commit to any project other than the change in lane configuration (project "a") at this time until some further analysis of projects "c" and "d" is done. The reconstruction of Boones Ferry Road intersection with Wilsonville Road will not be done until a large pending development south of Wilsonville Road is ready for construction.

**6. Staff recommends monitoring of the effects of induced changes in driver behavior and the DEQ Commute Reduction Program to ascertain intangible changes in trips for years 3, 4 and 5 of the PFTS.**

There are a number of factors that affect the commuting patterns and habits of drivers. Most are perceptual, are personal choice and therefore beyond the influence of local government policy. The objective of changing policies to cause changes in behavior should have the result of decreasing the number of peak hour trips through the impacted area. The city has an obligation to continually monitor traffic counts and movements to see if conditions are changing. In this fashion the city may be able to "capture" trips that can be reallocated in future years to new development.

Transportation Demand Management (TDM) consists of a set of policies designed to change driver behavior by encouraging alternative modes of transportation. The Planning Commission began their study of the TDM at their meeting in October 2004. The goal of the program is a reduction in single-occupancy vehicle (SOV) trips in order to comply with METRO regional goals to reduce the vehicle miles traveled (VMT). The TDM includes elements related to minimum and maximum parking regulations, bicycle facilities, encouragement of transit usage and trip reduction program aimed at businesses with more than 50 employees. This is also referred to as the DEQ Commute Reduce Program.

The City, Clackamas County and ODOT use a variety of Intelligent Transportation Systems (ITS) already in and around the freeway interchanges and other intersections. These include cameras linked to regional traffic monitoring stations, traffic detectors in the pavement and traffic controllers. We can expect more applications and expansion of the ways that drivers can become aware of traffic conditions and modify their travel plans.

ODOT operates a program called TRIPCHECK that allows Internet users to monitor traffic from their home or work site before leaving for the trip. The same information is available by calling 511 on the telephone. The use of message boards is another method of conveying traffic information to drivers already underway.

### **Future Perspectives**

The PFTS can only exist for two years unless extended by the City Council annually for an additional year. Based upon appropriate findings of fact this can be done to create a five-year life span for this strategy. There are a number of events that are likely to occur in the next few years that are known and can be expected to impact the number of P.M. peak hour trips.

- a. **Boeckman Road extension:** This is slated to begin construction sometime in 2005 and should allow drivers improved access to the Elligsen Road/I-5 interchange. Boeckman is being built along with other projects such as the extensions of Barber Street and Kinsman Road. These should have a positive impact and reduce the number to trips as drivers will have more choices as to their travel routes. This may eliminate as many as 150 P.M. peak hour trips through the impacted area and has the potential to be allocated in 2006 based on the concurrency policy.
- b. **Commuter Rail Station:** SMART and DKS believe that the commuter rail station has positive and negative impacts on P.M. trips. Bus routes will be modified to accommodate transfers at this multi-modal facility and it should attract commuters via rail that will combine a train ride with a trip on a SMART bus or bicycle to their job. To the extent that the rail station attracts drivers from the areas south of Wilsonville who choose to use the facility as a park and ride station it may increase traffic. Some of those commuter trips already exist and will be shifted from the park-n-ride lot at Regal Cinema. Current projects by DKS estimate an additional 69 P.M. peak hour trips through the interchange area after the expected startup in 2008.
- c. **Villebois:** The many partners in the development of Villebois have vested a substantial number of trips already yet need further consideration of about 124 trips. The pace of development and driving habits will affect the validity of those estimates. This has been accounted for in the number of trips available to be allocated by the PFTS in the first year.
- d. **NW Wilsonville Industrial Area:** Most development in this area will likely use the northern interchange but each applicant is considered on a case-by-case basis. These

*Interoffice Memo - Wilsonville Community Development*

trips are expected to have a *de minimis* impact on the Wilsonville Road interchange area.

Looking further in the future is more speculative. Events that may occur beyond 2009 include: an interchange at Boeckman Road and I-5, widening I-5 from Aurora to Hwy. 217 and construction of a 99W/I-5 connector. An alternative in the Freeway Access Study is the complete reconstruction of the Wilsonville Road interchange with I-5. Depending upon the configuration, these choices have different impacts on the number of trips generated and the amount of businesses and land areas disturbed or destroyed.

**Appendix:**

- Appendix 1 State Statute 197.768
- Appendix 2 Public Facilities Strategy Primer
- Appendix 3 Aerial Photo "Impacted Intersections"
- Appendix 4 Queuing and the Allocation of Trips – Examples
- Appendix 5 Comparison of Actions and Resulting Estimated Capacity Changes in Wilsonville Interchange Area

drw/pfts 022405

### Queuing and the Allocation of Trips

Discussion: Assuming that these strategies create additional trips to be allocated, at what stage in the master plan approval process does the city permit someone to obtain rights to a certain number of trips through the impacted intersections? When? How many? Under what conditions? Some of the options include:

1. Upon adoption of this PFTS, depending the specific strategies selected, there will be X number of trips available to be allocated. Are they all available immediately? Are some held in reserves for the second or subsequent years of the PFTS? Is this on a calendar year basis?
2. ~~Can someone vest trips upon approval of a Stage I master plan with a minimal traffic report? This would allow some speculation based upon a relatively small investment yet encourage a developer to move ahead quickly when the trips became available. This option normally requires the developer to post a financial guarantee of performance or face losing the allocation within X years if they fail to perform. The City Council wants to allocation to be done only after Stage II approval.~~
3. Allocation at Stage II master plan approval reduces the temptation of speculation but also requires a more substantial investment in the development process that may go unrewarded for several years awaiting the queue.
4. Do you wish to set a limit and allow only 40% of the number of trips in a calendar year to be available to a single development regardless of the need? **The City Council generally favored a first come/first served approach provided there were some trips (25%?) held in reserve so that a large development did not so dominate the allocation that few smaller developments could occur.**
5. Alternatively, should we set aside a smaller number of trips for those developments that exceed the *de minimis* limits (3 trips) but require not more than 10 P.M. trips?

#### Example:

- 1) The amount of 318 trips is established for rationing the first two years, with 159 trips per year for each of the first two years to be allocated. The yearly amount of trips is less than 1/5th of the total of the full five years because (a) the trips by driver taking different routes as well as a current reduction by employers with 50 or more employees are too indefinite to measure at this time, (b) results from \$20 million in improvements and Boones Ferry Road improvements are not likely to come on line within two years, and (c) a prudent holdback given land development, that is likely to occur in years 3 through 5. However there appears to be an opportunity to gain additional trips as early as the second year from new traffic counts, the construction of the Boeckman Road extension or other means.
- 2) A queue for the rationing of yearly trip allotment shall be established by order of preference for development by first in time to (a) receive an approved Stage I Master Plan, and (b) submit a traffic report as required by the Community Development

*Interoffice Memo - Wilsonville Community Development*

Department sufficient to determine the probable capacity impacts of the Stage II phase or phases of development that the applicant seeks to develop.

- 3) The order of exercising a preference position is sequenced 1, 2, 3, et seq. Any one development shall only be entitled to the trips set forth in the above mentioned traffic report for the development, but shall be limited in any one year to a maximum of 50% (or a lesser percentage if Council so determines as the PFTS is developed) of the total yearly allotment of trips for the whole queue provided further, that if prior preferences in the queue have been exercised and the remaining allotment is less than 50% of the total, then the preference could only be exercised up to the remaining yearly allotment in the year of exercise.
- 4) The rationing of trips may be accumulated over each year of the PFTS and any yearly extension thereof. Subject to moving up the queue as set forth below, a development's preferential position shall be held if the development has received some, but not all, of its needed trip until such time as it receives all of its needed trips. A development's preferential position shall be removed from the queue when it receives all its needed trips, when it advises in writing that it no longer wishes to be in the queue, or under such circumstances whereby a developer could not lawfully proceed. If a development is removed from the queue then each development below it shall move up sequentially, i.e. 2 to 1, 3 to 2, 4 to 3, etc. Thus, if position one received its needed trips in the first year, say 10% of the yearly total, position 2 received 50% of the yearly total, but needed more, and position 3 received what it needed at 40% of the total, then position 2 would move to 1 and position 4 would move to 2 for the following year, et seq., since position 1 and 3 would be removed.
- 5) A development shall be entitled to mitigate its traffic impacts on capacity by funding and/or contracting of capacity improvements and/or by providing a traffic management plan agreement with the City. Such a plan shall set forth actions that are probable to lessen the development's traffic capacity impacts, and such actions are benchmarked, and the benchmarks are capable of quantitative measurement (e.g. number of ride share trips to be accomplished and monthly record of achievement, use of SMART bus passes provided and their use is recorded monthly, etc.). Thus, a development could receive 50% of the allotted year's capacity in each of the first two years, but still be short trips to meet the traffic trip impacts the development generates. By adding capacity through infrastructure improvements or reducing trips by managing employees or suppliers to avoid or reduce PM peak hour trips, a development may be able to provide for the amount of trips it was short and proceed to obtain a building permit.

Another example of the allocation process might look like this:

|                  | Year 1 | Year 2 | Year 3 |
|------------------|--------|--------|--------|
| Est. Total Trips | 480    | 290    | 139    |
| 25% set aside    | -120   | -73    | -35    |
| Net Trips        | 360    | 217    | 104    |

*Interoffice Memo - Wilsonville Community Development*

|                 |      |      |     |
|-----------------|------|------|-----|
| Develop A       | -318 | 0    | 0   |
| Develop VB      | 0    | -124 | 0   |
| Develop B       | -25  | 0    | 0   |
| Trips Available | 137  | 354  | 229 |
| Develop C       | 0    | -160 | 0   |

City of

**WILSONVILLE**  
in OREGON



30000 SW Town Center Loop E  
Wilsonville, Oregon 97070  
(503) 682-1011  
(503) 682-1015 Fax  
(503) 682-0843 TDD

## COMMUNITY DEVELOPMENT MEMORANDUM

Date: March 2, 2005  
To: Sandi Young, Planning Director  
From: Eldon R. Johansen, Special Projects  
Subject: Public Facilities Transportation Strategy

---

With Council support for a change in level of service for the Wilsonville Road interchange area between Boones Ferry Road and Town Center Loop West (the impacted area) we have reduced our analysis of projected additional capacity from various projects and improvements to only the analysis with the level of service E. Attached is a chart that summarizes the increased capacity from various alternative projects and activities. The initial period for the Public Facilities Transportation Strategy would be limited to two years and those figures are in bold on the attached worksheet.

One item that will be subject to discussion during the Planning Commission Work Session is the proposed cap on trip allocations within the queue. For discussion purposes I have provided an allocation that would allow up to 75% of the available trips in any one year to go to a large user. We will need to discuss this to ensure that we protect both the interests of the large users and the other property owners.

ERJ:bgs

cc: Dave Waffle, Community Development Director  
Mike Stone, City Engineer  
PFTS File  
IOC-CD File



**Public Facilities Transportation Strategy**

**March 2, 2005 Comparison of Actions & Resulting Capacity Changes in Wilsonville Interchange Area**

Appendix 5

| Action                                                                                                                   | Description                                                                                                                                                                                                                | Total added capacity | Time frame for PFTS |      | Future projections |      |      |
|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|------|--------------------|------|------|
|                                                                                                                          |                                                                                                                                                                                                                            |                      | 2005                | 2006 | 2007               | 2008 | 2009 |
| Previously approved \$3.5MM project with a change in past driving habits and a change in code to LOS E with progression. | Current cost estimated at \$2MM from Urban Renewal with repayment from SSSDC. The previously approved project allowed the allocation of 702 trips.                                                                         | 480                  | 480                 |      |                    |      |      |
| Complete planning & funding of first Phase of Boeckman Extension.                                                        | Current cost estimated at \$16MM with \$6MM from Metro & state transportation funds & potentially \$750,000 from federal funds. The remainder from City Urban Renewal funds.                                               | 150                  |                     | 150  |                    |      |      |
| Improve intersection of Boones Ferry & Wilsonville Road.                                                                 | Current cost estimated at \$6.95 MM with \$3.65MM from develop payment and \$3.3MM from SDC funds to be determined.                                                                                                        | 0                    |                     |      |                    |      |      |
| Change in driving habits and count update.                                                                               | There will be an annual cost of approximately \$60,000 to recount, recalculate & monitor.                                                                                                                                  | 409                  | 0                   | 140  | 139                | 65   | 65   |
| Ramp improvements and other safety improvements for I-5 access.                                                          | Current cost estimated at \$5.5MM with proposed investment of \$5MM from state funds and \$.5MM from City Urban Renewal funds.                                                                                             | 0                    |                     |      |                    |      |      |
| Complete capacity improvement part of \$20MM project or an alternative.                                                  | Current cost estimated at \$9.5MM with proposed payment from state or federal funds at \$8MM and the City contribution of \$1.5MM from Urban Renewal funds and reimbursement to Urban Renewal from SDC's to be determined. | 348                  |                     |      |                    |      | 348  |
| Yearly increase in capacity                                                                                              |                                                                                                                                                                                                                            | 1387                 | 480                 | 290  | 139                | 65   | 413  |
| Cumulative increase in capacity                                                                                          |                                                                                                                                                                                                                            |                      | 480                 | 770  | 909                | 974  | 1387 |

**Possible allocation at first come first served and a 75% annual cap of available capacity per project**

|                                                                             |  |     |     |     |     |     |      |
|-----------------------------------------------------------------------------|--|-----|-----|-----|-----|-----|------|
| Remainder of trips for VB                                                   |  | 124 |     |     |     |     |      |
| Large commercial project                                                    |  | 318 | 0   |     |     |     |      |
| Other projects for sure                                                     |  | 38  | 150 |     |     |     |      |
| Other projects depending on changes in driving habits & interchange funding |  |     | 140 | 139 | 65  | 413 |      |
| Cumulative for other projects                                               |  |     | 38  | 328 | 467 | 532 | 945  |
| Annual allocation                                                           |  |     | 480 | 290 | 139 | 65  | 413  |
| Total allocation                                                            |  |     | 480 | 770 | 909 | 974 | 1387 |

ORDINANCE NO.

AN ORDINANCE ADOPTING A PUBLIC FACILITIES TRANSPORTATION STRATEGY FOR DEVELOPMENT IN THE CITY OF WILSONVILLE DUE TO THE LACK OF STREET CAPACITY IN THE WILSONVILLE ROAD I-5 INTERCHANGE AREA.

WHEREAS, the City Council of the City of Wilsonville finds:

1. **Purpose**

The purpose of this ordinance is to provide for a public facilities transportation strategy in conformance with ORS 197.768. This strategy is intended to be limited to situations in which clear and objective standards demonstrate that:

- A. There is a rapid increase in land development in a specific geographic area; and
- B. The total land development would exceed the planned or existing capacity of public facilities.

2. **Specific Geographic Area**

- A. The City Council has identified the areas of the City which primarily use the Wilsonville Road Interchange with I-5 and which are either undeveloped or are capable of having further development occur, both types of areas being within the City, and have experienced a rapid increase in total development and be affected by the fact that the total land development would exceed the existing capacity of public transportation facilities.
- B. These areas are the geographic areas for the public facility strategy since the estimated demand for transportation service exceeds the capacity street system currently available and expected to be available during the next two to three years. This area uses the Wilsonville Road Intersection with Interstate 5 for access to I-5. The Planning Department has on file the

various locations of these areas and development projects within this area. The areas encompass the area north of the Willamette River as the Charbonneau District south of the River has experienced almost full build out and south of Boeckman Road as traffic north of Boeckman Road uses the Stafford Interchange.

3. **Problem Summary**

The budget for FY 2003/04 and continuing into 2004/05 included \$3.5 million for capacity improvements at the Wilsonville Road Interchange. This capacity became available for development in 2003 and has been fully allocated. The Transportation Systems Plan and also the I-5/Wilsonville Freeway Access Study included a significant expansion of the Wilsonville Road Interchange and was anticipated that with the planned development between 2003 and 2020 this expansion would provide capacity through 2020. The anticipated rate of development is significantly faster than was anticipated at the time the Freeway Access Study was completed. As a result the capacity that was needed in 2020 will actually be needed by the year 2009. Part of the anticipation of available capacity was based on a substantial change in driving habits by 2020 and the conditions supporting this change in driving habits will not occur in total by 2009. In addition, the \$20 million in interchange improvements is not in any of the Oregon Department of Transportation funding programs. Further, the City level of service requirements are somewhat more restrictive than the ODOT requirements and this difference needs to be resolved as part of the planning process. In addition, the Transportation Systems Plan indicates that Council can change the standards on Wilsonville Road from level of service D to level of service E which is more compatible with state and regional standards.

4. **Applicable Concurrency Goals, Policies and Standards from City of Wilsonville Comprehensive Plan**

Goal : 2.1 To allow for urban growth while maintaining community livability, consistent with the economics of development, City administration, and the provision of public facilities and services.

Policy 2.1.1. The City of Wilsonville shall support the development of all land within the City, other than designated open space lands, consistent with the land use designations of the Comprehensive Plan.

Implementation Measure 2.1.e. Allow new development to proceed concurrently with the availability of adequate public services and facilities as specified in Public Facilities and Services Section (Section C) of the Comprehensive Plan.

Implementation Measure 2.1.f. To insure timely, orderly and efficient use of public facilities and services, while maintaining livability within the community, the city shall establish and maintain growth management policies consistent with the City's regional growth allocation and coordination with a Capital Improvements Plan.

1. The Planning Commission shall periodically review growth-related data, eg., the availability of public facilities, scheduled capital improvements, need for housing, commercial development and/or industrial development, etc.; and shall, as determined necessary following a public hearing, make recommendations to the City Council regarding Growth Management Plans.

Primary facilities and services include: those which significantly impact public health and safety and are directly linked to the land development process, in terms of service capacity, location, and design or directly affect public health and safety. Therefore, adequate provision must be made for these facilities/services prior to or concurrently with urban level development. These facilities and services include:

Sanitary sewer;  
Water service  
Roads and transportation;  
Storm drainage;  
Fire protection; and  
Police protection and public safety.

Goal 3.1: To assure that good quality public facilities and services are available with adequate capacity to meet community needs, while also assuring that growth does not exceed the community's commitment to provide adequate facilities and services.

Policy 3.1.1 The City of Wilsonville shall provide public facilities to enhance the health, safety, educational, and recreational aspects of urban living.

Implementation Measure 3.1.1.a The City will continue to prepare and implement master plans for facilities/services, as sub-elements of the City's Comprehensive Plan. Facilities/services will be designed and constructed to help implement the City's Comprehensive Plan.

Policy 3.1.2 The City of Wilsonville shall provide, or coordinate the provision of, facilities and services concurrent with need (created by new development, redevelopment, or upgrades of aging infrastructure).

Implementation Measure 3.1.2.a Urban development will be allowed only in areas where necessary facilities and services can be provided.

Implementation Measure 3.1.2.b Development, including temporary occupancy, that threatens the public's health, safety, or general welfare due to a failure to provide adequate public facilities and services, will not be permitted. Development applications will be allowed to proceed on the following basis:

1. Planning approvals may be granted when evidence, including listing in the City's adopted Capital Improvement Program, supports the finding that facilities/services will be available within two years. Applicants may be encouraged or required to plan and complete development in phases, in order to assure that the rate of development does not exceed the capacity of needed facilities/services.
2. Building permits will be issued when planning approvals have been granted and funding is in place to assure completion of required facilities/services prior to occupancy. Applicants must sign a statement acknowledging that certificates of occupancy will not be given until adequate facilities/services, determined by the Building Official, after consulting with the City Engineer, are in place and operational. Parks, recreation facilities, streets and other transportation system improvements may be considered to be adequately in place and operational if they are listed in the City's adopted Capital Improvement Program, or other funding is committed for their completion within two years. In such cases, water, sewer, and storm drainage facilities must be available, to the satisfaction of the City Engineer, on at least a temporary basis, prior to occupancy.
3. Final certificates of occupancy will not be given until required facilities/services are in place and operational. Temporary certificates of occupancy may only be granted when the Building Official determines, after consulting with the City Engineer, that needed facilities/services will be in place and operational at the conclusion of the time period specified in the temporary certificate of occupancy. Nothing in this policy is intended to indicate that a temporary certificate of occupancy will be granted without assurance of full compliance with City requirements.

Implementation Measure 3.1.2.c Where a shortage of facilities/services exists or is anticipated in the near future, and other alternatives are not feasible to correct the deficiency, the City shall take steps to implement a moratorium on development

activity or to manage growth through a public facilities strategy, as provided by statute. In the event that State laws provide other alternatives to address shortages of facilities/services, the City will consider those alternatives as well.

Implementation Measure 3.1.2.e When development is proposed in areas of the City where full urban services/facilities are not yet available, development approval shall be conditioned on the provision of adequate facilities and services to serve the subject property. Where the development can reasonably proceed in phases prior to the availability of full urban services/facilities, such development may be permitted. However, the use of on-site sewage disposal and private water systems shall only be approved where permitted by City ordinance.

#### Roads and Transportation Plan

*Note: This section will be redrafted with completion of the Transportation Systems Plan.*

Wilsonville is bisected by the I-5 freeway, just south of its intersection with I-205. The freeway provides excellent north-south transportation linkages to Portland and the southern Willamette Valley. In fact, I-5 remains one of the most important transportation links between Canada and Mexico. The combination of large amounts of developable land, with both rail and freeway transportation access, present Wilsonville with continued growth potential for residential, commercial, and industrial development. While the freeway is a major growth impetus, it also creates certain limitations on the growth and development of the City. The freeway is a barrier between the east and west sides of the community and makes it both difficult and expensive to add streets connecting the east and west sides of town. Also, heavy traffic at freeway interchanges during rush-hour times can result in traffic backups into other nearby intersections.

In the late 1990s, substantial public investments were made to up-grade both the Wilsonville Road and Elligsen Road interchanges (exits 283 and 286, respectively). In spite of those improvements, capacity limitations can be seen in both of those interchanges, as the existing freeway on-off ramps at Wilsonville Road are inadequate to handle projected traffic volumes. The City recognizes these problems and notes that if travel patterns continue as they are today and appropriate street improvements, including an additional freeway interchange, are not made, substantial growth limitations will result. It also, however, recognizes the potentials for proper planning and land development to generate certain transportation efficiencies. Therefore, the following policies have been established to promote sound economic growth while providing for an efficient and economical transportation system. The Plan identifies three areas of responsibility in transportation planning.

1. What the City expects to do in providing for efficient transportation.
2. What the City will expect developers and businesses to do in support of efficient transportation.
3. What the City will expect from Federal, State and regional agencies in support of the City's planning efforts.

The State's Transportation Planning Rule calls for reductions in vehicle miles traveled (VMTs) per capita and restrictions on the construction of new parking spaces in order to encourage planning that responds to the transportation and land use impacts of growth. Metro's 2040 Growth Concept Plan calls for more compact development as a means of encouraging more efficient use of land, promoting non-auto trips, and protecting air quality. In addition, the federally-mandated air quality plan adopted by the State of Oregon relies on Metro fully achieving the 2040 Growth Concept transportation objectives. Notably, the air-quality plan relies upon reducing

vehicle trips per capita through limitations on the maximum parking ratios allowed for different land uses.

A compact urban form requires that each use of land is carefully considered and that more efficient forms are favored over less efficient ones. Parking, especially that provided in new developments, can result in less efficient land usage and lower floor area ratios. Parking also has implications for transportation. In areas where transit is provided, or other non-auto modes (e.g., walking, biking) are convenient, less parking can be provided and still allow accessibility and mobility for all modes, including autos. Reductions in auto trips when substituted by non-auto modes can alleviate congestion and improve air quality.

The City is required by State and regional plans to address these needs through adopting, implementing, and regular updating of a Transportation Systems Plan.

The City is also required to adopt minimum and maximum parking ratios in accordance with Title 2 of the Metro Urban Growth Management Functional Plan, or may use categories or measurement standards other than those in the Regional Parking Ratios Table (of that Functional Plan), as long as findings are provided that show such regulations will be substantially the same as the application of the Regional Parking Ratios.

As part of the regional effort, the City is required to monitor and provide the following data to Metro on an annual basis:

- a. *the number and location of newly developed parking spaces, and*
- b. demonstration of compliance with the minimum and maximum parking standards, including the application of any variances to the regional standards in this Title. Coordination with Metro through the collection of other building data will also continue.

This section will be modified with completion of the Transportation Systems Plan.

Implementation Measure 3.1.6.g Minimum street service levels shall continue to be established. Dedication of adequate right-of-way, as established by the Street System Master Plan, or as otherwise approved by the Development Review Board or City Council shall be required prior to actual site development

Implementation Measure 3.1.6.cc If adequate regional transportation services, including I-5 interchange modification or additions, and high capacity public transportation, cannot be provided, then the City shall reevaluate and reduce the level of development and/or timing of development anticipated by other elements of this Plan. Such reductions shall be consistent with the capacity of the transportation system at the time of re-evaluation.

**5. Applicable Transportation Systems Plan Provisions**

In June 2003 the Transportation Systems Plan was adopted as a sub-element of the Comprehensive Plan and includes the following:

Policy 4.1.1 Design the City street system per the street standards set forth in this TSP and to meet LOS D, which is the standard in the City. As may be approved by the City Council, possible exceptions to the LOS D standard are a change to LOS E on Boones Ferry Road and/or Elligsen Road, and on Wilsonville Road between and including the intersections with Boones Ferry Road and Town Center Loop West. Other capacity improvements intended to allow continued development without exceeding LOS E may also be approved by the City Council in permitted locations.

Policy 4.1.5 Promote other existing routes and/or provide connections to other regional roadways that provide alternative routes into and out of the City to reduce the reliance on I-5 and its interchanges within the City.

Policy 4.1.6 Develop a system of signal coordination and tie in with the I-5 ITS system providing a system of integrated parallel arterials and collectors.

Implementation Measure 4.1.5.a. Continue to actively participate in all regional transportation planning efforts, including activities of ODOT, Metro, Clackamas County, and Washington County, advocating for Wilsonville's needs including funding allocations. The commitment to jointly plan and program for transportation projects will be made in new or updated intergovernmental agreements with the counties and other appropriate policies.

Implementation Measure 4.2.1.a. Amend the Wilsonville Comprehensive Plan Policy 3.1.2 on Timing and Concurrency Issues by changing the language of Implementation Measure 3.1.2.b.1 to read as follows:

“1. Planning approval may be granted when evidence, including listing in the City's adopted Capital Improvement Program, supports the finding that facilities/services will be available within two years for surface streets and four years for all improvements to Interstate-5 and its associated crossings, interchanges, and approach streets.”

6. **Applicable Implementing Development Code Provisions**

In 1982 the City implemented its plan through its zoning and development code, which is Chapter 4 of the Wilsonville Code, and which was also acknowledged by LCDC, which includes the following:

WC 4.139(4) “A planned development permit may be granted by the Planning Commission only if it is found that the development conforms to all the following

criteria, as well as to the Planned Development Regulations in Sections 4.130 to 4.140: .....

- (c) That the location, design, size and uses are such that the residents or establishments to be accommodated will be adequately served by existing or immediately planned facilities and services.”

WC4.140(.09)J

- J. A planned development permit may be granted by the Development Review Board only if it is found that the development conforms to all the following criteria, as well as to the Planned Development Regulations in Section 4.140:
1. The location, design, size and uses, both separately and as a whole, are consistent with the Comprehensive Plan, and with any other applicable plan, development map or Ordinance adopted by the City Council.
  2. That the location, design, size and uses are such that traffic generated by the development at the most probable used intersection(s) can be accommodated safely and without congestion in excess of Level of Service D, as defined in the Highway Capacity manual published by the National Highway Research Board, on existing or immediately planned arterial or collector streets and will, in the case of commercial or industrial developments, avoid traversing local streets. Immediately planned arterial and collector streets are those listed in the City's adopted Capital Improvement Program, for which funding has been approved or committed, and that are scheduled for completion within two years of occupancy of the development or four year if they are an associated crossing, interchange, or approach street improvement to Interstate 5.
    - a. In determining levels of Service D, the City shall hire a traffic engineer at the applicant's expense who shall prepare a written report containing the following minimum information for consideration by the Development Review Board:
      - i. An estimate of the amount of traffic generated by the proposed

development, the likely routes of travel of the estimated generated traffic, and the source(s) of information of the estimate of the traffic generated and the likely routes of travel; (Amended by Ord 561, adopted 12/15/03.)

- ii. What impact the estimate generated traffic will have on existing level of service including traffic generated by (1) the development itself, (2) all existing developments, (3) Stage II developments approved but not yet built, and (4) all developments that have vested traffic generation rights under section 4.140(.10), through the most probable used intersection(s), including state and county intersections, at the time of peak level of traffic. This analysis shall be conducted for each direction of travel if backup from other intersections will interfere with intersection operations. (Amended by Ord 561, adopted 12/15/03.).

- b. The following are exempt from meeting the Level of Service D criteria standard:

- i. A planned development or expansion thereof which generates three (3) new p.m. peak hour traffic trips or less;
- ii. A planned development or expansion thereof which provides an essential governmental service.

c. Traffic generated by development exempted under this subsection on or after Ordinance No. 463 was enacted shall not be counted in determining levels of service for any future applicant. (Added by Ord 561, adopted 12/15/03.)

d. Exemptions under 'b' of this subsection shall not exempt the development or expansion from payment of system development charges or other applicable regulations. (Added by Ord 561, adopted 12/15/03.)

e. In no case will development be permitted that creates an aggregate level of traffic at LOS "F". (Added by Ord 561, adopted 12/15/03.)

3. That the location, design, size and uses are such that the residents or establishments to be accommodated will be adequately served by existing or immediately planned facilities and services.

**7. The Relationship between Concurrency Policy and Street Infrastructure and Development**

Normally, without the street construction at the Wilsonville Road Interchange, development would be denied because its street requirements would exceed the capacity of the existing streets. However, Comprehensive Plan Policy 3.1.2 recited above provides for a "concurrency policy", allowing planning approvals to go forward if evidence, including listing in the City's adopted Capital Improvements Program, supports the finding that facilities/services will be available within two years. The TSP contains the following suggested change to Policy 3.1.2.

"Implementation Measure 4.2.1.a. Amend the Wilsonville Comprehensive Plan Policy 3.1.2 on Timing and Concurrency Issues by changing the language of Implementation Measure 3.1.2.b. 1 to read as follows:

"1. Planning approval may be granted when evidence, including listing in the City's adopted Capital Improvement Program, supports the finding that facilities/services will be available within two years for surface streets and four years for all improvements to Interstate-5 and its associated crossings, interchanges, and approach streets."

Once the Interchange Projects are planned and funded planning approval could be granted under this policy, however, health and safety must be maintained while the planned interchange improvement design and construction proceeds.

- A. The City of Wilsonville is a home rule city under the laws of the State of Oregon and has a duly acknowledged Comprehensive Plan.
- B. The City's acknowledged Comprehensive Plan is intended to ensure that the rate of community growth and development does not exceed the community's ability to provide essential public services and facilities, including roads and streets for movement of vehicles, bicycles and pedestrians. The City's acknowledged Comprehensive Plan further provides that a continued improvement in street capacity will be available to meet the City's growing needs into the future, but the City's acknowledged Comprehensive Plan is silent as to how the City is to provide adequate streets without an adequate source of funding.
- C. The City's acknowledged Comprehensive Plan policies also commit the City to provide street service that keeps pace with development.
- D. The following are findings, as required by ORS 197.768:
  - 1) The land use that was used as a basis for development of the Transportation Systems Plan was based on Metro growth projections with build out by the year 2020. A recent City review of the planned growth in Wilsonville between the Willamette River and Boeckman Road indicates that a very high percent of the growth that had been projected to occur by 2020 is proposed for development by 2009. This clearly supports the finding that there has been a rapid increase in the rate of land development in a specific geographic area that was unanticipated at the time the original planning for that area was adopted.
  - 2) The applications that have been submitted and deemed complete for considerations for Stage II approval exceed both the existing

capacity and the planned capacity at the Wilsonville Road Interchange with funded improvements.

- 3) The Public Facilities Transportation Strategy is structured to ensure that projects that have previously had planning approval for which the capacity through the Wilsonville Road Interchange area has been “vested” will have transportation capacity be maintained during the period of the Public Facilities Transportation Strategy. In addition, the capacity that is generated during the period of the strategy will be allocated based on percentage basis with no applicant receiving more than 50% of the available capacity in any year. The logic of this approach is that the projects that have received the necessary planning approval would be based on the housing and commercial and industrial facility requirements and is, in fact, a self policing method of ensuring that the supply will not be adversely impacted. This supports the finding that the strategy is structured to ensure that the necessary supply of housing in commercial and industrial facilities that will be impacted within the relevant geographic area is not unreasonably restricted by the adoption of the Public Facilities Strategy.

In addition if we assume that growth will continue at the rate projected to meet Metro residences and employment by 2020 the City has more than a two year supply of residential commercial and industrial property approved for development in the area included in the Public Facilities Transportation Strategy. In other words, we could have continued growth without any future planning approvals for the next two years.

#### 8. **The Queue and Capacity Allocation Plan**

Because the predicted, over-capacity condition of the street system, was identified as a potential limitation on future development in Plan policies, the City has also

provided a policy to establish a queue and allocate capacity. In order to manage immediate growth, Comprehensive Plan Implementation Measure 3.1.2.e provided a process for development phasing.

9. **Specific Steps the City Has Taken to Ensure Adequate Transportation Capacity in the Wilsonville Road Interchange**

- A. The City participated with ODOT in major improvements to the interchange and the road from Town Center Loop West to Boones Ferry Road under the provisions of a cooperative improvement and immediate opportunity fund agreement dated March 16, 1994. As part of that agreement ODOT replaced and lengthened the I-5 structures over crossing Wilsonville Road to allow for widening of Wilsonville Road under the interstate. Wilsonville contributed right-of-way and \$3 million towards the estimated total cost of \$7,350,000 for the project. In addition, Wilsonville paid for the construction costs and right-of-way to extend the road from the ends of the ODOT project through Town Center Loop West on the east side and Boones Ferry Road on the west side.
- B. The City on \_\_\_\_\_ adopted Ordinance No. \_\_\_\_\_ that declared a modified moratorium on traffic whose most probable used intersections included the Wilsonville Road interchange area.
- C. This modified moratorium was subsequently replaced by Ordinance No. \_\_\_\_\_ dated \_\_\_\_\_ that established a Public Facilities Strategy.
- D. This strategy terminated upon adopted of the 2003 Transportation Systems Plan on June 2, 2003. (Check sunset per ORS)
- E. The City has budgeted \$3.5 million for the modification of the Wilsonville Road Interchange area to change the striping and traffic control to allow a

left-turn lane, a through-left lane and a thru-lane in each direction at the interchange, therefore, providing additional capacity.

**10. Land Development Is On a Pace to Exceed the Capacity of the Wilsonville Road Interchange Area with Funded Improvements**

- A. The following chart further illustrates development, since added capacity from the \$3.5 million dollar project summarized in 9 above was declared available:

CHART GOES HERE

**11. The Public Facilities Alternative**

- A. The City was an active participant in developing the Public Facilities Strategy legislation with the Home Builders, Department of Land Conservation and Development (DLCD), and the Oregon League of Cities, as an alternative approach to address these types of facilities issues as exemplified by the Wilsonville Road/I-5 capacity problems and the City's Public Facilities Transportation Strategy.

The City is again faced with the prospect of denying development applications within Wilsonville based on the inadequacy transportation capacity in the Wilsonville Road Interchange area. The \$3.5 million project to provide additional capacity at the interchange as mentioned in paragraph 9.E. resulted in increased capacity for 702 PM peak hour trips through the Wilsonville Road interchange area. The development agreement between the City and Costa Pacific properties has been written to ensure that there will be capacity for build out of the Villebois Village development. This will require an addition 124 PM peak hour trips through the Wilsonville Road interchange. In addition, a developer for a commercial project has requested approval for a large commercial facility adjacent to Boones Ferry Road south of Wilsonville Road. This will

require an additional 657 PM peak hour trips through the interchange area. These trips could be separated into 318 PM peak hour trips which would be similar to other trips through the interchange area and an additional 339 PM peak hour trips which would use the intersection of Boones Ferry Road and Wilsonville Road without venturing into the I-5 ramp area. The developer of the large commercial project is tolling the days pending further policy decisions as recommended by the Planning Commission and approved by Council.

The City has a number of alternatives that can be considered.

The City could begin denying approval of projects. Two denials or more could be interpreted as a pattern of practice of denying or delaying permits and could be classified as a moratorium. Given judicial prior interpretation of this language and its decision regarding the City's Ordinance No. 431, Traffic Growth Management Ordinance, and such actions could be interpreted as a moratorium.

Second, the City could change the level of service on Wilsonville Road, on Boones Ferry to Town Center Loop West from level of service D to E. This change is included as a decision which could be adopted by Council per the adopted City Transportation Systems Plan. This change in level of service along with the recent change in driving habits would provide capacity for 480 PM peak hour trips. This would provide the immediate resolution of the lack of capacity but would not provide capacity for future projects nor would it provide a long range program to manage development so that it matches the availability of additional capacity.

The third alternative would be to adopt a public facilities transportation strategy. This would offer a degree of flexibility not available in a moratorium as defined in ORS 197.505 and would allow phased development to coincide with construction of additional capacity and changes in driving habits.

12. **Housing within Wilsonville**

- A. The present inventory of approved or vested housing projects within the City of Wilsonville is significant and the availability of vacant land within the City is not of such proportion as to negatively affect adjacent communities upon implementation of this strategy. There are at least \_\_\_\_\_ housing projects with approximately \_\_\_\_\_ housing units which can move forward under previous Stage II approvals for vesting agreements. These are summarized as follows:

CHART GOES HERE.

13. **LCDC Acknowledgement**

- A. ORS 197.768 requires that the City Comprehensive Plan be acknowledged under ORS 197.251 and that the periodic review be completed under revisions of ORS 197.628 to 197.650 to preclude providing a detailed analysis and making findings relative to the state wide planning goals. The City has an acknowledged Comprehensive Plan and has recently completed periodic review.

14. **Specific Notice and Process Findings**

- A. The City has duly provided the Department of Land Conservation and Development with the required 45 day written notice prior to first public hearing.
- B. The City has duly provided notice to all property owners.
- C. Public hearing before the Planning Commission and the City Council on the adoption of this ordinance which sets forth the public facilities transportation strategy and the findings which support the strategy has been duly held.
- D. The City Council finds that based upon reasonably available information found in the record growth management limitations on new development are justified to prevent a shortage of service capacity of a public transportation facility which will otherwise occur during the effective period of this public facilities strategy.

**NOW, THEREFORE, THE CITY OF WILSONVILLE ORDAINS AS FOLLOWS:**

**SECTION 1: DETERMINATIONS AND FINDINGS**

- A. The City Council adopts the above recited findings as findings of fact and incorporates them by reference in support of this ordinance and the determinations hereinafter made.
- B. The City Council hereby determines that 630 PM confirmed peak hour trips and an additional probable 140 PM peak hour trips through the Wilsonville Road Interchange area are available over a two year period with a change in level of service from D to E for Wilsonville Road from Boones Ferry to Town Center

Loop West, completion of the \$3.5 million interchange project and captured changes to driving habits.

- C. Wilsonville Comprehensive Plan Policy 3.3.3 permits development to go forward upon conditions relating to the timing of the provision of public services. Policy 3.3.3 is met if the public service capacity improvement is planned and funding is committed for construction to occur prior to the issuance of a building permit and occupancy permit for a conditioned development, provided there is no serious endangerment to public health and safety.
- D. The City Council hereby determines that the Public Facilities Transportation Strategy recited hereafter meets the requirements of ORS 197.768 and under the totality of the circumstances, provides for development to go forward under conditions which will protect the public health and safety.

## SECTION 2: THE STRATEGY

1. That Council in an ordinance to be contemporaneously adopted by Council approves a change from LOS D to LOS E for Wilsonville Road between and including the intersections with Boones Ferry Road and Town Center Loop West as provided in Policy 4.1.1. of the Transportation Systems Plan.
2. That notwithstanding any other City as an exception to paragraph 4.140(.oa)J.2 of the City Code Council authorize the establishment of a transportation queue on a first approved basis for projects which meet all other requirements for Stage II approval except for capacity at the impacted area.
3. That Council authorizes projects to advance in the queue on a first approved basis subject to the limitation that no project shall be allocated more than 50% of the capacity as determined per Section 4 of this ordinance each year. Allocated capacity shall accrue until a project has sufficient capacity for development.

4. That notwithstanding any other City requirements to the contrary, project traffic capacity for the impacted area will be determined based on location in the queue and trip allocation. The impact of trips on the impacted area is based on averages and typical conditions. Whenever the impact of individual developments present special or unique situations such that the trips through the impacted area is disproportionate to the actual impact of the development, the DRB may approve modifications to the trips included in the queue for the development.
5. That Council in an ordinance to be contemporaneously adopted by Council reinforce the exemption for essential government services by removing the limitations that "In no case will development be permitted that creates an aggregate level of traffic at LOS "F"."
6. That Council recognizes, encourage and capture changes in driving habits which provide added available capacity in the impacted intersections to include:
  - a. Continue to develop the local street system to provide alternate routes. The first major impact will be the finding of the Boeckman Extension from 95<sup>th</sup> Avenue to 110<sup>th</sup> Avenue which will result in a reduction of 150 trips through the Wilsonville Road area.
  - b. That in an ordinance to be subsequently adopted Council approves support for monitoring and supporting the DEQ commute reduction program.
  - c. Recognize that as our balance between job and housing improves and as Interstate 5 nears maximum capacity residents and employers within the city will change driving habits to avoid the impacted intersections during peak traffic conditions.
  - d. Annually in the spring conduct traffic counts and upgrade traffic projections to allow for development that uses the available capacity from changes in driving habits per paragraph 8 of this section.
6. That Council continues to improve capacity in the impacted area. Projects include:

- a. Modify the interchange area to change from two through lanes and a left-turn lane in each direction to a through lane, a combination through/left lane and a left-turn lane in each direction at a cost of \$3.5llion.
  - b. Modify the intersection of Boones Ferry Road and Wilsonville Road to increase capacity.
  - c. The Transportation Systems Plan includes a future widening of Wilsonville Road at this interchange to accommodate two through lanes and a double left turn lane in each direction with added ramp and safety improvements at a cost of \$20 million. There is a two path approach to the interchange improvements. First, we will work with ODOT to initiate the funding discussion for ramp improvements. Second, before we begin the improvements we will complete an alternatives analysis to determine if there is an alternative which provides better results with minimal increased impact on the local area.
7. That Council direct staff to develop a plan to fund the improvements and adjust systems development charges to provide funds for capacity improvements.
  8. Notwithstanding any other City requirements to the contrary, those developments that receive planning and zoning approvals and for which impacted area street capacity is not yet available to be allocated, shall have the effective time of their development and zoning approvals tolled (continued) beyond their two-year expiration for a time equal to the time period between the approval of the application and the allocation of capacity.

### SECTION 3. REPORT TO COUNCIL.

The City Council shall receive a report from the Community Development Director each May 1 beginning in 2006, at which time the Community Development Director shall present information on the status of this ordinance, including capacities in the queue, capacity allocated since the last report, and an update of capacities available for allocation.

SECTION 4. EXPIRATION

Upon completion of six months without any projects in the queue, this Public Facilities Transportation Strategy ordinance shall automatically sunset and cease to be in effect.

SECTION 5. VALIDITY

The validity of any section, clause, sentence or provisions of this ordinance shall not affect the validity of any other provision of this ordinance which can be given effect without reference to the invalid part or parts.

**SUBMITTED** to the Wilsonville City Council and read for the first time at a regular meeting thereof on the 1st day of May, 2005, commencing at the hour of 7:00 P.M. at the Wilsonville Community Center.

\_\_\_\_\_  
SANDRA C. KING, CMC, City Recorder

**ENACTED** by the Wilsonville City Council at a regular meeting thereof this \_\_\_\_\_ day of \_\_\_\_\_, by the following votes:

YEAS:

NAYS:

\_\_\_\_\_  
SANDRA C. KING, CMC, City Recorder

DATED and signed by the Mayor this \_\_\_\_\_ day of \_\_\_\_\_  
2005.

**CHARLOTTE LEHAN, Mayor**

**SUMMARY of votes:**

**Mayor Lehan**

**Councilor Kirk**

**Councilor Barton**

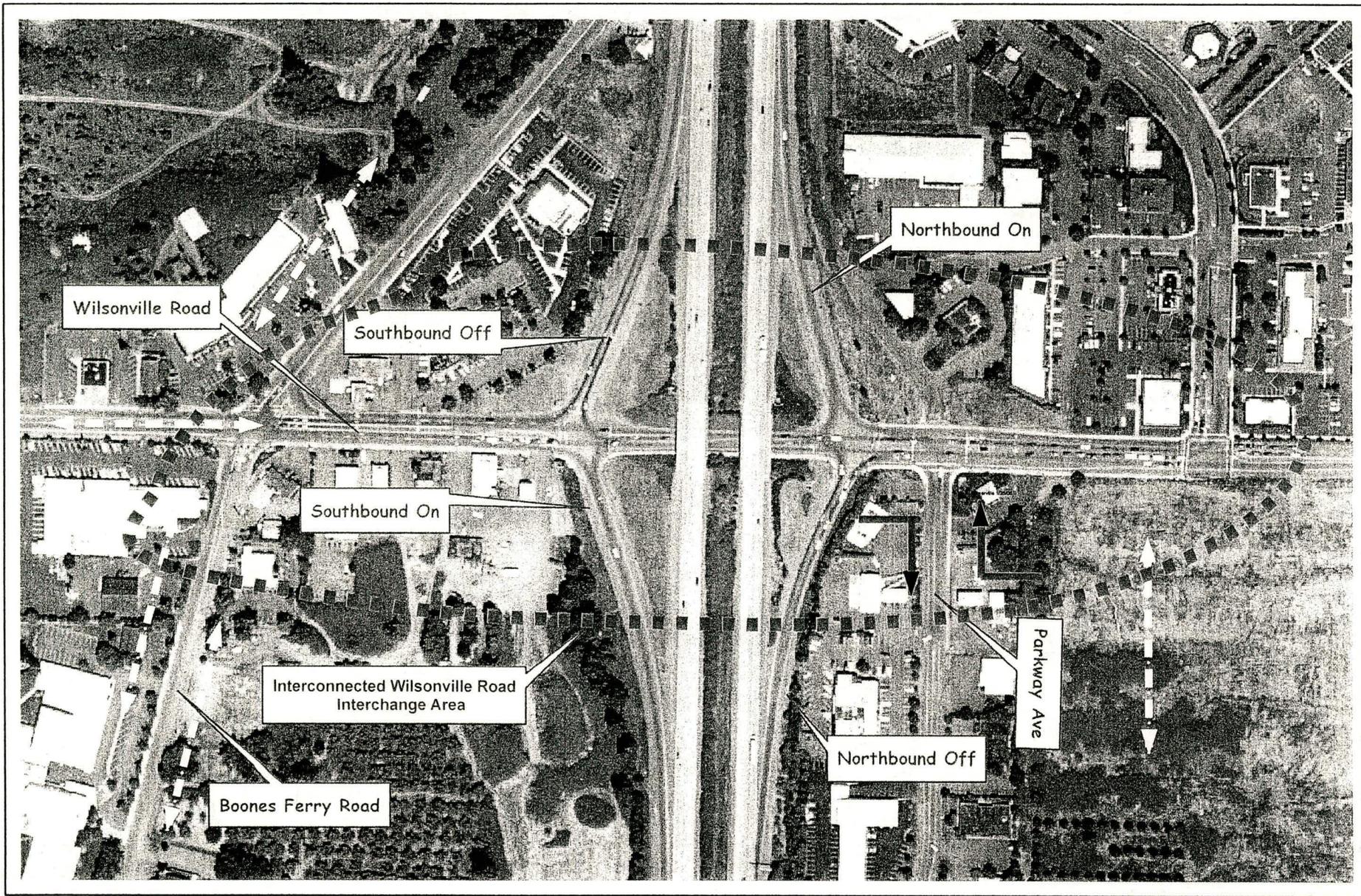
**Councilor Helser**

**Councilor Holt**

Revised on 3/2/05 by B. Somerville

# Public Facilities Transportation Strategy Impacted Intersections

Trips entering Wilsonville Road Interchange Intersections



|                                  | Year 1 | Year 2 | Year 3 | Total Trips |
|----------------------------------|--------|--------|--------|-------------|
| Est. New Trips                   | 480    | 290    | 139    |             |
| Carry Over                       |        | 0      | 56     |             |
| Est. Total Trips                 | 480    | 290    | 195    |             |
| <b>Max Trips per project 90%</b> | 432    | 261    | 176    | <b>90%</b>  |
| Develop FM (318 trips)           | -318   | 0      | 0      | -318        |
| Develop VB (124)                 | 0      | -124   | 0      | -124        |
| Develop B (25)                   | -25    | 0      | 0      | -25         |
| Develop C (160)                  | -137   | -23    | 0      | -160        |
| Develop D (60)                   |        | -60    | 0      | -60         |
| Develop E (27)                   |        | -27    | 0      | -27         |
| Develop F (90)                   |        |        | -90    | -90         |
| Trip Balance                     | 0      | 56     | 105    |             |

|                                  | Year 1 | Year 2 | Year 3 | Total Trips |
|----------------------------------|--------|--------|--------|-------------|
| Est. New Trips                   | 480    | 290    | 139    |             |
| Carry Over                       |        | 0      | 56     |             |
| Est. Total Trips                 | 480    | 290    | 195    |             |
| <b>Max Trips per project 75%</b> | 360    | 217    | 146    | <b>75%</b>  |
| Develop FM (318 trips)           | -318   | 0      | 0      | -318        |
| Develop VB (124)                 | 0      | -124   | 0      | -124        |
| Develop B (25)                   | -25    | 0      | 0      | -25         |
| Develop C (160)                  | -137   | -23    | 0      | -160        |
| Develop D (60)                   |        | -60    |        | -60         |
| Develop E (27)                   |        | -27    |        | -27         |
| Develop F (90)                   |        |        | -90    | -90         |
| Trip Balance                     | 0      | 56     | 105    |             |

|                                  | Year 1 | Year 2 | Year 3 | Total Trips |
|----------------------------------|--------|--------|--------|-------------|
| Est. New Trips                   | 480    | 290    | 139    |             |
| Carry Over                       |        | 55     | 56     |             |
| Est. Total Trips                 | 480    | 345    | 195    |             |
| <b>Max Trips per project 50%</b> | 240    | 173    | 98     | <b>50%</b>  |
| Develop FM (318 trips)           | -240   | -78    | 0      | -318        |
| Develop VB (124)                 | 0      | -124   | 0      | -124        |
| Develop B (25)                   | -25    | 0      | 0      | -25         |
| Develop C (160)                  | -160   | 0      | 0      | -160        |
| Develop D (60)                   |        | -60    |        | -60         |
| Develop E (27)                   |        | -27    |        | -27         |
| Develop F (90)                   |        |        | -90    | -90         |
| Trip Balance                     | 55     | 56     | 105    |             |

|                                  | Year 1 | Year 2 | Year 3 | Total Trips |
|----------------------------------|--------|--------|--------|-------------|
| Est. New Trips                   | 480    | 290    | 139    |             |
| Carry Over                       |        | 215    | 155    |             |
| Est. Total Trips                 | 480    | 505    | 294    |             |
| <b>Max Trips per project 25%</b> | 120    | 126    | 74     | <b>25%</b>  |
| Develop FM (318 trips)           | -120   | -126   | -72    | -318        |
| Develop VB (124)                 | 0      | -124   | 0      | -124        |
| Develop B (25)                   | -25    | 0      | 0      | -25         |
| Develop C (160)                  | -120   | -40    | 0      | -160        |
| Develop D (60)                   |        | -60    | 0      | -60         |
| Develop E (27)                   |        | 0      | -27    | -27         |
| Develop F (90)                   |        |        | -90    | -90         |
| Trip Balance                     | 215    | 155    | 105    |             |

Projects that require more than one year in queue due to allocation maximum limits or end of queue

drw/pfts 030905

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Included in the April 13, 2005 Planning Commission meeting packet:**

Draft Resolution No. 04PC03A

Draft Resolution No. 04PC03B

- Exhibit 15: A memorandum dated April 5, 2005, to Chris Neamtzu, from Eldon Johansen, regarding Public Facilities Transportation Strategy.
- Exhibit 14: A letter dated March 7, 2005, to the Planning Commission, from Robert Currey-Wilson of Fred Meyer Stores.
- Exhibit 13: A table, "Capacity of Wilsonville Road Intersections (Operational Threshold)
- Exhibit 12: Draft Level of Service Ordinance dated 4/6/05
- Exhibit 11: Draft Public Facilities Transportation Strategy Ordinance dated 4/15/2005

**DRAFT  
PLANNING COMMISSION  
RESOLUTION NO. 04PC03A**

**A WILSONVILLE PLANNING COMMISSION RESOLUTION RECOMMENDING  
THAT THE CITY COUNCIL ADOPT AN ORDINANCE ADOPTING A PUBLIC  
FACILITIES TRANSPORTATION STRATEGY FOR DEVELOPMENT IN THE CITY  
OF WILSONVILLE DUE TO THE LACK OF STREET CAPACITY IN THE  
WILSONVILLE ROAD/I-5 INTERCHANGE AREA.**

WHEREAS, the Wilsonville Planning Director submitted proposed Ordinance amendments to the Planning Commission, along with a Staff Report, in accordance with the public hearing and notice procedures that are set forth in Sections 4.008, 4.010, 4.011 and 4.012 of the Wilsonville Code (WC); and

WHEREAS, the Planning Commission, after providing the required notice, held Public Hearings on September 8, 2004, October 13, 2004, December 8, 2004, and February 9, 2005 to review a proposed ordinance adopting a Public Facilities Transportation Strategy and to gather additional testimony and evidence regarding the Ordinance; and

WHEREAS, the Commission has afforded all interested parties an opportunity to be heard on this subject and has entered all available evidence and testimony into the public record of their proceeding; and

WHEREAS, the Planning Commission has duly considered the subject, including the staff recommendations and all the exhibits and testimony introduced and offered by all interested parties; and

NOW, THEREFORE, BE IT RESOLVED that the Wilsonville Planning Commission does hereby adopt all Planning Staff Reports along with the findings and recommendations contained therein and, further, recommends that the Wilsonville City Council approve an ordinance adopting a Public Facilities Transportation Strategy as reviewed by the Planning Commission; and

BE IT RESOLVED that this Resolution shall be effective upon adoption.

ADOPTED by the Planning Commission of the City of Wilsonville at a regular meeting thereof this 13<sup>th</sup> day of April, 2005, and filed with the Planning Administrative Assistant on April 14, 2005.

---

Wilsonville Planning Commission

Attest:

---

Linda Straessle, Administrative Assistant I

SUMMARY of Votes:

Chair Iguchi : \_\_\_\_\_

Commissioner Goddard: \_\_\_\_\_

Commissioner Faiman: \_\_\_\_\_

Commissioner Guyton: \_\_\_\_\_

Commissioner Hinds: \_\_\_\_\_

Commissioner Juza: \_\_\_\_\_

Commissioner Maybee: \_\_\_\_\_

**DRAFT  
PLANNING COMMISSION  
RESOLUTION NO. 04PC03B**

**A WILSONVILLE PLANNING COMMISSION RESOLUTION RECOMMENDING THAT  
THE CITY COUNCIL ADOPT AN ORDINANCE REVISING THE LEVEL OF SERVICE AT  
THE SEVERAL INTERSECTIONS ASSOCIATED WITH THE WILSONVILLE ROAD/I-5  
INTERCHANGE AREA DUE TO A LACK OF TRANSPORTATION CAPACITY,  
EXEMPTING ESSENTIAL GOVERNMENT SERVICES FROM THE LEVEL OF SERVICE  
CONSTRAINTS.**

WHEREAS, the Wilsonville Planning Director submitted proposed Ordinance amendments to the Planning Commission, along with a Staff Report, in accordance with the public hearing and notice procedures that are set forth in Sections 4.008, 4.010, 4.011 and 4.012 of the Wilsonville Code (WC); and

WHEREAS, the Planning Commission, after providing the required notice, held Public Hearings on September 8, 2004, October 13, 2004, December 8, 2004, and February 9, 2005 to review a proposed ordinance for revising the level of service at specific intersections, exempting essential government services from level of service constraints, and to gather additional testimony and evidence regarding the Ordinance; and

WHEREAS, the Commission has afforded all interested parties an opportunity to be heard on this subject and has entered all available evidence and testimony into the public record of their proceeding; and

WHEREAS, the Planning Commission has duly considered the subject, including the staff recommendations and all the exhibits and testimony introduced and offered by all interested parties; and

NOW, THEREFORE, BE IT RESOLVED that the Wilsonville Planning Commission does hereby adopt all Planning Staff Reports along with the findings and recommendations contained therein and, further, recommends that the Wilsonville City Council approve and adopt an ordinance revising the level of service at specific intersections, exempting essential government services from level of service constraints, as reviewed by the Planning Commission; and

BE IT RESOLVED that this Resolution shall be effective upon adoption.

ADOPTED by the Planning Commission of the City of Wilsonville at a regular meeting thereof this 13<sup>th</sup> day of April, 2005, and filed with the Planning Administrative Assistant on April 14, 2005.

---

Wilsonville Planning Commission

Attest:

---

Linda Straessle, Administrative Assistant I

SUMMARY of Votes:

Chair Iguchi : \_\_\_\_\_

Commissioner Goddard: \_\_\_\_\_

Commissioner Faiman: \_\_\_\_\_

Commissioner Guyton: \_\_\_\_\_

Commissioner Hinds: \_\_\_\_\_

Commissioner Juza: \_\_\_\_\_

Commissioner Maybee: \_\_\_\_\_

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

---

**Included in the April 13, 2005 Planning Commission meeting packet:**

Draft Resolution No. 04PC03A

Draft Resolution No. 04PC03B

**A memorandum dated April 7, 2005, from Chris Neamtzu, regarding Public Facilities Transportation Strategy.**

- Exhibit 15: A memorandum dated April 5, 2005, to Chris Neamtzu, from Eldon Johansen, regarding Public Facilities Transportation Strategy..
- Exhibit 14: A letter dated March 7, 2005, to the Planning Commission, from Robert Currey-Wilson of Fred Meyer Stores.
- Exhibit 13: A table, "Capacity of Wilsonville Road Intersections (Operational Threshold)".
- Exhibit 12: Draft Level of Service Ordinance dated 4/6/05
- Exhibit 11: Draft Public Facilities Transportation Strategy Ordinance dated 4/5/2005
- 

**Items previously distributed at Planning Commission Work Session that are to be entered into the 04PC03A and 04PC03B record. Copies of these items will be available at the April 13, 2005 Planning Commission meeting.**

- Exhibit 16: An Interoffice Memorandum dated March 3, 2005 for the March 9, 2005 Planning Commission Work Session, to Debra Iguchi and Members of the Planning Commission, from Dave Waffle, regarding the Public Facility Transportation Strategy.
- Exhibit 17: An Interoffice Memorandum dated March 3, 2005 for the March 9, 2005 Planning Commission Work Session, to Arlene Loble, from Dave Waffle and Mike Kohlhoff, regarding the Public Facility Transportation Strategy.
- Exhibit 18: A Community Development Memorandum dated March 2, 2005, to Sandi Young, from Eldon Johansen, regarding PFTS:
- Exhibit 19: Draft Ordinance for PFTS included in the March 9, 2005 meeting packet, combining PFTS and LOS language (04PC03A & 04PC03B)
- Exhibit 20: A photograph, Public Facilities Strategy Impacted Intersections.
- Exhibit 21: A table, "Allocation and Queuing Examples."

**Planning Division  
Memorandum**



30000 SW Town Center Loop E  
Wilsonville, Oregon 97070  
(503) 682-1011  
(503) 682-1015 Fax  
(503) 682-0843 TDD

Date: April 7, 2005  
To: Planning Commission  
From: Chris Neamtzu, Long-Range Planning Manager  
Subject: Public Facilities Transportation Strategy

---

The Planning Commission will be conducting public hearings on two of three Ordinances that comprise the Public Facilities Transportation Strategy (PFTS).

The ordinance proposed in (04PC03A) contains the actual strategy that is intended to accommodate future development while maintaining the Level of Service requirements. The proposal involves an approach for allocating PM Peak Hour Trips through the I-5 / Wilsonville Road Interchange area which has a lack of street capacity. Together with construction of planned improvements, changes in driving habits and companion Ordinances (04PC03 B and C), additional capacity can be created.

The Ordinance proposed under (04PC03B) will change the Level of Service in the impacted area from "D" to "E" and will exempt "essential government services" from Level of Service standards.

The documentation in support of these ordinances is presented in a different manner than usual. The findings and conclusions usually included in a separate staff report have been incorporated into the Ordinances themselves.

Findings are made as follows: (Unless otherwise specified, page numbers refer to the Staff Report.)

**04PC03A:**

- Compliance with ORS 197.768 - pp 4, 5, 18, 19, 25 of 41.
- Notice and Process - pg.25 and 26 of 41.
- Acknowledged Comprehensive Plan - pg. 25 of 41.
- Comprehensive Plan Policies - pp. 6- 14, 17 and 18 of 41; and Section 1, A, B, C, pg. 26 of 41.
- Transportation Systems Plan - pp.13 and 14 of 41, together with Exhibits 16, 17 and 21.

**04PC03B:**

- Notice and Process - pg. 25 of 41.
- Acknowledged Comprehensive Plan - pg. 25 of 41
- Comprehensive Plan Policies - pg. 32 of 41.



- Transportation Systems Plan – pp. 8, 9 of Attachment 1, September 8, 2004 Planning Commission Packet; together with the August 8, 2004 DKS Memorandum regarding I-5/Wilsonville Road Interchange Capacity Memo; and August 27, 2004 DKS Memo titled, "Public Facilities Transportation Strategy Traffic Analysis."

Packet Assembly: the packet has been set up with the two Ordinances (04PC03 A and B) located at the front, and all of the supporting documents, staff reports and attachments being included as exhibits. Because these two Ordinances are so closely related and rely upon one another to create a major part of the Strategy, the Exhibits would apply to both files, and are included only once for simplicity's sake.

If there are any questions regarding any element of the proposed applications, please call Sandi, Young, Planning Director or Dave Waffle, Community Development Director at 503-682-4960.

**AN ORDINANCE ADOPTING A PUBLIC FACILITIES TRANSPORTATION STRATEGY FOR DEVELOPMENT IN THE CITY OF WILSONVILLE DUE TO THE LACK OF STREET CAPACITY IN THE WILSONVILLE ROAD I-5 INTERCHANGE AREA.**

WHEREAS, the City Council of the City of Wilsonville finds:

**1. Purpose**

The purpose of this ordinance is to provide for a public facilities transportation strategy in conformance with ORS 197.768. This strategy is intended to be limited to special geographic areas where:

- A. There is a rapid increase in land development; and
- B. The total land development would exceed the planned or existing capacity of public facilities.

**2. Specific Geographic Area**

- A. From information presented by and on file with the Planning and Engineering Departments, the City Council has identified the areas of the City that (1) primarily use the Wilsonville Road Interchange with I-5, (2) are either undeveloped or are capable of having further development occur, (3) have experienced a rapid increase in total development, and are affected by the fact that the total land development would exceed the existing capacity of public transportation facilities.
- B. Since the estimated demand for transportation service exceeds the street system capacity currently available and expected to be available during the next two to three years to service these areas, they form the geographic area for this public facilities transportation strategy ordinance. The geographic area encompasses the area north of the Willamette River and south of Boeckman Road as traffic north of Boeckman Road primarily

uses the Stafford Interchange and the Charbonneau District, south of the river, has experienced almost full build out. The geographic area extends to the City's western border to include Villebois and to the City's eastern border to include the Renaissance Homes development. Wilsonville Road and the I-5 interchange area is located approximately in the middle of this geographic area. A summary of the potential development projects which could have an impact on the Wilsonville Road Interchange area is shown as Table 1.

**Table 1: Anticipated Development Projects Through 2009**

| <b>ID</b>                      | <b>Property</b>             | <b>Land Use</b>      | <b>Size*</b> |
|--------------------------------|-----------------------------|----------------------|--------------|
| <i>Anticipated Development</i> |                             |                      |              |
| 1                              | Fred Meyer                  | Retail               | 181 KSF      |
| 2                              | Renaissance Homes           | Residential          | 23.46 Acres  |
| 3                              | Commuter Rail               | Parking              | 397 Stalls   |
| 4                              | Hydro-Temp                  | Industrial           | 21 KSF       |
| 5                              | Coca-Cola                   | Industrial           | 60 KSF       |
| 6                              | Wesleyan Church             | Church               | 8.6 KSF      |
| 7                              | Bernert Property            | Residential          | 25.5 Acres   |
| 8                              | Bernert Property            | Industrial           | 60 Acres     |
| 9                              | Water Treatment Plant/park  | Utility/Recreational | N/A          |
| 10                             | Reeves Property             | Industrial           | 9.13 Acres   |
| 11                             | Jack Property               | Industrial           | 21.13 Acres  |
| 12                             | Hollywood Entertainment     | Office               | 61 KSF       |
| 13                             | Kaiser Property             | Clinic               | 7.41 Acres   |
| 14                             | Kaiser Property             | Commercial           | 7.24 Acres   |
| 15                             | North of Chili's            | Retail               | 0.69 Acres   |
| 16                             | Abele Property              | Residential          | 20 Lots      |
| 17                             | Nikzi Property              | Commercial           | 1.15 Acres   |
| 18                             | Vlahos Property             | Commercial           | 2.06 Acres   |
| 19                             | Kohl Property               | Commercial           | 2.93 Acres   |
| 20                             | Graphic Information Systems | Industrial           | 20 KSF       |
| 21                             | Open                        | Residential          | 14 Acres     |
| 22                             | Open                        | Residential          | 12 Lots      |
| 23                             | John Smith Property         | Residential          | 3 Lots       |
| 24                             | Reeves North Property       | Industrial           | 3.1 Acres    |
| 26                             | Villebois                   | Residential          | 501 Units    |

3. **Problem Summary**

The budget for FY 2003/04 and continuing into 2004/05 included \$3.5 million for capacity improvements at the Wilsonville Road Interchange. Under the City's planned and funded concurrency policy, this capacity became available for development in 2003 and has been fully allocated in 2004. The Transportation Systems Plan and the I-5/Wilsonville Freeway Access Study provided for a significant expansion of the Wilsonville Road Interchange involving \$20 million in improvements that were designed to provide capacity through 2020. The anticipated rate of development is significantly faster than was anticipated at the time the Freeway Access Study was completed. As a result the capacity that was needed in 2020 will actually be needed by the year 2009. Part of the anticipated capacity noted in the Freeway Access Study is based on a substantial change in driving habits by 2020 and the conditions supporting this change in driving habits will not occur in total by 2009. In addition, the \$20 million in interchange improvements is not currently in any of the Oregon Department of Transportation funding programs. Further, the City level of service requirements are more restrictive than the ODOT requirements and this difference must be reconciled as part of the planning process. However, the Transportation Systems Plan indicates that Council can change the standards on Wilsonville Road from level of service D to level of service E which is more compatible with state and regional standards.

4. **Applicable Concurrency Goals, Policies and Standards from City of Wilsonville Comprehensive Plan**

*"Goal : 2.1 To allow for urban growth while maintaining community livability, consistent with the economics of development, City administration, and the provision of public facilities and services.*

*Policy 2.1.1. The City of Wilsonville shall support the development of all land within the City, other than designated open space lands, consistent with the land use designations of the Comprehensive Plan.*

*Implementation Measure 2.1.e. Allow new development to proceed concurrently with the availability of adequate public services and facilities as specified in Public Facilities and Services Section (Section C) of the Comprehensive Plan.*

*Implementation Measure 2.1.f. To insure timely, orderly and efficient use of public facilities and services, while maintaining livability within the community, the city shall establish and maintain growth management policies consistent with the City's regional growth allocation and coordination with a Capital Improvements Plan.*

- 1. The Planning Commission shall periodically review growth-related data, eg., the availability of public facilities, scheduled capital improvements, need for housing, commercial development and/or industrial development, etc.; and shall, as determined necessary following a public hearing, make recommendations to the City Council regarding Growth Management Plans.*

*Primary facilities and services include: those which significantly impact public health and safety and are directly linked to the land development process, in terms of service capacity, location, and design or directly affect public health and safety. Therefore, adequate provision must be made for these facilities/services prior to or concurrently with urban level development. These facilities and services include:*

*Sanitary sewer;  
Water service  
Roads and transportation;  
Storm drainage;  
Fire protection; and  
Police protection and public safety.*

*Goal 3.1: To assure that good quality public facilities and services are available with adequate capacity to meet community needs, while also assuring that growth does not exceed the community's commitment to provide adequate facilities and services.*

*Policy 3.1.1 The City of Wilsonville shall provide public facilities to enhance the health, safety, educational, and recreational aspects of urban living.*

*Implementation Measure 3.1.1.a The City will continue to prepare and implement master plans for facilities/services, as sub-elements of the City's Comprehensive Plan. Facilities/services will be designed and constructed to help implement the City's Comprehensive Plan.*

*Policy 3.1.2 The City of Wilsonville shall provide, or coordinate the provision of, facilities and services concurrent with need (created by new development, redevelopment, or upgrades of aging infrastructure).*

*Implementation Measure 3.1.2.a Urban development will be allowed only in areas where necessary facilities and services can be provided.*

*Implementation Measure 3.1.2.b Development, including temporary occupancy, that threatens the public's health, safety, or general welfare due to a failure to provide adequate public facilities and services, will not be permitted. Development applications will be allowed to proceed on the following basis:*

- 1. Planning approvals may be granted when evidence, including listing in the City's adopted Capital Improvement Program, supports the finding that facilities/services will be available within two years. Applicants may be encouraged or required to plan and complete development in phases, in order to assure that the rate of development does not exceed the capacity of needed*

*facilities/services. (Note: Ordinance including a change for interchange facilities is proposed for approval contemporaneously with this strategy.)*

2. *Building permits will be issued when planning approvals have been granted and funding is in place to assure completion of required facilities/services prior to occupancy. Applicants must sign a statement acknowledging that certificates of occupancy will not be given until adequate facilities/services, determined by the Building Official, after consulting with the City Engineer, are in place and operational. Parks, recreation facilities, streets and other transportation system improvements may be considered to be adequately in place and operational if they are listed in the City's adopted Capital Improvement Program, or other funding is committed for their completion within two years. In such cases, water, sewer, and storm drainage facilities must be available, to the satisfaction of the City Engineer, on at least a temporary basis, prior to occupancy.*
3. *Final certificates of occupancy will not be given until required facilities/services are in place and operational. Temporary certificates of occupancy may only be granted when the Building Official determines, after consulting with the City Engineer, that needed facilities/services will be in place and operational at the conclusion of the time period specified in the temporary certificate of occupancy. Nothing in this policy is intended to indicate that a temporary certificate of occupancy will be granted without assurance of full compliance with City requirements.*

*Implementation Measure 3.1.2.c Where a shortage of facilities/services exists or is anticipated in the near future, and other alternatives are not feasible to correct the deficiency, the City shall take steps to implement a moratorium on development activity or to manage growth through a public facilities strategy, as provided by statute. In the event that State laws provide other alternatives to address shortages of facilities/services, the City will consider those alternatives as well.*

*Implementation Measure 3.1.2.e When development is proposed in areas of the City where full urban services/facilities are not yet available, development approval shall be conditioned on the provision of adequate facilities and services to serve the subject property. Where the development can reasonably proceed in phases prior to the availability of full urban services/facilities, such development may be permitted. However, the use of on-site sewage disposal and private water systems shall only be approved where permitted by City ordinance.”*

Roads and Transportation Plan (from Chapter 3, Public Facilities and Services of the City of Wilsonville Comprehensive Plan).

*This section is being redrafted following completion of the Transportation Systems Plan. It is quoted for historical content. (Note: Staff has prepared a compendium of the necessary plan and code amendments to implement the TSP. However, that work has been delayed by the continuing Villebois applications and issues resolution process. The trip reduction portions of the TSP are included in a companion ordinance to the proposed PFTS ordinance.)*

*“Wilsonville is bisected by the I-5 freeway, just south of its intersection with I-205. The freeway provides excellent north-south transportation linkages to Portland and the southern Willamette Valley. In fact, I-5 remains one of the most important transportation links between Canada and Mexico. The combination of large amounts of developable land, with both rail and freeway transportation access, present Wilsonville with continued growth potential for residential, commercial, and industrial development. While the freeway is a major growth impetus, it also creates certain limitations on the growth and development of the City. The freeway is a barrier between the east and west sides of the community and makes it both difficult and expensive to add streets connecting the east and west sides of town. Also, heavy traffic at freeway interchanges during rush-hour times can result in traffic backups into other nearby intersections.*

*In the late 1990s, substantial public investments were made to up-grade both the Wilsonville Road and Elligsen Road interchanges (exits 283 and 286, respectively). In spite of those improvements, capacity limitations can be seen in both of those interchanges, as the existing freeway on-off ramps at Wilsonville Road are inadequate to handle projected traffic volumes. The City recognizes these problems and notes that if travel patterns continue as they are today and appropriate street improvements, including an additional freeway interchange, are not made, substantial growth limitations will result. It also, however, recognizes the potentials for proper planning and land development to generate certain transportation efficiencies. Therefore, the following policies have been established to promote sound economic growth while providing for an efficient and economical transportation system. The Plan identifies three areas of responsibility in transportation planning.*

- 1. What the City expects to do in providing for efficient transportation.*
- 2. What the City will expect developers and businesses to do in support of efficient transportation.*
- 3. What the City will expect from Federal, State and regional agencies in support of the City's planning efforts.*

*The State's Transportation Planning Rule calls for reductions in vehicle miles traveled (VMTs) per capita and restrictions on the construction of new parking spaces in order to encourage planning that responds to the transportation and land use impacts of growth. Metro's 2040 Growth Concept Plan calls for more compact development as a means of encouraging more efficient use of land, promoting non-auto trips, and protecting air quality. In addition, the federally-mandated air quality plan adopted by the State of Oregon relies on Metro fully achieving the 2040 Growth Concept transportation objectives. Notably, the air-quality plan relies upon reducing vehicle trips per capita through limitations on the maximum parking ratios allowed for different land uses.*

*A compact urban form requires that each use of land is carefully considered and that more efficient forms are favored over less efficient ones. Parking, especially that provided in new developments, can result in less efficient land usage and lower floor area ratios. Parking also has implications for transportation. In areas where transit is provided, or other non-auto modes (e.g., walking, biking) are convenient, less parking can be provided and still allow accessibility and mobility for all modes, including autos. Reductions in auto trips when substituted by non-auto modes can alleviate congestion and improve air quality.*

*The City is required by State and regional plans to address these needs through adopting, implementing, and regular updating of a Transportation Systems Plan.*

*The City is also required to adopt minimum and maximum parking ratios in accordance with Title 2 of the Metro Urban Growth Management Functional Plan, or may use categories or measurement standards other than those in the Regional Parking Ratios Table (of that Functional Plan), as long as findings are provided that show such regulations will be substantially the same as the application of the Regional Parking Ratios. (Note: This has been adopted.)*

*As part of the regional effort, the City is required to monitor and provide the following data to Metro on an annual basis:*

- a. the number and location of newly developed parking spaces, and*
- b. demonstration of compliance with the minimum and maximum parking standards, including the application of any variances to the regional standards in this Title. Coordination with Metro through the collection of other building data will also continue.*

*Implementation Measure 3.1.6.g Minimum street service levels shall continue to be established. Dedication of adequate right-of-way, as established by the Street System Master Plan, or as otherwise approved by the Development Review Board or City Council shall be required prior to actual site development*

*Implementation Measure 3.1.6.cc If adequate regional transportation services, including I-5 interchange modification or additions, and high capacity public transportation, cannot be provided, then the City shall reevaluate and reduce the level of development and/or timing of development anticipated by other elements of this Plan. Such reductions shall be consistent with the capacity of the transportation system at the time of re-evaluation.”*

**5. Applicable Transportation Systems Plan Provisions**

In June 2003 the Transportation Systems Plan was adopted as a sub-element of the Comprehensive Plan and includes the following:

*“Policy 4.1.1 Design the City street system per the street standards set forth in this TSP and to meet LOS D, which is the standard in the City. As may be approved by the City Council, possible exceptions to the LOS D standard are a change to LOS E on Boones Ferry Road and/or Elligsen Road, and on Wilsonville Road between and including the intersections with Boones Ferry Road and Town Center Loop West. Other capacity improvements intended to allow continued development without exceeding LOS E may also be approved by the City Council in permitted locations.*

*Policy 4.1.5 Promote other existing routes and/or provide connections to other regional roadways that provide alternative routes into and out of the City to reduce the reliance on I-5 and its interchanges within the City.*

*Policy 4.1.6 Develop a system of signal coordination and tie in with the I-5 ITS system providing a system of integrated parallel arterials and collectors.*

*Implementation Measure 4.1.5.a. Continue to actively participate in all regional transportation planning efforts, including activities of ODOT, Metro, Clackamas County, and Washington County, advocating for Wilsonville's needs including funding allocations. The commitment to jointly plan and program for transportation projects will be made in new or updated intergovernmental agreements with the counties and other appropriate policies.*

*Implementation Measure 4.2.1.a. Amend the Wilsonville Comprehensive Plan Policy 3.1.2 on Timing and Concurrency Issues by changing the language of Implementation Measure 3.1.2.b.1 to read as follows:*

*"1. Planning approval may be granted when evidence, including listing in the City's adopted Capital Improvement Program, supports the finding that facilities/services will be available within two years for surface streets and four years for all improvements to Interstate-5 and its associated crossings, interchanges, and approach streets." (Note: Plan change with a slightly different wording is proposed for contemporaneous approval with the PFTS.)*

**6. Applicable Implementing Development Code Provisions**

In 1982 the City implemented its plan through its zoning and development code, which is Chapter 4 of the Wilsonville Code, and which was also acknowledged by LCDC, which includes the following:

*"WC 4.139(4) "A planned development permit may be granted by the Planning Commission only if it is found that the development conforms to all the following criteria, as well as to the Planned Development Regulations in Sections 4.130 to 4.140: .....*

*(c) That the location, design, size and uses are such that the residents or establishments to be accommodated will be adequately served by existing or immediately planned facilities and services."*

WC4.140(.09)J

- J. *A planned development permit may be granted by the Development Review Board only if it is found that the development conforms to all the following criteria, as well as to the Planned Development Regulations in Section 4.140:*
1. *The location, design, size and uses, both separately and as a whole, are consistent with the Comprehensive Plan, and with any other applicable plan, development map or Ordinance adopted by the City Council.*
  2. *That the location, design, size and uses are such that traffic generated by the development at the most probable used intersection(s) can be accommodated safely and without congestion in excess of Level of Service D, as defined in the Highway Capacity manual published by the National Highway Research Board, on existing or immediately planned arterial or collector streets and will, in the case of commercial or industrial developments, avoid traversing local streets. Immediately planned arterial and collector streets are those listed in the City's adopted Capital Improvement Program, for which funding has been approved or committed, and that are scheduled for completion within two years of occupancy of the development or four year if they are an associated crossing, interchange, or approach street improvement to Interstate 5.*
    - a. *In determining levels of Service D, the City shall hire a traffic engineer at the applicant's expense who shall prepare a written report containing the following minimum information for consideration by the Development Review Board:*
      - i. *An estimate of the amount of traffic generated by the proposed*

*development, the likely routes of travel of the estimated generated traffic, and the source(s) of information of the estimate of the traffic generated and the likely routes of travel; (Amended by Ordinance 561, adopted 12/15/03.)*

- ii. What impact the estimate generated traffic will have on existing level of service including traffic generated by (1) the development itself, (2) all existing developments, (3) Stage II developments approved but not yet built, and (4) all developments that have vested traffic generation rights under section 4.140(.10), through the most probable used intersection(s), including state and county intersections, at the time of peak level of traffic. This analysis shall be conducted for each direction of travel if backup from other intersections will interfere with intersection operations. (Amended by Ordinance 561, adopted 12/15/03.).*

- b. The following are exempt from meeting the Level of Service D criteria standard:*

- i. A planned development or expansion thereof which generates three (3) new p.m. peak hour traffic trips or less;*
- ii. A planned development or expansion thereof which provides an essential governmental service.*

*c. Traffic generated by development exempted under this subsection on or after Ordinance No. 463 was enacted shall not be counted in determining levels of service for any future applicant. (Added by Ordinance 561, adopted 12/15/03.)*

*d. Exemptions under 'b' of this subsection shall not exempt the development or expansion from payment of system development charges or other applicable regulations. (Added by Ordinance 561, adopted 12/15/03.)*

e. *In no case will development be permitted that creates an aggregate level of traffic at LOS "F". (Added by Ordinance 561, adopted 12/15/03.)*

3. *That the location, design, size and uses are such that the residents or establishments to be accommodated will be adequately served by existing or immediately planned facilities and services."*

7. **The Relationship between Concurrency Policy and Street Infrastructure and Development**

Normally, without the street construction at the Wilsonville Road Interchange, development would be denied because its street requirements would exceed the capacity of the existing streets. However, Comprehensive Plan Policy 3.1.2 recited above provides for a "concurrency policy", allowing planning approvals to go forward if evidence, including listing in the City's adopted Capital Improvements Program, supports the finding that facilities/services will be available within two years. The TSP contains the following suggested change to Policy 3.1.2.

"Implementation Measure 4.2.1.a. Amend the Wilsonville Comprehensive Plan Policy 3.1.2 on Timing and Concurrency Issues by changing the language of Implementation Measure 3.1.2.b. 1 to read as follows:

"1. Planning approval may be granted when evidence, including listing in the City's adopted Capital Improvement Program, supports the finding that facilities/services will be available within two years for surface streets and four years for all improvements to Interstate-5 and its associated crossings, interchanges, and approach streets." **(Note: Plan change with a slightly different wording is proposed for contemporaneous approval with this PFTS.)**

Once the Interchange Projects are planned and funded planning approval could be granted under this policy, however, health and safety must be maintained while the planned interchange improvement design and construction proceeds.

- A. The City of Wilsonville is a home rule city under the laws of the State of Oregon and has a duly acknowledged Comprehensive Plan.
- B. The City's acknowledged Comprehensive Plan is intended to ensure that the rate of community growth and development does not exceed the community's ability to provide essential public services and facilities, including roads and streets for movement of vehicles, bicycles and pedestrians. The City's acknowledged Comprehensive Plan further provides that a continued improvement in street capacity will be available to meet the City's growing needs into the future, but the City's acknowledged Comprehensive Plan is silent as to how the City is to provide adequate streets without an adequate source of funding.
- C. The City's acknowledged Comprehensive Plan policies also commit the City to provide street service that keeps pace with development.
- D. The following are findings, as required by ORS 197.768:
  - 1) The land use plan that was used as a basis for development of the Transportation Systems Plan was based on Metro growth projections with build out by the year 2020. A recent City review of the planned growth in Wilsonville between the Willamette River and Boeckman Road indicates that a very high percent of the growth that had been projected to occur by 2020 is proposed for development by 2009. This clearly supports the finding that there has been a rapid increase in the rate of land development in a specific geographic area that was unanticipated at the time the original planning for that area was adopted.

- 2) The applications that have been submitted and deemed complete for considerations for Stage II approval exceed both the existing capacity and the planned capacity at the Wilsonville Road Interchange with funded improvements.
- 3) The Public Facilities Transportation Strategy is structured to ensure that projects that have previously had planning approval for which the capacity through the Wilsonville Road Interchange area has been “vested” will have transportation capacity be maintained during the period of the Public Facilities Transportation Strategy. In addition, the capacity that is generated during the period of the strategy will be allocated based on percentage basis with no applicant receiving more than 50% of the available capacity in any year. The logic of this approach is that the projects that have received the necessary planning approval would be based on the housing and commercial and industrial facility requirements and is, in fact, a self policing method of ensuring that the supply will not be adversely impacted. This supports the finding that the strategy is structured to ensure that the necessary supply of housing in commercial and industrial facilities that will be impacted within the relevant geographic area is not unreasonably restricted by the adoption of the Public Facilities Strategy.

In addition assuming that growth will continue at the rate projected to meet Metro residences and employment by 2020 the City has more than a two year supply of residential, commercial and industrial property approved for development in the area included in the Public Facilities Transportation Strategy. In other words, there will be continued growth without any future planning approvals for the next two years.

8. **The Queue and Capacity Allocation Plan**

Since the predicted, over-capacity condition of the street system, was identified as a potential limitation on future development in Plan policies, the City has also provided a policy to establish a queue and allocate capacity. In order to manage immediate growth, Comprehensive Plan Implementation Measure 3.1.2.e provided a process for development phasing.

9. **Specific Steps the City Has Taken to Ensure Adequate Transportation Capacity in the Wilsonville Road Interchange**

- A. The City participated with ODOT in major improvements to the interchange and the road from Town Center Loop West to Boones Ferry Road under the provisions of a cooperative improvement and immediate opportunity fund agreement dated March 16, 1994. As part of that agreement ODOT replaced and lengthened the I-5 structures over crossing Wilsonville Road to allow for widening of Wilsonville Road under the interstate. Wilsonville contributed right-of-way and \$3 million towards the estimated total cost of \$7,350,000 for the project. In addition, Wilsonville paid for the construction costs and right-of-way to extend the road from the ends of the ODOT project through Town Center Loop West on the east side and Boones Ferry Road on the west side.
- B. The City on August 15, 1994 adopted Ordinance No. 431 that declared a modified moratorium on traffic whose most probable used intersections included the Wilsonville Road interchange area.
- C. This modified moratorium was subsequently replaced by Ordinance No. 463 adopted October 17, 1996 that established a Public Facilities Transportation Strategy.

D. This strategy terminated by operation of law December 31, 2001. On June 2, 2003 the 2003 Transportation Systems Plan was adopted.

E. The City has budgeted \$3.5 million for the modification of the Wilsonville Road Interchange area to change the striping and traffic control to allow a left-turn lane, a through-left lane and a thru-lane in each direction at the interchange, therefore, providing additional capacity.

**10. Land Development Is On a Pace to Exceed the Capacity of the Wilsonville Road Interchange Area with Funded Improvements**

A. The following table further illustrates development, since added capacity from the \$3.5 million dollar project summarized in 9 above was declared available:

**Table 2**  
**Summary of Wilsonville Road/I-5 Interchange Area Trip Capacity**

3/14/2005

| Project #                                                                                     | Development                                          | P.M. Trips Required Thru WV Rd & I-5 IC area | Approved trips | Available trips |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------|----------------|-----------------|
|                                                                                               |                                                      |                                              |                | 702             |
| <b>Approved Projects</b>                                                                      |                                                      |                                              |                |                 |
| 03DB20                                                                                        | WV Park Pavilion                                     | 89                                           | 89             | 613             |
| 03DB23                                                                                        | VB South SAP PDP1                                    | 35                                           | 35             | 578             |
| 03DB29                                                                                        | Trammel Crow WH                                      | 87                                           | 87             | 491             |
| 02DB30                                                                                        | Jiffy Lube                                           | 5                                            | 5              | 486             |
| 03DB30                                                                                        | Family Fun Center                                    | 3                                            | 3              | 483             |
| 03DB33                                                                                        | WV High School Exp (exempt)                          | 58                                           | 58             | 483             |
| 03DB27                                                                                        | Honda                                                | 73                                           | 73             | 410             |
|                                                                                               | Additional requirement for VB                        | 534                                          | 410            | 0               |
| <b>Subsequent approvals using Stafford Interchange as most probable &amp; project changes</b> |                                                      |                                              |                |                 |
| 03DB31                                                                                        | Penske Truck Leasing                                 | 0                                            | 0              | 0               |
| 03DB36                                                                                        | Berrey Properties 157,800sf in 2 bldgs               | 5                                            | 5              | -5              |
| 04DB01                                                                                        | Wood Middle School Expansion                         | 0                                            | 0              | -5              |
| 03DB42                                                                                        | NW Pacific Properties 16,000sf WH (American Medical) | 3                                            | 3              | -8              |

**Table 2**  
**Summary of Wilsonville Road/I-5 Interchange Area Trip Capacity**  
 3/14/2005

|                                                                                   |                                                                                       |     |     |     |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----|-----|-----|
| 03DB43                                                                            | Renaissance Homes 63 single family lots                                               | 9   | 9   | -17 |
| Letter                                                                            | Reduction in build-out size for Boones Ferry Primary School from 1223 to 800 students | -42 | -42 | 25  |
| 04DB02                                                                            | Pac Trust adjustment from prior approval                                              | -2  | -2  | 27  |
| 04DB04                                                                            | Nissan Rebco                                                                          | 7   | 7   | 20  |
| 04DB05                                                                            | Vision Plastics Expansion                                                             | 1   | 1   | 19  |
| 04DB06                                                                            | Town & Country adjustment from prior approval                                         | 2   | 2   | 17  |
| 04DB10                                                                            | Rite Choice                                                                           | 10  | 10  | 7   |
| <b>Requested for approval of complete applications and remaining vested trips</b> |                                                                                       |     |     |     |
|                                                                                   | Villebois                                                                             | 124 |     |     |
| 03DB39                                                                            | Fred Meyer 181,093sf main bldg & 15,000sf of future pads                              | 318 |     |     |

**11. The Public Facilities Alternative**

- A. The City was an active participant in developing the Public Facilities Strategy legislation with the Home Builders, Department of Land Conservation and Development (DLCD), and the Oregon League of Cities, as an alternative approach to address these types of facilities issues as exemplified by the Wilsonville Road/I-5 capacity problems and the City's prior Public Facilities Transportation Strategy.

The City is again faced with the prospect of denying development applications within Wilsonville based on the inadequate transportation capacity in the Wilsonville Road Interchange area. The \$3.5 million project to provide additional capacity at the interchange as mentioned in paragraph 9.E. resulted in increased capacity for 702 PM peak hour trips through the Wilsonville Road interchange area. The development agreement between the City and Costa Pacific Properties has been written to ensure that there will be capacity for build out of the Villebois Village

development. This will require an addition 124 PM peak hour trips through the Wilsonville Road interchange. In addition, a developer for large commercial facility adjacent to Boones Ferry Road south of Wilsonville Road has submitted an application. This will require an additional 657 PM peak hour trips through the interchange area. With additional improvements of approximately \$6.9 million to the Boones Ferry Road and Wilsonville Road intersection in conjunction with the interchange area, these trips could be separated into 318 PM peak hour trips which would be similar to other trips through the interchange area and an additional 339 PM peak hour trips which would use the intersection of Boones Ferry Road and Wilsonville Road without venturing into the I-5 ramp area. The developer of the large commercial project is tolling the days pending further policy decisions as recommended by the Planning Commission and approved by Council.

The City has a number of alternatives that can be considered.

(1) The City could begin denying approval of projects. Given judicial prior interpretation of this language and its decision regarding the City's Ordinance No. 431, Traffic Growth Management Ordinance, two denials or more could be interpreted as a pattern or practice of denying or delaying permits and could be classified as a moratorium under ORS 197.505. A moratorium would stop the development process, but is more limited in time and a solution is not likely to occur within the time frame of a moratorium.

(2) The City could change the level of service on Wilsonville Road, from Boones Ferry to Town Center Loop West from "D" to "E". This change is included as a decision which could be adopted by Council per the adopted City Transportation Systems Plan. This change in level of service along with the recent change in driving habits would provide capacity for 480

PM peak hour trips in the first year. While this might provide an immediate resolution of the lack of capacity for some development in the first year, it would not provide capacity for future projects nor would it provide a program to manage development so that it matches the availability of additional capacity in the term beyond the first year.

(3) The third alternative would be to adopt a public facilities transportation strategy. This would allow development to proceed to obtain approvals subject to having traffic trips allocated to the development on a pro rata basis. If a cap is established for large traffic generating developments with the ability to accumulate allocated trips, further equity can be achieved between small development traffic generators and larger traffic generators. By thus managing the trip allocation over a two year period, a greater degree of flexibility can be achieved that is not available in a moratorium and phased development will be allowed to coincide with construction of additional capacity and changes in driving habits.

**12. Housing within Wilsonville**

- A. The present inventory of approved or vested housing projects within the City of Wilsonville is significant and the availability of vacant land within the City is not of such proportion as to negatively affect adjacent communities upon implementation of this strategy. There are at least five housing projects with approximately 1,900 housing units which can move forward under previous Stage II approvals for vesting agreements. These are summarized as follows:

**Table 3**

March 7, 2005

**Housing Projects with Vesting or Planning Approval**

| <b>Project</b>        | <b>Units Remaining</b> |
|-----------------------|------------------------|
| Ash Meadows           | 22                     |
| River Green Phase III | 10                     |
| Cedar Pointe          | 6                      |
| Renaissance           | 63                     |
| Villebois             | 1,799                  |
| <b>Total</b>          | <b>1,900</b>           |

**13. LCDC Acknowledgement**

A. ORS 197.768 requires that the City Comprehensive Plan be acknowledged under ORS 197.251 and that the periodic review be completed under revisions of ORS 197.628 to 197.650 to preclude providing a detailed analysis and making findings relative to the state wide planning goals. The City has an acknowledged Comprehensive Plan and has substantially completed periodic review.

**14. Specific Notice and Process Findings**

A. The City has duly provided the Department of Land Conservation and Development with the required 45 day written notice prior to first public hearing.

B. The City has duly provided notice.

C. Public hearing before the Planning Commission and the City Council on the adoption of this ordinance which sets forth the public facilities transportation strategy and the findings which support the strategy has been duly held.

D. The City Council finds that based upon reasonably available information found in the record, growth management limitations on new development

are justified to prevent a shortage of service capacity of a public transportation facility which will otherwise occur within a specified geographic area during the effective period of this public facilities strategy.

**NOW, THEREFORE, THE CITY OF WILSONVILLE ORDAINS  
AS FOLLOWS:**

**SECTION 1: DETERMINATIONS AND FINDINGS**

- A. The City Council adopts the above recited findings as findings of fact and incorporates them by reference in support of this ordinance and the determinations hereinafter made.
- B. The City Council hereby determines that 630 PM confirmed peak hour trips and an additional probable 140 PM peak hour trips through the Wilsonville Road Interchange area are available over a two year period with a change in level of service from D to E for Wilsonville Road from Boones Ferry to Town Center Loop West, completion of the \$3.5 million interchange project and captured changes to driving habits.
- C. Wilsonville Comprehensive Plan Policy 3.3.3 permits development to go forward upon conditions relating to the timing of the provision of public services. Policy 3.3.3 is met if the public service capacity improvement is planned and funding is committed for construction to occur prior to the issuance of a building permit and occupancy permit for a conditioned development, provided there is no serious endangerment to public health and safety.
- D. The City Council hereby determines that the Public Facilities Transportation Strategy recited hereafter meets the requirements of ORS 197.768 and under the

totality of the circumstances, provides for development to go forward under conditions which will protect the public health and safety.

SECTION 2: THE STRATEGY

1. That Council shall adopt an ordinance contemporaneously herewith that approves a change from LOS D to LOS E for Wilsonville Road between and including the intersections with Boones Ferry Road and Town Center Loop West as provided in Policy 4.1.1. of the Transportation Systems Plan.
2. As an exception to paragraph 4.140(.0a)J.2 of the City Code, Council authorize the establishment of a transportation queue on a first approved priority basis for projects which meet all other requirements for Stage II approval except for traffic capacity at the impacted area.
3. Council authorizes projects to advance in the queue on a first approved basis subject to the limitation that no project shall be allocated more than 50% of the annual capacity as determined each year per Section 4 of this ordinance. A project shall be permitted to advance to develop when it is allocated the required capacity for its development and the project shall then be removed from the queue. Those projects listed below in priority to a removed project shall move up in the queue priority in sequence to their position. Allocated capacity shall accrue until a project has sufficient capacity for development.
4. Notwithstanding any other City requirements to the contrary, project traffic capacity for the impacted area will be determined based on location in the queue and trip allocation. The impact of trips on the impacted area is based on averages and typical conditions. Whenever the impact of individual developments present special or unique situations such that the trips through the impacted area are disproportionate to the actual impact of the development, the DRB may approve modifications to the number of the project's trips to be allocated to the project for its position in the queue.

5. In an ordinance to be contemporaneously adopted herewith, the Council shall reinforce the exemption for essential government services, by removing the limitations that "In no case will development be permitted that creates an aggregate level of traffic at LOS "F"."
  
6. The Council recognizes, encourage and capture changes in driving habits which provide added available capacity in the impacted intersections to include:
  - a. Continuing to develop the local street system to provide alternate routes. A current example is the Boeckman Extension from 95<sup>th</sup> Avenue to 110<sup>th</sup> Avenue which will result in a reduction of 150 trips through the Wilsonville Road area.
  - b. Developing an ordinance to be subsequently adopted by Council that supports the DEQ commute reduction program.
  - c. Annually in the spring continuing to conduct traffic counts and update traffic projections to allow for development that uses the available capacity from changes in driving habits per paragraph 8 of this section.
  
6. The Council shall continue to improve capacity in the impacted area through project development subject to fund availability. Projects include:
  - a. Modify the interchange area to change from two through lanes and a left-turn lane in each direction to a through lane, a combination through/left lane and a left-turn lane in each direction at a cost of \$3.5 million.
  - b. Modify the intersection of Boones Ferry Road and Wilsonville Road to increase capacity.
  - c. The Transportation Systems Plan includes a future widening of Wilsonville Road at this interchange to accommodate two through lanes and a double left turn lane in each direction with added ramp and safety improvements at a cost of \$20 million. There is a two path approach to the interchange improvements. First, the City will work with ODOT to initiate the funding discussion for ramp improvements. Second, before the City begins the future

widening improvements the City will complete an alternatives analysis to determine if there is an alternative which provides better results with minimal increased impact on the local area.

7. The Council direct staff to develop a plan to fund the various improvements and adjust systems development charges where appropriate to provide funds for capacity improvements.
8. Notwithstanding any other City requirements to the contrary, those developments that receive Stage II development approval and for which impacted area street capacity is not yet available to be allocated, shall have the effective time of their development approvals tolled (continued) equal to the time period between the approval of the application and the allocation of capacity to commence the two year time period for expiration of their approval.
9. Except for vesting of PM peak hour traffic trips previously authorized in accordance with Ordinance No. 561, the vesting of PM peak hour traffic trips shall occur in accordance with this PFTS and the provisions regarding vesting of Ordinance No. 561 are hereby suspended while this PFTS is in effect.

**SECTION 3. REPORT TO COUNCIL.**

Each May 1 beginning in 2006 and any succeeding May 1 as may be authorized by the City Council by lawful continuance of this ordinance, the Community Development Director shall report to the City Council on the status of this ordinance, including capacities in the queue, capacity allocated since the last report, and an update of capacities that the Director has determined are available for allocation. Unless otherwise modified by the City Council, the Director's determination of capacity available for allocation shall stand for the ensuing year.

**SECTION 4. EXPIRATION**

Upon completion of two years from enactment unless otherwise lawfully continued by the City Council, this Public Facilities Transportation Strategy ordinance shall automatically sunset and cease to be in effect.

**SECTION 5. VALIDITY**

In the event any section, clause, sentence or provision of this ordinance is determined to be invalid, such a determination shall not affect the validity of any other provision of this ordinance which can be given effect without reference to the invalid part or parts.

**SUBMITTED** to the Wilsonville City Council and read for the first time at a regular meeting thereof on the 9th day of May, 2005, commencing at the hour of 7:00 P.M. at the Wilsonville Community Center.

\_\_\_\_\_  
SANDRA C. KING, CMC, City Recorder

**ENACTED** by the Wilsonville City Council at a regular meeting thereof this \_\_\_\_\_ day of \_\_\_\_\_, by the following votes:

YEAS:

NAYS:

\_\_\_\_\_  
SANDRA C. KING, CMC, City Recorder

DATED and signed by the Mayor this \_\_\_\_\_ day of -  
\_\_\_\_\_ 2005.

\_\_\_\_\_  
CHARLOTTE LEHAN, Mayor

SUMMARY of votes:

Mayor Lehan

Councilor Kirk

Councilor Knapp

Councilor Scott-Tabb

Councilor Holt

## ORDINANCE NO. XXX

### **AN ORDINANCE REVISING THE LEVEL OF SERVICE AT THE SEVERAL INTERSECTIONS ASSOCIATED WITH WILSONVILLE ROAD/I-5 INTERCHANGE AREA DUE TO LACK OF TRANSPORTATION CAPACITY, EXEMPTING ESSENTIAL GOVERNMENT SERVICES FROM LEVEL OF SERVICE CONSTRAINTS.**

**WHEREAS,** the City Council of the City of Wilsonville finds that the Wilsonville Road Corridor is a specific geographic area which has experienced a rapid and unanticipated increase in total development and within which the total land development would exceed the planned or existing capacity of public transportation facilities. Within the Wilsonville Road Corridor, specific intersections have been identified as operating at greater than Level of Service "D" during the p.m. peak hour. Those intersections are I-5/Wilsonville Road, Southbound, I-5/Wilsonville Road Northbound, Boones Ferry Road/Wilsonville Road and Town Center Loop West/Wilsonville Road. These intersections shall be designated the "impacted intersections", and

**WHEREAS,** the purpose of this ordinance is to modify the level of service (LOS) at the impacted intersections from LOS "D" to LOS "E" as allowed by the City's Comprehensive Plan and Transportation Systems Plan in order to not unreasonably restrict the necessary supply of housing and of commercial and industrial facilities as provided for in the City's Comprehensive Plan, and

**WHEREAS,** the City has determined, as described in the staff report attached hereto as Exhibit "A", that total anticipated land development which will impact the Wilsonville Road /I-5 Interchange Area will exceed the existing capacity of transportation facilities in the Area at LOS "D", and

**WHEREAS,** the City Council finds that the previously approved p.m. peak trip capacity through the impacted intersections has been fully allocated either to existing developments or reserved under prior vesting ordinances for as yet un-built projects with Stage II approvals, and

**WHEREAS,** the City has determined that allocation of trips is necessary in order that the supply of housing and of commercial and industrial facilities impacted by the transportation deficiencies in the Wilsonville Road/I-5 Interchange Area will not be unreasonably restricted, and

**WHEREAS,** The City Council further finds that the completion of the planned Phase 2 and 3 improvements to the I-5/Wilsonville Road Interchange and the improvements at the Boones Ferry Road/Wilsonville Road intersections, together with a planned change in driving habits as described in "Exhibit

“A”, will not reasonably accommodate future development without a change from LOS “D” to LOS “E” through the impacted intersections, and

**WHEREAS,** the City Council has determined that essential government services, including, but not limited to, public safety, public schools and public transportation services are necessary for the health and well-being of the citizens of Wilsonville and cannot be unreasonably restricted by a requirement to meet LOS standards, and

**WHEREAS,** the City provided the Department of Land Conservation and Development with the required 45 day written notice prior to the first evidentiary hearing to consider this amendment. Notice was sent on March 26, 2004 for a hearing before the Planning Commission on May 12, 2004. That hearing was continued to September 8, 2004 and April 13, 2005. The Planning Commission has recommended approval as contained in Resolution No. LP-2005-02-00005, and

**WHEREAS,** the City Council held a properly noticed public hearing on \_\_\_\_\_ 2005 to hear testimony and consider the evidence in the record, and determined that the change in level of service from LOS “D” to LOS “E” is necessary in order that the supply of housing and of commercial and industrial facilities impacted by the transportation deficiencies in the Wilsonville Road/I-5 Interchange Area will not be unreasonably restricted, and has also determined that the need for essential government services for the continued health and welfare of the citizens of Wilsonville takes precedence over compliance with level of services restrictions,

**NOW THEREFORE, THE CITY OF WILSONVILLE ORDAINS AS FOLLOWS:**

- 1. The level of service at the impacted intersections is hereby revised from LOS “D” to LOS “E”.**
- 2. Essential government services, defined as facilities for the purpose of public education, public safety, public transportation and/or public services and administration, are hereby exempted from compliance with level of service standards.**
- 3. The City Council adopts as supplemental findings the staff report in this matter dated 2005, attached as Exhibit A, and incorporated by reference as if fully set forth.**
4. The City Recorder is directed to make appropriate formatting and stylistic changes to conform the aforementioned amendments to the format and style of the Wilsonville Code. Staff is directed to prepare documents necessary for the implementation of the Commute Trip Reduction Program.

5. For the reasons appearing in the recitals above and in the attached Staff Report, dated 2005, the City Council hereby determines that a delay in adopting this amendment will negatively impact implementation of Ordinance No. XXX, a system for specific allocation of trip capacity through the impacted intersections, increasing the risk that capacity through said intersections will not be available for development under approved Master Plans, for pending applications, for development of industrial lands consistent with the need for such lands as determined by Metro, or for other development consistent with the approved Comprehensive Plan, with the consequent reduction in financing for, and timely construction of planned transportation system improvements for additional capacity. As such, time is of the essence and the public interest militates in favor of a declaration that this Ordinance shall take effect immediately upon final reading and passage by the Council.
  
6. Validity: The validity of any section, clause, sentence or provision of this ordinance shall not affect the validity of any other provision of this ordinance which can be given effect without reference to the invalid part or parts.

SUBMITTED to the Wilsonville City Council and read for the first and second time at a regular meeting thereof on the xx day of , 2005, commencing at the hour of 7:00 p.m. at the Wilsonville Community Center, 7965 SW Wilsonville Road, Wilsonville, Oregon.

ADOPTED by the Wilsonville City Council at a regular meeting thereof this xx day of , 2005, and filed with the Wilsonville City Recorder this date.

\_\_\_\_\_  
Charlotte Lehan, Mayor

ATTEST:

\_\_\_\_\_  
Sandra King, City Recorder

SUMMARY OF VOTES:

|                        |       |
|------------------------|-------|
| Mayor Lehan            | _____ |
| Council President Kirk | _____ |
| Councilor Holt         | _____ |
| Councilor Knapp        | _____ |
| Councilor Scott-Tabb   | _____ |

drw/pfts 040605

# Exhibit 13

## Capacity of Wilsonville Road Intersections (Operational Threshold)

| <i>Intersection</i>                                | <i>Existing</i> | <i>Shared-Left</i> | <i>Double-Lefts</i> |
|----------------------------------------------------|-----------------|--------------------|---------------------|
| <b>Vehicle Delay Not to Exceed 55 seconds</b>      |                 |                    |                     |
| Wilsonville Road/Boones Ferry Road                 | 3,700           | 3,700              | 4,000               |
| Wilsonville Road/I-5 Southbound Ramps              | 4,200           | 4,400              | 4,500               |
| Wilsonville Road/I-5 Northbound Ramps              | 2,800           | 4,300              | 4,800               |
| Wilsonville Road/Town Center Loop West             | 3,400           | 4,300              | 4,300               |
| <b>Vehicle Delay Not to Exceed 80 seconds</b>      |                 |                    |                     |
| Wilsonville Road/Boones Ferry Road                 | 3,700           | 4,300              | 4,500               |
| Wilsonville Road/I-5 Southbound Ramps              | 4,200           | 4,300              | 4,600               |
| Wilsonville Road/I-5 Northbound Ramps              | 4,100           | 5,300              | 5,600               |
| Wilsonville Road/Town Center Loop West             | 3,900           | 4,600              | 4,900               |
| <b>Volume to Capacity Ratio Not to Exceed 0.99</b> |                 |                    |                     |
| Wilsonville Road/Boones Ferry Road                 | -               | 3,605              | 3,825               |
| Wilsonville Road/I-5 Southbound Ramps              | -               | 4,544              | 4,811               |
| Wilsonville Road/I-5 Northbound Ramps              | -               | 4,755              | 5,019               |
| Wilsonville Road/Town Center Loop West             | -               | 3,974              | 4,195               |

## Capacity of Wilsonville Road Intersections (Interchange Comparison)

| <i>Intersection</i>                                | <i>Loop Ramps</i> | <i>Split Diamond</i> | <i>Single-Point</i> |
|----------------------------------------------------|-------------------|----------------------|---------------------|
| <b>Volume to Capacity Ratio Not to Exceed 0.99</b> |                   |                      |                     |
| Wilsonville Road/Boones Ferry Road                 | 6,800             | 6,800                | 6,800               |
| Wilsonville Road/I-5 Southbound Ramps              | 7,300             | 5,900                | 6,400               |
| Wilsonville Road/I-5 Northbound Ramps              | 4,900             | 5,200                | -                   |
| Wilsonville Road/Town Center Loop West             | 6,000             | 6,000                | 6,000               |

What's on your list today? You'll find it at

**FredMeyer**

**FRED MEYER STORES** • P.O. Box 42121 • Portland, OR 97242-0121 • 3800 SE 22nd Ave. • Portland, OR 97202-2918 • 503 232-8844 • <http://www.fredmeyer.com>

Robert T. Currey-Wilson  
VP, Real Estate and Store Development  
(503) 797-3550 FAX (503) 797-3539  
e-mail bob.currey-wilson@fredmeyer.com

March 7, 2005

**Exhibit 14**

City of Wilsonville  
Planning Commission – Chair Debra Iguchi and Commissioners  
Community Development Annex  
8445 SW Elligsen Road  
Wilsonville, Oregon 97070

Re: Public Facilities Transportation Strategy (PFTS)

Dear Commissioners,

Fred Meyer submits the following comments on the proposed Public Facilities Transportation Strategy (PFTS) scheduled to be reviewed by the commission.

A goal of the PFTS is to provide a way for the traffic issues associated with the I-5 / Wilsonville Rd interchange to be resolved while allowing development to continue to occur. There are six strategies being considered for incorporation into the PFTS. Strategy Three relates to determining a process to allow the allotment of trips and allocating them at either Stage I or Stage II of the development approval process. The other five strategies provide for increased trip capacity at the Wilsonville Road interchange.

Fred Meyer supports a PFTS that provides trip vesting at the Stage I or Stage II level. We would not support a limit on the number or percentage of trips a particular project could vest in a given year, nor a percentage for certain types of uses (residential vs. commercial). Such limits would favor small developments over larger ones, and unnecessarily delay a larger project even if additional trip capacity is available.

The other five strategies are supported by Fred Meyer, as they would provide for additional capacity at the interchange. It is our understanding that these include a change in Level of Service from LOS D to LOS E at the I-5 interchange, an exemption of "Essential governments services", development of new SDC's to pay for transportation improvements, public investment in Wilsonville Road and I-5 improvements, and accounting for changes in driver behavior.

Fred Meyer is a long-standing, commercial property owner in the Wilsonville community. Since the initial denial of its development application in the mid 1990's, Fred Meyer has been a consistent supporter of the City's efforts to resolve growth issues and promote its development vision. For example, Fred Meyer was the largest private contributor to the City's campaigns for a new water treatment facility. We were also the largest contributor to the campaign in support of the creation of the urban renewal area that is enabling the City's vision for the west side, including Villebois, to move forward.

March 7, 2005

Page 2

In 2003 Fred Meyer re-started the effort to develop a store on our Wilsonville property with the submission of Stage I, Stage II, and Site and Design Review applications for the development of a 181,093 SF Fred Meyer store and 15,000 SF of pad retail along Boones Ferry Road. This plan also retains the existing church structure and a grove of large Douglas Fir trees on the site. Fred Meyer has worked with City staff to develop a plan that we believe is compatible with and appropriate for this large commercial site. Fred Meyer's application is complete, but at the City's request, we have agreed to place the application on hold, and have tolled the 120-day rule for decision making, in order to allow the City time to review the above strategies and implement the pending PFTS.

At the time we were preparing our application, the City was also in the process of initial review of the Villebois project, which will affect many of the same intersections that the Fred Meyer project will affect, in particular the I-5 interchange intersections. Given the importance of the Villebois project to the community's vision for the West Side, Fred Meyer agreed to step aside and delay our application for approval such that trips were available to enable Villebois to proceed. However, two years later, the Fred Meyer application is still on hold, pending resolution of the continuing traffic issues via the PFTS.

Staff has identified improvements to the intersection of Wilsonville Road and Boones Ferry Road, which would reduce Fred Meyer's impact to the remaining interchange intersections in the PM peak hour. City staff has identified a range of trips which may be allotted to new development each year for PM peak hour trips. If 100% vesting was allowed, Fred Meyer could proceed with development and occupancy in one to two years, depending on the final trip allotment and assuming no other developments obtain trips ahead of Fred Meyer. If trips were limited to something less than 100%, it could take significantly longer for the Fred Meyer project to proceed. Additionally, it is important to note that the development of Fred Meyer will make a significant contribution to not only off-site improvements that will benefit this intersection and the City, but also a positive economic impact to the community, and bring new services not available on the West Side.

In summary, Fred Meyer supports a PFTS that includes the ability for proposed development, at the Stage I or Stage II level to vest up to 100% of the available trips for a particular year as needed for the particular project. In addition, we support strategies which provide sufficient capacity during the duration of the PFTS that allows development to proceed.

Thank you for the opportunity to provide these comments.

Sincerely,

Fred Meyer Stores, Inc.



Robert Currey-Wilson  
VP, Real Estate and Store Development

# Exhibit 15

## COMMUNITY DEVELOPMENT MEMORANDUM

Date: April 5, 2005  
To: Chris Neamtzu, Long Range Planning  
From: Eldon R. Johansen, Special Projects  
Subject: Public Facilities Transportation Strategy

---

Three individuals representing two different firms took the effort to provide their thoughts on the earlier draft of the Public Facilities Transportation Strategy. These include the following:

Mr. Timothy V. Ramis of Ramis Crew Corrigan & Bachrach LLP representing Fred Meyer, Inc. provided his comments in a letter dated October 11, 2004 reference Proposed Public Facilities Transportation Strategy Application No. 04PC03A.

Michelle Rudd of Stoel Rives representing the Kohl family provided comments in a letter dated October 13, 2004 reference Proposed Public Facilities Strategy.

Mr. Robert T. Currey-Wilson representing Fred Meyer provided his comments in a letter dated March 7, 2005 reference Public Facilities Transportation Strategy.

In the following subparagraphs I will briefly summarize the suggestions that we received and provide staff comments on those suggestions.

### **Suggestion 1:**

Mr. Ramis suggested that in establishing a queue that we establish priority based on the time of the Stage II application.

### **Comment:**

*Staff concurs that the queue should be based on Stage II planning actions; however, Staff has concluded that continuing to establish all dates for follow-up on planning activities should be based on the approval date rather than the application date. If we would attempt to use a separate date for the establishment of a queue that we used for any of the other follow-up planning activities we would have a needlessly cumbersome and potentially unfair system.*

**Suggestion 2:**

Mr. Ramis in his letter recommends that the priority by filing date should be absolute. Mr. Currey-Wilson, in his letter subsequently suggested the same thing, that we go strictly based on first come, first serve. On the other hand, Ms. Rudd suggests that the annual allocation of trips could be further restricted by limiting the maximum number of trips any single development can accrue each year.

**Comment:**

*In the Public Facilities Transportation Strategy draft, Staff has tried to use the middle ground and has suggested that a large development could take no more than 50% of the available trips in any given year. This seems to be an equitable approach to allowing the larger developments to accumulate capacity relatively quickly while also allowing the smaller developments to move forward.*

**Suggestion 3:**

Ms. Rudd suggests that it is essential that the strategy adopted by the City allows for some development to occur so that the revenue can be collected and the improvements required as conditions of approval are actually constructed.

**Comment:**

*Staff concurs with the basic approach subject to meeting the level of service criteria as recommended by the Planning Commission and adopted by Council. Staff is of the opinion that the recommended Public Facilities Transportation Strategy does satisfy the suggestion as well as the overall City level of service criteria.*

**Suggestion 4:**

Ms. Rudd recommends the following combined strategies. 1) A modification to the plan function capacity and performance standards applied through the Boones Ferry intersection and I-5 Interchange on Wilsonville Road coupled with an annual trip allocation and queuing system, and 2) A limited exception to the trip allocation requirement of those properties which cannot avoid use of the problematic Boones Ferry intersection.

**Comment:**

*The Public Facilities Transportation Strategy includes a modification of the level of service standards for Wilsonville Road and Boones Ferry Road, and Town Center Loop West. It also includes a queuing system with an annual trip allocation. It does not include a limited exception to the trip allocation requirement because it is Staff's recommendation that we maintain our overall modified level of service standards.*

**Suggestion 5:**

Ms. Rudd provides her version of why we have a false level of service D and states that rather than continue this false LOS, the City should declare that they are not going to attempt to maintain level of service D through this problem segment and allow it to fail as part of a larger strategy.

**Comment:**

*Staff agrees that we need to change the level of service in this area from D to E, however, we do not think that we have a false level of service since the level of service has, over the years, continued to meet adopted standards. We also do not agree that we should be further reducing the standards from level of service E to allow failure.*

**Suggestion 6:**

Ms. Rudd suggests that if the City chooses to go forward with the proposed Public Facilities Transportation Strategy in substantially its current form, applicant should enter the queue at Stage I approval.

**Comment:**

*This was a viable alternative and has been discussed in detail. The final recommendation is to base the queuing system on Stage II approval, primarily to reduce speculation.*

**Suggestion 7:**

Ms. Rudd suggests that existing master plan approvals such as Square 76 should be recognized and given a place within the queue.

**Comment:**

*The strategy does provide a mechanism for projects such as Square 76 to obtain a place within the queue, and that is to obtain Stage II approval.*

**Suggestion 8:**

Ms. Rudd suggests that a variance procedure should be established for properties uniquely affected by the City's transportation strategy and further states for those properties which could not be developed without use of the critical Boones Ferry intersection should be given special consideration.

***Comment:***

*My primary problem with the special consideration is that the properties that are generally south of Boeckman Road and north of the river all use either the Wilsonville Road intersection with Boones Ferry Road or with Town Center Loop West as the most probable used intersections under our level of service criteria. If we would allow an exception for projects that use these intersections the most probable used intersection, our exception would be the primary rule since over substantially 50% of the remaining undeveloped property in the City is in the exception area. We also looked at whether there would be a way to draft an alternate exception area and it would require abandonment of our level of service standards to come up with meaningful exception. Staff is not willing to make this recommendation.*

The comments provided by Mr. Ramis, Mr. Currey-Wilson and Ms. Rudd are very much appreciated.

ERJ:bgs

cc: Public Facilities Transportation Strategy  
IOC-CD

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Motion from the February 2, 2005 Planning Commission meeting to continue the Public Hearings for 04PC03A, 04PC03B and 04PC03C to the April, 13, 2005 Planning Commission meeting.**

## PLANNING COMMISSION

WEDNESDAY  
FEBRUARY 9, 2005  
6:30 P.M.

Wilsonville Community Development Annex  
8445 SW Elligsen Road  
Wilsonville, Oregon

### Motion

---

#### II. CONTINUED PUBLIC HEARINGS

##### A. APPLICATION NO. 04PC03A

**Applicant:** City of Wilsonville

**Request:** A Proposed Public Facilities Transportation Strategy, a strategy to accommodate future development while maintaining the City's and ODOT's level of service requirements by allocation of p.m. peak hour trips through the intersections of Wilsonville Road with I-5, Boones Ferry Road and Town Center Loop West together with construction of planned transportation improvements and anticipated changes in driving habits.

##### B. APPLICATION NO. 04PC03B

**Applicant:** City of Wilsonville

**Request:** A proposal to change the Level of Service from "D" to "E" on Wilsonville Road between and including the intersections with I-5, Boones Ferry Road and Town Center Loop West and on portions of Boones Ferry Road adjacent to those intersections as authorized by Wilsonville Transportation Systems Plan Policy 4.1.1, and to exempt "essential government services" from all Level of Service standards.

##### C. APPLICATION NO. 04PC03C

**Applicant:** City of Wilsonville

**Request:** A proposal to amend the Wilsonville Planning and Land Development Ordinance by adoption of a new section, Section 4.150 – Transportation Demand Management and amendment to WC 4.118 – Standards Applying to All Planned Development Zones.

City Staff requested a continuance of these Public Hearings to the April Planning Commission meeting. A work session regarding these applications is planned for the March meeting.

Chair Iguchi moved to continue Applications 04PC03A, 04PC03B and 04PC03C to the April 13, 2005 Planning Commission meeting. Commissioner Hinds seconded the motion, which carried 7 to 0.

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Motion from the December 8, 2004 Planning Commission meeting to continue the Public Hearings for 04PC03A, 04PC03B and 04PC03C to the February 9, 2005 Planning Commission meeting.**

**City of Wilsonville  
Planning Commission**

Approved January 12, 2005

**Wednesday  
December 8, 2004,  
6:30 PM**

**Wilsonville Community Development Annex  
8445 SW Elligsen Road  
Wilsonville, Oregon**

**Minutes**

---

---

**I. CALL TO ORDER - ROLL CALL**

Chair Iguchi called the meeting to order at 6:30 p.m. Those present:

Planning Commission: Debra Iguchi, Mary Hinds, Craig Faiman, Richard Goddard, Heidi Juza and Sue Guyton. Joe Maybee was absent. City Council Liaison Alan Kirk was also present.

City Staff: Chris Neamtzu, Sandi Young and Linda Straessle.

~~~~~

VI. CONTINUED PUBLIC HEARINGS

- A. 04PC03A Public Facilities Transportation Strategy**
- B. 04PC03B Change LOS "D" to LOS "E" at Specific Intersection**
- C. 04PC03C Transportation Demand Management**

City Staff requested continuance of these Public Hearings to the February 9, 2005 Planning Commission meeting, and requested that the Planning Commission schedule a January 12, 2005 work session for these applications.

Commissioner Juza moved to continue Public Hearings for 04PC03A, 04PC03B and 04PC03C to the February 9, 2005 Planning Commission meeting. Commissioner Hinds seconded the motion, which passed 6 to 0.

~~~~~

**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Minutes from the October 13, 2004 Planning Commission meeting.**

# PLANNING COMMISSION

WEDNESDAY  
OCTOBER 13, 2004  
6:30 P.M.

Approved  
December 8, 2004

Wilsonville Community Development Annex  
8445 SW Elligsen Road  
Wilsonville, Oregon

## Meeting Minutes

---

### I. CALL TO ORDER - ROLL CALL

Chair Iguchi called the meeting to order at 6:35 p.m. Those present:

Planning Commission: Debra Iguchi, Mary Hinds, Craig Faiman, Richard Goddard, Heidi Juza and Joe Maybee. Sue Guyton was absent. City Council Liaison Alan Kirk was also present.

City Staff: Chris Neamtzu, Sandi Young, Paul Lee, Eldon Johansen and Linda Straessle.

---

### C. Application No. 04PC03A

Applicant: City of Wilsonville

Request: A Proposed Public Facilities Transportation Strategy, a strategy to accommodate future development while maintaining the City's and ODOT's level of service requirements by allocation of p.m. peak hour trips through the intersections of Wilsonville Road with I-5, Boones Ferry Road, and Town Center Loop West together with construction of planned transportation improvements and anticipated changes in driving habits.

*This item is continued from the September 8, 2004 Planning Commission meeting.*

### D. Application No. 04PC03B

Applicant: City of Wilsonville

Request: A proposal to change the Level of Service from "D" to "E" on Wilsonville Road between and including the intersections with I-5, Boones Ferry Road and Town Center Loop West and on portions of Boones Ferry Road adjacent to those intersections as authorized by Wilsonville Transportation Systems Plan Policy 4.1.1, and to exempt "essential government services" from all Level of Service standards.

*This item is continued from the September 8, 2004 Planning Commission meeting.*

Chair Iguchi opened the public hearing for 04PC03A and 04PC03B. She read the Legislative Hearing Procedure for the record and called for the Staff Report.

Ms. Young noted that two letters regarding these matters had been distributed at the beginning of the meeting:

Exhibit 10: A letter dated October 11, 2004 from Tim Ramis of Ramis Crew Corrigan and Bachrach, regarding Proposed Public Facilities Transportation Strategy Application No. 04PC03A.

Exhibit 9: A letter dated October 13, 2004, from Michelle Rudd of Stoel Rives, regarding Proposed Public Facilities Strategy.

Community Development Director Eldon Johansen explained that there are still a number of issues for which he does not yet have answers for regarding these two public hearing items. The outstanding issues include:

- The commuter rail station.
  - \* It appears that commuter rail will generate approximately 62 pm peak hour trips through the Wilsonville Road/I-5 interchange, but he still has to refine the details regarding these trips before he can give specific answers about this issue.
- The DKS Associates traffic study in the September Planning Commission meeting packet (Exhibit 4: A letter dated August 27, 2004, from Randsford McCourt of DKS Associates, regarding Public Facilities Transportation Strategy Traffic Analysis) indicated that there is little difference in capacity gained with the \$3.5 million improvements to the Wilsonville Road/I-5 interchange and the \$20 million improvements to the interchange.
  - \* He has DKS Associates running a progression analysis in this area.
  - \* The proposed dual left turn lanes are supposed to make traffic move better than what is being indicated. He needs to work this out.
  - \* The DKS Associates traffic report lists a split diamond interchange at Wilsonville Road/I-5 interchange as an option. While he is saying no to this suggestion because construction of a split diamond interchange would tear up too much of the City in this area, he wants to take a better look at it.
- The I-5/Wilsonville Freeway Access Study (FAS) dated November 2002, offers an option of a central point interchange at the Wilsonville Road/I-5 interchange, such as what was built at the Market Street interchange in Salem. He would like to take a better look at this option.
- Although the \$20 million improvements to the Wilsonville Road/I-5 interchange appear to add capacity in this area until 2020, this is only after substantial changes in driving habits. It does not look like those changes in driving habits will happen by 2009-2010. He needs to figure out a way of working this transition.
- The initial modeling done for the Wilsonville Road/I-5 interchange area was based on a change to Level of Service (LOS) E because this is what the Transportation Systems Plan (TSP) calls for. He needs to figure out what the impact would be if this area remains at LOS "D", as requested by the Planning Commission.
- The DKS Associates traffic report has a number of individual projects that provide some improvement in the Wilsonville Road/I-5 interchange area by reducing trip demand. He needs to do a time/phase strategy to find out what could be expected each year from the change in driving habits and other trip reduction strategies.

The Commissioners questioned Mr. Johansen regarding 04PC03A and 04PC03B with these issues being addressed:

- Mr. Johansen does not think that the traffic study is wrong and is not asking DKS Associates to redo the traffic study, but rather he is looking to supplement the traffic report with more information.
- He will be able to come up with numbers for the changes in driving habits and other trip reduction strategies.

PUBLIC TESTIMONY:

Mark Ottenad, Executive Director of the Wilsonville Chamber of Commerce, PO Box 3737, Wilsonville. Mr. Ottenad stated that the Wilsonville Chamber of Commerce is requesting that the public hearings for 04PC03A, 04PC03B and 04PC03C be continued for two months. He noted that meetings have been scheduled between the Chamber of Commerce and Ms. Young in November 2004 to review these proposals so that the Chamber of Commerce can understand what is being proposed and the long-term implications, and come to agreement, in the same manner that the parties worked together with the industrial land issues. He is asking that these public hearings be continued to the December 2004 Planning Commission meeting.

Ben Altman, Altman Urban Solutions, PO Box 4063, Wilsonville. Mr. Altman explained that he represents Kohl, Inc. He noted that the letter from Michelle Rudd of Stoel Rives (Exhibit 9 distributed at the beginning of the meeting) was in behalf of the Kohl Family. He noted that Ms. Rudd's letter contained new information, and the Kohl Family supports a continuance of these public hearings.

The Commissioners questioned Mr. Altman regarding his testimony and Ms. Rudd's letter (Exhibit 9).

- Commissioner Faiman suggested that Ms. Rudd's letters is stating that the Kohl Family is experiencing an unfair hardship because there is not enough capacity in the Wilsonville Road/I-5 interchange and has been treated inequitably.
  - While he does not dispute that there are not enough trips, he does not understand the claim that the Kohl Family is being treated unfairly and inequitable as all the property owners south of Boeckman Road are experiencing the same hardship. He asked Mr. Altman to explain why the Kohl Family feels they are being treated unfairly.
  - Mr. Altman explained that they were focusing on the Kohl-owned property, but the whole area in and around the Wilsonville Road/Boones Ferry Road intersection is affected and the problem is that other developments outside this area are allowed to develop even though they impact that intersection; even if the majority if the development traffic may go elsewhere, there are still trips impacting that interchange and intersection that further degrade the Level of Service.
    - Mr. Altman explained that there is no other way out of the Old Town area other than the Wilsonville Road/Boones Ferry intersection and if it is already at LOS "D" or below, and it is continually being degraded by allowing other development, then there is no way to ever further develop the Old Town area.
    - The Kohl property is 2.5 acres, which would never generate \$2.5 million to make the needed capacity improvements in this area.
    - The Kohl property is in the Urban Renewal District, and if it is developed it would generate some tax increment that would help support the improvements over time.
    - The Kohl Family's argument is that past practices of inequitably and unfairly treating people by geographic location, rather than strictly by trip location, adds up to false Level of Service. Allowing other development in other areas which impact this area is unfair to those who want to develop in Old Town but can't meet the LOS "D" test because they only have the choice of using that one intersection (Wilsonville Road/Boones Ferry Road intersection).
    - Properties, south of Boeckman Road but outside of Old Town, have other route options. Even when the Fifth Street extension is built, connecting with Kinsman Road or Brown Road, as specified in the Transportation Systems Plan, studies have shown the Wilsonville Road/Boones Ferry Road intersection area is likely to have a LOS "D" problem for decades to come because every permit that is issued in this City impacts that intersection one way or another. These trips are not being counted consistently.
  - Commissioner Hinds asked Mr. Altman to clarify that the trips that he is saying are not being counted consistently are the essential government services trips.
    - Mr. Altman responded that the essential government services trips are exempt as well as the de minimis trips of three or fewer trips. Also the trips that are generated from outside the City

are not counted. All these trips are still there and are still impacting the true functioning of the intersection.

- The LOS "D" is mythical and this is the basis of the Kohl Family's argument.
- \* Mr. Altman suggested that the Public Facilities Transportation Strategy is a "band-aid" solution and the City needs to be looking at long-term solutions. Ms. Rudd's letter (Exhibit 9) offers alternative methods for solutions.

**Commissioner Faiman moved to continue the Public Hearings for Applications 04PC03A and 04PC03B to the December 8, 2004 meeting. Commissioner Goddard seconded the motion, which carried 6 to 0.**

~~~~~

04PC03A
Public Facilities Transportation Strategy
and
04PC03B
LOS "D" to LOS "E"
Planning Commission
Record Index

Distributed at the October 13, 2004 Planning Commission Meeting:

- Exhibit 10: A letter dated October 11, 2004 from Tim Ramis of Ramis Crew Corrigan and Bachrach, regarding Proposed Public Facilities Transportation Strategy Application No. 04PC03A.
- Exhibit 9: A letter dated October 13, 2004, from Michelle Rudd of Stoel Rives, regarding Proposed Public Facilities Strategy.

Exhibit 10

RAMIS CREW CORRIGAN & BACHRACH LLP

ATTORNEYS AT LAW

1727 NW HOYT STREET
PORTLAND, OREGON 97209
TELEPHONE (503) 222-4402
FAX (503) 243-2944
WWW.RCCB.COM

Timothy V. Ramis
tvr@rccb.com

October 11, 2004

Wilsonville Planning Commission
Wilsonville Community Development Annex
8445 SW Elligsen Road
Wilsonville, Oregon

Re: Proposed Public Facilities Transportation Strategy
Application No. 04PC03A

Dear Planning Commission Members:

I represent Fred Meyer, Inc., which has submitted an application for a land use approval on property it owns south of Wilsonville Road on the west side of I-5. Fred Meyer supports the proposal to develop a transportation facilities strategy that will provide for needed infrastructure and create a queuing system for projects that obtain land use approvals. Fred Meyer understands the City's need to protect its transportation facilities by creating a system that will allow development to occur as capacity in the system becomes available.

The City is considering two options for queuing. One option would have a project's place in the queue established at the time of a Stage I application. The other option would establish the priority based on the time of the Stage II application. There appear to be pros and cons for each option. On the whole, Fred Meyer believes that establishing the priority based on the Stage II application would be a somewhat better approach. We hope to work with City staff in defining the details of the system.

We do ask that the priority date be established by the date the applicant submits all parts of the application for a Stage II approval within the applicant's control. This does not include the traffic report, which is prepared by the City's consultant. The consultant does not take the same amount of time for the report on each application, with the result that a property owner can submit a complete application weeks or months ahead of another property owner, yet not have its application be deemed complete first if the traffic report for the second applicant is completed first. Also, because the approval process may take different lengths of time for reasons outside the control of the applicant, the approval date should not control the priority in the queue.

Finally, the priority by filing date should be absolute, unless a project does not proceed when it gets the go-ahead from the City to proceed. A project that generates a smaller number of trips should not be able to proceed until all projects ahead of it in the queue are authorized to proceed. To have a different rule would result in no large projects being built, because capacity would continued to be utilized by smaller developments.



900 S.W. Fifth Avenue, Suite 2600
 Portland, Oregon 97204
 main 503.224.3380
 fax 503.220.2480
 www.stoel.com

October 13, 2004

MICHELLE RUDD
 Direct (503) 294-9390
 mrudd@stoel.com

Planning Commission
 City of Wilsonville
 30000 SW Town Center Loop E
 Wilsonville, OR 97070

Exhibit 9

Re: Proposed Public Facilities Strategy

Dear Commissioners:

Thank you for the opportunity to submit comments on the proposed Public Facilities Strategy. We believe additional preliminary discussion is necessary and support staff's request for a continuance.

The Kohl family is heavily invested in finding a solution for the traffic problems that have hampered development of their property in Old Town for years. They believe their property has been unfairly and inequitably treated under past and current code requirements and Public Facilities Strategies, and on their behalf we submit this letter for inclusion in the record and as a basis for further discussion.

Under state law a public facilities strategy may be adopted for 24 months and extended for up to three one year extensions. Extending the strategy requires, however, a finding that progress is being made toward correcting the underlying problem. While we appreciate staff's efforts at developing a strategy, the staff report acknowledges that a long-term solution will still be required. We urge the commission to focus on identifying a long term solution now.

Property owners in the southern portion of the city have long endured being severely limited or even unable to develop their land because of various infrastructure inadequacies. Properties in Old Town in particular have an even greater burden to overcome in meeting the traffic level of service standards simply because of their unique geographic location.

We propose an approach that treats both large and small property owners located in various parts of the city more equitably and facilitates a long-term solution to the lack of capacity problem through the Wilsonville Road segments at Boones Ferry and the I-5 Interchange.

Oregon
 Washington
 California
 Utah
 Idaho



Planning Commission

October 13, 2004

Page 2

- **Some development must be allowed.**

The city relies heavily upon revenues in the form of SDC's and Tax Increment (Urban Renewal) to fund needed system capacity improvements. Therefore it is essential that the strategy adopted by the city allows for some development to occur so that the revenue may be collected and the improvements required as project conditions of approval are actually constructed.

The past public facilities strategies, code requirements, and the proposed strategy have allowed some development to occur but in an unfair and inequitable manner. The proposed queuing option begins to address the inequity issues, but we do not feel it goes far enough.

Development in the city has been stymied by the city's general requirement that trips be available concurrent with development. State law does not, however, require this approach. The state transportation planning rule provides that "amendments to functional plans, acknowledged comprehensive plans, and land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the identified function, capacity, and performance standards (e.g. level of service) volume to capacity ratio, etc.) of the facility." OAR 660-012-0060. The rule does not require, however, that this be achieved by construction of road improvements. The city has options.

To date, the city has primarily chosen the option of "[l]imiting allowed land uses to be consistent with the planned function, capacity, and performance standards of the transportation facility." OAR 660-012-0060(1)(a). This has barred development in certain parts of the city because the planned level of service of the road facilities cannot be met. On some properties, no use of the property is possible, without significant system improvements that are well beyond the ability of any one property or even group of properties to finance.

The primary bottleneck has and continues to be the segment of Wilsonville Road through the I-5 interchange. The costs of the next phase of required improvements at the I-5 Interchange is so large (\$20+ million) funding cannot be secured by local funds alone. This means that the availability of funds and the timing thereof is a significant unknown. The availability of funding is also largely outside of the city's control, as significant funds (50%+) must be obtained from ODOT.

In addition, even with the \$20+ million improvements to the interchange, there are still service level problems at the intersection of Boones Ferry Road and Wilsonville Road, because of its geometry and close proximity to the I-5 interchange. This intersection creates a particular problem for properties in Old Town, because traffic generated in Old Town cannot avoid this



Planning Commission
October 13, 2004
Page 3

intersection. Estimates for required improvements to this intersection are \$2.5 million. And, with all these costly improvements, there is not long term certainty of maintaining "D" LOS through these two critical road segments.

Given the lack of funding available to build the large-scale transportation infrastructure improvement necessary to provide adequate capacity for development of the vacant land in the vicinity of the Wilsonville- I-5 interchange, the other options available under state law must be considered.

• **The Transportation Planning Rule allows for development.**

Pursuant to OAR 660-012-0060(1), the city may

- Amend the TSP to provide transportation facilities adequate to support the proposed land uses consistent with the requirements of this division;
- Alter land use designations, density or design requirements to reduce demand for automobile travel and meet travel demands; or
- **Amend the TSP to modify the planned function, capacity and performance standards, as needed to accept greater motor vehicle congestion to promote mixed use, pedestrian friendly development where multimodal travel choices are provided. (Emphasis added.)**

For Wilsonville, amending the TSP to allow greater congestion is the correct choice at this time because it will allow necessary revenues (SDC's & Tax Increment) to be collected. These funds, combined with state and local contributions, will finance construction of the large-scale transportation improvements needed to provide more than a band-aid solution to the capacity problem. In this regard we suggest two combined strategies:

1. **A modification to the planned function, capacity and performance standards applied through the Boones Ferry intersection and I-5 interchange on Wilsonville Road, coupled with an annual trip allocation and queuing system; and**
2. **A limited exception to the trip allocation requirement for those properties which cannot avoid use of the problematic Boones Ferry intersection.**



Planning Commission
October 13, 2004
Page 4

- **The city should create a queuing system and a system for a guaranteed annual release of trips.**

Regarding the first strategy, the city should acknowledge that by default, if nothing else, the Boones Ferry and I-5 segment on Wilsonville Road is a weak link and will have to periodic, if not continual, failure (below D-E LOS). Further it must be specifically acknowledged that the capacity problem at this location is a cumulative impact, which is not created solely by developments located south of Boeckman Road. Therefore any regulation limiting development should not be inequitably applied to some properties and not others.

To date, the city has allowed development in other parts of the city to degrade the intersection by using the "most probable intersection" provision to allow development to occur in other parts of the city so long as no more than 49% of the associated trips go through the problem intersections. Even though the Comprehensive Plan and Code requires concurrency, the current methodology is not consistent with concurrency and not equitably applied. Current practice allows some properties to create impacts at the critical Wilsonville Road segments, without actual system improvements to maintain D LOS, while it specifically limits other developments, which may create similar or even less impacts at this location.

Further, the city exempts other developments (essential government services and de minimus) from the LOS standard, even though they actually contribute to increased congestion. The Code, also specifically eliminates external pass-through background traffic from counts at these limited intersections on Wilsonville Road. The result is a false D LOS.

Rather than continue this false LOS, the city should declare that they are not going attempt to maintain D LOS through this problem segment, and allow it to fail as part of a larger strategy.

If the city chooses to go forward with the proposed Public Facilities Strategy in substantially its current form, applicants should enter the queue at Stage 1 approval. The queue strategy should, however, be coupled with a yearly allocation of trips up to a maximum number per site set by ordinance. The approach proposed by staff will not work without the availability of trips. In addition to preventing the raising of needed revenue for infrastructure improvements, the inability to obtain trips negatively affects the private sector. The property owners and realtors are losing sales opportunities, which then limits planning and engineering services, and construction opportunities. These development related activities all contribute to increased economic growth in the community. But, as these opportunities fail to develop, the city loses out on increased tax revenue, which would help finance the necessary improvements. Further, the city is losing the opportunity to provide services close to where people are, which in itself will



Planning Commission
October 13, 2004
Page 5

reduce trips. Currently there is a negative impact created by increased need for trips external to the city.

SDC's alone are not capable of building the required transportation system needed to maintain "D" LOS. The SDC's are as defined by state law, the "proportional share", which can be charged to new development, based on its impact to the system. And yet, when all future SDC's are added up the potential SDC's from vacant land and even potential redevelopment of some properties, the total revenue generated is less than the total cost of the system.

Thus, a fatal flaw in the current strategy relates to the combination of total cost, the need for external funding (state and federal), and the basic geographic geometry of Boones Ferry Road and the I-5 Interchange at Wilsonville Road. This is the primary critical area where cumulative traffic impacts cause system failure, as defined by excess of "D" LOS.

Entering a queue with no clear indication of when trips will be available provides no incentive to applicants to pay SDCs substantially in advance of development. By allowing some development to occur now, the city will collect SDCs, beginning to raise the funds necessary for construction of a long-term solution.

The city should take a stance more aggressive than that previously proposed by staff and allocate those trips anticipated to become available as trip patterns change locally on an annual basis beginning now. The annual allocation of trips could be further restricted by limiting the maximum number of trips any single development can accrue each year. This would allow large impacts such as Fred Meyer to accumulate trips over several years, while smaller projects could move forward. It still provides the city with a phasing program, which delays major impacts at the critical segments, but also treats all land throughout the city equally.

Under the current program, properties and potential developments that impact Wilsonville Road directly, simply because of their geographic location, not the traffic impact per se, are penalized, while other developments with similar impacts are allowed. This is an inequitable and unacceptable situation.

Part of the overall strategy to manage congestion is to reduce trips through the critical weak link segment through diverted trips to other streets and increased use of transit and other mode options. Integral components of these alternatives include:

- Having alternative routes available;



Planning Commission

October 13, 2004

Page 6

- Having land use patterns that provide needed goods, services, and jobs available locally, thus minimizing out of city commuter trips.
- Having choices for goods and services on both sides of the Freeway, thus minimizing the need for cross-town trips.
- Allowing some failure at I-5 to increase the probability of travelers using alternative routes and modes.

As long as good capacity ("D" or better) is maintained through the I-5 weak link, there is no real incentive for modified driving patterns. Therefore allowing congestion in excess of "D" at this limited location can be found consistent with the overall TSP and traffic management strategy.

Since essentially everyone in town contributes to the total congestion at Wilsonville Road/I-5, it is appropriate that everyone shares the discomfort and disadvantages. It is unfair and unreasonable to disproportionately burden a limited number of properties, such as those in Old Town, for the general benefit of others, including the public in general.

To date, the city has been able to slow development, and, more importantly, to secure significant funding for major westside system improvements through the Master Planning and financial package of Villebois. The city has also been successful in securing state funding, combined with local urban renewal and SDC funding to complete essential connectivity links, which, when completed, will provide critical alternative routes to the Wilsonville Road/I-5 connection. Urban renewal funding should also be utilized to address the remaining deficiencies.

With these, mostly westside, road links in place, all areas of the city will have alternative routes available when traffic backs up at Wilsonville Rd./I-5, and subsequently at Boones Ferry Road. These alternate routes make it possible to consider other options in addressing congestion through the Wilsonville Road weak link segment.

The Kohl property is located in Old Town and is part of Wilsonville Square 76. This is a valid master plan but does not qualify for vesting or queuing under the proposed strategy because it was adopted prior to June 2, 2003. Existing master plan approvals such as Square 76 should be recognized and given a place within the queue.



Planning Commission

October 13, 2004

Page 7

- **A variance procedure should be established for properties uniquely affected by the city's transportation system.**

Regarding the second strategy, the city should recognize the unique physical characteristics and constraints affecting a limited number of properties located in Old Town. Those properties, which could not be developed without use of the critical Boones Ferry intersection should be given special consideration.

The current system includes an exception for development, which degrades the level of operation of the transportation facilities. Government services are allowed to affect these intersections. Developments in other parts of the city are allowed to affect capacity at these intersections so long as the majority of their traffic will go through other intersections.

The city has continued to allow developments to occur in other areas of the city (through "most probable intersection clause"), even though these developments actually continue to impact the Critical Boones Ferry & I-5 weak link. While these other developments are allowed to effectively further degrade the level of service at Boones Ferry & I-5, properties along Wilsonville Road, and particularly those in Old Town, have been shut out, because of the lack of available trips or simply an inability to maintain the "D" LOS at Boones Ferry Road. The cumulative impact of these other allowed developments are no less of a problem and thus equal to the trip generation that might have occurred as a result of allowing development to occur south of Boeckman Road, and in particular, Old Town.

Small developments on these isolated properties which will not add more than x peak hour trips to the intersection (where x = the number of trips anticipated to be obtained in a given year through changes in driving habits) should be allowed to go forward with payment of SDCs.

The properties in Old Town have a unique burden unshared by the rest of the city. This unique geographic location is isolated from road network options by I-5 on the east, the Railroad on the west, the river on the south, and the problematic Boones Ferry Road on the north. There is no other location in Wilsonville that has such limited road access, and limited options for future circulation, as Old Town. And, as previously noted, by such geographic default, the LOS constraints of the Boones Ferry & I-5 weak link bear disproportionately on Old Town Properties.

Variations are generally allowed under the city's code when certain conditions are met.

"Where difficulties exist rendering compliance with Chapter 4 impractical and such compliance would create unnecessary hardship to the owner or user of land or buildings,



Planning Commission
October 13, 2004
Page 8

the Development Review Board may grant a variance from the provision of this Code after the prescribed public hearing as set forth in Section 4.013, and after an investigation; provided all of the following conditions exist:

- A. The difficulty would apply to the particular land or building regardless of the owner.
- B. The request for a variance is not the result of an illegal act on the part of the applicant or the applicant's agent.
- C. The plight of the owner is due to unique circumstances, such as lot size or shape, topography, and size or shape of building, which are not typical of the general conditions of the surrounding area.
- D. The practical difficulty or unnecessary hardship asserted as a ground for a variance must relate to the premises for which the variance is sought and not to other premises or personal conditions of the applicant." Wilsonville Development Code section 4.196.01.

Similar consideration should be given to property such as the Kohl's.

In applying the variance criteria, it is clear that the inability to access the Kohl property without using the Wilsonville I-5 interchange area applies to the property regardless of owner. The lack of alternative access is not the result of any illegal act. The owner's plight is not typical of the general conditions in the city because the vast majority of other properties have other options regarding access. The hardship relates to the Kohl Square 76 property and not other premises or personal conditions of Kohl. The city has effectively granted variances in allowing government facilities to develop despite the fact that associated trips will degrade the facility. A variance process specific to the trip issue is also consistent with the Transportation Rule allowing cities to increase congestion while promoting mixed-use development. The city should mend the TSP to allow increased congestion and mixed-use development in the area of the Kohl property.

This approach should be applied to those properties, which are virtually land locked and have no option but to use one of the intersections at issue. Given the transportation constraints at these locations, they should be allowed to develop with mixed use, pedestrian friendly environments.

The Kohl's developed an apartment complex on a portion of their property in the 1970's. They wish to pursue commercial development of the adjacent parcel. The strategy adopted by the city should amend the transportation system plan to allow completion of development in a manner



Planning Commission
October 13, 2004
Page 9

which links the two sites in a pedestrian friendly manner and encourages a reduction in trips by providing convenient commercial services to these apartments.

While the Comprehensive Plan calls for concurrency, the city has allowed some development to precede construction of improvements when funding has been committed for the improvements. For example, some development will be allowed based on the \$3.5 million of approved but unconstructed improvements planned at the I-5 interchange. All of that capacity has, however, been claimed and the improvement provides no relief to owners like the Kohl family who have had numerous buyers interested in the property over the years but have been unable to complete a sale because first, water was unavailable and then, trips became unobtainable. Relief should be provided for this hardship.

We look forward to working with staff to develop a long term solution for all of Wilsonville.

Thank you for your consideration.

Very truly yours,

Michelle Rudd

MR:cl:mlp

04PC03A
Public Facilities Transportation Strategy
and
04PC03B
LOS "D" to LOS "E"
Planning Commission
Record Index

September 8, 2004 Meeting Minutes

**CITY OF WILSONVILLE
PLANNING COMMISSION**

**WEDNESDAY
SEPTEMBER 8, 2004
6:30 P.M.**

Approved
October 13, 2004

**Wilsonville Community Development Annex
8445 SW Elligsen Road
Wilsonville, Oregon**

AGENDA

I. CALL TO ORDER - ROLL CALL

Vice Chair Hinds called the meeting to order at 6:32 p.m. Those present:

Planning Commission Mary Hinds, Craig Faiman, Richard Goddard, Susan Guyton, Heidi Juza and Joe Maybee. Chair Iguchi was absent. City Council Liaison Alan Kirk was also present.

City Staff: Eldon Johansen, Sandi Young, Paul Lee, Chris Neamtzu, Danielle Cowan, Gus Wettstein and Linda Straessle.

~~~~~  
**V. PUBLIC HEARINGS**

**A. FILE NO. 04PC03A**

**APPLICANT:** City of Wilsonville

**REQUEST:** A Proposed Public Facilities Transportation Strategy, a strategy to accommodate future development while maintaining the City's and ODOT's level of service requirements by allocation of p.m. peak hour trips through the intersections of Wilsonville Road with I-5, Boones Ferry Road, and Town Center Loop West together with construction of planned transportation improvements and anticipated changes in driving habits.

Commissioner Hinds opened the public hearing for 04PC03A at 6:35 p.m. and read the Legislative Hearing Procedure for the record. She called for the presentation of the Staff Report.

Community Development Director Eldon Johansen explained that trip capacity that was gained by the improvements to the Wilsonville Road/I-5 interchange a few years ago has been used up. The City is once again out of trip capacity at the Wilsonville Road/I-5 interchange. The capacity that will be gained by \$3.5 million improvements that City Council budgeted in the 2004-2005 budget has already been allocated and once again the City is in the position of not being able to approve any additional development that would generate trips in the Wilsonville Road/I-5 interchange vicinity.

Mr. Johansen summarized the approach of the Public Facilities Transportation Strategy (PFTS) that is being proposed:

- Increase capacity at the Wilsonville Road/I-5 interchange. In order to do this, two things have to be done:

- \* The Boones Ferry Road/Wilsonville Road intersection will need a second westbound to southbound turn lane and the northbound lane on Boones Ferry Road will need an additional eastbound turn lane.
- \* The current improvements at the Wilsonville Road/I-5 interchange are to change it from two through-lanes and one left-turn lane to one through/left turn lane and another left-turn lane. It needs re-striping and a change in the traffic control to make this work. The November 2002 Freeway Access Study (FAS) recommended that Wilsonville Road have two through-lanes in each direction, two left-turn lanes in each direction, and ramp improvements. This proposed PFTS is based on the FAS recommendations in terms of the improvements and capacity.
- Reduce the demand. This is also being called the "Plan Your Way Out" method. There are four approaches to this method:
  - \* Build the Boeckman Road, Barber Street, Kinsman Road, and Canyon Creek Road South extensions. This doesn't open up any capacity, but will pull traffic away from the Wilsonville Road/I-5 interchange.
  - \* Projections indicate that as traffic on the freeway continues to get worse, people will not try to access the freeway during p.m. peak hours because it is already "clogged up", but will use other north/south routes instead. The question is whether this is going to "clog" up Wilsonville Road and the local freeway ramps. Mr. Johansen thought that it would not.
  - \* As Wilsonville continues to grow, it will get a better mix of commercial, industrial and residential development resulting in a higher percentage of city traffic staying in the city relieving the pressure on the interchange. Wilsonville's traffic growth will be less than its population or job growth.
  - \* Commute Reduction Program. Trip reductions from Transportation Demand Management/Transportation Systems Management are difficult to calculate. Overall trip generation has been decreasing through the Wilsonville Road/I-5 interchange. The proposal is to only declare the trips from this trip reduction after traffic has been physically counted at the interchange to see what the decrease is. Mr. Johansen stated that he can't guarantee that additional trips are going to be gained through a commute reduction program and would not recommend that they be added to the capacity until it is known whether the trips are really there. Planning Director Sandi Young will discuss this option later in the meeting.
- Changing the Level of Service for the area on Wilsonville Road from Boones Ferry Road to Town Center Loop West.
  - \* The Transportation Systems Plan (TSP) recommends that, upon City Council decision, the Level of Service in this area be changed from LOS "D" to LOS "E". Capacity was "built into" the TSP by making this change. City staff is recommending that the change from LOS "D" to LOS "E" along Wilsonville Road between Boones Ferry Road and Town Center Loop West be done at this time.
    - This will create a problem in regards to how the essential government services trips are handled. Currently they are exempt from being counted and can cause the LOS "D" to go to LOS "E". If the City is already at LOS "E", the essential government services trips could cause LOS "F".
    - Mr. Johansen stated that although he does not like it, he is recommending that the essential government services trips continue to be exempt, even if they create LOS "F" because you can't stop building schools and other essential government facilities.
- A queuing system. How to do this is still a question. There are two different methods for queuing:
  - \* When a Stage I Master Plan is approved, the applicant can apply for getting into the queue, and when trips come available, the applicant could then apply for the Stage II approval.
    - The problem with this is that developers could be waiting in the queue ten years.
  - \* The alternative is to set the queuing for after a Stage II approval.
    - The queuing list may go up to five or six years before trips become available. With this length of time, the market is going to change, and changes would have to be made in what was previously approved.

- The problem is that our current requests for Stage II approvals would generate 771 trips.
- It would take five or six years before development could happen unless there is a major improvement to the Wilsonville Road/I-5 interchange.
- Mr. Johansen suggested consideration of asking the large earlier applicants to wait to build until after the improvements to the interchange are done with a guarantee that they would be allowed to move ahead with their developments; to allow some of the smaller developments that generate fewer trips to build as additional capacity becomes available.
- How to pay for the improvements to the system?
  - \* Mr. Johansen explained that another Supplemental Street System Development Charge would have to be created.
- How to sunset the PFTS.
  - \* Typically a public facilities strategy lasts for two years, followed by three one-year extensions. Hopefully a method of sunsetting the PFTS will be determined by then.

Mr. Johansen referred to the DKS Associates Traffic Study (Page 14 of Exhibit 4, a letter dated August 24, 2004, from Randsford McCourt of DKS Associates), and explained that doing the double-double left turn lanes would cost \$25 million and would create about 100 trips at each of the ramps and intersections. Calculating this out it comes to \$250,000 per trip. This probably is not going to happen.

- Mr. Johansen has asked DKS Associates to take another look at the figures.
- Mr. Johansen asked the Commissioners to ignore this chart in the Report

The Commissioners questioned Mr. Johansen:

Commissioner Faiman:

- How many trips would be gained by the change from LOS "D" to LOS "E"?
  - \* Mr. Johansen responded that he does not have an exact figure, but normally it would be about 10%. He explained how the level of service is calculated by the City and by ODOT. ODOT uses a volume capacity ratio and the City uses controlled delay.
- How many trips would be needed for the Fred Meyer store?
  - \* Mr. Johansen answered that Fred Meyer would need about 771 trips. Right now, the Wilsonville Road/Boones Ferry Road intersection is at full capacity. About 400 trips will be gained at the Wilsonville Road/Boones Ferry intersection if the LOS "D" is changed to LOS "E".
    - A change from LOS "D" to LOS "E" would probably not make any difference at the interchange right now because of the ramp situation.
- What would happen if the all the components of the PFTS proposal is approved except for the LOS "D" to LOS "E" change?
  - \* Mr. Johansen answered that it would probably take longer to realize the capacity change and would slow up development in the long run.
- If Fred Meyer decides not to build at the Boones Ferry Road site, there is plenty of other development that would take its place. He suggested that it is other development that is of concern, as it is needed to build out an urban renewal district in order to capture the financing for the road improvements.
  - \* Mr. Johansen stated that the City has to plan for the development of the entire City. If Fred Meyer did not develop at this location, something else will that would require about the same trip generation. The City needs to plan for that capacity in that area.
- If the change is made to LOS "E", could it ever go back to LOS "D"? What events could conspire to allow changing back to LOS "D"?
  - \* Mr. Johansen answered that he did not think that the change back to LOS "D" would ever happen. The Boeckman Road Interchange is 20 years into the future. A split diamond interchange at Wilsonville Road/I-5 interchange is unlikely because of the amount of existing development in that part of the city.

Commissioner Hinds:

- Asked that it be verified that the 702 trips gained from the Vesting Ordinance (No. 561) have already been vested. Mr. Johansen confirmed that they were.
- Asked Mr. Johansen to verify that he is recommending that the trips that would be gained from a commute reduction program not be counted because they are based on people's behavioral changes; their commuting patterns and methods.
  - \* Mr. Johansen answered that it is his recommendation not to count any of trips resulting from the "plan your way out" trip reductions as the City needs to physically see it on the ground before those trips can be allocated to someone else. The City will need to do traffic counts to verify the trip reductions.
  - \* Mr. Johansen stated that he anticipates that overall the trip reductions coming from the additional grid system, the interchange/ramp improvements, and the additional balance of commercial/industrial development.
    - In order to meet the 2020 projections, the City is going to have to get about 125 trips per year from the trip reductions.
- The change from LOS "D" to LOS "E" is only being proposed in the Wilsonville Road/I-5 interchange area?
  - \* It was clarified that four intersections would be changed to LOS "E" along Wilsonville Road; with its intersections at Boones Ferry Road and Town Center Loop West, and at the two freeway on-ramps.
- Where are the current and planning goals that would trigger a sunset to the PFTS?
  - \* Mr. Johansen responded that this would happen when there is adequate capacity to routinely grant Stage II approvals as they come in. This is what needs to be planned for.
- Asked that the issue of essential government services potentially causing a LOS "F" be further explained.
  - \* Mr. Johansen explained that if the LOS "D" is changed to LOS "E" and enough trips from an essential government service are exempted, it could cause LOS "F".
    - While this creates a bad traffic situation, he cannot see where the City could not allow new schools and other facilities to develop.
  - \* Commissioner Hinds referred to the parents who drive their children to school and asked if there could be a bus system so parents are not driving their children to school.
    - Mr. Johansen responded that this would help but there would still be the buses and the teachers driving to the schools.
  - \* Mr. Johansen suggested an alternative to reducing the level of service change was to reserve some trips for the essential government services; don't include them in the available trips for development. He stated that he is not in favor of this alternative because it is difficult already to meet any standard.
- How many years will it be before LOS "E" is reached if this change is approved?
  - \* Mr. Johansen explained that these intersections are at peak capacity right now because of the interchange ramps. Sometimes it is the City's level of service that is at capacity and sometimes it is the ODOT volume-to-capacity ratio that is causing the problem. He estimates that once the additional trips are being approved under LOS "E", these four intersection will be at LOS "E" immediately.

Commissioner Faiman:

- Of the four intersections impacted by the LOS "D" to LOS "E" change, are there any that could remain at LOS "D" without slowing development?
  - \* Mr. Johansen explained that the freeway ramps with ODOT's volume-to-capacity ratio are controlling what is happening at the other intersections. If those are taken out of the LOS "E" change, it would not make any difference. The intersections are currently being analyzed by a progression analysis. If there is a back up at one intersection to the next intersection, and if there is LOS "E" at any one of the intersections, the other impacted intersections also go to LOS "E" very quickly.

Commissioner Goddard:

- Stated that he is familiar with electric utility models and compared a electric utility model and a traffic model. Electric utilities are similar to the freeway interchanges in terms of getting electricity from Point A to Point B as compared to traffic patterns. As in any utility, there are concentrated areas of the system that experience where the desired uses, and in some cases contractually committed uses, exceed the available capacity.
  - \* The solution to lack of capacity is a combination of supply-side solutions, such as adding additional power plants and wires, and demand-side solution, such as asking people to conserve, energy-efficiency measures, and incentives to conserve energy.
  - \* He asked if consideration had given to incentives for reducing the traffic demand side other than the requirement that businesses reduce peak-hour trips. Can the reduction of trips gained by traffic demand management (TDM) and incentives be audited to add some sort of predictability to the demand side of the equation on traffic?
    - Mr. Johansen stated that Ms. Young will be explaining about the commute reduction options later. The only way to audit the reduction of trips is to do an annual count; see physically what is going through the interchange area. He did not know if counting trips from the individual businesses would pay or not. He has been against the "big brother" approach and would not like to get into that much detail.
  - \* Commissioner Goddard referred to his electric utility example and stated that the Federal Utility Regulatory Commission requires that requests for access to a constrained electric system to be evaluated in a non-discriminatory way. When new infrastructure is needed, these improvements are "lumped" in nature and often the resulting capacity exceeds one customer's required use.
    - He suggested that this could be done for traffic. As Mr. Johansen mentioned, it would be difficult to require a single business to pay for a \$25 million interchange.
  - \* Again using the electric utility analogy, there is mechanism that would permit a customer to be reimbursed over time for capacity that is created in excess of that customer's desired use; if the customer had to pay for a \$25 million interchange in order to accommodate their development, they would receive credit back over time.
    - Is there the ability for a number of customers to fund a \$25 million infrastructure improvement together?
    - Mr. Johansen explained that Systems Development Charges (SDCs) and Local Improvement Districts (LIDs) are available as funding mechanisms for collecting funding from businesses to help pay for infrastructure improvements. He gave a brief explanation of these two funding mechanisms.
  - \* Commissioner Goddard suggested that the solution to the capacity problems in the Wilsonville Road/I-5 interchange area would include a combination of supply side improvements, capacity improvements, and demand side improvements in some form. He does not think that reducing the Level of Service Standard should be included in the solution.
    - In the case of utilities, where the demand exceeds the supply, either the demand has to be reduced or the supply increased. Typically it is a combination of both. Suggesting that the solution is that the lights ought to be out 15 minutes a day to accommodate the peak hour is typically not well received and is not usually included in the range of options. There are criteria that prevent utilities from implementing these types of solutions.
    - He thought queuing of trips is reasonable.
    - The demand side alternatives offer some promise and ought to be explored further.

PUBLIC TESTIMONY:

Tim Ramis, representing Fred Meyer Stores, 1727 NW Hoyt, Portland Oregon 97209. Mr. Ramis thanked City staff for moving this issue forward as it critical for Fred Meyer as well as for the City in the

future. He recalled when the Planning Commission was looking at Development Code amendments for establishing a vesting procedure (Ordinance No. 561) so that Villebois could vest some trips, Fred Meyer testified in favor of the Vesting Ordinance because of its support for the Villebois project. Fred Meyer recognizes that this is a team challenge for all and all need to work together to address the issue.

Mr. Ramis thanked the City and Villebois for the team effort in lobbying ODOT for funds for improving conditions at the interchange. The City, Villebois and Fred Meyer Stores have worked together over time to pursue that funding, and Fred Meyer Stores expects to continue this team effort.

Mr. Ramis addressed the issue of the queuing of trips as proposed by Mr. Johansen:

- Fred Meyer Stores would like the opportunity to work with City staff to understand the implications that the essential government services trip exception, and the two different vesting suggestions. Once Fred Meyer Stores' traffic people take a look at these issues, Fred Meyer Stores will submit their comments in writing.
- City staff has asked Fred Meyer Stores about their opinion in regards to taking a position at the back of the queue to the extent that other projects would be allowed to go forward and Fred Meyer Stores to go forward only when the \$25 million fee for the interchange improvements is available.
  - \* Fred Meyer Stores agreed previously to delay their quasi-judicial application so as not to compete with Villebois for the trips and Fred Meyer Stores agreed to do that.
  - \* This time Fred Meyer Stores' position is that if a queue is established to deal with a limited resource, then the right way to do that is in a non-discriminatory fashion.
    - It needs to be first come, first serve. Once the criteria for queuing is established, and an applicant has met that criteria, then it can assume its place in line and as trips become available, the project can move forward.
  - \* It is important to encourage Fred Meyer Stores and other entities to work together with the City to try to provide the funding and the trip reductions and other types of methodologies to create trips and capacity; not bog down the system.
  - \* To say to a developer that the City wants their participation and help, but the reward is that the developer has to move to the back of the line is a disincentive to participation, and is not fair.
- Fred Meyer Stores asks when establishing a queue, the principle of non-discrimination is followed.
- Fred Meyer Stores supports the principal of paying its fair share; its proportionate share. It expects to pay a fair and proportionate share, whether it is done through exactions, or a combination of exactions, SDCs and LIDs. It will not shirk that responsibility. Its past efforts have shown a willingness to do everything possible to pursue all sources of funding.
- He referred to Commissioner Goddard's analogies with the electric utilities and stated that many jurisdictions have a system in place for when there is a lack of service, a person can front the dollars for the creation of additional capacity and then be repaid over time as others connect to the facility.

The Commissioners questioned Mr. Ramis regarding his testimony:

Commissioner Faiman:

- Stated that the Fred Meyer traffic study has yet to be presented to the Planning Commission.
  - \* Mr. Ramis explained that many months ago, Fred Meyer Stores submitted an application to develop to the City and received a completeness letter from the City indicating it was ready to move ahead in the land use process, only to receive a letter from the City stating that a mistake had been made, the application was not complete as the DKS Associates traffic analysis is not complete.
  - \* Mr. Ramis stated that he has instructions to send a letter to the City tomorrow morning requesting that the traffic report be made available as soon as possible.

Susan Myers, Capital Realty Corporation, 101 SW Main, Suite 320, Portland OR 97204. Ms. Myers explained that Capital Realty Corp. owns the Wilsonville Town Center shopping center. She stated that

the change to LOS "E" is a concern because the Wilsonville Town Center has 40-plus businesses and to go to what is essentially gridlock will impact the viability of those businesses.

- She asked that the Planning Commission not consider this change.
- She suggested that the supply and implementing methods to decrease demand is the best way to go.

Ms. Myers referred to Fred Meyer Stores needing 700 trips to develop and there only being 300 trips that would become available under the PFTS, and suggested that would be many years before Capital Realty Corp. could develop its empty pads if the Fred Meyer store is approved, even if the pads only generates 40 trips.

Commissioner Faiman noted that it is LOS "F" that is considered to be gridlock, not LOS "E". Ms. Myers explained that there are already complaints about the traffic in the Wilsonville Town Center area so going to a decreased level of service is not good.

It was explained that 04PC03A and 04PC03B are the applications under review tonight. City staff has requested that 04PC03C, the TDM application, be continued to the October 13, 2004 Planning Commission meeting.

Ms. Young suggested that the Planning Commission confirm with Mr. Ramis that he is asking the Planning Commission to continue the Public Hearings for 04PC03A and 04PC03B, as he did not specifically make that request. Commissioner Hinds asked Mr. Ramis to clarify the intent of his testimony in regards to continuing the Public Hearings. Mr. Ramis stated that Fred Meyer Stores would like more time to review what is being proposed. He requested that the Planning Commission continue the Public Hearings for 04PC03A and 04PC03B to the October Planning Commission meeting.

The Commissioners discussed whether to continue the Public Hearing on 04PC03A.

Commissioner Faiman:

- Asked about the practical implications of a delay.
  - \* Mr. Johansen stated he did not see a problem with delaying the public hearing.
  - \* Assistant City Attorney Paul Lee suggested that a practical effect of the Planning Commission continuing 04PC03A tonight is that people who have applications into the City are continuing those applications in anticipation of the outcome of this process. If their application generates enough traffic to make the LOS "D" fail, they face a denial of their application.
  - \* Ms. Young reported that there are public hearings scheduled before the Development Review Board (DRB) for proposed applications through October. These public hearings would not have been scheduled if their projects faced denial because of the trip issue.
    - Developers call the City to ask if additional trips have become available; they are waiting to see what happens with this proposed PFTS. She does not know how many developers are waiting to be able to develop. She suggested that these are mostly small developments.
    - There are several Villebois applications scheduled for public hearings before the DRB. Villebois has 445 vested trips.
    - There are other applications for development north of Boeckman Road that are not impacted by the Wilsonville Road/I-5 interchange trip deficiency.
  - \* Mr. Ramis clarified that his continuance request was specific to review the queuing process. He suggested that the Staff Report poses a number of policy questions and Fred Meyer Stores would like to discuss the implications of the policy issues with City staff before they submit something in writing.
  - \* Commissioner Faiman asked Mr. Ramis what the effect of approving everything tonight except for the queuing process would have on Fred Meyer Stores, and if there was any practical benefit to this.

- Mr. Ramis answered that if moving everything forward but the queuing process is useful, he would support it.
- \* Commissioner Hinds stated that she is in favor of continuing the Public Hearing for 04PC03A in its entirety, as she would like more time to review the Staff Report.
- \* Mr. Lee explained that because people are waiting, the practical effect of the delay relates to the queuing issue being resolved and carving this one part out of the PFTS proposal doesn't make a much difference. Moving all of the PFTS together is an efficiency move.
- \* Commissioner Goddard, Commissioner Maybee, Commissioner Faiman, Commissioner Guyton indicated they would favor continuing 04PC03A to the October 13, 2004 Planning Commission meeting. Commissioner Juza indicated that she was prepared to make a decision tonight on it.
- \* Commissioner Faiman suggested that the Planning Commission should extend the courtesy of continuing the Public Hearing for 04PC03A to Fred Meyer Stores.

There was a Planning Commission consensus to continue the Public Hearing on 04PC03A to the October 13, 2004 Planning Commission meeting.

**B. FILE NO. 04PC03B**

**APPLICANT:** City of Wilsonville

**REQUEST:** A proposal to change the Level of Service from "D" to "E" on Wilsonville Road between and including the intersections with I-5, Boones Ferry Road and Town Center Loop West and on portions of Boones Ferry Road adjacent to those intersections as authorized by Wilsonville Transportation Systems Plan Policy 4.1.1, and to exempt "essential government services" from all Level of Service standards.

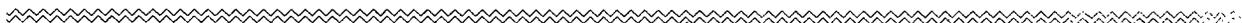
Commissioner Hinds opened the Public Hearing for 04PC03B at 7:40 p.m. She noted that this item had been discussed already during the 04PC03A Public Hearing. She asked if there were any additional testimony specific to this issue. No one in the audience indicated that they wanted to offer additional testimony on this item. Commissioner Goddard noted that some of his earlier comments offered during the 04PC03A Public Hearing are relevant to 04PC03B.

Councilor Kirk asked Mr. Johansen to discuss essential government services and the impact of a commuter rail station, and the history of when a prior Planning Commission discussed how essential government service trips are not to take trips from nonessential government services in the queue and prevent them from being approved. He understands that what is being proposed in 04PC04B is a change from what has been discussed in the past.

- Mr. Johansen explained that the when traffic reports are done, two different runs are done: one as if the essential government service was not recognized and is discounted from the calculations, and the second run includes the essential government services.
  - \* The Level of Service is done based on the runs without the essential government services.
  - \* Development will be approved even if the essential government service trips cause an LOS "F". The change is that under this circumstance there is not the buffer that there is now.
  - \* Councilor Kirk suggested that if the Wilsonville Road/I-5 interchange area is already at LOS "E", and if the commuter rail comes in as an essential government service, and the interchange area goes to LOS "F", then it would be denied.
    - Mr. Johansen explained that under this proposal, the commuter rail station would not be denied even if it creates an LOS "F" situation.
- \* Commissioner Faiman noted that Mr. Johansen had suggested two alternatives for the essential government services; exempt them or reserve trips for them.

- \* Councilor Kirk asked Mr. Johansen to provide information regarding the number of trips that the commuter rail station would generate at the October 13, 2004 meeting.

**Commissioner Maybee moved to continue the Public Hearings for 04PC03A and 04PC03B to the October 13, 2004 Planning Commission meeting. Commissioner Faiman seconded the motion, which carried 6 to 0.**



**04PC03A**  
**Public Facilities Transportation Strategy**  
**and**  
**04PC03B**  
**LOS "D" to LOS "E"**  
**Planning Commission**  
**Record Index**

**Included in the September 8, 2004 Planning Commission Meeting Packet:**

Memorandum dated September 1, 2004, from Sandi Young regarding PFTS Policy Memo Draft Resolution No. 04PC03A including:

Attachment 1; A Community Development Staff Report (04PC03), dated September 1, 2004, from Eldon R. Johansen, regarding Public Facilities Transportation Strategy, with the following Exhibits:

- Exhibit 1: A Community Development Memorandum dated August 23, 2003, to Arlene Loble, from Eldon Johansen regarding Wilsonville Road/I-5 interchange; with an attached memorandum dated August 28, 2003, from Ransford S. McCourt and Scott M. Mansur, of DKS Associates, regarding I-5/Wilsonville Road Interchange Capacity Memo.
- Exhibit 2: Ordinance No. 561.
- Exhibit 3: Summary of Trip Vesting, 2/2/2004
- Exhibit 4: A letter dated August 27, 2004, from Randsford McCourt of DKS Associates, regarding Public Facilities Transportation Strategy Traffic Analysis.
- Exhibit 5: Public Facilities Transportation Strategy
- Exhibit 6: Historical PM Peak Hour Count Data
- Exhibit 7: Public Facilities Transportation Strategy, Projected Growth From 2000 to 2020.
- Exhibit 8: Section 2.7 "Traffic Levels of Service" from the Transportation Systems Plan.

**PLANNING DIVISION  
STAFF REPORT**

**Date:** September 1, 2004  
**To:** Planning Commission  
**From:** Sandi Young, AICP, Planning Director  
**Subject:** PFTS Policy Memo

---

**Summary:** The attached staff report from Eldon Johansen contains the Findings of Fact and conclusionary findings in support of the proposed Public Facilities Transportation Strategy. This memo is a concise summary of the various policy decisions embedded in the proposed resolutions.

**Policies:**

1. Change in LOS from "D" to "E" at the impacted intersections.
2. Exemption of "essential government services" from all LOS limits.
3. Queuing of trips at either State I or at Stage II development review.
4. Develop new SSSDCs to pay for transportation system improvements
5. Work towards a more permanent solution to capacity issues before the 5-year sunset of the PFTS
6. Adoption of a trip reduction ordinance in addition to the standard 'build our way out' approach of constructing transportation improvements.

**Options:**

- a. Amend Chapter 4 of the Development Code to include the TDM provisions from the TSP. This option would apply to future development only, and would be a stand-alone amendment which would not sunset with the PFTS. This option would be administered first by the Development Review board with monitoring of TDM Plan compliance by SMART. However, since the severe limits on capacity at the impacted intersections will limit the amount of approvable development, the incremental trip reduction would be very small.
- b. Incorporate the requirements of the ODEQ Employee Commute Options into either an ordinance or into the City Code. This option would require all existing and new employers of 50 or more employees at a single worksite to submit a trip reduction plan that reduces existing trips at each site by 10% within three years. SMART would administer this option. This option would apply to existing businesses as well as new businesses. These options would result in a far greater gain in trip reduction since



existing employers with high trip generation would be included. There are about 6000 total employees working in businesses employing 50 or more at a site. A rough estimate @ 10% reduction in 3 years is a reduction of 600 trips, or 200 trips each year which would exceed the needed 100 trip annual reduction. If this option is incorporated into the PFTS, it would sunset with the PFTS. If it is not in the PFTS, then some other legal methodology must be found for adoption that would apply to existing as well as new businesses.

At this time, staff requests discussion of the TDM options, and direction in drafting a resolution for your review and action at the October meeting.



**COMMUNITY DEVELOPMENT  
STAFF REPORT (04PC03)**

**Date:** September 1, 2004  
**To:** Planning Commission  
**From:** Eldon R. Johansen, Community Development Director  
**Subject:** Public Facilities Transportation Strategy

**Attachment 1 to**  
Resolution 04PC03A and  
Resolution 04PC03B

**Problem Summary**

Interstate-5 (I-5) runs north to south through Wilsonville and forms an interchange with Wilsonville Road approximately one mile north of the Boone Bridge. This interchange is constructed at right angles over Wilsonville Road with on and off ramps on both the north and south sides of Wilsonville Road. The interchange configuration is commonly described as a diamond-shaped interchange.

In 1982, the City's acknowledged Comprehensive Plan identified the I-5/Wilsonville Road Interchange as a potentially limiting factor to development. It noted at page 20 that, "*The Transportation Report also identified a structural deficiency of the Wilsonville Road underpass. The design of the underpass will result in a 40% to 120% over-capacity condition on Wilsonville Road.....*"

The referenced transportation report (Report on Transportation, City of Wilsonville, March 23, 1981 by Carl Buttke, Consulting Transportation Engineer) included a projection of Year 2000 traffic volumes. By 1994, growth in the City had caused the projected Year 2000 volume to be exceeded, causing an over-capacity situation. The 2010 projected traffic volumes for the City's 1991 Transportation Report update were also exceeded.

By 1994, the lack of capacity in the Wilsonville Road/I-5 Interchange was causing City intersections immediately to the east (Wilsonville Road and Town Center Loop West) and to the west (Wilsonville Road and Lower Boones Ferry Road) to operate in excess of LOS "D", thus violating the concurrency policies and standards found in the City's Comprehensive Plan and Development Code. The Development Code, at that time, stated in part,

*(4) A planned development permit may be granted by the Planning Commission only if it is found that the development conforms to all the following criteria, as well as to the Planned Development Regulations in Sections 4.130 – 4.140."*

*(b) that the location, design, size and uses are such that traffic generated by development at the most probable used intersection(s) can be accommodated safely*



*and without congestion in excess of Level of Service "D" defined in the Highway Capacity Manual published by the National Highway Research Board on existing or immediately planned arterial or collector streets and will, in the case of commercial or industrial developments, avoid traversing local streets.*

City Comprehensive Plan Policy 3.3.3 stated that,

*"If the proposed development would cause an existing street to exceed minimum services capacity, then appropriate improvements shall be made prior to occupancy of the completed development. Said improvements may be deferred if they are scheduled and funding is confirmed through the City's Capital Improvement Plan for construction within two years of the date of occupancy, provided that such a postponement of improvements would not seriously endanger public health and safety. In such case, interim improvements shall be required."*

On August 17, 1994, the Council adopted an ordinance approving a traffic management program and procedures for allocating traffic capacity in the vicinity of the I-5/Wilsonville Interchange. This was subsequently declared to be a moratorium by LUBA. During this time, staff worked with the legislature and the Metro Homebuilders Association to develop revised statutes concerning public facilities strategies.

Subsequently, on October 7, 1996, the Council adopted Ordinance No. 463 which approved a Public Facilities Transportation Strategy for development in the Wilsonville Road Corridor due to lack of street capacity in the Wilsonville/I-5 Wilsonville Road Interchange. This ordinance required all new developments to file traffic management plans for reduction in PM peak hour trips. Developments, *for which the most probable intersection(s) were determined not to be the impacted intersections, and all public agencies*, were exempted from the requirements of the ordinances. Total trip allocation was limited to 1435 PM peak hour trips through the intersections of Wilsonville Road with Boones Ferry Road and Town Center Loop West. Trips were to be allocated after Stage II approval. All 1435 trips have been allocated. Ordinance No. 463 sunset by legislative action.

The 2003 Transportation Systems Plan was adopted by Council on June 2, 2003. In a parallel action, the City worked with Metro and ODOT to develop the Wilsonville Freeway Access Study. The Transportation Systems Plan provided the overall policy and facilities guidance for the City's transportation system. The Freeway Access Study addressed the needed construction at the interchanges and the required local street system within Wilsonville to most efficiently provide adequate freeway access.

The primary conclusion of the Freeway Access Study was that the Stafford Interchange and the Wilsonville Road Interchange could provide adequate interchange access and egress capacity through the year 2020 provided there were substantial improvements at the Wilsonville Road Interchange and that the local street system was improved. The project also included potential phasing in the improvements at the Wilsonville Road Interchange. The City provided funding in the amount of \$3.5 million dollars for the initial phases of the Wilsonville Road Interchange improvements. The budgeted improvements would provide additional capacity for 702 PM peak hour trips.

## **Background**

In the summer of 2003, the City had exhausted the available capacity on Wilsonville Road between Town Center Loop West and Boones Ferry Road with existing plus previously approved projects.

In the budget for FY 2003/04, Council included \$3.5 million dollars for initial interchange improvements. After a project is planned and funded that capacity from the improvement can be used to meet concurrency requirement. The improvements resulted in an additional 702 PM peak trips through the Wilsonville Road Interchange area. The community development memorandum with the traffic report from DKS and the estimate of trip availability are attached as Exhibit 1.

The City was working with Costa Pacific and Metro to plan an urban village on and near the former Dammasch state hospital property. This development would require approximately \$60 million in infrastructure improvements by the developer and approximately \$70 million by the City and other government agencies for the project to be completed. To ensure that the development could proceed, the City developed an ordinance, which allows vesting in capacity in the interchange area. This was approved by Ordinance No. 561 and a copy is attached as Exhibit 2.

The additional 702 PM peak hour trips that became available from the \$3.5 million interchange project were very quickly allocated to Stage II projects and to vested projects. The lists of projects that use these trips are attached as Exhibit 3.

Staff has continued to work with DKS and SMART to develop a transportation strategy that will maintain a satisfactory level of service on Wilsonville Road between Town Center Loop West and Boones Ferry Road while also allowing the development of an adequate supply of housing and commercial and industrial facilities. Our initial efforts have been largely unsatisfactory.

In our approach we first looked at the additional demands for capacity through the Wilsonville Road Interchange area. Planning staff did a detailed review and developed a list of projects which could be reasonably expected to request planning approval in the next five years. This list was forwarded to DKS to include in the traffic model and determination of the trip generation for each proposed development. The overall list is included in the draft Public Facilities Transportation Strategy Traffic Analysis by DKS dated August 27, 2004 (Exhibit 4) in Table 2.

In April 2004, staff provided the overall summary of the situation with regards to traffic capacity in the Wilsonville Road/I-5 Interchange area to the Planning Commission as well as the initial ideas for establishing a public facilities strategy. This report is attached as Exhibit 5.

## The Concept

In this paragraph I will very briefly describe the overall concept to continue to have traffic capacity in the Wilsonville Road Interchange area for the next three years. In the following paragraphs I will give a more detailed analysis of each of the items in the concept.

The concept is as follows:

**Increase the capacity of the Wilsonville Road/I-5 Interchange area by constructing improvements for the intersection of Boones Ferry Road and Wilsonville Road and major improvements at the Wilsonville Road Interchange.**

**Decrease traffic through the interchange area by continued construction of the City street system, implementing the commute reduction program that is required by DEQ, and planning for the ongoing change in driving habits as the Interstate becomes increasingly congested and a greater percentage of the trips generated in Wilsonville are to Wilsonville destinations, thereby reducing the traffic through interchange areas.**

**Change the LOS from "D" to "E" in the interchange area.**

**Establish a queuing system so that there is a reasonable progressive system for property owners to obtain development approval.**

**Develop a new or revised supplemental street systems development charge to pay for part of the improvements at the intersection of Boones Ferry Road and Wilsonville Road and at the interchange.**

**Include a method to "sunset" the strategy when it has met current and planning goals.**

## Additional Capacity

The budget for fiscal year 2003/04 and the following budget for FY 2004/05 both include funds for modification of the Wilsonville Road Interchange. The capacity for the overall section on Wilsonville Road from Town Center Loop West to Boones Ferry Road has been allocated to previously approved Stage II projects and vested projects.

Additional capacity is needed at the intersection of Boones Ferry Road and Wilsonville Road to allow continued development. The Transportation Systems Plan includes a requirement for two west bound to south bound lanes and also an additional north bound right-turn lane.

As far as the addition of capacity in the Wilsonville Road Interchange area, these two projects will, for the next several years, be the only projects that can be funded which will add capacity and that capacity has been allocated to previously approved and vested trips.

One future project included in the TSP is the addition of a second left-turn lane in each direction from Wilsonville Road onto I-5 and the improvement of all of the I-5 ramps at Wilsonville Road to provide additional capacity. This project has an estimated cost of \$25 million and is currently

not funded. The traffic study at Exhibit 4 is being refined to capture the advantages of this project.

As an alternate, DKS has looked at a split-diamond at the Wilsonville Road Interchange. This is most likely a very good idea that is too late. The construction would have serious impacts on the single family and multi family units that are being constructed at the Village at Main Street. The bottom line is that it will probably be too expensive to construct a split-diamond at the Wilsonville Road Interchange and we will need other methods of obtaining capacity.

### **Reduced Demand**

There are four primary ongoing activities that will reduce traffic at the Wilsonville Road Interchange in the PM peak hour. Three of these activities are ongoing and will happen in due time without any action by the City to make them happen or to accelerate them.

#### Street Construction

The first of these is the ongoing completion of the City street system. These items will be included in the ongoing Five Year Capital Improvement Plan and the annual budget, or as funds are available and each project will have some impact on the Wilsonville Road Interchange. A summary of the potential impacts is attached as Exhibit 4 in Table 4.

#### Congestion

The second item in our trip reduction will be the increase in congestion on Interstate 5 in the Wilsonville area during the PM peak hour and the increase in tendency for Wilsonville residents to use alternate routes or to modify their driving habits to minimize use of I-5 during congested periods.

The Freeway Access Study indicates that the Interstate will become increasingly congested over the years. It also indicates that as this happens there will be less traffic attempting to use the on and off ramp at Wilsonville Road. Staff has attempted to see if there is any validity to this assumption and the answer is clearly yes. Attached as Exhibit 6 is a record of the historical counts from 1992 to 2004 for the Wilsonville Road intersections at Boones Ferry Road, the I-5 southbound ramps, the I-5 northbound ramps and Town Center Loop West. Also attached is a graph that shows the PM peak hour vehicles at each of these intersections.

We have also tried to review the historic data to see if there is any support for the projection that the use of the Wilsonville Road Interchange will increase at a slower rate than the growth population and jobs. Also, attached as Exhibit 6 is a comparison of the 1990 and the 2000 data for households in the City, jobs in the City and the on and off ramp counts at Wilsonville Road. The growth overall on the interchange has been much less than the growth in households and jobs. There really is not enough solid data to draw any firm conclusions.

### Internal Trips

Population, the jobs and the commercial activities in Wilsonville continue to grow. There will be a higher percentage of the trips that will be internal to the City with less traffic as a percentage of the total trips going onto the freeway.

### Commute Trip Reduction

Businesses with over 50 employees at a single worksite are required by ODEQ to have a commute reduction program. The reduction in traffic from implementation of this program has the potential to be substantial. It would provide a good cushion.

I have looked at the overall projected growth as compared to the projected growth in traffic through the Wilsonville Road area and a summary of this review is as Exhibit 7. The comparison does verify that the traffic projections through the Wilsonville Road Interchange area are less than the projected growth in the number of households and jobs. It appears that we would need a reduction in approximately 100 PM peak hour trips per year between now and 2020 to match the traffic projections.

### Procedure

The reduction, because of changes in driving habits, is not something that is typically picked up in our methodology for doing traffic studies for individual developments in projecting the future capacity. A part of the change in driving habits will happen almost without any assistance on the part of the City and we need a method of determining what this change is so that it can be used to allow for added growth. The desired and recommended solution on the part of staff would be to only count the additional capacity available from the change in driving habits as being available for future growth when the change is actually verified by traffic counts. With this suggested approach we would do a detailed count of each intersection on a three-year basis and update the projections of available capacity based on these counts. This will be a substantial challenge in obtaining valid counts because whenever the interstate is moving slowly, there is a backup on the City streets and the volumes will be accordingly reduced. If we do not properly consider this reduction we could substantially overestimate the available capacity for development. Even with this caveat, it appears that doing counts every three years would be more realistic and more conservative than basing the estimates for the change in driving habits on 20-year traffic projections.

The commute reduction is a State requirement for employers with more than 50 employees. The overall policy and procedures for the trip reduction program need to apply to the whole City and will be included in a separate ordinance.

### Change LOS for Concurrency from "D" to "E" in the Interchange Area

The section of Wilsonville Road from Town Center Loop West to Boones Ferry Road has two separate level of service requirements. For the City requirements, we use the LOS "D" as we do for the remainder of the City. A LOS "D" would best be described as having a control delay for a signalized intersection at an overall average of less than 55 seconds. For the interchange ramp, ODOT uses a volume to capacity ratio of less than 1 as their standard for level of service. In the various traffic reports you may see either a V/C, which is volume to capacity or sometimes in

future projections, the terminology is D/C, which is demand/capacity. Information on level of service descriptions from the Transportation Systems Plan is attached as Exhibit 8.

In developing the transportation systems plan it became apparent that sometime in the future some of our signalized intersections would need to have the standard changed from LOS "D" to "E". Policy 4.1.1 of the TSP states that the City of Wilsonville shall:

*"Design the City street system per the street standards set forth in this Transportation Systems Plan and to meet LOS "D", which is the standard in the City. As may be approved by the City Council, possible exceptions to the LOS "D" standard are a change to LOS "E" on Boones Ferry Road and/or Elligsen Road, and on Wilsonville Road between and including the intersections with Boones Ferry Road and Town Center Loop West. Other capacity improvements intended to allow continued development without exceeding LOS "E" may also be approved by the City Council in permitted locations."*

It is apparent that the change from LOS "D" to "E" is needed at this time.

Our current Wilsonville Code has an exception to the LOS "D" standard for essential government services. This exception will need to be reviewed when and if we change to LOS "E". The primary reason for this is that although there is an exception for essential government services, it will only apply as long as the exception does not result in a LOS "F". With the change to LOS "E", we need to determine if the exception can take the City to a LOS "F". My recommendation would be that we delete the limitations on LOS "F" for essential government services recognizing that the services are essential and need to be accommodated. The other alternative would be to reserve part of the capacity for essential government services if we decide that we did not want to go to LOS "F" under any circumstances.

The change in the Wilsonville Code from LOS "D" to "E" for the area of Wilsonville Road between Town Center Loop West and Boones Ferry Road and the consideration of the change for essential government services will be included for consideration in a separate ordinance.

### Queuing Systems

Currently, we do not have a queuing system. When a project is proposed for Stage II approval, we have the options of 'approval', 'denial' or 'approval with conditions'. We did establish a vesting system to consider that if the developers of Villebois Village spent approximately \$60 million dollars to install infrastructure, that they would be able to continue development by paying for capacity in the Wilsonville Road Interchange. The capacity from that vesting system has been committed and there is no additional capacity available.

There are two separate methods of establishing a queuing system that staff has discussed. First is to follow the overall guidelines what were in the vesting systems and establish the queue based on the approved application under the queue system upon Stage I Master Plan approval. This would establish a system whereby a property owner could ensure that they would be able to obtain capacity whenever it was available. We would need to have a traffic report at the Stage I Master Plan approval that was more detailed than typically required for a Stage I approval in that

they would need to be able to project the traffic impact on the Wilsonville Road/I-5 Interchange area from the traffic study.

With the system for queuing based on Stage I Master Plan approval, the property owner would not have to go through a very complete and expensive planning approval to enter the queue and would be able to adjust detailed use of this property at the time they submitted for Stage II. After entering the queue, the property owner would be allowed to submit for Stage II approval when capacity was projected as being available (the project is planned and funded) or demand has been reduced.

The alternative to entering the queue at Stage I Master Plan approval would be to establish the queue based on the date of Stage II planning approval with the planning approval being granted subject to availability of capacity at the Wilsonville Road/I-5 Interchange area. The advantage of this system is that it would almost eliminate the potential speculation involved in approval at the Stage I Master Plan level because somebody would not go forward at the late Stage II approval unless they were reasonably certain that they would build. The disadvantage is that a project could have Stage II approval and be on hold for several years pending the availability of capacity in the Wilsonville Road Interchange area.

#### **Supplemental Street Systems Development Charge**

The City has advertised for a public hearing on a revised supplemental street systems development charge for the interchange area of \$3,000 for PM peak hour trips for the 702 trips that have been allocated. As a separate action, part of the strategy will be to determine how to pay for the additional construction that is required as part of this strategy. We can do a new supplemental street systems development charge and call it SSSDC3 or we can revise the SSSDC that has been proposed for hearing on September 20, 2004 to include the additional capacity and additional costs.

#### **Sunset**

The requirements for the Public Facilities Transportation Strategy cannot be an on-going permit strategy. It will need to be reviewed after two-years and can have three one-year extensions. We need to ensure that the time that we gain by adopting this strategy leads to a more permanent long-term solution. This could include a split-diamond interchange, a Boeckman interchange or other "out of the box" solutions.

#### **Not in present concept for the Public Facilities Transportation Strategy**

There are several good ideas that have not been included in the concept for the Public Facilities Transportation Strategy either because of timing or cost considerations. Some of these items are as follows:

##### **The Split-Diamond**

A split-diamond interchange in the vicinity of Wilsonville Road was an idea that has been discussed at various times through the 90's and the Freeway Access Study indicated that improvements to the Wilsonville Road Interchange would provide adequate capacity through 2020. It appears that the growth could be more rapid than was indicated in the Freeway Access

Study and in the DKS report they have recommended looking at a split-diamond interchange in lieu of addition of the left turn lanes.

Staff will do a little bit of additional analysis on this but our initial impression is that this is an idea that has been overcome by very rapid development in the Village at Main Street area which would preclude the split-diamond interchange.

### Development Rights

One of the items recommended for consideration by the Planning Commission was that we acquire the development rights to some properties to preclude development which would have a severe impact on the Wilsonville Road Interchange area.

This is an idea that would make sense if we had a funding mechanism that would work with this concept and if this concept would work with the overall ideas for regional development. Staff will keep this idea on the back burner, however, right now there is no intent to push this concept unless a real opportunity develops for implementation.

### Implementation Measure 3.1.2.c

Where a shortage of facilities/services exists or is anticipated in the near future, and other alternatives are not feasible to correct the deficiency, the City shall take steps to implement a moratorium on development activity or to manage growth through a public facilities strategy as provided by statute. In the event that State laws provide other alternatives to address shortages of facilities/services, the City will consider those alternatives as well.

### Applicable Concurrency Goals, Policies and Standards

#### Comprehensive Plan ~ Policy 3.1.2

The City of Wilsonville shall provide, or coordinate the provision of, facilities and services concurrent with need (created by new development, redevelopment, or upgrades of aging infrastructure).

#### Implementation Measure 3.1.2.a

Urban development will be allowed only in areas where necessary facilities and services can be provided.

#### Implementation Measure 3.1.2.b

Development, including temporary occupancy, that threatens the public's health, safety or general welfare due to a failure to provide adequate public facilities and services, will not be permitted. Development applications will be allowed to proceed on the following basis:

1. Planning approvals may be granted when evidence, including listing in the City's adopted Capital Improvement Program, supports the finding that facilities/services will be available within two years. Applicants may be encouraged or required to plan and complete development in phases in order to assure that the rate of development does not exceed the capacity of needed facilities/services.

2. Building permits will be issued when planning approvals have been granted and funding is in place to assure completion of required facilities/services prior to occupancy. Applicants must sign a statement acknowledging that certificates of occupancy will not be given until adequate facilities/services, determined by the Building Official after consulting with the City Engineer, are in place and operational. Parks, recreational facilities, streets and other transportation system improvements may be considered to be adequately in place and operational if they are listed in the City's adopted Capital Improvements Program or other funding is committed for their completion within two years. In such cases, water, sewer and storm drainage facilities must be available, to the satisfaction of the City Engineer, on at least a temporary basis prior to occupancy.
3. (Not directly applicable).

The City shall take the following steps to reduce VMTs and overall reliance on single occupancy vehicles:

1. Review all land use/development proposals with regard to transportation impacts. All development proposals shall be required to pay for a transportation impact analysis, unless specifically waived by the City's Community Development Director because the information is not needed.
2. Seek to minimize traffic congestion at the freeway interchanges as well as on local arterial and collector streets.
3. Seek to reduce the number and length of home-to-work trips.
4. Seek a balanced mix of activities which encourage consolidation of automobile oriented trips and encourage design and location of complementary activities that support public transit, ride-share programs and use of other alternative modes of transportation.
5. Require large developments and high employment and/or traffic generators to design for mass transit and to submit programs to the City indicating how they will reduce transportation impacts. All such proposals shall be subject to review by SMART, and if applicable, ODOT. Maximum parking limits shall be used in conformity with Metro standards.
6. Seek location of a permanent park and ride station as well as a commitment from Tri-Met to upgrade transit service to the greatest extent possible, in coordination with SMART. Note the potential need for a commuter rail station in conjunction with the park and ride lot.
7. Accommodate the expected growth in population and employment and the resulting transportation needs, the City by expanding local bus service in the residential and employment areas, continue to improve arterial and collector street networks, a bikeway system, ride-sharing programs including carpools and vanpools and encourage staggered or flex-time work-hour schedules.
8. Take steps to improve connectivity between existing neighborhoods and between residential areas and traffic generator locations. Also, work to provide more and better options for travel from one side of the freeway, the railroad and major drainage courses to the other planned streets.

9. Increase densities and intensities of development in or near the Town Center area and n other locations where transportation systems can meet those needs.
10. Improve the balance between housing, employment and commercial activities within the City in order to reduce commuting.

#### Implementation Measure 3.1.6.p

The City recognizes the value of the railroad to industrial growth in Wilsonville and will encourage the railroad and the State of Oregon to maintain quality service and provide needed improvements, rail crossings and signalization, etc. System expansion to accommodate commuter rail service shall be strongly encouraged.

#### Implementation Measure 3.1.6.cc

If adequate regional transportation services, including I-5 Interchange modification or additions, and high capacity public transportation cannot be provided, then the City shall reevaluate and reduce the level of development and/or timing of development anticipated by other elements of this Plan. Such reductions shall be consistent with the capacity of the transportation system at the time of reevaluation.

### **Transportation Systems Plan**

#### Goal 8.1

To develop and implement transportation demand management strategies to decrease the use of single occupancy vehicles, to decrease the need for costly additions to the roadway system and to minimize air pollution.

#### Implementation Measure 8.1.1.d

Amend the City's Development Code to require new large developments and high employment and/or traffic generators (i.e. new businesses that bring at least 50 new on-site employees to Wilsonville) to submit transportation demand management programs to the City indicating how they will reduce transportation impacts, the activities they intend to undertake, and how they will implement these activities. All such proposals shall be subject to review by the City Engineer, SMART, and if applicable by ODOT. The City shall coordinate all employer-based TDM efforts with Oregon DEQ to avoid duplicative requirements.

#### Implementation Measure 8.1.1.f

Allow for a reduction from minimum parking standards for developers who implement a transportation demand management program approved by SMART. Those parking spaces devoted to the transportation demand management plan should be excluded from the required parking maximum calculations in subsequent changes of use of the property, subject to approval by the Development Review Board.

**Implementation Measure 8.1.3.b**

Establish a transportation demand management program to work with area businesses and market travel demand management and commuting alternatives. Provide incentives that encourage employees to reduce SOV commute trips. Identify a lead individual within the City to be responsible for program coordination.

**Implementation Measure 8.1.3.f**

Coordinate with ODOT, Metro, Tri-Met and the Counties of Clackamas and Washington on the development of park-and-ride areas and transfer stations at freeway interchanges, and the planned commuter rail station in Wilsonville to ensure that service is coordinated and allows for inter-modal connectivity.

**Implementation Measure 8.1.3.g**

Develop and adopt City policies which encourage reduced reliance on the automobile by City employees and allow the City to act as a role model for other Wilsonville employers. These policies shall include provisions for flex and compressed workweek schedules, telecommuting, preferred parking, and other policies that encourage the use of alternative transportation modes.

**Implementation Measure 8.1.3.h**

Assist in the provision of alternative transportation options that provide a link between employment sites, retail services and transportation transfer points for both mid-day and commuting trips. These transportation options could take the form of shuttles or vanpools between park-and-ride lots or commuter rail stations and employment sites. Other options could include small alternative-fuel vehicles, scooters or bicycles.

COMMUNITY DEVELOPMENT MEMORANDUM

**Exhibit 1 to  
04PC03A and 04PC03B  
Staff Report**

Date: August 28, 2003  
To: Arlene Loble, City Manager  
From: Eldon R. Johansen, Community Development Director  
Subject: Wilsonville Road/I-5 Interchange

---

The 1656 trips from the last round of interchange improvements have been committed with projects with the existing traffic plus the projected traffic from previously approved Stage II projects. In looking at the interchange capacity, we have been looking at the intersections on Wilsonville Road from Town Center Loop West to Boones Ferry Road as an interconnected group of intersections that needs to be analyzed as a group rather than individually.

The Wilsonville Freeway Access Study recommended \$20.3 million dollars in Wilsonville Road Interchange improvements, which were to provide adequate access to Interstate 5 through 2020. In this memorandum I refer to the \$20.3 million as Alternate C. In addition, the work by DKS included a recommendation for \$2.2 million dollars in early improvements to provide added capacity.

The city capital improvement budget for this fiscal year includes \$3.5 million dollars for the initial interchange improvements. This includes the cost of the recommended improvements plus additional design funds. In addition, the city has been working to get additional OTIA funds that when combined with city funds could be used to construct the full \$20.3 million dollars in improvements.

DKS has analyzed the interchange capacity and the results for the \$3.5 million improvements are summarized in the attached draft memorandum dated August 22, 2003. The report provides a capacity analysis for two short-term alternatives. A follow-up report will be prepared for the \$20.3 million in interchange improvements and the Boeckman extension from 95<sup>th</sup> Avenue to Tooze Road will be completed later. My initial review of the report has been completed and my comments are as follows:

### **Existing Capacity Utilization**

Enclosed as Attachment 2 is a rough estimate of overall trip capacity under existing and projected alternatives. In comparing our existing plus our previously approved Stage II volumes with the estimated capacity at Level of Service D, the city intersections are at capacity. On the other hand there is no deficit so in prorating the cost for interchange improvements there would be no necessity to charge part of the improvements against existing users. The southbound and northbound ramps would both be in a deficit situation under Level of Service D conditions. At Level of Service E, the city intersections would have additional capacity available and there would be some deficiencies for the interchange ramp. In calculating future supplemental street systems development charges, we will have enough contributions from the Urban Renewal Agency to cover the deficiencies in the ODOT intersections so there is no reason to include the capacity for existing users in the supplemental street calculations.

### **Initial Improvements**

DKS looked at two separate near-term initial improvements, the first titled Alternative A used shared eastbound and westbound through left turn lanes. The details are on Page 5 of the DKS report. The other near-term alternative was titled Alternative B and included a double westbound left turn lane. This is also described on Page 5 of the DKS report. My initial opinion is that Alternative A is the safer approach since it maintains the current lane width through the interchange area. It also provides added eastbound to northbound I-5 capacity for the AM peak hour traffic. Although narrowing the lanes as needed to Alternative B would not be fatally flawed, it would cause additional consternation for the engineers on city staff and on ODOT staff. It would also require an exception to ODOT design policy.

One concern that has been identified by the engineers about the present interchange is the inability of drivers on Wilsonville Road to see the traffic signals at the ramps. This will need to be corrected either during the initial improvements or when the Alternate C improvements are constructed. Since the city will be contributing a fair amount to Alternate C, it would make sense to look at the cost of modifying the grades prior to accomplishing either Alternative A or B and to make these improvements as part of the Alternative A or B improvements with the understanding that the city's funds to modify grades would be counted in the City portion of the \$20.3 million project. If the \$20.3 million project is delayed it may be prudent to defer grade improvements since the contribution to the larger project could be irrelevant.

### **Long-Term Alternative (Alternate C)**

The long-term alternative for the full interchange improvements as described in the Freeway Access Study will be analyzed later.

### **Available Intersection Volume**

DKS used the linear growth method to project available intersection volumes. They carefully pointed out that this is a hypothetical exercise to provide a frame of reference as to how much traffic may be added to the interchange area beyond the existing plus Stage II scenario. In the Linear Growth Method they first determine the configuration of each intersection and then start adding trips to the existing plus previously approved Stage II trips until an intersection would fail. In this method they added both critical and non-critical movements to arrive at the failure point. We also used the Linear Growth Method in the original Public Facilities Transportation Strategy and it proved to be a reasonably accurate and conservative method of projecting future growth.

The Freeway Access Study for the 2020 timeframe was showing a substantial reduction in trips at the Wilsonville Road Interchange because the Interstate was clogged and traffic was using other routes. This reduction for traffic projections because of changing driving habits is something that may or may not happen, and if it does happen it will be a few years in the future. For this reason, the traffic report by DKS and the staff projections for the short-term have not considered this change in driving.

### **Additional Trips Available for Future Development**

With the Public Facilities Transportation Strategy we used the trips through the Wilsonville Road intersection with Boones Ferry and with Town Center Loop West as the basis for determining the number of trips. On Attachment 2, I have used that same basis for trip projections to determine the potential for development with various alternatives. The complete summary is at Attachment 2. The thumbnail sketch is as follows:

| <b><u>ALTERNATIVE</u></b>             | <b><u># OF TRIPS</u></b> |
|---------------------------------------|--------------------------|
| Alternative A with Level of Service D | 702                      |
| Alternative B with Level of Service D | 786                      |

The number of trips as provided in the above chart are just estimates based on a review of anticipated future development. Changes in the location of future development would cause a change in this estimate.

### **Supplemental Street SDC**

Our current supplemental street SDC is \$2,293 per trip. Since the funding for the improvements at the Wilsonville Road Interchange will include Urban Renewal funds, the level of the supplemental street systems development charge will be established based on the amount that we would expect to reimburse to the Urban Renewal District from supplement street systems development charge collections.

### **Projected Future Development**

Property owners and planners that are anticipating development have contacted the planning staff. Attachment 3 includes a summary of anticipated

future development and the anticipated trip requirements for those developments where the traffic report has recently been completed or for those cases where we have old traffic reports.

Projects with projected trip requirements are as follows:

|                                                                                                                              |            |
|------------------------------------------------------------------------------------------------------------------------------|------------|
| Wilsonville Park Pavilion                                                                                                    | 89         |
| School Expansion                                                                                                             | 58         |
| Auto Service                                                                                                                 | 5          |
| Subdivision                                                                                                                  | 12         |
| Master Planned Community (from Concept Plan<br>Traffic Report after completion of Boeckman<br>Extension, Kinsman and Barber) | 569        |
| Large Retail Stores                                                                                                          | <u>455</u> |
| Total                                                                                                                        | 1,188      |

Other potential requirements:

- Auto Dealership
- Commercial Pad in Existing Development
- Warehouse Change in Use
- Rail Station

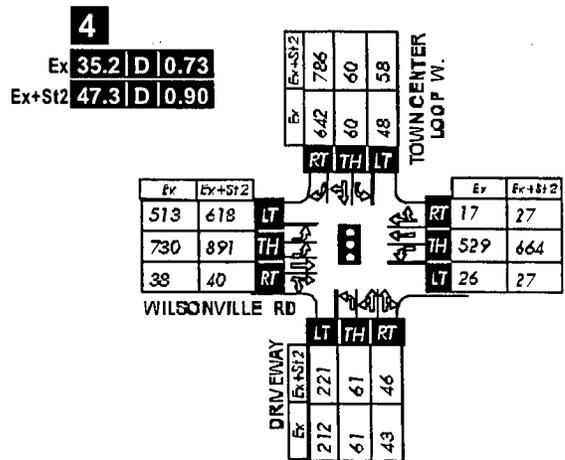
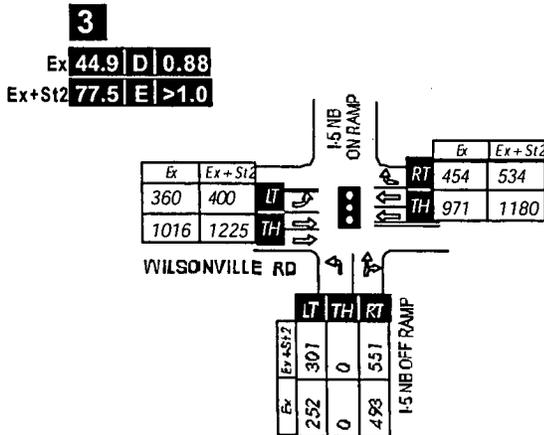
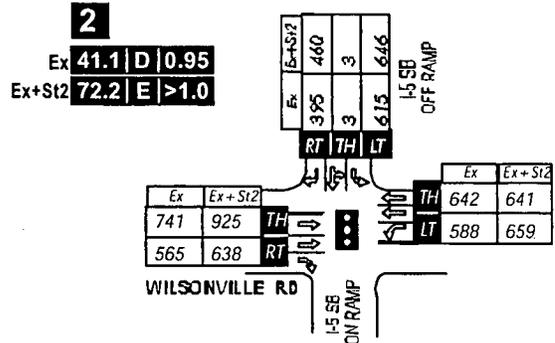
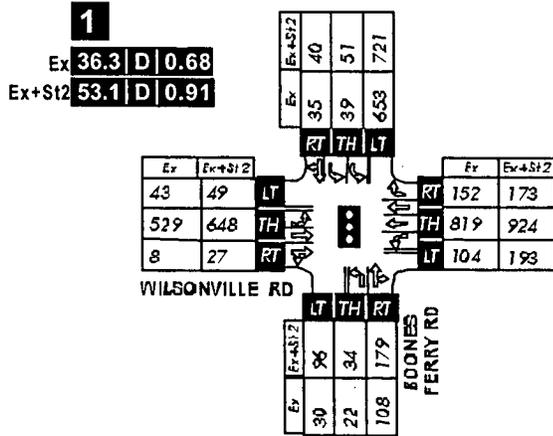
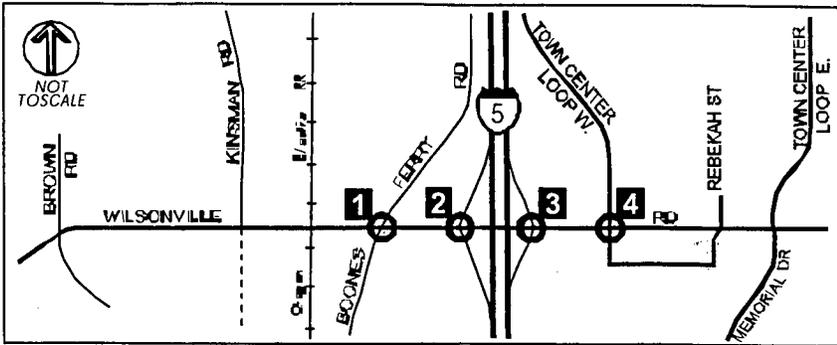
Although the Rail Station and the school expansion would not count against level of service for other developments we would design to provide capacity for these facilities.

In comparing the list in Attachment 3 with the projected availability of trips from Attachment 2, I arrived at the following conclusions:

- Alternative A with Level of Service D does provide capacity for the near term. We also need to continue with the planning of the Boeckman Extension and evaluation of added capacity from the \$20.3 million project and changes in driving habits. When the evaluation is completed, we can include the results in our projected trip availability.

#### **Future Actions**

- Get a design consultant on board to initiate the design of Alternative A improvements. Have this design looked at making the changes in grade under I-5.



**LEGEND**

YY | 00.0 | X | 0.00  
Delay LOS V/C

← -Existing Lane

YY = Ex-Existing  
Ex+St2-Existing+Stage2

⬛ -Existing Signal

**Figure 1**  
**WILSONVILLE INTERCHANGE STUDY AREA**  
**EXISTING/APPROVED**  
**VOLUMES & LOS PM PEAK HOUR**

**EXISTING PLUS STAGE II APPROVALS**

City staff<sup>9</sup> provided information for stage II development and sites currently under construction. Stage II traffic is associated with projects that are approved by the City of Wilsonville and could be constructed. Stage II traffic volumes would generally be expected over the next two years. With the addition of stage II traffic volumes, study intersections experience an increase in delay and volume-to-capacity ratio due to the addition of stage II traffic. The Wilsonville Road/I-5 Northbound Ramps and Wilsonville Road/I-5 Southbound Ramps would operate at LOS E with a V/C > 1.0. The existing plus stage II intersection levels of service are shown in Table 2 and the traffic volumes are shown in Figure 1.

**Table 2: Existing + Stage II Level of Service Conditions (PM Peak Hour)**

| Intersection                           | PM Peak Hour |     |      |
|----------------------------------------|--------------|-----|------|
|                                        | Delay        | LOS | V/C  |
| Wilsonville Road/Boones Ferry Road     | 53.1         | D   | 0.91 |
| Wilsonville Road/I-5 Southbound Ramps  | 72.2         | E   | >1.0 |
| Wilsonville Road/I-5 Northbound Ramps  | 77.5         | E   | >1.0 |
| Wilsonville Road/Town Center Loop West | 47.3         | D   | 0.90 |

Delay = Average Stopped Delay per Vehicle  
LOS = Level of Service  
V/C = Volume-to-Capacity Ratio

**WILSONVILLE ROAD/I-5 INTERCHANGE IMPROVEMENTS**

The City of Wilsonville currently has budgeted \$3.3 million dollars for short-term improvements at the Wilsonville Road/I-5 interchange.

Due to the high demand of westbound to southbound left turns at the Wilsonville Road/-5 southbound ramp during the PM peak hour, the highest operational priority is to add westbound left turn capacity. There are two low cost methods to achieve the added left turn capacity increase. One would be to convert one of the westbound through lanes on Wilsonville Road to a shared through-left configuration. A second option would be to restripe Wilsonville Road to narrower lane widths under I-5 to create room for a second left turn lane (takes about one foot away from each lane). The following improvements were assumed in each of the construction alternatives:

<sup>9</sup> DKS Associates, written response from Blaise Edmonds, July 3, 2003.

**Alternative A: Shared Eastbound and Westbound Through-Left Turn Lanes**

- Restripe the existing eastbound and westbound through lanes on Wilsonville Road at the I-5 southbound and northbound ramps to become a shared through-left lane.
- Add a third westbound approach through lane at the I-5 northbound ramp within the existing median (approximately 125 feet of storage and 125 feet of transition) to line up with the left turn lane under I-5.
- Add third eastbound approach through lane at the I-5 southbound ramp within the existing median (100 feet of storage and 125 feet of transition) to line up with the left turn lane under I-5.
- Widen the southbound and northbound I-5 on-ramps to receive two lanes of traffic.
- Traffic signal modifications
- Widen the northbound I-5 off-ramp for three approach lanes (two left and one right lane).
- Northbound right turn lane on Boones Ferry Road at Wilsonville Road
- Striping and signal modifications at Town Center Loop West/Wilsonville Road
- Retains existing interchange signal timing

**Alternative B: Double Westbound Left Turn Lanes**

- Restripe Wilsonville Road to provide double westbound left-turn lanes at the southbound ramps.
- Widen and lengthen the southbound on-ramp to receive two lanes of traffic.
- Traffic signal modifications
- Add a third westbound approach through lane at the I-5 northbound ramp within the existing median (approximately 125 feet of storage and 125 feet of transition) to line up with the left turn lane under I-5.
- Add third eastbound approach through lane at the I-5 southbound ramp within the existing median (100 feet of storage and 125 feet of transition) to line up with the left turn lane under I-5.
- Widen the southbound and northbound I-5 on-ramps to receive two lanes of traffic.
- Widen the northbound ramp for three approach lanes.
- Northbound right turn lane on Boones Ferry Road at Wilsonville Road (two left and one right lane).
- Striping and signal modifications at Town Center Loop West/Wilsonville Road
- Updated interchange signal timing

Sketch level drawings of each of the improvement alternatives are attached in the appendix. It should be noted that alternative A and B would be interim improvements for 5 to 20 years and a significant portion of the improvements constructed in either alternative A or B may have to be removed ("Throw Away Work") when long term improvements are constructed. This is due to the grading that would be required to bring the interchange up to current ODOT standards.

**IMPROVEMENT ALTERNATIVES ANALYSIS**

Improvements that were identified in each of the alternatives above were evaluated with existing plus stage II traffic volumes. This scenario was used as a baseline to compare the affects improvement alternatives have on capacity, delay, and level of service. Improvement operations are summarized on Table 3.

**Table 3: Improvement Alternative Level of Service Comparison (Existing + Stage II PM Peak Hour)**

| Intersection                           | Existing Geometry    | Alternative A (Shared) | Alternative B (Restripe Double) |
|----------------------------------------|----------------------|------------------------|---------------------------------|
|                                        | <i>Delay LOS V/C</i> |                        |                                 |
| Boones Ferry Road/Wilsonville Road     | 53.1 D 0.91          | 30.6 C 0.73            | 30.2 C 0.73                     |
| I-5 Southbound Ramps/Wilsonville Rd    | 72.2 E >1.0          | 31.2 C 0.87            | 30.5 C 0.85                     |
| I-5 Northbound Ramps/Wilsonville Rd    | 77.5 E >1.0          | 24.5 C 0.86            | 17.3 B 0.83                     |
| Town Center Loop West/Wilsonville Road | 47.3 D 0.90          | 40.1 D 0.83            | 35.9 D 0.83                     |

Since there would be no improvement differences between alternatives A and B at the Town Center Loop West/Wilsonville Road and Boones Ferry Road/Wilsonville Road intersections, there would be no change in V/C at these intersections. However, there would be a slight improvement in delay because alternative B optimizes signal timing; while alternative A retains ODOT diamond interchange signal timing. Under alternative B there would be a slight increase in capacity at the I-5 southbound ramp/Wilsonville Road. This alternative provides four westbound approach lanes (two through lanes and dual lefts) in comparison to alternative A that provides three lanes (one through, one shared through-left, and one left turn lane).

At the Wilsonville Road/I-5 northbound ramp alternative A would convert one of the through lanes to a through-left lane; due to the directional flow at this intersection during the PM peak hour (approximately 1200 through volume and 400 left turns), the two through lanes would provide more eastbound capacity for through traffic than the shared lane alternative. In the AM peak, alternative A would most likely provide more capacity than alternative B since the directional split would likely favor this configuration.

**CAPACITY OPERATING STANDARDS**

Level of service and volume-to-capacity (V/C) were used as operating standards to determine the amount of remaining capacity (above and beyond existing + stage II volumes) at the interchange area based on a phone conversation with City staff.<sup>10</sup> Level of service "D" was used as the operating standard for all of the study intersections. A V/C threshold of 1.0 was used at the Wilsonville Road/I-5 interchange ramps consistent with ODOT standards.

**CAPACITY SENSITIVITY TESTING**

In reviewing the existing + stage II conditions with the improvement alternatives A and B, the amount of traffic that can be added before the intersection goes below operating standards is dependant upon which intersection movement is considered. For example, significant traffic can sometimes be added to a non-critical movement with only minor impact on delay. Critical movements are the turns or through movements which constrain operations (require the most green time) at an intersection. For the purposes of this study, a linear growth of all movements was assumed to provide the "best guess" to the available

<sup>10</sup> Phone conversation with Eldon Johansen, City of Wilsonville, July 31, 2003.

capacity assuming future growth occurs similar to the current patterns (it should be emphasized that this is a hypothetical exercise to provide a frame of reference as to how much traffic may be added to the interchange area beyond the Existing plus Stage II scenario).

Linear growth assumes intersection turn movements associated with existing plus stage II traffic volumes would grow linearly until the point at which one of the Wilsonville Road interchange area intersections would not meet the operating standards. This would add traffic to the critical and non-critical movements at the same rate. At the hypothetical breaking point (critical intersection with LOS > D or V/C > 1.0), the additional capacity was determined for the critical intersection since the non-critical intersections would still have available capacity. This analysis method assumes future development would not significantly change travel patterns. The intersection capacity for the critical intersection is summarized in Table 4.

**Table 4: Linear Growth Capacity Summary– Existing + Stage II Volumes  
PM Peak Total Entering Vehicles (Net Increase)**

| Intersection                                      | Existing + Stage II Volumes | Alternative A Max Volumes | Alternative B Max Volumes |
|---------------------------------------------------|-----------------------------|---------------------------|---------------------------|
| I-5 Southbound Ramps/Wilsonville Rd <sup>11</sup> | 3972                        | 4544 (572)                | 4620 (648)                |

**SUMMARY**

The intersection of I-5 Southbound Ramp/Wilsonville Road was the critical intersection (first intersection to not meet operating standards) where the V/C reached 1.0. At that point, all four intersections would operate at level of service D. Based on an assumed linear growth at the Wilsonville Road interchange area intersections, improvement alternatives A & B would create additional capacity above and beyond the existing plus stage II traffic volumes (net increase of 572 peak hour trips at the critical intersection).

**CONCEPTUAL COST SUMMARY**

Preliminary cost estimates were determined for each of the improvement alternatives. Both alternatives A and B should be able to be constructed within the \$3.3 million that the City has currently allocated for improvements. Cost estimates are summarized on Table 8.

**Table 8: Preliminary Construction Cost Estimates**

| Alternatives                                   | Preliminary Construction Cost Estimate |
|------------------------------------------------|----------------------------------------|
| Alternative A: Shared Through-Left Lane        | \$2,200,000                            |
| Alternative B: Restriped Double Left Turn Lane | \$2,700,000                            |

Feel free to call if you have any questions or comments.

<sup>11</sup> I-5 Southbound Ramp/Wilsonville Road was the critical intersection for each of the alternatives at which the breakpoint was V/C = 1.0. At breaking point of V/C=1.0, all four study intersections would operate at LOS D.

**Appendix:**

**Estimate of trip availability**

|                                         | Boones<br>Ferry Rd &<br>WV Rd | I5 SB<br>Ramps &<br>WV Rd | I5 NB<br>Ramps &<br>WV Rd | TCLW &<br>WV Rd | Added trip | Estimated<br>cost | Cost per<br>trip |
|-----------------------------------------|-------------------------------|---------------------------|---------------------------|-----------------|------------|-------------------|------------------|
| 8/27/2003                               |                               |                           |                           |                 |            |                   |                  |
| Existing plus Stage II<br>volumes       | 3135                          | 3972                      | 4191                      | 3499            |            |                   |                  |
| Estimated existing<br>capacity at LOS D | 3101                          | 3362                      | 3627                      | 3499            |            |                   |                  |
| Estimated existing<br>capacity at LOS E | 3411                          | 3698                      | 3990                      | 3849            |            |                   |                  |
| Alt A volumes at LOS D<br>& V/C of 1    | 3605                          | 4544                      | 4755                      | 3974            |            |                   |                  |
| Alt B volumes at LOS D<br>& V/C of 1    | 3668                          | 4620                      | 4831                      | 4037            |            |                   |                  |

**Number of trips with Alt A & LOS D**

|                                                     |     |     |     |     |     |             |         |
|-----------------------------------------------------|-----|-----|-----|-----|-----|-------------|---------|
| Probable trips available<br>at LOS D from Alt A imp | 470 | 572 | 564 | 475 |     |             |         |
| Added trips east of I-5                             | 61  | 148 | 219 | 234 | 234 |             |         |
| Added trips west of I-5                             | 468 | 424 | 260 | 155 | 468 |             |         |
| Total trips thru IS                                 | 529 | 572 | 479 | 389 | 702 | \$2,200,000 | \$3,134 |

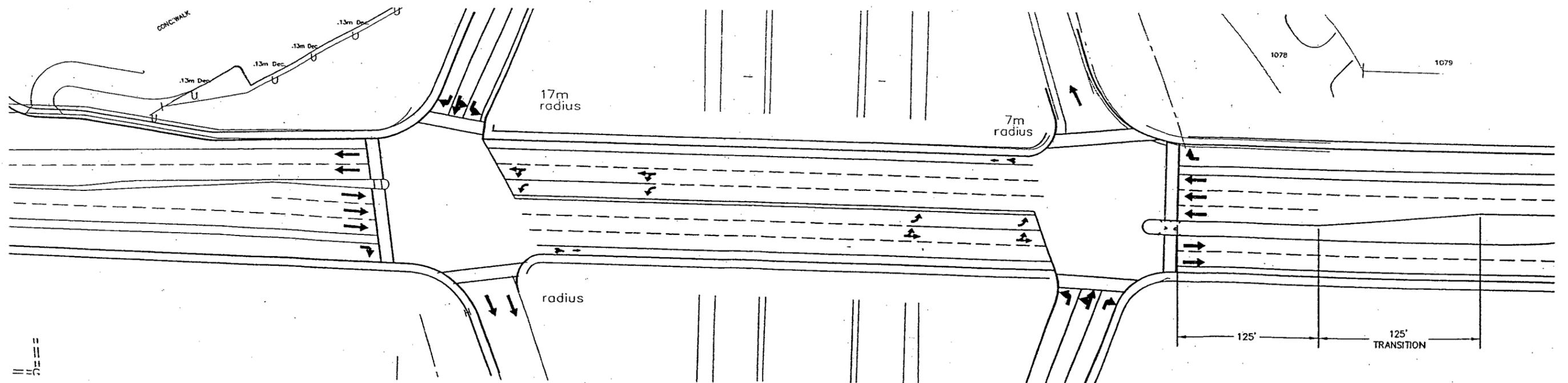
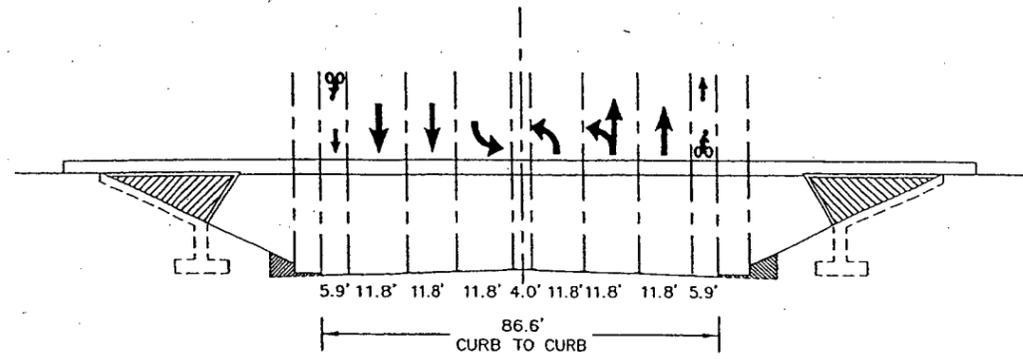
**Number of trips with Alt B & LOS D**

|                                                     |     |     |     |     |     |             |         |
|-----------------------------------------------------|-----|-----|-----|-----|-----|-------------|---------|
| Probable trips available<br>at LOS D from Alt B imp | 533 | 648 | 640 | 538 |     |             |         |
| Added trips east of I-5                             | 61  | 148 | 219 | 234 | 234 |             |         |
| Added trips west of I-5                             | 552 | 500 | 307 | 183 | 552 |             |         |
| Total trips thru IS                                 | 613 | 648 | 526 | 417 | 786 | \$2,700,000 | \$3,435 |

**Note 1 Alternate A changes traffic flows to include restriping westbound and eastbound through lanes to a through/left, signal mods & ramp improvements.**

**Note 2 Alternate B adds an additional left turn in the west direction onto southbound I-**

SCHMATIC DRAWING ONLY  
NOT TO SCALE



| REVISIONS | REVISIONS |
|-----------|-----------|
|           |           |
|           |           |
|           |           |

City of  
**Wilsonville**  
in Oregon

**DKS Associates**  
Traffic - Transportation - Engineering - ITS  
1400 SW FIFTH AVENUE, SUITE 500  
PORTLAND, OREGON 97201  
TELEPHONE: (503) 243-3500  
FAX: (503) 243-1934

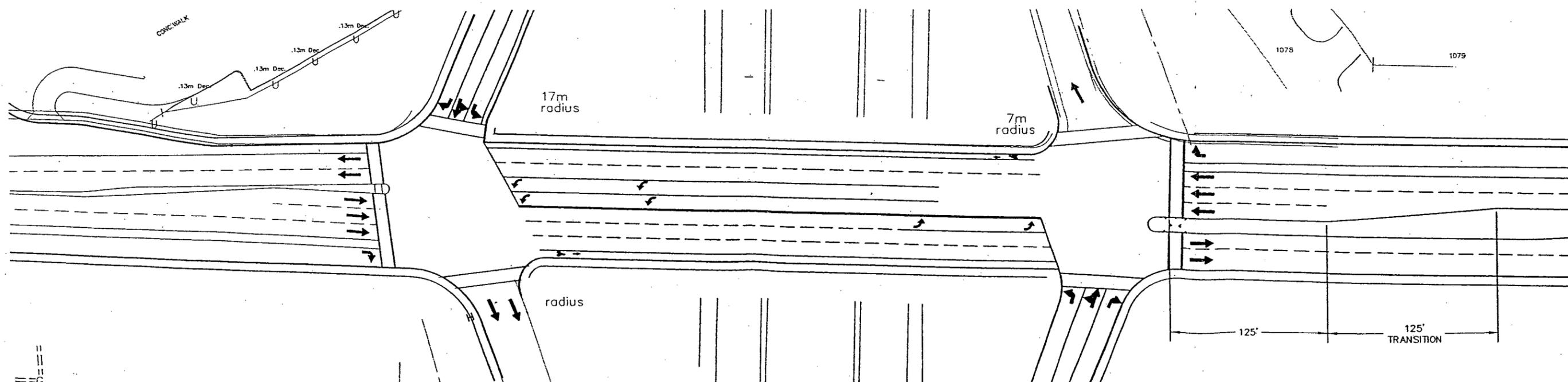
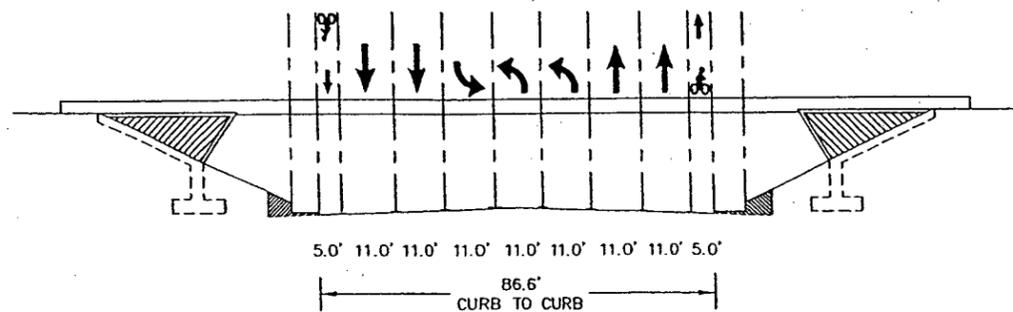
Date: JULY, 2003  
Scale: \_\_\_\_\_  
Designed By: SMM  
Drawn By: JCLD  
Checked By: RSM

ALTERNATIVE A: EASTBOUND/WESTBOUND SHARED THROUGH-LEFT TURN LANE CONCEPT  
**WILSONVILLE RD./I-5 RAMP TERMINALS**  
CITY OF WILSONVILLE,

Job Num: \_\_\_\_\_  
Sheet: \_\_\_\_\_  
OREGON 1 OF 1

1. NAME  
 2. DATE  
 3. SCALE  
 4. DRAWN BY  
 5. CHECKED BY  
 6. DATE

SCHEMATIC DRAWING ONLY  
NOT TO SCALE



| REVISIONS | REVISIONS |
|-----------|-----------|
|           |           |
|           |           |

City of  
**Wilsonville**  
 in Oregon

**DKS Associates**  
 Traffic • Transportation • Engineering • ITS  
 1400 SW FIFTH AVENUE, SUITE 500  
 PORTLAND, OREGON 97201  
 TELEPHONE: (503) 243-3500  
 FAX: (503) 243-1934

Date: JULY, 2003  
 Scale:  
 Designed By: SMM  
 Drawn By: JCLD  
 Checked By: RSM

ALTERNATIVE B: WESTBOUND DOUBLE LEFT TURN LANE CONCEPT  
**WILSONVILLE RD./I-5 RAMP TERMINALS**  
 CITY OF WILSONVILLE,

Job Number  
 Sheet  
 OREGON 2 OF 2

ORDINANCE NO. 561

Exhibit 2 to  
04PC03A and 04PC03B  
Staff Report

AN ORDINANCE OF THE CITY OF WILSONVILLE AMENDING WILSONVILLE CODE 4.140 (.09) I and J.2., PLANNED DEVELOPMENT, BY INCLUDING DEVELOPMENT AREAS THAT HAVE VESTED TRAFFIC GENERATION RIGHTS IN DETERMINING THE ESTIMATE OF THE IMPACT OF GENERATED TRAFFIC, CREATING THE RIGHT TO APPLY FOR A VESTED RIGHT TO USE AVAILABLE TRANSPORTATION CAPACITY ON WILSONVILLE ROAD BETWEEN BOONES FERRY ROAD AND TOWN CENTER LOOP WEST AND DECLARING AN EMERGENCY.

WHEREAS, the Wilsonville Council by Ordinance No. 552 adopted the City of Wilsonville 2003 Transportation Systems Plan (TSP) on June 2, 2003; and

WHEREAS, Section 4.2.2 of the TSP describes the I-5/Wilsonville Freeway Access Study and includes projects which are necessary to provide freeway access with continued growth over the next 20 years; and

WHEREAS, Section 4.2.2 describes an enhanced Wilsonville Road diamond interchange; and

WHEREAS, the City has budgeted \$3,500,000 to complete the first phases of the I-5/Wilsonville Road Interchange improvements to include ramp improvements and re-striping and traffic control improvements on Wilsonville Road to improve access to northbound and southbound I-5; and

WHEREAS, these improvements would allow for an additional 702 trips through the I-5 Wilsonville Road Interchange area at the City Level of Service D criteria as required in the Code and the ODOT volume to capacity ratio of one for the interchange ramps, of which trips 124 have been committed to approved but not yet built Stage II approvals or their equivalent; and

WHEREAS, these improvements will be completed within two years; and

WHEREAS, this additional capacity is available within two years and is being used for approval of future developments; and

WHEREAS, improvements of local City streets: the Boeckman Road extension west from 95<sup>th</sup> Avenue to Tooze Road, the Barber Street extension west from Kinsman Road to Brown Road and the Kinsman Road extension north from Barber to Boeckman are needed to best use the freeway access improvements; and

**ORDINANCE NO. 561**

**AN ORDINANCE OF THE CITY OF WILSONVILLE AMENDING WILSONVILLE CODE 4.140 (.09) I and J.2., PLANNED DEVELOPMENT, BY INCLUDING DEVELOPMENT AREAS THAT HAVE VESTED TRAFFIC GENERATION RIGHTS IN DETERMINING THE ESTIMATE OF THE IMPACT OF GENERATED TRAFFIC, CREATING THE RIGHT TO APPLY FOR A VESTED RIGHT TO USE AVAILABLE TRANSPORTATION CAPACITY ON WILSONVILLE ROAD BETWEEN BOONES FERRY ROAD AND TOWN CENTER LOOP WEST AND DECLARING AN EMERGENCY.**

WHEREAS, the Wilsonville Council by Ordinance No. 552 adopted the City of Wilsonville 2003 Transportation Systems Plan (TSP) on June 2, 2003; and

WHEREAS, Section 4.2.2 of the TSP describes the I-5/Wilsonville Freeway Access Study and includes projects which are necessary to provide freeway access with continued growth over the next 20 years; and

WHEREAS, Section 4.2.2 describes an enhanced Wilsonville Road diamond interchange; and

WHEREAS, the City has budgeted \$3,500,000 to complete the first phases of the I-5/Wilsonville Road Interchange improvements to include ramp improvements and re-striping and traffic control improvements on Wilsonville Road to improve access to northbound and southbound I-5; and

WHEREAS, these improvements would allow for an additional 702 trips through the I-5 Wilsonville Road Interchange area at the City Level of Service D criteria as required in the Code and the ODOT volume to capacity ratio of one for the interchange ramps, of which trips 124 have been committed to approved but not yet built Stage II approvals or their equivalent; and

WHEREAS, these improvements will be completed within two years; and

WHEREAS, this additional capacity is available within two years and is being used for approval of future developments; and

WHEREAS, improvements of local City streets: the Boeckman Road extension west from 95<sup>th</sup> Avenue to Tooze Road, the Barber Street extension west from Kinsman Road to Brown Road and the Kinsman Road extension north from Barber to Boeckman are needed to best use the freeway access improvements; and

WHEREAS, construction of these roads will require a very substantial investment of local funds; and

WHEREAS, the aforementioned road projects were included in the advisory vote on formation of the West Side Urban Renewal District in which approximately 80% of the voters were in favor of formation of the District; and

WHEREAS, on November 3<sup>rd</sup>, 2003, the City Council approved by non-emergency Ordinance No. 560, adopting the West Side Urban Renewal Plan; and

WHEREAS, the aforementioned local street improvement projects are planned for accomplishment under the West Side Urban Renewal Plan; and

WHEREAS, an Urban Renewal District obtains its funds based on the sale of bonds for which the debt service is paid by the increase in the tax revenues from the increase in valuation for the area within the district; and

WHEREAS, this increase in tax revenues will primarily occur from the increase in valuation created by new construction of homes, commercial or industrial properties and the infrastructure in support thereof within the district; and

WHEREAS, concurrency for improvements is based on proving that adequate capacity is available at the time of Stage II or Preliminary Development Plan (PDP) approval either by being currently in place or by being planned and funded within two years of development occupancy or planned and funded within four years if tied to Interstate 5 improvements; and

WHEREAS, the Villebois Village District is a large percentage of the West Side Urban Renewal District; and

WHEREAS, the development of the Villebois Village District will require a substantial long term investment in infrastructure and in development of the individual properties; and

WHEREAS, it is not feasible to obtain this long-term investment without having assurance that there will be capacity through the Wilsonville Road interchange; and

WHEREAS, by means of providing capacity through the Wilsonville Road interchange and thereby allowing Villebois Village District to move forward, the Villebois Village District will, in turn, provide funding sources essential to complete the Boeckman Road extension, Barber extension and the Kinsman extension; and will assist the concurrency for development dependent on these extension projects; and

WHEREAS, a system for vesting in traffic capacity on Wilsonville Road between Town Center Loop West and Boones Ferry Road can provide a means to assure interchange capacity for the Villebois Village District to develop; and

WHEREAS, a system for vesting can provide other owners seeking to develop their property an equal opportunity to vest in trips through the Wilsonville Road/I-5 interchange by applying the system to any Master Plan or Stage 1 Master Plan that was approved after the additional capacity at the Wilsonville Road Interchange area was identified in the adopted TSP; and

WHEREAS, Wilsonville Planning Commission conducted duly noticed public hearings on November 12<sup>th</sup>, 2003 and December 10, 2003, at which this proposed amendment to the Wilsonville Code was reviewed and said Commission recommended approval of the proposed amendment; and

WHEREAS, the Wilsonville City Council conducted a duly noticed public hearing on December 15, 2003.

NOW, THEREFORE, THE CITY OF WILSONVILLE ORDAINS AS FOLLOWS:

SECTION 1. DETERMINATION AND FINDINGS:

- a. The City Council adopts the above recitals and findings and incorporates them by reference in support of this ordinance.
- b. The City Council finds that the Wilsonville Road/I-5 interchange and the interrelated intersections are now operating at capacity.
- c. The City Council finds that the previously approved Peak PM Trip Capacity through the interchange has been fully allocated either to existing developments or reserved for projects with Stage II approvals that have not yet been built.
- d. The City Council further finds that the first phase of planned and funded I-5/Wilsonville Road interchange improvements will accommodate future development and allow for an additional 702 Peak PM Trips through the I-5/Wilsonville Road interchange which can be safely accommodated while maintaining the City's and ODOT's service level requirements, 219 trips of which have been committed to approved but not yet built stage II approvals or their equivalent.

e. The City Council further finds that limiting the allocation of Peak PM Trip capacity to projects with Stage II approvals will no longer support Comprehensive Plan Goal 2.1 “To allow for urban growth while maintaining community livability, consistent with the economics of development, city administration, and the provision of public facilities and services.”

f. The City Council finds that in order to “encourage master planning of large land areas” as called for in the Comprehensive Plan and to “establish and maintain revenue sources to support the City’s policies for urbanization and maintain needed public services and facilities” as called for in Implementation Measure 2.1.1.d, and to “allow new development to proceed concurrently with the availability of adequate public services and facilities...” (Implementation Measure 2.1.1.e), that a PM Peak Hour Traffic Capacity vesting plan is necessary.

g. The City Council finds that allowing developers the option to vest in trips through the Wilsonville Road/I-5 Interchange after Master Plan or Stage I Approval supports the City’s concurrency requirements and allows the long-term financial investment in projects that were planned to be developed in phases and over time.

h. The City Council further finds that the Peak PM Hour traffic trips that are used at the Wilsonville Road/I-5 Interchange and interrelated intersections of Wilsonville Road and the Interchange Ramps, Boones Ferry Road and Town Center Loop West is a valid proportional basis for allocating intersection capacity and a proportional share of the cost to the developer.

i. The City Council determines that a Supplemental Street SDC is a reasonable and rational means to impose the cost of these capacity improvements and that payment for early vesting of trip capacity is a financially prudent requirement for the City to impose in the public interest.

j. The City Council further adopts as supplemental findings that staff report in this matter dated December 11, 2003, attached as Exhibit A and incorporated by reference as if fully set forth.

## SECTION 2. AMENDMENT.

A. Wilsonville Code 4.140 (.09) J. 2. , Planned Development Regulations, is hereby amended as follows:

"2. That the location, design, size and uses are such that traffic generated by the development at the most probable used intersection(s) can be accommodated (safely and without congestion in excess of Level of Service D) as defined in the Highway Capacity Manual published by the National Highway Research Board, on existing or immediately planned arterial or collector streets and will, in the case of commercial or industrial developments, avoid traversing local streets. Immediately planned arterial and collector streets are those listed in the City's adopted Capital Improvement Program, for which funding has been approved or committed, and that are scheduled for completion within two years of occupancy of the development or four years if they are an associated crossing, interchange, or approach street improvement to Interstate 5.

"a. In determining Levels of Service D, the City shall hire a traffic engineer at the applicant's expense who shall prepare a written report containing the following minimum information for consideration by the Development Review Board.

"i. An estimate of the amount of traffic generated by the proposed development, the likely routes of travel of the estimated generated traffic, and the sources(s) of information of the estimate of the traffic generated and the likely routes of travel;

"ii. What impact the estimate of generated traffic will have on existing level of service including traffic generated by (1) the development itself, (2) all existing developments, (3) Stage II developments approved but not yet built, and (4) all developments that have vested traffic generation rights under section 4.140 (.10), through the most probable used intersection(s), including state and county intersections, at the time of peak level of traffic. This analysis shall be conducted for each direction of travel if backup from other intersections will interfere with intersection operations.

"b. The following are exempt from meeting the Level of Service D criteria standard:

"i. A planned development or expansion thereof which generates three (3) new p.m. peak hour traffic trips or less;

"ii. A planned development or expansion thereof which provides an essential governmental service.

"c. Traffic generated by development exempted under this subsection on or after Ordinance No. 463 was enacted shall not be counted in determining levels of service for any future applicant.

“d. Exemptions under 'b' of this subsection shall not exempt the development or expansion from payment of system development charges or other applicable regulations.

“e. In no case will development be permitted that creates an aggregate level of traffic at LOS ‘F’.”

B. Wilsonville Code 4.140 is hereby amended by adding the following subsection:

“(10) Early Vesting of Traffic Generation

“Applicants with Stage I or Master Plan approvals occurring after June 2, 2003 may apply to vest the right to use available transportation capacity at the intersections of Wilsonville Road with Boone’s Ferry Road and with Town Center Loop West, and/or the I-5 interchange. Vesting for properties with such approvals shall occur upon execution of a vesting agreement satisfactory to the city, which agreement shall include a proposed development schedule or phasing plan and either provide for the payment of any and all Supplemental Street SDCs or provide other means of financing public improvements. Vesting for properties pending such approvals shall occur upon such agreement and the date the approvals are final.

“The number of trips vested is subject to modification based upon updated traffic analysis associated with subsequent development approvals for the property. A reduction in vested trips shall attend repayment of vesting fees by the City. An increase in available vested trips shall occur upon payment of necessary vesting fees.

“Vesting shall remain valid and run with the property, unless an approval that is necessary for vesting to occur is terminated or a vesting agreement is terminated. If the vested right to use certain trips is lost or terminated, as determined by the Community Development Director with the concurrence of City Council, such trips shall be made available to other development upon City repayment, without interest, of associated vesting fees.”

C. W.C. 4.140 (.09) I, Planned Development Regulations, is hereby amended as follows:

“I. All Stage II Site Development plan approvals shall expire two years after their approval date, if substantial development has not occurred on the property prior to that time. Provided, however, that the Development Review Board may extend these expiration times for up to three (3) additional periods of not more than one (1) year each. Applicants seeking time extensions shall make their requests in writing at least thirty (30) days in advance of the expiration date. Requests for time extensions shall only be granted upon (1) a showing that the applicant has in good faith attempted to develop or market the property in the preceding year or that development can be expected to occur within the next year,

and (2) payment of any and all Supplemental Street SDCs applicable to the development. Upon such payment, the development shall have vested traffic generation rights under 4.140 (.10), provided however, that if the Stage II approval should expire, the vested right to use trips is terminated upon City repayment, without interest, of Supplemental Street SDCs. For purposes of this Ordinance, "substantial development" is deemed to have occurred if the required building permits or public works permits have been issued for the development, and the development has been diligently pursued, including the completion of all conditions of approval established for the permit."

3. Staff Direction.

The City Recorder is directed to make the appropriate formatting and stylistic changes to conform the aforementioned amendments to the format and style of the Wilsonville Code. Staff is directed to prepare a Supplemental Street SDC for the Wilsonville Road/I-5 Interchange and interrelated intersections.

4. Effective Date.

For the reasons appearing in the recitals above, the City Council hereby determines that a delay in adopting a system for vesting in traffic capacity on Wilsonville Road between Town Center Loop West and Boones Ferry Road increases the risk that capacity through said corridor will not be available for the development of property in the West Side Urban Renewal District, with the consequent loss of financing for, and the timely construction of, the Boeckman, Barber and Kinsman Road extensions. As such, time is of the essence and the public interest militates in favor of a declaration that this Ordinance shall take effect immediately upon final reading and passage by the Council.

SUBMITTED to the Wilsonville City Council and read for the first and second time at a regular meeting thereof on the 15th day of December, 2003, at the hour of 7 p.m. at the Wilsonville Community Center, 7965 SW Wilsonville Road, Wilsonville, Oregon.

---

SANDRA C. KING, CMC, City Recorder

ENACTED by the City Council on the 15th day of December, 2003, by the following  
votes: Yes: -5- No: -0-

---

SANDRA C. KING, CMC, City Recorder

DATED and signed by the Mayor this \_\_\_\_\_ day of December 2003.

---

CHARLOTTE LEHAN, MAYOR

SUMMARY OF VOTES:

|                      |            |
|----------------------|------------|
| Mayor Lehan          | <u>Yes</u> |
| Councilor Scott-Tabb | <u>Yes</u> |
| Councilor Kirk       | <u>Yes</u> |
| Councilor Holt       | <u>Yes</u> |
| Councilor Knapp      | <u>Yes</u> |

Attachments:

Exhibit A – Planning Division Staff Report dated December 11, 2003.

Exhibit 3 for  
04PC03A and 04PC03B  
Staff Report

Summary of Trip Vesting

2/2/2004

| Development                      | P.M. Trips Required<br>Thru WV Rd & I-5 IC | Vested/<br>PDP | Stage II/<br>PDP | Available |
|----------------------------------|--------------------------------------------|----------------|------------------|-----------|
|                                  |                                            |                |                  | 702       |
| WV Park Pavilion                 | 89                                         | 89             |                  | 613       |
| VB South SAP PDP1                | 35                                         | 35             |                  | 578       |
| Trammel Crow WH                  | 87                                         | 87             |                  | 491       |
| Jiffy Lube                       | 5                                          | 5              |                  | 486       |
| Family fun Center                | 3                                          | 3              |                  | 483       |
| WV High School Exp<br>(exempt)   | 58                                         | 58             |                  | 483       |
| Honda                            | 73                                         | 73             |                  | 410       |
| Additional requirement<br>for VB | 534                                        | 410            |                  | 0         |

August 27, 2004

Eldon Johansen  
Community Development Director  
City of Wilsonville  
30000 Town Center Loop East  
Wilsonville, OR 97070

**Subject: Public Facilities Transportation Strategy Traffic Analysis** P/A No. P04045-005

Dear Eldon:

This analysis updates the City of Wilsonville's Public Facilities Transportation Strategy (PFTS) and considers anticipated development and roadway projects over the next five years (2004-2009) within the City. The key elements of this analysis include:

- Changes in current land use to reflect traffic operations after City approved Stage II developments and City staff estimates of near term development by 2009 has been constructed.
- Anticipated roadway improvements (including several TSP street extensions).
- I-5/Wilsonville Road area improvements (including intersections and ramps).

### ***Executive Summary***

The majority of developable land parcels located south of Boeckman Road were assumed to be built out within the next five years (by 2009). As this land use pattern resembles the assumptions previously assumed for 2020 analysis, the capacity constraints are consistent with the Wilsonville Freeway Access Study<sup>1</sup> and the City of Wilsonville TSP<sup>2</sup>. This analysis includes projects such as the Boeckman Road extension, the Barber Street extension, the Kinsman Road extension, the Brown Road extension and the Canyon Creek Road extension. These road enhancements were determined to be necessary with the land use scenario assumed for 2009. The analysis includes traffic pattern changes associated with these road extensions, as well as intersection level mitigation measures and double left turn lanes at the east and west bound Wilsonville Road/I-5 ramp approaches, and finds that the Wilsonville Road corridor is at capacity in 2009.

---

<sup>1</sup> DKS Associates *Wilsonville Freeway Access Study*, November, 2002

<sup>2</sup> *Transportation System Plan*, City of Wilsonville, By Entranco, June 2, 2003.



1400 S.W. 5<sup>th</sup> Avenue  
Suite 500  
Portland, OR 97201-5502

(503) 243-3500  
(503) 243-1934 fax  
[www.dksassociates.com](http://www.dksassociates.com)

## **Background**

The City of Wilsonville had a Public Facilities Transportation Strategy (PFTS) in place from the mid 1990's until expiration on January 1, 2002 by legislative action. The purpose of this PFTS is to implement a system to match increases in traffic with increases in capacity through the Wilsonville Road and I-5 Interchange area. The improvements anticipated in the original PFTS have been constructed. Concurrent with the capacity increases, traffic volume has increased as Stage II projects have been constructed and occupied and traffic has been added to the roadway network. This added and anticipated volume from current Stage II projects has caused the interchange area to be at or near capacity. The City would like to adopt a new PFTS by anticipating additional needed street improvements as well as additional development. The anticipated 2009 street and development projects were evaluated to determine potential improvements required to provide adequate operation of the I-5/Wilsonville Road interchange area.

## **I-5/Wilsonville Road Interchange Area Transportation Analysis**

The existing and future I-5/Wilsonville Road interchange area operating conditions were determined based on PM peak hour traffic counts conducted during the fall of 2003. Simulation models of the Wilsonville Road corridor were used to provide a system wide assessment of traffic operating conditions. These models utilize Highway Capacity Manual<sup>3</sup> methodologies to evaluate traffic operation on a system level where queuing from one intersection could affect an adjacent intersection. Most importantly, the measures of effectiveness that are used come from the simulation of traffic in future scenarios which provide more detailed assessment of performance than isolated intersection evaluations. Measures of performance such as average stopped vehicle delay can be calculated and include the impacts of upstream vehicle queuing and blockages.

## **Existing Conditions**

All of the study intersections currently meet City and ODOT operating standards. The City requires intersection LOS D or better during the evening peak hour based on HCM methodology. ODOT's preferred performance standard<sup>4</sup> is a maximum volume-to-capacity ratio of 0.99 for the Wilsonville Road corridor and 1.1 for the Wilsonville Town Center.

Due to westbound queuing impacts from the Wilsonville Road/I-5 northbound ramp intersection, that are not considered in HCM methodology, the Synchro/SimTraffic software was used to simulate the existing operations. Synchro/SimTraffic showed that the intersection of Wilsonville Road/Town Center Loop West would actually operate at a delay similar to HCM's definition of LOS E due to queuing. This condition is created by a lane imbalance of volume destined for I-5 south and the ODOT diamond interchange traffic signal timing strategy. The existing study intersection levels of service are shown in Table 1. These results indicate limited additional capacity for previously approved projects is available today.

---

<sup>3</sup> 2000 Highway Capacity Manual, Transportation Research Board.

<sup>4</sup> 1999 Oregon Highway Plan, Oregon Department of Transportation, Table 6, Page 80.

**Table 1: Existing Conditions Intersection Level of Service (2003 PM Peak Hour)**

| Intersection                           | PM Peak Hour |                    |      |
|----------------------------------------|--------------|--------------------|------|
|                                        | Delay        | LOS                | V/C  |
| <i>Signalized</i>                      |              |                    |      |
| Wilsonville Road/Boones Ferry Road     | 39.0         | D                  | 0.73 |
| Wilsonville Road/I-5 Southbound Ramps  | 38.8         | D                  | 0.91 |
| Wilsonville Road/I-5 Northbound Ramps  | 38.7         | D                  | 0.89 |
| Wilsonville Road/Town Center Loop West | 39.0         | D (E) <sup>5</sup> | 0.76 |

Delay = Average Stopped Delay per Vehicle  
LOS = Level of Service (ODOT uses v/c 0.99 as standard, City of Wilsonville uses LOS D as standard).  
V/C = Volume-to-Capacity Ratio

### ***Future Operating Conditions***

Future operating conditions were evaluated based on 2009 traffic forecasts and the inclusion of identified roadway extension projects to assess the required intersection improvements for the I-5/Wilsonville Road interchange area.

Future 2009 traffic forecasts include existing PM peak hour traffic counts, Stage II approved projects<sup>6</sup>, vacated building sites, vested trips and additional parcels that are expected to be developed within the next five years. Stage II includes traffic from developments that have Stage II approval from the City. Vacated building sites include vehicle trips from vacated developments so as to maintain approved vehicle trips through the roadway network until the site is reoccupied, as directed by City staff<sup>7</sup>. This study scenario includes the Milgard Window development, which has approximately 62 reserved PM peak hour trips associated with the property. Vested trips include traffic from other developments that have approved trips through the Wilsonville Road interchange based on Stage I approval and a need for long term development. This study scenario includes the Villebois development, which has a vested agreement for 410 PM peak hour trips through the interchange area.

### **Anticipated Development for Five Year Planning Horizon**

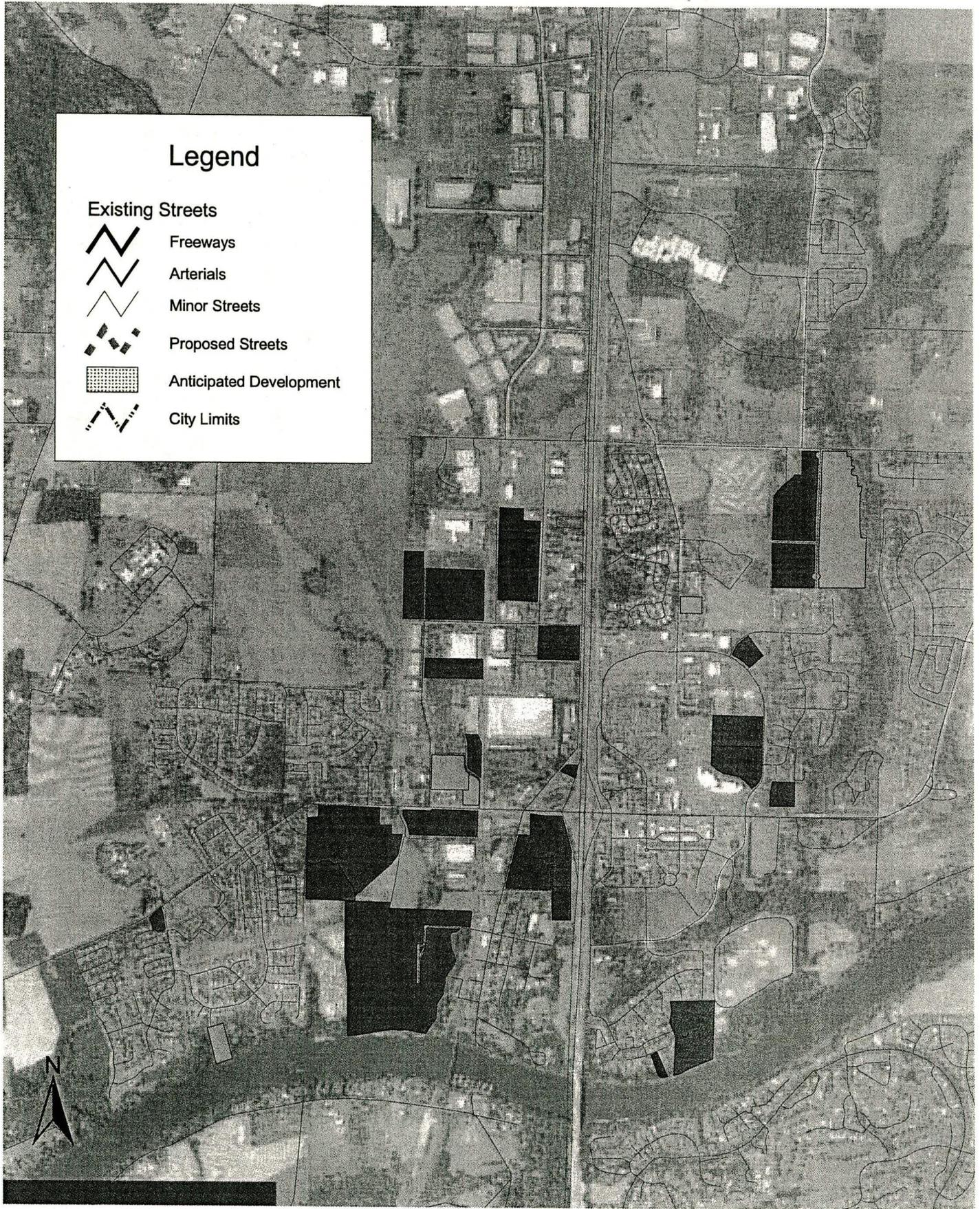
Anticipated development over the next five year period (2004-2009), as determined by City staff,<sup>8</sup> has been added to future volume forecasts. The anticipated developments and estimated trip generation are summarized in Table 2. The anticipated development project locations are shown in Figure 1.

<sup>5</sup> Based on simulation runs using Synchro and SimTraffic, Town Center Loop West/Wilsonville Road would actually operate at an average delay >55 seconds which would be similar to LOS E as defined by Highway Capacity Manual due to westbound queuing/lane imbalance on Wilsonville Road destined for I-5 south.

<sup>6</sup> Stage II approved projects provided by City of Wilsonville, April 23, 2004.

<sup>7</sup> Per Eldon Johnson, specifically in reference to the Milgard site, March 2004.

<sup>8</sup> Information provided by Chris Neamtzu, City of Wilsonville, July 29, 2004.



**ANTICIPATED DEVELOPMENT  
PROJECTS  
Figure 1**

**Table 2: Anticipated Development Projects (2004-2009)**

| ID                                | Property                    | Land Use             | Size*       | PM Peak Trip Generation (In/Out) |
|-----------------------------------|-----------------------------|----------------------|-------------|----------------------------------|
| <i>Anticipated Development</i>    |                             |                      |             |                                  |
| 1                                 | Fred Meyer                  | Retail               | 181 KSF     | 394/385                          |
| 2                                 | Renaissance Homes           | Residential          | 23.46 Acres | 60/34                            |
| 3                                 | Commuter Rail               | Parking              | 397 Stalls  | 56/230                           |
| 4                                 | Hydro-Temp                  | Industrial           | 21 KSF      | 44/46                            |
| 5                                 | Coca-Cola                   | Industrial           | 60 KSF      | 18/56                            |
| 6                                 | Wesleyan Church             | Church               | 8.6 KSF     | 2/7                              |
| 7                                 | Bernert Property            | Residential          | 25.5 Acres  | 163/94                           |
| 8                                 | Bernert Property            | Industrial           | 60 Acres    | 212/369                          |
| 9                                 | Water Treatment Plant/ Park | Utility/Recreational | N/A         | 0/0                              |
| 10                                | Reeves Property             | Industrial           | 9.13 Acres  | 32/56                            |
| 11                                | Jack Property               | Industrial           | 21.13 Acres | 75/130                           |
| 12                                | Hollywood Entertainment     | Office               | 61 KSF      | 22/108                           |
| 13                                | Kaiser Property             | Clinic               | 7.41 Acres  | 81/219                           |
| 14                                | Kaiser Property             | Commercial           | 7.24 Acres  | 28/138                           |
| 15                                | North of Chili's            | Retail               | 0.69 Acres  | 34/37                            |
| 16                                | Abele Property              | Residential          | 20 Lots     | 13/7                             |
| 17                                | Milgard Property            | Industrial           | 3 Acres     | 21/41                            |
| 18                                | Nikzi Property              | Commercial           | 1.15 Acres  | 67/74                            |
| 19                                | Vlahos Property             | Commercial           | 2.06 Acres  | 101/110                          |
| 20                                | Kohl Property               | Commercial           | 2.93 Acres  | 144/156                          |
| 21                                | Graphic Information Systems | Industrial           | 20 KSF      | 71/123                           |
| 22                                | Open                        | Residential          | 14 Acres    | 36/21                            |
| 23                                | Open                        | Residential          | 12 Lots     | 8/4                              |
| 24                                | John Smith Property         | Residential          | 3 Lots      | 1/1                              |
| 25                                | Reeves North Property       | Industrial           | 3.1 Acres   | 11/19                            |
| <i>Stage II Approved Projects</i> |                             |                      |             |                                  |
|                                   | Ash Meadows                 | Residential          | 22 Lots     | 14/7                             |
|                                   | TC Anchor                   | Retail               | 31.0 KSF    | 43/43                            |
|                                   | Rivergreen (phase 3)        | Residential          | 15 Lots     | 10/5                             |
|                                   | Village at Main Street      | Residential          | 325 Units   | 37/18                            |
|                                   | Wilsonville Business Center | Office               | 203.67 KSF  | 52/255                           |
|                                   | Lead-Tec (Phase II)         | Office               | 35.03 KSF   | 7/19                             |
|                                   | Mercedes Benz               | Auto                 | N/A         | 20/26                            |
|                                   | Holly Lane Office           | Office               | 7.6 KSF     | 3/17                             |
|                                   | Iosco Trucking              | Industrial           | 29 KSF      | 9/26                             |
|                                   | In Focus                    | Manufacturing        | 100 KSF     | 23/42                            |
|                                   | Basalt Creek Warehouse      | Warehouse            | 240 KSF     | 43/131                           |
|                                   | Arbor Crossing              | Residential          | 78 Lots     | 48/27                            |
|                                   | Argyle Square               | Retail               | 105 KSF     | 223/223                          |
|                                   | Lynne Angel                 | Office               | 6.4 KSF     | 4/21                             |
|                                   | Civic Park and City Hall    | Office               | 27 KSF      | 18/42                            |
|                                   | Prograss                    | Storage              | 14.7 KSF    | 1/7                              |
|                                   | Lazerquick                  | Retail               | 1.25 KSF    | 2/1                              |

| ID                                                                                                                                                                                                                                                                                                                                                                        | Property                | Land Use    | Size*     | PM Peak Trip Generation (In/Out) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------|-----------|----------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                           | Lowries Marketplace     | Commercial  | 94.9 KSF  | 190/206                          |
|                                                                                                                                                                                                                                                                                                                                                                           | Hi Cube Warehouse       | Warehouse   | 256 KSF   | 11/20                            |
|                                                                                                                                                                                                                                                                                                                                                                           | Cedar Pointe            | Residential | 18 Lots   | 12/7                             |
|                                                                                                                                                                                                                                                                                                                                                                           | Town Center Phase III   | Office      | 44.0 KSF  | 18/86                            |
|                                                                                                                                                                                                                                                                                                                                                                           | Town Center Phase III   | Commercial  | 18.8 KSF  | 74/73                            |
|                                                                                                                                                                                                                                                                                                                                                                           | Park Pavilion           | Commercial  | 14.9 KSF  | 65/62                            |
|                                                                                                                                                                                                                                                                                                                                                                           | Villebois Phase I       | Residential | 60 Lots   | 32/17                            |
|                                                                                                                                                                                                                                                                                                                                                                           | Villebois (vested)      | Residential | 410 Trips | 267/143                          |
|                                                                                                                                                                                                                                                                                                                                                                           | Jiffy Lube              | Retail      | 3 Bays    | 3/2                              |
| <i>Subtotal</i>                                                                                                                                                                                                                                                                                                                                                           |                         |             |           |                                  |
|                                                                                                                                                                                                                                                                                                                                                                           | Anticipated Development |             |           | 1,173/1,912                      |
|                                                                                                                                                                                                                                                                                                                                                                           | Stage II                |             |           | 962/1,383                        |
| <i>Total</i>                                                                                                                                                                                                                                                                                                                                                              |                         |             |           |                                  |
|                                                                                                                                                                                                                                                                                                                                                                           | Total Trips             |             |           | 2,135/3,295                      |
| KSF = 1,000 gross square feet of building area<br>Lots = Dwelling units<br>* = Typical floor area ratios (FAR) were assigned to properties where acres were the only unit of measurement available, producing an estimated building square foot size which was then used to calculate trip generation for the site. See appendix for FAR rates assumed for each land use. |                         |             |           |                                  |

While trip generation data at site driveways is widely available, as is information of pass-by and diverted link trips, there is little data available regarding the distance trips travel between their origin and destination and new land uses assumed in Table 1. For site-impact analysis, three sources of data were considered: 1) existing travel patterns based upon actual traffic counts, 2) forecasted 2000 travel patterns from the City's EMME/2 model, and 3) future 2020 forecasted travel patterns from the City's travel demand model. For this study, travel patterns similar to existing conditions were utilized due to the short term nature (2009) of this analysis. This approach is conservative since some of the regional trips may transition to originating or terminating within the City as local trip productions and attractions are added with development.

The regional travel demand forecast model was used to forecast 2009. In Wilsonville, Metro's regional 2020 travel demand forecast model has been refined by the City of Wilsonville. A travel demand model is based on anticipated land uses in the future and does a better job of reflecting trips that begin and end within Wilsonville as well as reflecting anticipated travel pattern changes (i.e. more people living and working in Wilsonville or more people commuting to Wilsonville from regional areas to the south (i.e. Woodburn, Salem, etc.)). These travel pattern changes may be caused by regional congestion conditions to the north or the availability of more housing and employment within Wilsonville.

Since a travel demand forecast model is not available for 2009, the short-term approach of incrementally adding specific land use projects was undertaken. However, this approach (when used for a large number of projects) can over represent existing patterns when extended numerous years into the future. Assuming large amounts of retail, industrial and residential development by 2009 (projects previously discussed) using the incremental approach of adding trip distribution for each development, a double counting of trips will take place through the Wilsonville interchange

area. For example, a residential development might distribute trips to an industrial project, while an industrial project will distribute trips to the residential project, essentially causing a trip between the residential and industrial area to be double counted. To avoid this problem, adjustments were made to new residential development trip generation to eliminate the double counting problem. A portion of the residential to employment link trips were reduced based upon data derived from the 2020 travel demand model.

**Anticipated Roadway Projects**

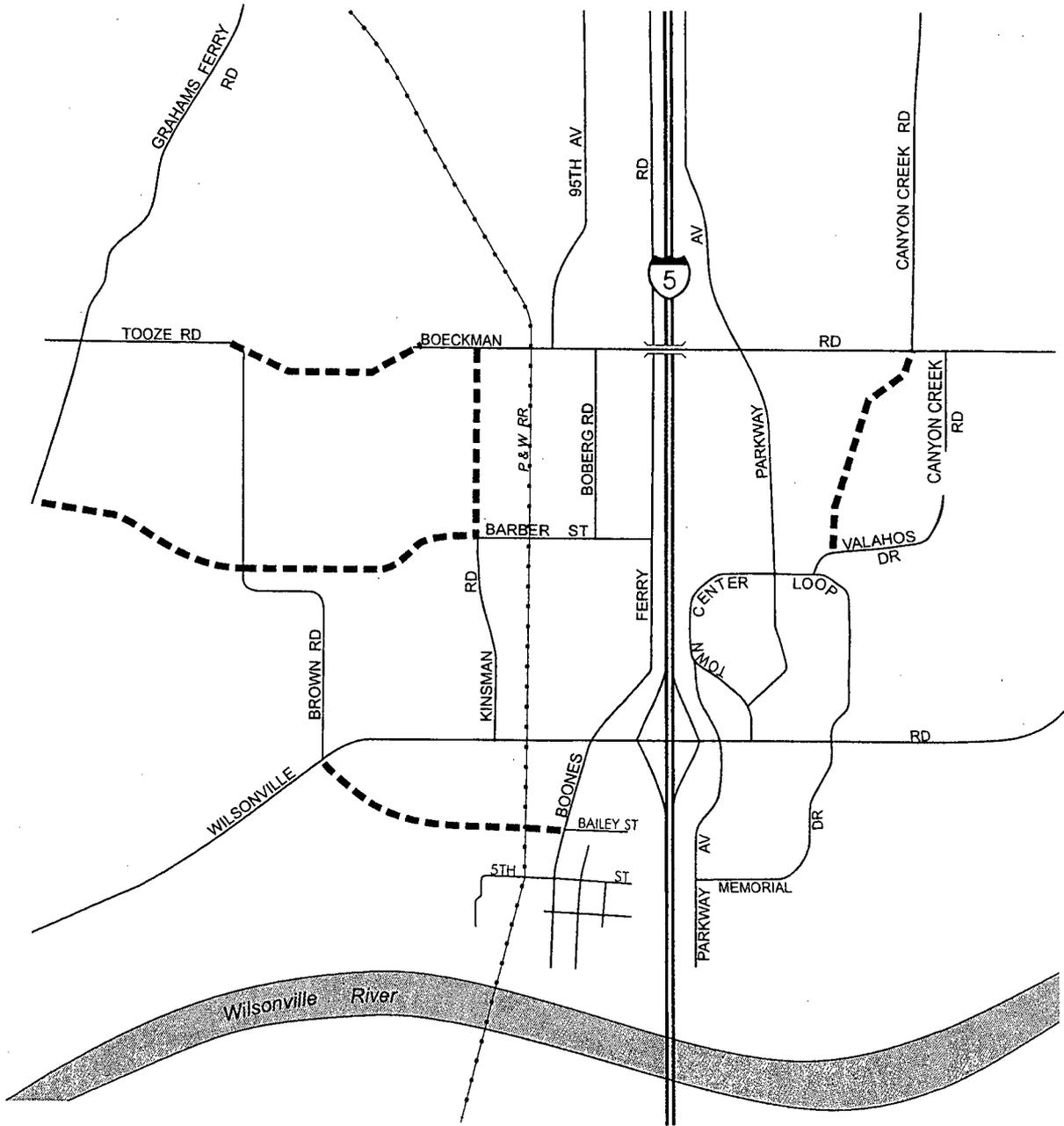
A number of planned roadway projects have been identified by the City. Each of these projects is anticipated to be funded within the next five years (prior to 2009). These projects are shown in Figure 2 and include the following:

- Wilsonville Road and I-5 interchange improvements
- Boeckman Road Extension (2 to 3 lanes from 95<sup>th</sup> Avenue to 110<sup>th</sup> Avenue)
- Barber Street Extension (2 to 3 lanes from Kinsman Road to Brown Road)
- Kinsman Road Extension (2 to 3 lanes from Barber Street to Boeckman Road)
- Canyon Creek Road South Extension (3 lanes from Boeckman Road to Town Center Loop West)
- Brown Road Extension (2 to 3 lanes from Wilsonville Road to Boones Ferry Road—assumed with development of large parcels south of Wilsonville Road)

The extension of Brown Road would provide an important connectivity enhancement and reduce capacity constraints along Wilsonville Road between Brown Road and Boones Ferry Road. The extension is envisioned to connect Wilsonville Road at Brown Road with Boones Ferry Road just south of the currently proposed Fred Meyer site. It is expected, unlike the other previously mentioned connectivity improvements, that the Brown Road extension would be triggered by yet-to-be-defined development of vacant land and would therefore be constructed as land parcels (assumed in this analysis) south of Wilsonville Road develop. Future major trip generators served by this extension include the Bernert Property (parcels 7 and 8 shown in Figure 2) as well as the Reeves property (parcel 10 on Figure 2). Table 3 summarizes the relationship between the street extensions and key development projects as well as identifying a generalized prioritization for intersection/interchange projects along Wilsonville Road.

**Table 3: Street Extension Relationships**

| Development Project(s)                                                                                                   | Associated Street Extension                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>▪ Villebois</li> <li>▪ Commuter Rail</li> <li>▪ Boburg Industrial Area</li> </ul> | <ul style="list-style-type: none"> <li>▪ Boeckman Road Extension</li> <li>▪ Barber Street Extension</li> <li>▪ Kinsman Road Extension</li> </ul> |
| <ul style="list-style-type: none"> <li>▪ Properties west of I-5 and south of Wilsonville Road</li> </ul>                 | <ul style="list-style-type: none"> <li>▪ Brown Road Extension</li> </ul>                                                                         |
| <ul style="list-style-type: none"> <li>▪ Canyon Creek Residential</li> <li>▪ Vlahos Property</li> </ul>                  | <ul style="list-style-type: none"> <li>▪ Canyon Creek Extension</li> </ul>                                                                       |



**LEGEND**

----- - Anticipated Roadway Projects

**Figure 2**  
**PLANNED STREET EXTENSIONS**

## Roadway Project Impacts on Wilsonville Road Capacity

Using the City's travel demand model, an incremental analysis was conducted in an effort to identify the benefit each individual capacity enhancing project would produce (measured in reduction of capacity and level of service constraints placed on the Wilsonville Road corridor). Street improvement projects were assumed in the future base roadway network for the 5-year analysis scenario (2009). Both the Wilsonville base year (2000) and future year (2020) travel demand forecast models were used to determine the changes in existing traffic volumes to Wilsonville Road. Table 4 summarizes the change in through volume on Wilsonville Road when each improvement is added. The individual project lines represent traffic volumes on Wilsonville Road for that particular project. The "All Extensions" row in the tables represents traffic volume on Wilsonville Road if all the projects were completed.

**Table 4: Potential Impacts to Wilsonville Road with Various Roadway Extensions**

| <i>Improvement Project</i> | <i>Wilsonville Road Eastbound (west of I-5)</i> | <i>Wilsonville Road Westbound (west of I-5)</i> | <i>Wilsonville Road Eastbound (east of I-5)</i> | <i>Wilsonville Road Westbound (east of I-5)</i> | <i>Ramps Total</i> | <i>Boones Ferry Road North bound</i> | <i>Boones Ferry Road South bound</i> | <i>Town Center Loop West South bound</i> |
|----------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|--------------------|--------------------------------------|--------------------------------------|------------------------------------------|
| <b>2000 Base Model</b>     |                                                 |                                                 |                                                 |                                                 |                    |                                      |                                      |                                          |
| Boeckman Extension         | -35                                             | -70                                             | -35                                             | -65                                             | +10                | 0                                    | -30                                  | -15                                      |
| Kinsman Extension          | +5                                              | +5                                              | +5                                              | +5                                              | -5                 | 0                                    | -20                                  | -5                                       |
| Barber Extension           | -15                                             | +5                                              | -10                                             | +5                                              | 0                  | 0                                    | -30                                  | -5                                       |
| Canyon Creek South         | 0                                               | +5                                              | 0                                               | -5                                              | -5                 | 0                                    | 0                                    | -5                                       |
| Downtown Connector         | +5                                              | +5                                              | 0                                               | +5                                              | 0                  | -10                                  | 0                                    | 0                                        |
| All Extensions             | -40                                             | -65                                             | -35                                             | -65                                             | 10                 | -10                                  | -60                                  | -20                                      |
| <b>2020 Future Model</b>   |                                                 |                                                 |                                                 |                                                 |                    |                                      |                                      |                                          |
| Boeckman Extension         | -65                                             | -210                                            | -85                                             | -205                                            | -5                 | 0                                    | -30                                  | -175                                     |
| Kinsman Extension          | +4                                              | -5                                              | +5                                              | 0                                               | 0                  | 0                                    | -5                                   | -5                                       |
| Barber Extension           | -50                                             | -90                                             | -50                                             | -60                                             | -5                 | 0                                    | -65                                  | -40                                      |
| Canyon Creek South         | 0                                               | -5                                              | +5                                              | +10                                             | +5                 | 0                                    | -15                                  | +10                                      |
| Downtown Connector         | -10                                             | 0                                               | -10                                             | +5                                              | +5                 | -70                                  | +35                                  | +10                                      |
| All Extensions             | -55                                             | -195                                            | -70                                             | -175                                            | +5                 | -70                                  | -90                                  | -160                                     |

In the 2000 regional travel demand model, the Boeckman extension provides almost as much relief to Wilsonville Road as all of the other improvement projects combined. The remaining extensions do not provide extensive relief to Wilsonville Road, although they do provide enhanced connectivity, relief to other roads and local access in the community. In aggregate, the range of potential benefit of the roadway extensions would be approximately

In the 2020 regional travel demand model, similar findings were found in relation to the Boeckman Road extension. However, the Barber Extension also provides a fairly substantial relief to Wilsonville Road. Again, the remaining extensions are very useful for community connectivity, but do not have a large volume reduction effect on Wilsonville Road. In general, the approximate range of potential benefit of the roadway extensions would be about 200 to 300 trips which would use alternative routes other than the I-5/Wilsonville Road interchange area.

**2009 Operating Conditions with Planned Street Extensions for the I-5/Wilsonville Road Interchange Area**

Future operating conditions based on 2009 traffic forecasts and the inclusion of identified roadway extension projects are summarized in Table 5. The Boones Ferry Road, I-5 southbound and northbound ramp intersections operate with LOS F. The Town Center Loop West/Wilsonville Road intersection meets City operating standards.

**Table 5: 2009 Level of Service With Planned Street Extensions (PM Peak Hour)**

| Intersection                                                                                                                                                                        | PM Peak Hour |     |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----|------|
|                                                                                                                                                                                     | Delay        | LOS | V/C  |
| <i>Signalized</i>                                                                                                                                                                   |              |     |      |
| Wilsonville Road/Boones Ferry Road                                                                                                                                                  | >80.0        | F   | >1.0 |
| Wilsonville Road/I-5 Southbound Ramps                                                                                                                                               | >80.0        | F   | >1.0 |
| Wilsonville Road/I-5 Northbound Ramps                                                                                                                                               | >80.0        | F   | >1.0 |
| Wilsonville Road/Town Center Loop West                                                                                                                                              | 45.8         | D   | 0.89 |
| Delay = Average Stopped Delay per Vehicle<br>LOS = Level of Service (ODOT uses v/c 0.99 as standard, City of Wilsonville uses LOS D as standard).<br>V/C = Volume-to-Capacity Ratio |              |     |      |

**2009 Operating Conditions With Planned Street Extensions + Planned Improvements for the I-5/Wilsonville Road Interchange Area**

Several improvements are planned associated with the approved or pending land use actions and the City's coordination with ODOT to provide additional capacity at the I-5/Wilsonville Road interchange area. The planned improvements include:

- Second westbound left turn lane at Wilsonville Road/Boones Ferry Road
- Separate northbound right turn lane at Wilsonville Road/Boones Ferry Road
- Signal timing modifications for the corridor
- Third westbound through lane at Wilsonville Road/I-5 southbound ramps
- Third eastbound through lane at Wilsonville Road/I-5 northbound
- Shared double westbound left turn lanes at Wilsonville Road/I-5 southbound ramps
- Shared double eastbound left turn lanes at Wilsonville Road/I-5 northbound ramps

Table 6 displays the operating conditions associated with all of the above mentioned improvements, including future anticipated development improvements and anticipated future traffic. With all of the above enhancements in place and the associated project traffic from the anticipated projects, the Wilsonville Road corridor has reached capacity. The TSP acknowledges the need to change standards in the Wilsonville Road Interchange area to LOS E and this change

has been included in the analysis. ODOT's preferred performance standard<sup>9</sup> is a maximum volume-to-capacity ratio of 0.99 for the Wilsonville Road corridor and 1.1 for the Wilsonville Town Center. While these operating conditions approach acceptable performance, the Town Center Loop West/Wilsonville Road interchange does not meet the City's LOS D standard.

**Table 6: 2009 Intersection Level of Service with Planned Street Extensions + Planned Improvements (PM Peak Hour)**

| Intersection                              | PM Peak Hour |     |      |
|-------------------------------------------|--------------|-----|------|
|                                           | Delay        | LOS | D/C  |
| <i>Signalized</i>                         |              |     |      |
| Wilsonville Road/Boones Ferry Road        | 54.9         | D   | 0.94 |
| Wilsonville Road/I-5 Southbound Ramps     | 47.6         | D   | 1.03 |
| Wilsonville Road/I-5 Northbound Ramps     | 28.4         | C   | 0.96 |
| Wilsonville Road/Town Center Loop West    | 65.1         | E   | 1.00 |
| Delay = Average Stopped Delay per Vehicle |              |     |      |
| LOS = Level of Service                    |              |     |      |
| D/C = Demand-to-Capacity Ratio            |              |     |      |

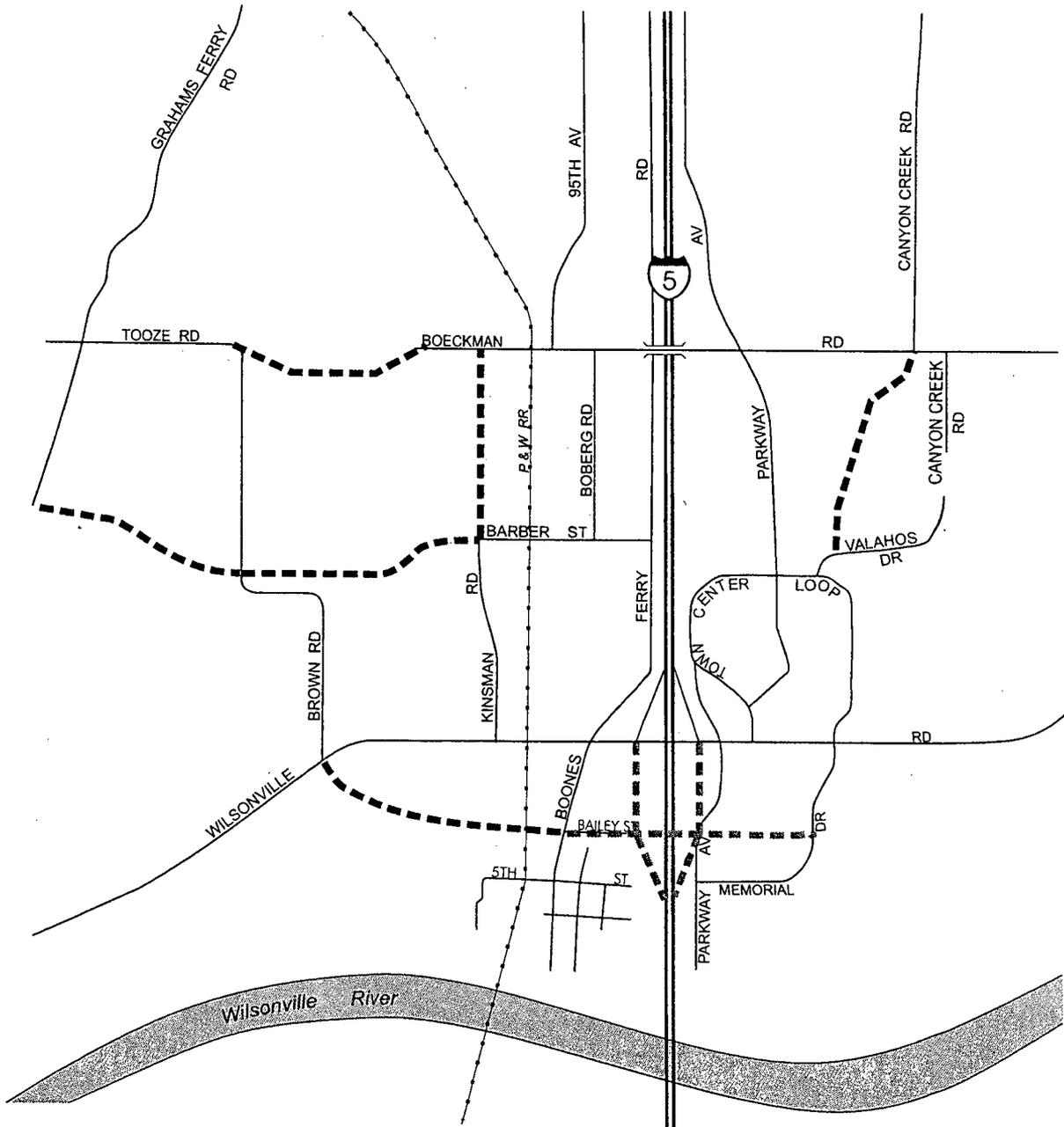
### **Alternative Improvements**

Capacity at the Wilsonville Road interchange would be mostly consumed by 2009, should the development mentioned above be constructed and planned improvements implemented. In the I-5 Freeway Access Study, it was noted that other interchange improvements could provide additional capacity beyond the double left turn lane scenario. A split diamond configuration was noted in the I-5 Freeway Access Study as an alternative that required further consideration (the split diamond was referenced in connection with a Memorial Drive/Trask Road/5<sup>th</sup> Avenue connection). A sensitivity analysis was performed to determine the performance of this alternative. Table 7 summarizes the intersection performance of this alternative (including the upgrade of Bailey Road linking the Brown Road extension to Bailey Road and an additional roadway crossing of Interstate 5). The split diamond would extend from the previously discussed Brown Road extension to Boones Ferry Road, crossing I-5 and terminating at Memorial Drive and would include an at-grade railroad crossing and a stream crossing. Additionally, the project would require Bailey Road to Brown Road extension and north/south controlled access ramp connectors, in the form of a one-way couplet on each side of Interstate 5 between Wilsonville Road and Bailey Road (Figure 3).

The performance of the split diamond configuration points to several key findings:

- Adequate service capacity can be provided, including significant residual capacity for unforeseen or anticipated future growth.
- Several substantial street improvements can be averted with the split diamond configuration including the significant widening of Wilsonville Road under I-5 for double left turn lanes, the

<sup>9</sup> 1999 Oregon Highway Plan, Oregon Department of Transportation, Table 6, Page 80.



**LEGEND**

- - Anticipated Roadway Projects
- - Split Diamond

**Figure 3**  
**WILSONVILLE TRANSPORTATION STRATEGY**  
**SPLIT DIAMOND**

### **Interchange Alternatives Capacity Requirements**

In order to more clearly differentiate benefits of alternative capacity enhancing infrastructure projects described above, capacity requirements were determined at each of the four interchange intersections under the following interchange configurations using 2009 traffic volumes (as developed above):

- Existing Geometry
- \$3.5 million option (shared-left turn lanes)
- \$25 million option (double-double left turn lanes)
- Split Diamond option

Table 8 shows PM peak hour total entering volumes expected at each intersection under the different alternatives. It should be noted that two volumes are listed for the split diamond configuration. The reason for this is that some traffic is accommodated at the southern intersections along Bailey Road, distributing the traffic over more than one interchange.

**Table 8: Existing and Forecasted Intersection Volume Summary (PM Peak Hour)**

| Intersection                           | Total Entering Volumes |                    |                     |                       |       |
|----------------------------------------|------------------------|--------------------|---------------------|-----------------------|-------|
|                                        | 2004                   | 2009               | 2009                | 2009                  |       |
|                                        |                        | <i>Shared Left</i> | <i>Double-Lefts</i> | <i>Split Diamond*</i> |       |
|                                        |                        |                    |                     | Bailey                | WV    |
| Wilsonville Road/Boones Ferry Road     | 2,800                  | 4,500              | 4,500               | 1,000                 | 3,000 |
| Wilsonville Road/I-5 Southbound Ramps  | 3,600                  | 4,900              | 4,900               | 1,300                 | 4,500 |
| Wilsonville Road/I-5 Northbound Ramps  | 3,800                  | 4,700              | 4,700               | 1,300                 | 3,500 |
| Wilsonville Road/Town Center Loop West | 3,000                  | 3,700              | 3,700               | 1,000                 | 3,200 |

\*Volume separated between the Wilsonville Road and Bailey Road interchanges.

Maximum capacity requirements were developed based on two methods to determine the number of vehicles each intersection in the three future infrastructure scenarios could handle. The first method is linear growth. Table 9 summarizes expected PM peak hour intersection volume under the 2009 linear growth scenario. Intersection maximum capacities were determined by adding volume proportionately to all turn movements until the intersection volume-to-capacity ratio reached 0.99 or 1.0. These resulting volumes are assumed to represent the theoretical capacity of the intersection.

**Table 9: Capacity of Wilsonville Road Intersections\* - Linear Growth Method**

| <i>Intersection</i>                    | <i>2004</i> | <i>2009<br/>Shared Left</i> | <i>2009<br/>Double-Lefts</i> | <i>2009<br/>Split Diamond**</i> |           |
|----------------------------------------|-------------|-----------------------------|------------------------------|---------------------------------|-----------|
|                                        |             |                             |                              | <i>Bailey</i>                   | <i>WV</i> |
| Wilsonville Road/Boones Ferry Road     | 2,800       | 4,300                       | 4,800                        | 1,000                           | 4,200     |
| Wilsonville Road/I-5 Southbound Ramps  | 3,600       | 4,500                       | 4,800                        | 2,000                           | 4,800     |
| Wilsonville Road/I-5 Northbound Ramps  | 3,800       | 4,600                       | 4,700                        | 2,500                           | 5,600     |
| Wilsonville Road/Town Center Loop West | 3,000       | 3,700                       | 3,800                        | 1,400                           | 3,500     |

\* Based upon total entering volume to intersection with Wilsonville Road in PM peak hour at a v/c (volume to capacity) ratio of 0.99.

\*\*Volume separated between the Wilsonville Road and Bailey Road interchanges.

The second method is the critical movement method. Significant traffic can sometimes be added to a non-critical movement with only minor impact on delay. Critical movements are the turns or through movements which constrain operations (require the most green time) at an intersection. **(It should be emphasized that this is a hypothetical exercise to provide a frame of reference as to how much traffic may be added to interchange area beyond the Existing Plus Stage II scenario).** Table 10 summarizes this computed capacity based on critical movements at the four study intersections. In theory, the traffic volumes shown in Table 11 are the maximum that could be handled at each of the study intersections under the improvement scenario described if volume grew on the conflicting movements. Additional volume could be accommodated at each of the intersections on non-critical movements.

**Table 10: Capacity of Wilsonville Road Intersections – Critical Movement Method**

| <i>Intersection</i>                    | <i>2004</i> | <i>2009<br/>Shared Left</i> | <i>2009<br/>Double-Lefts</i> | <i>2009<br/>Split Diamond*</i> |           |
|----------------------------------------|-------------|-----------------------------|------------------------------|--------------------------------|-----------|
|                                        |             |                             |                              | <i>Bailey</i>                  | <i>WV</i> |
| Wilsonville Road/Boones Ferry Road     | 1,450       | 2,300                       | 2,500                        | 700                            | 2,200     |
| Wilsonville Road/I-5 Southbound Ramps  | 1,900       | 1,900                       | 2,200                        | 700                            | 1,900     |
| Wilsonville Road/I-5 Northbound Ramps  | 2,050       | 2,200                       | 2,400                        | 400                            | 2,900     |
| Wilsonville Road/Town Center Loop West | 1,200       | 1,800                       | 1,900                        | 400                            | 1,600     |

\*Volume separated between the Wilsonville Road and Bailey Road interchanges.

### ***Transportation Demand Management***

The City should consider a transportation demand management program to peak hour demand through the I-5/Wilsonville Road interchange area. This would shorten the list of improvement project in the interchange area required to meet operating standards in 2009. Demand management strategies could include:

- Implement a commute trip reduction program, including flexible hours
- Continue to improve local street system to provide alternative routes to the interchange area
- Improve the local transit system
- Take full advantage of the proposed commuter rail system

The implementation of some or all of these programs would have a positive impact on available capacity in the I-5/Wilsonville Road interchange area and produce operational benefits that could be useful in managing the performance of the interchange area. There is a potential to postpone the future need for interchange improvements with the demand management program.

### ***De Minimis Test For Essential Government Services***

The City of Wilsonville has an ordinance in place (Ordinance No. 545) excepting essential government services ("Services and facilities provided by a governmental unit, that are basic and inherent to the public health and welfare including, but not limited to, fire, police, water, sewer, transportation, emergency communication, education, and governmental services and facilities in support thereof") from meeting the City's LOS D standard. Traffic volumes associated with the following projects were removed from the system (either removed if the project is already in operation, or simply not added if the project is a Stage II approved project that has not yet been occupied):

- Town Center Park/Korean War Memorial
- Wilsonville Prison
- Boones Ferry Primary School
- Wilsonville Community Center Expansion
- Water Treatment Plant
- Wilsonville High School Modular Classroom Expansion
- Library Expansion
- Clackamas Community College Pole Yard
- Clackamas Community College Phase II
- Civic Park & City Hall

There was no significant change in the 2009 LOS for any of the study intersections along Wilsonville Road with the removal of the trips associated with these developments and the inclusion of all future extensions.

### **Comparison to Previous Studies**

Projected 2009 traffic volumes were compared to the *Wilsonville Freeway Access Study*, completed by DKS Associates in November, 2002. For some approaches, traffic volumes projected for 2009 are higher than those projected using Wilsonville's 2020 travel demand forecast model for the *Freeway Access Study*. This is due, in part, to two differences:

- The assumption that 2009 trip distribution patterns will not differ significantly from those today.
- Developed land assumed for the entire City in 2020 is being built in a concentrated area by 2009.

Wilsonville's 2020 travel demand model indicates that a shift in travel behavior will occur where more PM peak hour trips will stay in Wilsonville and travel to and from the south than current travel patterns. Trips using a regional facility, such as I-5, comprise a major percentage of total trips, meaning that the Wilsonville Road interchange must accommodate many of the trips generated by development in Wilsonville. The regional model shows that Wilsonville will capture more internal trips by 2020 due to changing travel patterns and land use changes within the city (less reason for trips to travel to a regional destination as the City of Wilsonville will have many origin/destination points). Our analysis has attempted to take this shift in travel pattern into account, however, not all of it could be accounted for, meaning that volumes through the interchange area are more reflective of today's (2004) travel patterns as opposed to 2020 travel patterns.

Comparing land development assumptions for 2009 versus 2020, it is noted that much of the land that is anticipated to develop by 2009 is located south of Boeckman Road, and west of the I-5/Wilsonville Road interchange area. For the most part, the 2009 land use assumptions included nearly all the forecasted growth to 2020 assumed in the Freeway Access Study and TSP. Consequently, this study has condensed all of the growth that is accounted for in the regional travel demand model for 2020 in 2009. Additionally, this development is located in the southwest corner of Wilsonville as opposed to being evenly distributed throughout the City. The locations of these developments cause the majority of project traffic to utilize the Wilsonville Road interchange area. For the period between 2009 and 2020, much of the anticipated development would occur to the north and some of the development is planned for areas that are currently outside the Urban Growth Boundary.

### **Summary and Conclusions**

Traffic conditions in the Wilsonville Road corridor already experience significant westbound queuing during the day. It is expected that operations would degrade beyond acceptable levels of service as currently vacant or underutilized parcels have been fully developed, should street improvements not be made. The number of vehicles expected to pass through this corridor can be greatly reduced through mitigation efforts such as the completion of several street extensions including the Brown Road extension (Table 12). By providing better connectivity, the street network is able to disperse trips and provide more options for individual travelers. While in 2009 the improvements identified in the TSP and Freeway Access Study are able to operate at or just below capacity, alternative interchange configurations (such as a split diamond) can provide additional residual capacity without considerable widening of Wilsonville Road.

Please contact me or Sean Kennedy with any questions or comments.

Sincerely,

**DKS Associates**

Randsford McCourt, P.E., P.T.O.E.  
Principal

*X:\Projects\2004\P04045-005 (WV Public Facilities Strategy)\Documents\WV PFP.doc*

## Public Facilities Transportation Strategy

Exhibit 5 to  
04PC03A and 04PC03B  
Staff Report

The purpose of this memorandum is to lay out some of the background and the alternatives for resolving the absence of additional capacity at the Wilsonville Road Interchange with I-5.

### Background

On August 17, 1994, the Council adopted an ordinance approving a traffic management program and procedures for allocating traffic capacity in the vicinity of the I-5/Wilsonville Interchange.

This was subsequently declared to be a moratorium by the court system. Staff worked with the legislature and the Homebuilders Association to develop revised statutes concerning public facilities strategy. Subsequently on October 7, 1996, the Council adopted Ordinance No. 463 which approved a Public Facilities Transportation Strategy for development in the Wilsonville Road Corridor due to lack of street capacity in the Wilsonville/I-5 Wilsonville Road Interchange. This legislative action sunset prior to adoption of the city's Transportation Systems Plan. The 2003 Transportation Systems Plan was adopted by Council on June 2, 2003. In a parallel action, the City worked with Metro and ODOT to develop the Wilsonville Freeway Access Study. The Transportation Systems Plan provided the overall policy and facilities guidance for the city transportation system. The Freeway Access Study addressed the construction at the interchanges and the required local street system within Wilsonville to most efficiently provide adequate freeway access.

The primary conclusion of the Freeway Access Study was that the Stafford Interchange and the Wilsonville Road Interchange could provide adequate interchange access and egress capacity through the year 2020 provided there were substantial improvements at the Wilsonville Road Interchange and that the local street system was improved. The project also included potential phasing in the improvements at the Wilsonville Road Interchange. The City provided funding in the amount of \$3.5 million dollars for the initial phases of the Wilsonville Road Interchange improvements. The budgeted improvements would provide additional capacity for 702 PM peak hour trips.

The City is also required to make improvements to the local street system in conjunction with the interchanges improvements. In order to fund these improvements, (and for other reasons) City voters approved a West Side Urban Renewal District in Fall 2003. Projects to be constructed under the umbrella of the Urban Renewal District are:

- Kinsman Road from Barbur to Boeckman
- Boeckman Road from the vicinity of 95<sup>th</sup> Avenue to Tooze Road
- Tooze Road to Graham's Ferry Road
- Barbur from Kinsman Road to Brown Road
- Graham's Ferry Road from Tooze Road to the vicinity of the Living Enrichment Center
- The connection from Lower Boone's Ferry Road and Old Town to Wilsonville Road west of the railroad tracks
- Improvement of Brown Road between Wilsonville Road and Evergreen Road

These improvements are dependent on funding from the tax increment from development in Villebois Village.

The City then adopted a Trip Vesting Ordinance (Ordinance 561) establishing a system for trip vesting through the Wilsonville Road Interchange vicinity for projects with Urban Village Master Plan or Stage I Master Plan approval after June 2, 2003. The combination of previously approved Stage II applications and vested PM peak hour trips have used all the capacity from the \$3.5 million project and leave a shortfall. The 702 trips are allocated as shown in the table below.

It is anticipated that development over the next five years could require additional trips through the Wilsonville Road Interchange area. In the absence of any further action by staff, Planning Commission and council, it is anticipated that we will deny development applications due to nonconformance with concurrency requirements, setting up a pattern of denial, and the need to declare a moratorium. The Planning Commission has asked staff to look at establishing a Public Facilities Transportation Strategy, (PFTS) to allow continued controlled growth and avoid a moratorium situation.

We have not seriously looked at down zoning. Part of the process in developing the transportation process in developing the Transportation Systems Plan looked at changes in land use and the traffic impacts were relatively minor.

We also have not looked at any change in level of service other than the potential change to LOS "E" for Wilsonville Road from Boones Ferry to Town Center Loop West. This is an idea that is to be implemented based on the TSP and future Council approval. Presently we analyze the interchange ramps according to ODOT standards and the intersections from Town Center Loop West to Boones Ferry according to City standards and the ODOT standards are the most restrictive at present.

We also have not looked at purchase of property with high trip generation to reduce overall demands.

**The Problem:**

Attached is a list of potential development that would have an impact on the Wilsonville Road Interchange in the next five years.

| Project #                   | Project                                                       | PM Peak Hour Trips                                   | PM Peak Hour Trips through I-5 Interchange     |
|-----------------------------|---------------------------------------------------------------|------------------------------------------------------|------------------------------------------------|
| <b>APPROVED TRIPS</b>       |                                                               |                                                      |                                                |
| 03DB20                      | Park Pavilion                                                 | 127                                                  | 89                                             |
| 03DB23                      | Villebois South SAP, PDP # 1                                  | 49                                                   | 35                                             |
| 03DB27                      | Honda Dealership                                              | 82                                                   | 73                                             |
| 03DB29                      | Trammel Crow Warehouse                                        | 116                                                  | 87                                             |
| 03DB30                      | Jiffy Lube                                                    | 5                                                    | 5                                              |
| 03DB32                      | Family Fun Center                                             |                                                      | 3                                              |
| 03DB33                      | WV High School Expansion <sup>1</sup>                         | 97                                                   | 58                                             |
| <b>SUBTOTAL</b>             |                                                               | <b>476</b>                                           | <b>292 (350)</b>                               |
| <b>VESTED PROJECTS</b>      |                                                               |                                                      |                                                |
|                             | Villebois Master Plan                                         | 1783                                                 | 410                                            |
|                             | Honda is vested and has received Stage II approval. See above |                                                      |                                                |
| <b>SUBTOTAL</b>             |                                                               |                                                      | <b>702</b>                                     |
| <b>CURRENT APPLICATIONS</b> |                                                               |                                                      |                                                |
| Project #                   | Project                                                       | Project Description                                  | PM Peak Hour Trips through the I-5 Interchange |
| 03DB31                      | Penske Truck Leasing                                          | 2397 SF expansion of office and maintenance facility | 0                                              |
| 03DB36                      | Berrey Properties                                             | 157,800 SF total in 2 buildings                      | 5                                              |
| 03DB39                      | Fred Meyer                                                    | 181,093 SF main bldg., 15,000 SF of future pads      |                                                |
| 04DB01                      | Wood Middle School Expansion <sup>1</sup>                     |                                                      |                                                |
| 03DB42                      | NW Pacific Properties                                         | 16,000 SF warehouse                                  |                                                |
| 03DB43                      | Renaissance Homes                                             | 45 single family lot subdivision                     | 12                                             |
| <b>TOTAL</b>                |                                                               |                                                      |                                                |

<sup>1</sup> Trips exempt per WC 4.140.09(J)(2)(b)(ii) Essential government Services (including schools) are not factored into LOS calculations for any future applicants on City intersections.

**Estimate of Five Year Development Potential Impacting Wilsonville Road Interchange  
3/9/04**

| Development                                                                                                | PM Peak Hour Trip Generation | PM Peak Hour Trips through Wilsonville Road/I-5 Interchange Area |
|------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------------------------|
| Additional capacity for Villebois                                                                          | 539                          | 124                                                              |
| Fred Meyer                                                                                                 |                              |                                                                  |
| Renaissance Homes (Canyon Creek South – 80 – 100 SF homes)                                                 |                              |                                                                  |
| Penske Truck Leasing                                                                                       |                              | 0                                                                |
| Berry Properties                                                                                           |                              | 5                                                                |
| Wood Middle School Expansion                                                                               |                              | exempt                                                           |
| Commuter Rail w adjacent 400 vehicle park-&-ride                                                           |                              |                                                                  |
| Hydro-Temp property on Boberg (redevelopment and master plan)                                              |                              |                                                                  |
| Coca Cola plant expansion                                                                                  |                              |                                                                  |
| Wesleyan Church Expansion, Phase III (gymnasium & sanctuary)                                               |                              |                                                                  |
| Bernert property (Comp Plan amendment, zone change from industrial to residential/commercial, Master Plan) |                              |                                                                  |
| Kohl property along I-5                                                                                    |                              |                                                                  |
| Water Treatment Plant (fields and park development)                                                        |                              |                                                                  |
| Reeves property on Wilsonville road (Industrial to commercial)                                             |                              |                                                                  |
| Jack property as industrial warehouses, not commuter rail (for planning)                                   |                              |                                                                  |
| Hollywood Entertainment Headquarters (Third story addition)                                                |                              |                                                                  |
| Kaiser Property in Town Center (partitioning and development of all or part)                               |                              |                                                                  |
| Small commercial development north of Chili's                                                              |                              |                                                                  |
| LEC                                                                                                        |                              |                                                                  |
| Knapp (industrial to commercial)                                                                           |                              |                                                                  |
| Abele property (subdivision of 10 – 20 lots)                                                               |                              |                                                                  |
| Milgard property (redevelopment)                                                                           |                              |                                                                  |
| Nikzi property (commercial development)                                                                    |                              |                                                                  |
| Small industrial development SE corner of Boberg and Boeckman                                              |                              |                                                                  |
| Commercial property east of post office and vacant property on corner of Vlahos and TCLE                   |                              |                                                                  |

## Approaches

Both the Freeway Access Plan and the City's Transportation Systems Plan anticipate a substantial change in driving habits between now and 2020. Projections in both documents indicate that, with the planned system improvements, we will be able to maintain our level of service standards in 2020, if there is a substantial change in driving habits over the next 16 years. In other words, we need to develop a system that would function very well in 2020, but may have substantial interim level of service problems because the local street improvements have not yet been fully implemented and/or the driving habits have not fully changed.

It is anticipated that the Public Facilities Transportation Strategy will require a combination approach where we rely on efforts to both 'plan our way out' of the problem and 'build our way out' of the problem.

To implement the "plan our way out" portion of the approach, the City will implement the transportation demand management policies and strategies contained in Chapter 8 of the City's Transportation Systems Plan. ODOT's Transportation Planning Rule (TPR)(OAR 660-012-0000 through 660-012-0060) sets the following TDM objectives for the Metro area.

- No increase in automobile vehicle miles traveled (VMT) per capita within the first 10 years following adoption of the Regional Transportation Systems Plan
- A 10% reduction in VMT per capita within 20 years
- An additional 5% reduction in VMT per capita within 30 years

The City, in its TSP, has adopted a goal of 45% non-SOV trips by 2020. Annualized, this reduction equates to 2.25% per year, or 11.25% over 5 years.

The City's TSP states that the City will meet its goal of 45% through the following measures:

- An inter-connected street system that encourages walking and bicycling.
- Addition of bike lanes and sidewalks throughout the City.
- An effective transit system that responds to the mobility needs of residents and employees and permits easy shifts from one mode of transportation to another (i.e. bike to bus, car to bus, etc.)
- Transportation demand management strategies to decrease the use of single occupancy vehicles.

The PFTS will utilize all of these methods, but will rely primarily on reduction of single occupancy vehicle trips through increased use of transit, carpooling and other methodologies. The proposed construction of a commuter rail station and multi-modal center in Wilsonville connecting Wilsonville and points south to the MAX station in Beaverton will further enhance the movement from SOV to other modes of transportation.

The City will also work with SMART and DEQ to strongly encourage local businesses with 50 or more employees to comply with the requirements of the Employee Commute Options (ECO) program, which require a 10% reduction in vehicle miles traveled (VMT) within 3 years of the initiation of the program. (See Appendix xx) According to City business license records, there are 53 companies with 50 or more employees. SMART works with the DEQ ECO program by

providing the education about options for trip reduction and developing employee surveys and transportation demand management plans. According to ECO records, of the 53 businesses with over 50 employees, 14 are in full or partial compliance with ECO requirements leaving 39 companies who are not complying.

There are also 8 companies with 40 or more employees but less than 50, who are not required to meet ECO requirements, but who also generate trips through the W/I-5 interchange. The City may choose to apply the ECO requirements to those businesses as well in order to recognize the amount of needed trip reduction within 5 years.

The City's TSP contains a table (Appendix xx) of Potential Transportation Demand Management Methods which includes detailed potential SOV Auto Trip Reduction factors for different TDM techniques. Transit subsidies and work alternatives appear to provide the greatest impacts on potential trip reductions at a potential 30% or greater reduction. This table is based on DEQ ECO guidelines.

In addition, we will need the active support of our existing residential, commercial and industrial populations in order to achieve the goals of the City's TSP and of the Freeway Access Study.

As part of the development approval process in Wilsonville, applicants are required to submit a traffic study prepared by DKS, Inc., a traffic engineering firm under contract with the city. The attached table provides selected trip generation information as well as ECO compliance data for businesses employing 50 or more, and also looks at businesses employing between 40 and 50 to see if additional trip reductions are feasible using ECO guidelines.

The "build our way out" portion of the program will be construction of system improvements as described in the Freeway Access Study and Chapter 4 of the Transportation Systems Plan.

## **The Strategy**

### **Vesting: (Years 2004 – 2009)**

Continue the capacity vesting system through the Wilsonville Road/I-5 Interchange as currently included in the Wilsonville Code with the following exceptions:

- Limit the vested capacity to no more than five years of projected growth and available capacity.
- For the next five years, use a combination of Transportation Demand Management and construction of new facilities to provide added capacity. The five-year period for the Public Facilities Transportation Strategy as currently described in state statutes will completely use all the capacity that can be generated through 2020 by constructed improvements. We need to look at what we will do from 2010 to 2020 to ensure that whatever we spend in the first five years will be funds that have been well spent and will be providing facilities that are fully compatible with long range requirements. There are two basic approaches to providing capacity for the period from 2010 to 2020.

**Transportation Demand Management, including Change in Driving Habits**  
**(Years 2010 – 2020)**

The projections by both the Freeway Access Study and the Transportation Systems Plan indicate that there will be sufficient change in our driving habits through 2020 and that this change, together with construction of projected system improvements, will be sufficient to maintain level of service standards through 2020.

The basic approach would be two-fold. The first part would be to continue the emphasis on Transportation Demand Management as previously described for the first five year period.

The second part would be to adjust projected capacity for the actual change in driving habits. There are two ways to do this.

- Take the total capacity gained by the change in driving habits and distribute this at 1/10<sup>th</sup> of the added capacity per year, or
- Conduct annual traffic counts and distribute the additional capacity gained from the change in driving habits annually. This is the more conservative approach. There will be some inconsistencies in this approach because driving habits and thus traffic counts change from day to day. This approach may prevent construction of added facilities in the 2010 to 2020 time period due to verified changes in driving habits and resultant gained capacity.

According to growth projections, there will be an 80% growth in households and a 99% growth in jobs overall in Wilsonville over this time period. This projection is from the Metro traffic model. We then used the combination of the City and Metro projections to look at the area that would most likely impact the Wilsonville Road/I-5 Interchange, more specifically the property within City limits between Boeckman Road and the Willamette River. This includes the property within the proposed City limits expansion in Villebois Village. The projection for this 'area of impact' is a 77% increase in households and a 156% increase in jobs.

The most conservative approach would be to use the projections for the entire city in that it would build in the largest margin for error for a viable transportation strategy. The overall City projections correlate with an average total intersection capacity increase at the I-5 southbound ramps of 33% and a total overall average intersection capacity (demand?) increase of northbound ramps of 35%. Therefore, from a strictly numbers viewpoint, this would indicate that we need to take care of 34% of the increased traffic from future added households and jobs by constructing capacity for an additional 34% demand. The remaining 56% overall increase will be taken care of by a combination of a strong transportation demand management system and the normal change in driving habits resulting from:

- An improved jobs/housing balance in the City of Wilsonville
- Completion of the local street grid to divert traffic from I-5
- Increasing congestion of through traffic on I-5 creating a disincentive to use I-5 during the PM peak hour

### **Added Interchange Capacity**

Reliance on "Change in Driving Habits" puts a very high degree of faith in our ability to model future changes. If our projections are wrong, then the decisions we make now may result in unwise expenditures of considerable amounts of funds.

In view of the possibility of error in projections, we should continue to look at alternate facilities that could be constructed to manage our very apparent limitations on interchange capacity in the mid and long term. One alternative is to modify the Wilsonville Road Interchange to a split diamond. The split would probably go to the south in the vicinity of 5<sup>th</sup> Street. This would be a modification of an existing interchange and would possibly be able to qualify for more relaxed rules at ODOT and the Federal Highway Administration than were imposed for the previously studied Boeckman Interchange.

The alternative to the split diamond would be to go back to the brick wall titled the Boeckman Interchange, stand in front of it and pound our heads against it for several more months to see if it would be viewed more favorably. The only significant change from the modeling that was done for the Freeway Access Study that proved we would not need an interchange at Boeckman Road is the change in the areas of projected development. The Freeway Access Study and the TSP projected a uniform growth rate in the undeveloped property over the 20 year period. We are faced with a very substantial commercial development south of Wilsonville Road on Boones Ferry Road that is completely contrary to the uniform growth rate. Although it is nearly impossible to accommodate this development in the near term, it appears that if we are successful in changing driving habits, it would be reasonable to expect to be able to accommodate the facility within the 20-year time frame.

### **Incentives:**

TDM may provide considerable cost savings to the City and the state in the mid and long-term by delaying additional expensive improvements to both local streets and the I-5 interchange. Because of this benefit, the City and the state are willing to provide a benefit for companies who show a trip reduction consistent with the PFTS.

City: The City currently charges an I-5 supplemental street SDC (SSSDC) of \$2293 per trip for uses which generate more than three pm peak hour trips through the Wilsonville/I-5 interchange. This has been done through vesting agreements, and will continue to be done through agreements under the PFTS. The city is proposing to refund SSSDCs equivalent to reduced pm peak trips through the W/I-5 interchange subject to evidence gathered through ECO compliance documentation, a traffic study done by DKS or other consultant of city choice or TDM Plan monitoring reports that verifiable trip reductions have occurred and that the programs/systems are in place which continue to maintain the reductions at least through the period of a PFTS agreement between a business or developer and the city.

SMART: SMART, in conjunction with the State Department of Energy, is prepared to offer participation in the Business Energy Tax Credit Pass-through Option Program. (See Appendix XX) Under this program, Oregon businesses can receive a state tax credit for projects that reduce

energy used in transportation. Non-profits and government agencies in Oregon can transfer their tax credit project eligibility to a business with Oregon tax liability. The following types of projects that encourage alternatives to Single Vehicle Occupancy (SOV) and reduction in air pollution are eligible: bicycle projects, car sharing projects, commuter pool vehicle program, financial incentive programs for reduction in vehicle miles traveled (VMT), parking cash-out program, an R & D project that reduces VMT through innovative methods, telework, transit passes and transportation management services fees. Details about each program are found in Appendix XXX.

## **Implementation Measures**

### **New Construction:**

Construct the Boeckman Extension from 95<sup>th</sup> Avenue to the vicinity of 110<sup>th</sup> and Tooze Road. This will provide an alternate route between the Sherwood vicinity and the Wilsonville Road vicinity east of I-5.

Construct Kinsman from Barber to Boeckman. This provides an additional north/south route and will reduce the traffic through the Wilsonville road Interchange Area.

Construct Barber from Kinsman to Brown. This also provides another east/west connection particularly for Wilsonville generated traffic

Construct an alternate route from Boones Ferry Road in the Old Town area to Wilsonville Road west of the railroad tracks. This will reduce the traffic through the intersection of Boones Ferry and Wilsonville Roads

Construct the Phase 3 Wilsonville Road Interchange improvements including widening to 8 vehicular lanes on Wilsonville Road under I-5, two through lanes in each direction, a double left in each direction and ramp improvements.

Improve the Boones Ferry and Wilsonville Road intersection by constructing a westbound double left turn to Boones Ferry Road and other northbound and eastbound lane enhancements.

Construct Canyon Creek south from Boeckman to Vlahos.

### **Transportation Demand Management**

Reduce PM peak hour trips by existing industrial, office and large commercial facilities in the Wilsonville Road Interchange area through implementation of Transportation Demand Management techniques and improved coordination with SMART. In coordination with DEQ, require TDM plans for businesses not in compliance with ECO requirements.

Increase SMART public transit capacity between Wilsonville and other cities, and within the city.

Amend City Code to require TDM plans for new industrial, office and commercial facilities, especially those with over 40 employees or those with high trip generation numbers through the Wilsonville/I-5 interchange, including a facility generated regular monitoring program.

Authorize the refund of supplemental street systems development charges for TDM actions that result in verifiable PM peak trip reductions, especially through the W/I-5 interchange.

Evaluate construction of a commuter rail park and ride facility south of the Willamette River to reduce trips through the W/I-5 interchange.

Verify projected trip reduction resultant from activation of commuter rail service in Wilsonville. Modify PFTS as necessary to incorporate those conclusions.

| Company                | Total PM Peak Trips | PM Peak Trips WR/I-5 Interchange | # of employees (2003) | ECO base rate (if not in ECO Program, 1.0) | City's 45% reduction in trips (11.25% in 5 years) | ECO Target Trip Rate (10% reduction in 3 years) | ECO Trip reduction to date (2002) | Net potential remaining trips (ECO) |
|------------------------|---------------------|----------------------------------|-----------------------|--------------------------------------------|---------------------------------------------------|-------------------------------------------------|-----------------------------------|-------------------------------------|
| Xerox                  |                     |                                  | 1553                  | 1.0<br>(1553)                              | 174                                               | 155                                             | Ex                                |                                     |
| Mentor Graphics        |                     |                                  | 1051                  | 0.94<br>(987)                              | 111                                               | 0.84<br>(168)                                   | 0.90<br>(105)                     | 63                                  |
| Precision Interconnect |                     |                                  | 791                   | 0.82<br>(648)                              | 73                                                | 0.74<br>(205)                                   | 0.84<br>(127)                     | 78                                  |
| Hollywood Management   |                     |                                  | 467                   | 1.0<br>(467)                               | 53                                                | 47                                              | 0                                 | 47                                  |
| Infocus Systems        |                     |                                  | 439                   | 0.93<br>(408)                              | 46                                                | 0.86<br>(61)                                    | 0.91<br>(40)                      | 21                                  |
| Sysco Food Services    |                     |                                  | 414                   | 0.95<br>(393)                              | 44                                                | 0.86<br>(58)                                    | 0.97<br>(12)                      | 46                                  |
| Nike USA               |                     |                                  | 350                   | 1.0<br>(350)                               | 39                                                | 35                                              | 0                                 | 35                                  |
| Fry's Electronics      |                     |                                  | 299                   | 1.0<br>(299)                               | 34                                                | 30                                              | 0                                 | 30                                  |
| ADECCO USA             |                     |                                  | 284                   | 1.0<br>(284)                               | 32                                                | 28                                              | 0                                 | 28                                  |
| RiteAid Distribution   |                     |                                  | 280                   | 0.91<br>(254)                              | 29                                                | 0.82<br>(50)                                    | 0.83<br>(48)                      | 2                                   |
| Costco                 |                     |                                  | 260                   | 1.0<br>(260)                               | 29                                                | 26                                              | 0                                 | 26                                  |

| Company                              | Total PM Peak Trips | PM Peak Trips WR/ I-5 Inter change | # of employees (2003) | ECO base rate (if not in ECO Program, 1.0) | City's 45% reduction in trips (11.25% in 5 years) | ECO Target Trip Rate (10% reduction in 3 years) | ECO Trip reduction to date (2002) | Net potential remaining trips (ECO) |
|--------------------------------------|---------------------|------------------------------------|-----------------------|--------------------------------------------|---------------------------------------------------|-------------------------------------------------|-----------------------------------|-------------------------------------|
| GI Joe's                             |                     |                                    | 187                   | 0.90<br>(168)                              | 19                                                | 0.81<br>(36)                                    | 0.86<br>(26)                      | 10                                  |
| Oregon Glass                         |                     |                                    | 159                   | 1.0<br>(159)                               | 18                                                |                                                 | Ex                                |                                     |
| OrePac Building Products             |                     |                                    | 158                   | 1.0<br>(158)                               | 18                                                | 16                                              | 0                                 | 16                                  |
| City of Wilsonville                  |                     |                                    | 151                   | 0.95<br>(143)                              | 17                                                | 0.86<br>(18)                                    | 0.87<br>(17)                      | 1                                   |
| Vision Plastics                      |                     |                                    | 150                   | 0.94<br>(141)                              | 16                                                | 0.85<br>(23)                                    | 0.79<br>(32)                      | 0                                   |
| Houston's, Inc.                      |                     |                                    | 131                   | 1.0<br>(131)                               | 15                                                | 13                                              | 0                                 | 13                                  |
| Hollywood Entertainment              |                     |                                    | 125                   | 1.0<br>(125)                               | 14                                                | 13                                              | 0                                 | 13                                  |
| Conway Transportation                |                     |                                    | 123                   | 1.0<br>(123)                               | 14                                                | 12                                              | 0                                 | 12                                  |
| Lamb's Thriftway                     |                     |                                    | 120                   | 0.93<br>(111)                              | 12                                                | 0.84<br>(19)                                    |                                   | 19                                  |
| Target                               |                     |                                    | 120                   | 1.0<br>(120)                               | 14                                                | 12                                              | 0                                 | 12                                  |
| Great Western Sweeping               |                     |                                    | 116                   | 1.0<br>(116)                               | 13                                                | 12                                              | 0                                 | 12                                  |
| SSI Shredding Systems                |                     |                                    | 110                   | 0.87<br>(95)                               | 11                                                | 0.78<br>(24)                                    |                                   | 24                                  |
| Mastercraft Furniture                |                     |                                    | 102                   | 0.70<br>(71)                               | 11                                                | 0.63<br>(38)                                    |                                   | 38                                  |
| Northwest Trailer Parts Distribution |                     |                                    | 102                   | 0.88<br>(89)                               | 11                                                | 0.79<br>(21)                                    | 0.83<br>(17)                      | 4                                   |
| Kinetics, Inc.                       |                     |                                    | 100                   | 0.95<br>(95)                               | 11                                                | 0.86<br>(14)                                    | 0.92<br>(8)                       | 6                                   |
| Coca Cola                            |                     |                                    | 96                    | 1.0<br>(96)                                | 10                                                |                                                 | Ex                                |                                     |
| McKesson Drug Company                |                     |                                    | 91                    | 1.0<br>(91)                                | 10                                                | 9                                               | 0                                 | 9                                   |
| PGE                                  |                     |                                    | 90                    | 1.0<br>(90)                                | 10                                                | 9                                               | 0                                 | 9                                   |
| PML Microbiologicals                 |                     |                                    | 87                    | 0.88<br>(76)                               | 9                                                 | 0.79<br>(18)                                    |                                   | 18                                  |
| Ikon Office Solutions                |                     |                                    | 84                    | 1.0<br>(84)                                | 9                                                 | 8                                               | 0                                 | 8                                   |
| Kershaw Knives                       |                     |                                    | 82                    | 1.0<br>(82)                                | 9                                                 | 8                                               | 0                                 | 8                                   |
| West Coast Bank                      |                     |                                    | 80                    | 1.0<br>(80)                                | 9                                                 | 8                                               | 0                                 | 8                                   |

| Company                               | Total PM Peak Trips | PM Peak Trips WR/ I-5 Inter change | # of employees (2003) | ECO base rate (if not in ECO Program, 1.0) | City's 45% reduction in trips (11.25% in 5 years) | ECO Target Trip Rate (10% reduction in 3 years) | ECO Trip reduction to date (2002) | Net potential remaining trips (ECO) |
|---------------------------------------|---------------------|------------------------------------|-----------------------|--------------------------------------------|---------------------------------------------------|-------------------------------------------------|-----------------------------------|-------------------------------------|
| Wilsonville/West Linn School District |                     |                                    |                       |                                            |                                                   |                                                 |                                   |                                     |
| Interstate Distribution Company       |                     |                                    | 79                    | 1.0<br>(79)                                | 9                                                 | 8                                               | 0                                 | 8                                   |
| Kinetic Systems                       |                     |                                    | 74                    | 1.0<br>(74)                                | 8                                                 | 7                                               | 0                                 | 7                                   |
| Clarity Visual Systems                |                     |                                    | 71                    | 1.0<br>(71)                                | 8                                                 | 7                                               | 0                                 | 7                                   |
| Spring Ridge @ Charbonneau            |                     |                                    | 70                    | 1.0<br>(70)                                | 8                                                 | 7                                               | 0                                 | 7                                   |
| Integrative Therapeutics              |                     |                                    | 67                    | 1.0<br>(67)                                | 8                                                 | 7                                               | 0                                 | 7                                   |
| Owens & Minor Distribution            |                     |                                    | 67                    | 1.0<br>(67)                                | 8                                                 | 7                                               | 0                                 | 7                                   |
| Spring Ridge Court at Charbonneau     |                     |                                    | 63                    | 1.0<br>(63)                                | 7                                                 | 6                                               | 0                                 | 7                                   |
| Utility Vault/Oldcastle               |                     |                                    | 63                    | 1.0<br>(63)                                | 7                                                 | 6                                               | 0                                 | 7                                   |
| LazerQuick                            |                     |                                    | 62                    | 1.0<br>(62)                                | 7                                                 | 6                                               | 0                                 | 7                                   |
| Coastwide Labs                        |                     |                                    | 60                    | 1.0<br>(60)                                | 7                                                 | 6                                               | 0                                 | 6                                   |
| ProGrass                              |                     |                                    | 60                    | 1.0<br>(60)                                | 7                                                 | 6                                               | 0                                 | 6                                   |
| GWG, LLC, The Hampton                 |                     |                                    | 59                    | 1.0<br>(59)                                | 7                                                 | 6                                               | 0                                 | 6                                   |
| ESP Technologies                      |                     |                                    | 58                    | 1.0<br>(58)                                | 7                                                 | 6                                               | 0                                 | 6                                   |
| Logic General                         |                     |                                    | 58                    | 1.0<br>(58)                                | 7                                                 | 6                                               | 0                                 | 6                                   |
| Mercedes-Benz                         |                     |                                    | 58                    | 1.0<br>(58)                                | 7                                                 | 6                                               | 0                                 | 6                                   |
| Family Fun Center                     |                     |                                    | 53                    | 1.0<br>(53)                                | 6                                                 | 5                                               | 0                                 | 5                                   |
| Chilli's Grill                        |                     |                                    | 50                    | 1.0<br>(50)                                | 6                                                 | 5                                               | 0                                 | 5                                   |
| Clackamas Community College           |                     |                                    |                       |                                            |                                                   |                                                 |                                   |                                     |
| <b>TOTAL</b>                          |                     |                                    |                       |                                            |                                                   |                                                 |                                   | <b>726<br/>plus ECO</b>             |

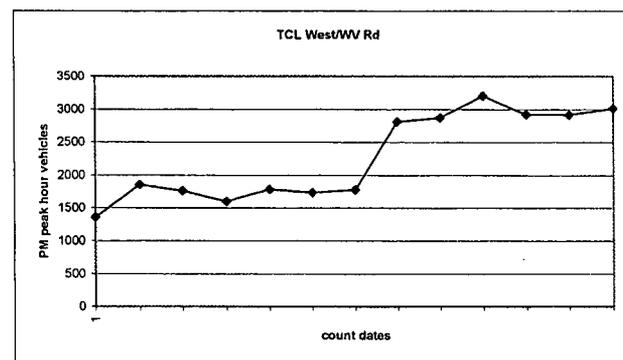
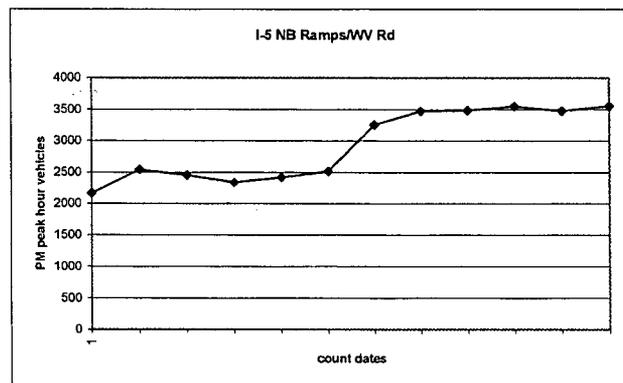
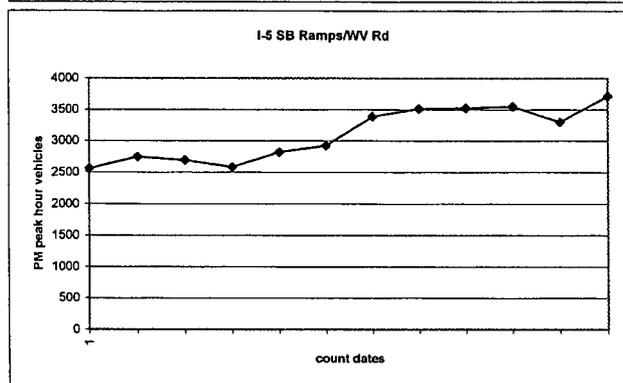
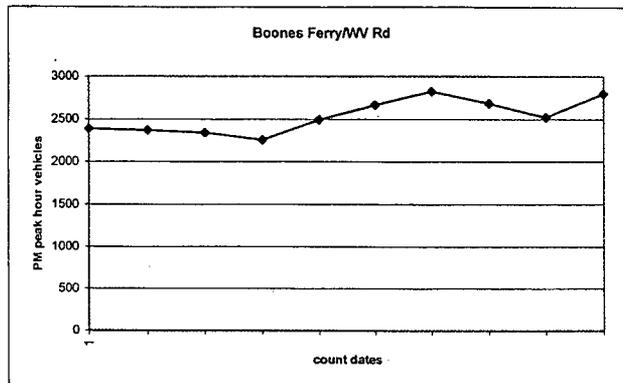
| Company                        | Total PM Peak Trips | PM Peak Trips WR/ I-5 Inter change | # of employees (2003) | ECO base rate (if not in ECO Program, 1.0) | City's 45% reduction in trips (11.25% in 5 years) | ECO Target Trip Rate (10% reduction in 3 years) | ECO Trip reduction to date (2002) | Net potential remaining trips (ECO) |
|--------------------------------|---------------------|------------------------------------|-----------------------|--------------------------------------------|---------------------------------------------------|-------------------------------------------------|-----------------------------------|-------------------------------------|
|                                |                     |                                    |                       |                                            |                                                   |                                                 |                                   | exempt                              |
| <b>40 – 50 employees</b>       |                     |                                    |                       |                                            |                                                   |                                                 |                                   |                                     |
| Marquis Care                   |                     |                                    | 49                    | 1.0<br>(49)                                | 1                                                 |                                                 |                                   |                                     |
| American Presidential Services |                     |                                    | 46                    | 1.0<br>(46)                                | 1                                                 |                                                 |                                   |                                     |
| Terminix International         |                     |                                    | 44                    | 1.0<br>(44)                                | 1                                                 |                                                 |                                   |                                     |
| Red Robin                      |                     |                                    | 43                    | 1.0<br>(43)                                | 1                                                 |                                                 |                                   |                                     |
| Wilsonville Concrete Products  |                     |                                    | 43                    | 1.0<br>(43)                                | 1                                                 |                                                 |                                   |                                     |
| Town & Country Dodge           |                     |                                    | 42                    | 1.0<br>(42)                                | 1                                                 |                                                 |                                   |                                     |
| Holiday Inn                    |                     |                                    | 40                    | 0.90<br>(36)                               | 1                                                 |                                                 |                                   |                                     |
| Process Tube Systems           |                     |                                    | 40                    | 1.0<br>(40)                                | 1                                                 |                                                 |                                   |                                     |
|                                |                     |                                    |                       |                                            |                                                   |                                                 |                                   |                                     |

## EXHIBIT 6

### Historical PM Peak Hour Count Data

#### I-5/Wilsonville Road Interchange

| Boones Ferry Road/Wilsonville Road |             | EBR | EBT  | EBL | SBR | SBT | SBL | NBL | NBT | NBR | WBL | WBT  | WBR | TEV  |      |
|------------------------------------|-------------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|------|
| 7/1/92                             | 16:30-17:30 | 32  | 485  | 27  | 34  | 154 | 448 | 55  | 35  | 321 | 216 | 497  | 84  | 2388 | 1992 |
| 12/3/92                            | 16:20-17:20 | 33  | 433  | 25  | 35  | 181 | 432 | 61  | 44  | 379 | 222 | 439  | 86  | 2370 | 1992 |
| 5/26/93                            | 16:30-17:30 | 36  | 479  | 41  | 42  | 138 | 465 | 55  | 45  | 277 | 166 | 501  | 95  | 2340 | 1993 |
| 4/5/94                             | 16:35-17:35 | 25  | 442  | 32  | 43  | 164 | 436 | 62  | 64  | 323 | 159 | 428  | 76  | 2254 | 1994 |
| 8/31/99                            | 16:35-17:35 | 33  | 662  | 30  | 38  | 33  | 490 | 41  | 23  | 175 | 127 | 681  | 159 | 2492 | 1999 |
| 5/25/00                            | 16:30-17:30 | 53  | 715  | 27  | 56  | 64  | 435 | 40  | 23  | 177 | 142 | 775  | 157 | 2664 | 2000 |
| 10/1/01                            |             | 31  | 632  | 57  | 119 | 63  | 566 | 41  | 26  | 170 | 134 | 854  | 129 | 2822 | 2001 |
| 6/25/03                            |             | 4   | 619  | 32  | 29  | 39  | 703 | 29  | 23  | 123 | 92  | 838  | 157 | 2688 | 2003 |
| 11/1/03                            |             | 32  | 637  | 28  | 47  | 43  | 500 | 48  | 22  | 143 | 143 | 713  | 166 | 2522 | 2003 |
| 6/1/04                             |             | 44  | 759  | 26  | 58  | 74  | 523 | 62  | 36  | 214 | 172 | 763  | 67  | 2798 | 2004 |
| I-5 SB Ramps/Wilsonville Road      |             | EBR | EBT  | EBL | SBR | SBT | SBL | NBL | NBT | NBR | WBL | WBT  | WBR | TEV  |      |
| 6/2/92                             | 17:05-18:05 | 391 | 602  | 0   | 492 | 0   | 391 | 0   | 0   | 0   | 261 | 421  | 0   | 2558 | 1992 |
| 12/3/92                            | 16:40-17:40 | 396 | 764  | 0   | 530 | 0   | 353 | 0   | 0   | 0   | 329 | 378  | 0   | 2750 | 1992 |
| 3/16/93                            | 16:30-17:30 | 492 | 721  | 0   | 405 | 0   | 354 | 0   | 0   | 0   | 285 | 441  | 0   | 2698 | 1993 |
| 3/17/93                            | 16:25-17:25 | 501 | 715  | 0   | 385 | 0   | 306 | 0   | 0   | 0   | 288 | 388  | 0   | 2583 | 1993 |
| 3/18/93                            | 16:35-17:35 | 538 | 736  | 0   | 453 | 0   | 361 | 0   | 0   | 0   | 312 | 420  | 0   | 2820 | 1993 |
| 3/31/94                            | 16:25-17:25 | 555 | 777  | 0   | 493 | 0   | 366 | 0   | 0   | 0   | 257 | 477  | 0   | 2925 | 1994 |
| 8/31/99                            | 16:35-17:35 | 558 | 765  | 0   | 437 | 0   | 534 | 0   | 0   | 0   | 504 | 590  | 0   | 3388 | 1999 |
| 6/1/01                             |             | 479 | 864  | 0   | 424 | 0   | 586 | 0   | 0   | 0   | 509 | 654  | 0   | 3516 | 2001 |
| 10/1/01                            |             | 452 | 869  | 0   | 432 | 0   | 615 | 0   | 0   | 0   | 498 | 658  | 0   | 3524 | 2001 |
| 6/1/03                             |             | 565 | 741  | 0   | 395 | 3   | 615 | 0   | 0   | 0   | 588 | 642  | 0   | 3549 | 2003 |
| 11/1/03                            |             | 499 | 746  | 0   | 417 | 0   | 556 | 0   | 0   | 0   | 489 | 595  | 0   | 3302 | 2003 |
| 6/1/04                             |             | 595 | 897  | 0   | 429 | 0   | 528 | 0   | 0   | 0   | 540 | 724  | 0   | 3713 | 2004 |
| I-5 NB Ramps/Wilsonville Road      |             | EBR | EBT  | EBL | SBR | SBT | SBL | NBL | NBT | NBR | WBL | WBT  | WBR | TEV  |      |
| 6/2/92                             | 17:05-18:05 | 0   | 683  | 320 | 0   | 0   | 0   | 182 | 0   | 240 | 0   | 506  | 233 | 2164 | 1992 |
| 12/3/92                            | 16:35-17:35 | 0   | 753  | 420 | 0   | 0   | 0   | 184 | 0   | 244 | 0   | 551  | 389 | 2541 | 1992 |
| 3/16/93                            | 16:35-17:35 | 0   | 703  | 393 | 0   | 0   | 0   | 185 | 0   | 283 | 0   | 544  | 344 | 2452 | 1993 |
| 3/17/93                            | 16:40-17:40 | 0   | 613  | 443 | 0   | 0   | 0   | 185 | 0   | 262 | 0   | 501  | 335 | 2339 | 1993 |
| 3/18/93                            | 16:50-17:50 | 0   | 673  | 416 | 0   | 0   | 0   | 189 | 0   | 272 | 0   | 556  | 308 | 2414 | 1993 |
| 3/31/94                            | 16:30-17:30 | 0   | 726  | 420 | 0   | 0   | 0   | 208 | 0   | 277 | 0   | 540  | 340 | 2511 | 1994 |
| 8/31/99                            | 16:55-17:55 | 0   | 925  | 345 | 0   | 0   | 0   | 241 | 0   | 446 | 0   | 913  | 383 | 3253 | 1999 |
| 10/1/01                            |             | 0   | 969  | 366 | 0   | 0   | 0   | 246 | 0   | 472 | 0   | 970  | 444 | 3467 | 2001 |
| 6/1/01                             |             | 0   | 1054 | 388 | 0   | 0   | 0   | 232 | 0   | 460 | 0   | 934  | 413 | 3481 | 2001 |
| 6/1/03                             |             | 0   | 1016 | 360 | 0   | 0   | 0   | 252 | 0   | 493 | 0   | 971  | 454 | 3546 | 2003 |
| 11/1/03                            |             | 0   | 972  | 393 | 0   | 0   | 0   | 199 | 0   | 532 | 0   | 938  | 439 | 3473 | 2003 |
| 6/1/04                             |             | 0   | 987  | 355 | 0   | 0   | 0   | 257 | 0   | 440 | 0   | 1083 | 431 | 3553 | 2004 |
| TCLWest/Wilsonville Road           |             | EBR | EBT  | EBL | SBR | SBT | SBL | NBL | NBT | NBR | WBL | WBT  | WBR | TEV  |      |
| 1/28/92                            | 16:40-17:40 | 0   | 491  | 243 | 232 | 0   | 16  | 0   | 0   | 0   | 0   | 351  | 25  | 1358 | 1992 |
| 12/3/92                            | 16:55-17:55 | 0   | 568  | 338 | 466 | 0   | 24  | 0   | 0   | 0   | 0   | 424  | 33  | 1853 | 1992 |
| 3/16/93                            | 16:50-17:50 | 0   | 599  | 314 | 396 | 0   | 26  | 0   | 0   | 0   | 0   | 400  | 25  | 1760 | 1993 |
| 3/17/93                            | 16:55-17:55 | 0   | 522  | 274 | 374 | 0   | 19  | 0   | 0   | 0   | 0   | 383  | 27  | 1599 | 1993 |
| 3/18/93                            | 16:50-17:50 | 0   | 593  | 312 | 387 | 0   | 29  | 0   | 0   | 0   | 0   | 426  | 39  | 1786 | 1993 |
| 4/5/94                             | 16:58-17:58 | 0   | 549  | 363 | 392 | 0   | 22  | 0   | 0   | 0   | 0   | 390  | 20  | 1736 | 1994 |
| 6/20/95                            | 16:20-17:20 | 0   | 500  | 378 | 439 | 0   | 17  | 0   | 0   | 0   | 0   | 392  | 50  | 1776 | 1995 |
| 9/1/99                             | 16:50-17:50 | 49  | 692  | 502 | 596 | 63  | 37  | 159 | 46  | 29  | 51  | 547  | 38  | 2809 | 1999 |
| 5/24/00                            | 17:00-18:00 | 60  | 643  | 525 | 606 | 75  | 44  | 191 | 47  | 58  | 52  | 516  | 53  | 2870 | 2000 |
| 10/1/01                            |             | 44  | 743  | 571 | 734 | 116 | 33  | 205 | 51  | 9   | 31  | 624  | 42  | 3203 | 2001 |
| 6/10/03                            |             | 38  | 730  | 513 | 642 | 60  | 48  | 212 | 61  | 43  | 26  | 529  | 17  | 2919 | 2003 |
| 11/1/03                            |             | 70  | 697  | 501 | 632 | 61  | 28  | 224 | 75  | 19  | 38  | 523  | 49  | 2917 | 2003 |
| 6/1/04                             |             | 79  | 716  | 508 | 625 | 80  | 49  | 243 | 53  | 55  | 41  | 528  | 36  | 3013 | 2004 |



**Public Facilities Transportation Strategy**

**Historical growth from 1990 to 2000**

|                                                                                  | 3/15/2004 | 1990 | 2000  | Increase | Change by percent |
|----------------------------------------------------------------------------------|-----------|------|-------|----------|-------------------|
| HH                                                                               |           | 3535 | 8209  | 4674     | 132%              |
| Jobs                                                                             |           | 7593 | 17653 | 10060    | 132%              |
| WV Rd/I-5 south bound off ramps (from ODOT Env Assess & WV Freeway Access Study) |           | 450  | 1050  | 600      | 133%              |
| WV Rd/I-5 south bound on ramps (from ODOT Env Assess & WV Freeway Access Study)  |           | 600  | 950   | 350      | 58%               |
| WV Rd/I-5 north bound off ramps (from ODOT Env Assess & WV Freeway Access Study) |           | 750  | 570   | -180     | -24%              |
| WV Rd/I-5 north bound on ramps (from ODOT Env Assess & WV Freeway Access Study)  |           | 600  | 810   | 210      | 35%               |

**Exhibit 6, page 3, of  
04PC03A and 04PC03B  
Staff Report**

**Public Facilities Transportation Strategy**

**Exhibit 7 to  
04PC03A and 04PC03B  
Staff Report**

**Projected growth from 2000 to 2020**

|                                                                                                                                                | 3/15/2004 | 2000  | 2020  | Increase | Change<br>by<br>percent |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|-------|----------|-------------------------|
| Total households (from TSP)                                                                                                                    |           | 8209  | 14809 | 6600     | 80%                     |
| Total jobs (from TSP)                                                                                                                          |           | 17653 | 35143 | 17490    | 99%                     |
| Households between Boeckman & the river<br>(from TSP)                                                                                          |           | 4828  | 8542  | 3714     | 77%                     |
| Jobs between Boeckman and the river (from<br>TSP)                                                                                              |           | 5061  | 12978 | 7917     | 156%                    |
| WV Rd/I-5 south bound off ramps (from WV<br>Freeway Access Study)                                                                              |           | 1050  | 743   | -307     | -29%                    |
| WV Rd/I-5 south bound on ramps (from WV<br>Freeway Access Study)                                                                               |           | 950   | 1590  | 640      | 67%                     |
| WV Rd/I-5 north bound off ramps (from WV<br>Freeway Access Study)                                                                              |           | 570   | 1070  | 500      | 88%                     |
| WV Rd/I-5 north bound on ramps (from WV<br>Freeway Access Study)                                                                               |           | 810   | 760   | -50      | -6%                     |
| WV Rd/I-5 south bound ramp intersection<br>total count (from WV Freeway Access Study)                                                          |           | 3530  | 4763  | 1233     | 35%                     |
| WV Rd/I-5 north bound ramp intersection<br>total count (from WV Freeway Access Study)                                                          |           | 3320  | 4410  | 1090     | 33%                     |
| WV Rd/I-5 south bound ramp intersection<br>total projected count if traffic grows at the<br>same rate as the average of households and<br>jobs |           | 3530  | 6707  | 3177     | 90%                     |
| WV Rd/I-5 north bound ramp intersection<br>total projected count if traffic grows at the<br>same rate as the average of households and<br>jobs |           | 3320  | 6308  | 2988     | 90%                     |
| Estimated annual reduction because of<br>change in driving habits                                                                              |           |       |       | 96       | 3%                      |

## 2.7 TRAFFIC LEVELS OF SERVICE

Level of Service (LOS) refers to the range of operating conditions that a transportation facility may experience. LOS is a ratio used to measure the performance of a transportation facility.

The RTP and OHP facility deficiency thresholds and operating standards are based on a link volume-to-capacity (v/c) ratio or a link demand-to-capacity (d/c) ratio. A link is defined as a segment of roadway. Volume refers to the number of vehicles using a segment of roadway, while demand is the number of vehicles that are projected to use a segment of roadway. Link LOS is a planning level measure of operation.

Another measure of how well a roadway operates is based on intersection operations, rather than mid-block or segment operations. This is because the corridor is constrained by its capacity at intersections located along the corridor, especially as intersection spacing decreases. Intersection LOS is an operational level of measure. The 1997 update to the *Highway Capacity Manual* (HCM), Transportation Research Board *Special Report 209*, Washington, D.C., provides procedures for measuring the quality of operations at signalized and unsignalized intersections, known as level of service (LOS).

Level of service refers to the degree of congestion on a roadway or intersection. It is a measure of vehicle operating speed, travel time, travel delays, freedom to maneuver, and driving comfort. A letter scale from A to F is generally used to describe LOS. For intersections, LOS A represents free-flow conditions—motorists experience little or no delay, and LOS F represents forced-flow conditions—motorists experience excessive delay. Control delay is measured in seconds per vehicle. At signalized intersections, the control delay value that determines LOS is the average of all the control delay experienced at all movements of a signalized intersection during one hour. At unsignalized intersections, the reported control delay is for only one movement, the movement experiencing the worst control delay (typically one of the stop-controlled side street approaches).

The LOS analysis for this TSP based on intersection operation was conducted using principles of the Transportation Research Board's 1997 HCM through two computer based software programs known as HCS (Highway Capacity Software) and Synchro. HCS is used to determine operations at unsignalized intersections and Synchro is used to determine operations at signalized intersections.

**Table 2.k** and **Table 2.l** list brief descriptions of each LOS as given in the 1997 update to the HCM, as well as threshold values for a detailed operational (control delay) LOS analysis.

**Exhibit 8 to  
The 04PC03A and  
04PC03B  
Staff Report**

**Table 2.k**  
**Level of Service Description and Threshold Values**  
**for Link Segments**

| LOS | Traffic Flow Characteristics                            | v/c ratio    |
|-----|---------------------------------------------------------|--------------|
| A   | Virtually free flow; completely unimpeded               | < 0.60       |
| B   | Stable flow with slight delays, reasonably unimpeded    | 0.61 to 0.70 |
| C   | Stable flow with delays, less freedom to maneuver       | 0.71 to 0.80 |
| D   | High density, but stable flow                           | 0.81 to 0.90 |
| E   | Operating conditions at or near capacity, unstable flow | 0.91 to 1.00 |
| F   | Forced flow, breakdown conditions                       | 1.01 to 1.10 |
| >F  | Demand exceeds roadway capacity                         | > 1.10       |

Source: 1997 update to the Highway Capacity Manual, Special Report 209, Transportation Research Board, 1994; and Interim Materials on Highway Capacity, Circular 212, Transportation Research Board, 1980.

**Table 2.l**  
**Level of Service Description and Threshold Values**  
**for Signalized Intersections**

| LOS | Description                                                                                                                                                                    | Unsignalized       | Signalized         |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|
|     |                                                                                                                                                                                | Intersection       | Intersection       |
|     |                                                                                                                                                                                | Control            | Control            |
|     |                                                                                                                                                                                | Delay <sup>3</sup> | Delay <sup>1</sup> |
|     |                                                                                                                                                                                | (Sec/veh)          | (sec/veh)          |
| A   | Progression is extremely favorable; most vehicles arrive during green phase and do not stop at all.                                                                            | $D \leq 10$        | $D \leq 10$        |
| B   | Good progression, short cycle lengths, or both; more vehicles stop than with LOS A.                                                                                            | $10 < D \leq 15$   | $10 < D \leq 20$   |
| C   | Fair progression, longer cycle lengths, or both; some cycle failures witnessed; frequency of stopped vehicles is significant, though many still pass through without stopping. | $15 < D \leq 25$   | $20 < D \leq 35$   |
| D   | Unfavorable progression, long cycle lengths, or high delay; many vehicles stop; individual cycle failures <sup>2</sup> are noticeable.                                         | $25 < D \leq 35$   | $35 < D \leq 55$   |
| E   | Poor progression, long cycle lengths, high delay; individual cycle failures are frequent occurrences.                                                                          | $35 < D \leq 50$   | $55 < D \leq 80$   |
| F   | Over-saturation: arrival flow rates exceed capacity; very high delay witnessed; many individual cycle failures.                                                                | $D > 50$           | $D > 80$           |

<sup>1</sup>Detailed operational analysis

<sup>2</sup>Individual cycle failure means that a car waits through more than one red light.

<sup>3</sup>The LOS breakpoints for unsignalized intersections are different than those for signalized intersections due to driver expectations that signalized intersections are designed to carry higher traffic volumes than unsignalized intersections, therefore, a higher level of control delay is acceptable at a signalized intersection for the same level of service.

Source: 1997 update to the Highway Capacity Manual, Special Report 209, Transportation Research Board, 1994; and Interim Materials on Highway Capacity, Circular 212, Transportation Research Board, 1980.

Intersection turning movement counts were conducted at the study intersections during the p.m. peak hour, and were used to determine the existing LOS based on the 1997 HCM methodology for signalized and unsignalized intersections. Two signalized intersections were not analyzed because recent data were not available: Wilsonville Road/Meadows Parkway and Ridder Road/95th Avenue. **Table 2.m** summarizes the p.m. peak-hour LOS for signalized intersections and unsignalized intersections. The LOS results for both signalized and unsignalized intersections are illustrated in **Figure 2.9**.

All of the existing signalized and unsignalized intersections meet City standards (LOS D or better) except for the unsignalized intersection of SW 65th Avenue and Stafford Road.

**PLANNING COMMISSION  
RESOLUTION NO. 04PC03A**

**A RESOLUTION RECOMMENDING TO THE WILSONVILLE CITY COUNCIL THE  
ADOPTION OF A PUBLIC FACILITIES TRANSPORTATION STRATEGY FOR  
DEVELOPMENT IN THE CITY OF WILSONVILLE DUE TO LACK OF  
TRANSPORTATION CAPACITY, PARTICULARLY RELATED TO THE  
WILSONVILLE ROAD/I-5 INTERCHANGE AREA.**

WHEREAS, the Planning Commission of the City of Wilsonville finds that it is necessary to adopt a Public Facilities Transportation Strategy for development in the City of Wilsonville due to lack of transportation capacity, particularly related to the Wilsonville Road/I-5 Interchange Area; and

WHEREAS, the purpose of this resolution is to provide for a public facilities transportation strategy in conformance with ORS 197.768 that will provide a methodology for maintaining LOS "D" on local arterial and collector streets and LOS 'E' at the impacted intersections as required by the City's Comprehensive Plan and Transportation Systems Plan while not unreasonably restricting the necessary supply of housing and of commercial and industrial facilities as provided for in the City's Comprehensive Plan; and

WHEREAS, the Planning Commission has identified the Wilsonville Road Corridor as a specific geographic area which has experienced a rapid and unanticipated increase in total development and within which the total land development would exceed the planned or existing capacity of public transportation facilities. Within the Wilsonville Road Corridor, specific intersections have been identified as operating at greater than Level of Service "D" during the p.m. peak hour. Those intersections are I-5/Wilsonville Road, Southbound, I-5/Wilsonville Road Northbound, Boones Ferry Road/Wilsonville Road and Town Center Loop West/Wilsonville Road. These intersections shall be designated the "impacted intersections"; and

WHEREAS, the City has determined, as described in the staff report attached hereto as Attachment 1, that total anticipated land development which will impact the Wilsonville Road /I-5 Interchange Area will exceed the existing capacity of transportation facilities in the Area; and

WHEREAS, the Planning Commission finds that the previously approved p.m. peak trip capacity through the impacted intersections has been fully allocated either to existing developments or reserved under prior vesting ordinances for as yet un-built projects with Stage II approvals; and

WHEREAS, the City has determined that allocation of trips is necessary in order that the supply of housing and of commercial and industrial facilities impacted by the transportation deficiencies in the Wilsonville Road/I-5 Interchange Area will not be unreasonably restricted; and

WHEREAS, the Planning Commission further finds that the capacity from planned completion of Phase 2 and 3 improvements to the I-5/Wilsonville Road Interchange has been allocated to previous approved Stage II and vested properties; and

WHEREAS, completion of improvements at Boones' Ferry Road/Wilsonville Road intersection and changes in driving habits will provide very limited additional capacity; and

WHEREAS, the Planning Commission finds that placing developments in a queue at Stage 1 approval with the option for specific allocation of trips through the impacted intersections following approval of Stage 2 is consistent with the City's concurrency requirements and allows the long-term financial investment in related transportation projects that have been planned to be developed in phases over the next several years; and

WHEREAS, the Planning Commission further finds that the p.m. peak hour trips that are projected to travel through the impacted intersections form a valid proportional basis for allocating intersection capacity and a proportional share of cost to the developer; and

WHEREAS, the Planning Commission determines that a Supplemental Street SDC is a reasonable and rational means to impose the cost of these capacity improvements and that payment for early allocation of trip capacity is a financially prudent requirement for the city to impose in the public interest; and

WHEREAS, the City provided the Department of Land Conservation and Development with the required 45 day written notice prior to the first evidentiary hearing to consider this public facilities transportation strategy. Notice was sent on March 26, 2004 for a hearing before the Planning Commission on May 12, 2004. That hearing was continued to September 8, 2004; and

WHEREAS, the Planning Commission held a properly noticed public hearing on September 8, 2004 to hear testimony and consider the evidence in the record, and determined that the Public Facilities Transportation Strategy contains a clear, objective and detailed description of actions and practices to be used to control the time and sequence of development approvals in response to the identified transportation deficiencies in the Wilsonville Road/I-5 Interchange Area;

NOW, THEREFORE, BE IT RESOLVED:

Section 1. Recommendation. The Wilsonville Planning Commission recommends that the Wilsonville City Council approve and adopt a Public Facility Transportation Strategy as follows:

1. All new commercial and industrial developments, and all residential developments of two acres or more shall be developed as planned unit developments wherein all uses are encouraged to reduce traffic.
2. Development shall be limited based upon the LOS "E" capacity standard at the impacted intersections as measured by p.m. peak hour traffic for arterial and major collector streets.

More specifically, the p.m. peak hour trips for development generating traffic through the impacted intersections shall be allocated as follows:

- a. Increased traffic through the impacted intersections shall be limited to available capacity.
  - b. Developments that travel through the impacted intersections as the most probable used intersections, but contribute less than three (3) p.m. peak hour trips through those intersections, whether because of design, location, hours of operation, implementation of a transportation management plan, or other reasons, shall not be subject to the requirements of this ordinance.
  - c. Developments with trips through the intersections associated with the Stafford/North Wilsonville Interchange as the most probable used intersection are not subject to the requirements of this ordinance.
  - d. Any traffic capacity approved by the City, and allocated to a specific development and site, shall remain with that development, as long as the development remains in strict accordance with the Stage I, Master Plan and Stage II approvals. Allocated traffic capacity may not be transferred to other properties, except as provided in Section 4 of this ordinance.
  - e. Substantial changes which affect Stage I, Master Plan or Stage II approvals shall be reviewed by the Development Review Board for compliance with this ordinance.
  - f. Developments using the impacted intersections as the most probable used intersections, except for essential governments services, which will result in degrading the capacity of the impacted intersections to LOS "F" shall not be approved.
3. In the event that the full trip capacity available to the impacted intersections is reached during the effective period of this ordinance, the following strategy will be in effect:
- a. Continue strategies indicated in Section 2 of this ordinance.
  - b. Approve only those developments generating traffic through the impacted intersections which meet one or more of the following:
    - i. Has a de minimus impact (three or fewer p.m. peak trips through the impacted intersections)
    - ii. Provides essential government services, including public school facilities and public transportation facilities.
    - iii. Developments with trips through the intersections associated with the Stafford/North Wilsonville Interchange as the most probable used intersections.
  - c. Six months after completion of planned transportation improvements anticipated to improve traffic capacity through the impacted intersections, and every three years thereafter to capture additional capacity resulting from a change in driving habits, the City shall conduct a traffic analysis to determine the impact of said improvements on the impacted intersections, and may revise this ordinance to reflect additional capacity and potential for subsequent trip allocations, provided that the actual capacity of the street system exceeds the current projections.
4. Capacity which is allocated to any current or future Stage II approval shall be reclaimed by the City for reuse if the Stage II approval has expired or if additional capacity becomes available because previously approved shell buildings, when fully leased,

contain uses that generate fewer trips than originally anticipated. All reclaimed p.m. peak capacity shall be added to the total unused remaining traffic capacity and shall be used to prolong the useful life of the impacted intersections. The City Engineer shall make those additional trips available for reallocation to new developments, and shall maintain a list of active Stage II approvals, showing the number of trips allocated to each development and the net number of remaining trips available for allocation.

5. The City Council shall receive an annual report from the City Engineer within the month of the anniversary date of this ordinance. The report shall include information on trip allocations, development projects, progress in completion of planned improvement projects contributing to additional capacity at the impacted intersections, and progress in trip reductions through compliance with traffic management plans.
6. This Public Facilities Transportation Strategy shall be effective for a period of 24 months from the date of adoption by the City Council. The Strategy may be extended three times, for a period not to exceed one year for each extension, provided that a properly noticed public hearing is held on the extension and that findings meeting the requirements of ORS 197.768.6 are adopted.

Section 2. Order.

1. The Planning Commission adopts as supplemental findings the staff report in this matter dated September 8, 2004, attached as Attachment 1, and incorporated by reference as if fully set forth.
2. Staff is directed to prepare documents necessary for the implementation of the Commute Trip Reduction Program.

BE IT RESOLVED that this Resolution shall be effective upon adoption.

SUBMITTED to the Wilsonville Planning Commission on the 8th day of September, 2004, commencing at the hour of 6:30 p.m. at the Wilsonville Community Development Annex, 8445 SW Elligsen Road, Wilsonville, Oregon.

ADOPTED by the Wilsonville Planning Commission of the City of Wilsonville at a regular meeting thereof this 8th day of October, 2004, and filed with the Wilsonville Planning Administrative Assistant this date.

---

Wilsonville Planning Commission

ATTEST:

---

Linda Straessle, Administrative Assistant I

SUMMARY OF VOTES:

Chair Iguchi: \_\_\_\_\_  
Commissioner Hinds: \_\_\_\_\_  
Commissioner Faiman: \_\_\_\_\_  
Commissioner Goddard: \_\_\_\_\_  
Commissioner Guyton: \_\_\_\_\_  
Commissioner Juza: \_\_\_\_\_  
Commissioner Maybee: \_\_\_\_\_

Attachment:

Attachment 1: Staff Report for 04PC03

**WILSONVILLE PLANNING COMMISSION  
RESOLUTION NO. 04PC03B**

**A RESOLUTION RECOMMENDING TO THE WILSONVILLE CITY COUNCIL THE  
ADOPTION OF AN ORDINANCE REVISING THE LEVEL OF SERVICE AT THE  
SEVERAL INTERSECTIONS ASSOCIATED WITH WILSONVILLE ROAD/I-5  
INTERCHANGE AREA DUE TO LACK OF TRANSPORTATION CAPACITY,  
EXEMPTING ESSENTIAL GOVERNMENT SERVICES FROM LEVEL OF SERVICE  
CONSTRAINTS.**

WHEREAS, the Planning Commission of the City of Wilsonville finds that the Wilsonville Road Corridor is a specific geographic area which has experienced a rapid and unanticipated increase in total development and within which the total land development would exceed the planned or existing capacity of public transportation facilities. Within the Wilsonville Road Corridor, specific intersections have been identified as operating at greater than Level of Service "D" during the p.m. peak hour. Those intersections are I-5/Wilsonville Road Southbound, I-5/Wilsonville Road Northbound, Boones Ferry Road/Wilsonville Road and Town Center Loop West/Wilsonville Road. These intersections shall be designated the "impacted intersections"; and

WHEREAS, the purpose of this ordinance is to modify the Level of Service (LOS) at the impacted intersections from LOS "D" to LOS "E" as allowed by the City's Comprehensive Plan and Transportation Systems Plan in order to not unreasonably restrict the necessary supply of housing and of commercial and industrial facilities as provided for in the City's Comprehensive Plan; and

WHEREAS, the City has determined, as described in the staff report attached hereto as Attachment 1, that total anticipated land development which will impact the Wilsonville Road /I-5 Interchange Area will exceed the existing capacity of transportation facilities in the area at LOS "D"; and

WHEREAS, the Planning Commission finds that the previously approved p.m. peak trip capacity through the impacted intersections has been fully allocated either to existing developments or reserved under prior vesting ordinances for as yet un-built projects with Stage II approvals; and

WHEREAS, the City has determined that allocation of trips is necessary in order that the supply of housing and of commercial and industrial facilities impacted by the transportation deficiencies in the Wilsonville Road/I-5 Interchange Area will not be unreasonably restricted; and

WHEREAS, The Planning Commission further finds that the completion of the planned Phase 2 and 3 improvements to the I-5/Wilsonville Road Interchange and the improvements at the Boones Ferry Road/Wilsonville Road intersections, together with a planned change in driving habits as described in Attachment 1, will not reasonably accommodate future

development without a change from LOS "D" to LOS "E" through the impacted intersections;  
and

WHEREAS, the Planning Commission has determined that essential government services, including, but not limited to, public safety, public schools and public transportation services are necessary for the health and well-being of the citizens of Wilsonville and cannot be unreasonably restricted by a requirement to meet LOS standards; and

WHEREAS, the City provided the Department of Land Conservation and Development with the required 45 day written notice prior to the first evidentiary hearing to consider this amendment. Notice was sent on March 26, 2004 for a hearing before the Planning Commission on May 12, 2004. That hearing was continued to September 8, 2004; and

WHEREAS, the Planning Commission held a properly noticed public hearing on September 8, 2004 to hear testimony and consider the evidence in the record, and determined that the change in Level of Service from LOS "D" to LOS "E" is necessary in order that the supply of housing and of commercial and industrial facilities impacted by the transportation deficiencies in the Wilsonville Road/I-5 Interchange Area will not be unreasonably restricted, and has also determined that the need for essential government services for the continued health and welfare of the citizens of Wilsonville takes precedence over compliance with Level of Services restrictions,

NOW, THEREFORE, BE IT RESOLVED: :

Section 1. Recommendation.

1. The level of service at the impacted intersections be revised from LOS "D" to LOS "E".
2. Essential government services, defined as facilities for the purpose of public education, public safety, public transportation and/or public services and administration, be exempted from compliance with level of service standards.

Section 2. Order.

1. The Planning Commission adopts as supplemental findings the staff report in this matter dated September 8, 2004, attached as Attachment 1, and incorporated by reference as if fully set forth.
2. Staff is directed to prepare documents necessary for the implementation of the Commute Trip Reduction Program.

BE IT RESOLVED that this Resolution shall be effective upon adoption.

SUBMITTED to the Wilsonville Planning Commission at a regular meeting thereof on the 8th day of September 2004, commencing at the hour of 6:30 p.m. at the Wilsonville Community Development Annex, 8445 SW Elligsen Road Wilsonville, Oregon.

ADOPTED by the Wilsonville Planning Commission at a regular meeting thereof this 8th day of September 2004, and filed with the Wilsonville Planning Administrative Assistant this date.

---

Wilsonville Planning Commission

ATTEST:

---

Linda Straessle, Administrative Assistant I

SUMMARY OF VOTES:

Chair Iguchi: \_\_\_\_\_  
Commissioner Hinds: \_\_\_\_\_  
Commissioner Faiman: \_\_\_\_\_  
Commissioner Goddard: \_\_\_\_\_  
Commissioner Guyton: \_\_\_\_\_  
Commissioner Juza: \_\_\_\_\_  
Commissioner Maybee: \_\_\_\_\_

Attachment:

Attachment 1: Staff Report for 04PC03



# **CITY OF WILSONVILLE**

## **PUBLIC WORKS STANDARDS - 2006**

### **Engineering Department**

*Revised April, 2006*

**These Standards were compiled by information obtained from,  
or input received from the following sources:**

American Association of State Highway and Transportation Officials  
American Public Works Association  
American Water Works Association  
Asphalt Institute  
City of Beaverton Public Works Standards  
City of Gresham Public Works Standards  
City of Tualatin Public Works Standards  
City of Portland Parks and Recreation  
CleanWater Services Agency of Washington County  
King County, Washington  
Oregon Department of Environmental Quality  
Oregon Department of Fish and Wildlife  
Oregon Department of Transportation  
Oregon Health Division  
Portland Cement Association  
Portland General Electric  
Stormwater Management Manual for Western Washington  
Tualatin Valley Fire and Rescue  
Washington County Department of Land Use and Transportation  
Water Environment Services of Clackamas County

# **STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION**

## **FOREWORD**

The 2006 edition of the City of Wilsonville Public Works Standards will provide the technical engineering design and construction information standards for all Public Works transportation projects, storm system projects, sanitary sewer projects, and water distribution system projects in the interest of health, safety and welfare of the residents of the City of Wilsonville. These Public Works Standards – 2006 will supersede all previously issued Standard Specifications.

Interpretation and enforcement of these standards shall be the responsibility of the City of Wilsonville Engineering Division.

All federal, state, county (Clackamas or Washington) or local laws and ordinances are to be adhered to. If there is any conflict between the Standard Specifications and pertinent laws and ordinances, the laws and ordinances shall prevail.

**CITY OF WILSONVILLE**  
**PUBLIC WORKS STANDARDS - 2006**

**Table of Contents**

|                                                                                         |           |
|-----------------------------------------------------------------------------------------|-----------|
| <b>SECTION 1 GENERAL CONSTRUCTION REQUIREMENTS &amp; ADMINISTRATIVE PROVISIONS.....</b> | <b>15</b> |
| <b>101.1.00 AVAILABILITY.....</b>                                                       | <b>15</b> |
| 101.1.01 Reference to Standards .....                                                   | 15        |
| <b>101.2.00 INTENT .....</b>                                                            | <b>15</b> |
| 101.2.01 Intent of Public Works Standards .....                                         | 15        |
| 101.2.02 Order of Precedence.....                                                       | 16        |
| <b>101.3.00 SCOPE .....</b>                                                             | <b>16</b> |
| <b>101.4.00 DEFINITIONS .....</b>                                                       | <b>17</b> |
| <b>101.5.00 CONTROL OF PUBLIC WORKS PROJECTS .....</b>                                  | <b>25</b> |
| <b>101.6.00 DEVELOPMENT PROCESS REQUIREMENTS.....</b>                                   | <b>26</b> |
| 101.6.01 Pre-Application Conference.....                                                | 26        |
| 101.6.02 Plan Check and Permits .....                                                   | 27        |
| 101.6.03 Plan Check Requirements .....                                                  | 27        |
| 101.6.04 Plan Review .....                                                              | 28        |
| 101.6.05 Record Drawings, Maps, and Plans Not Guaranteed.....                           | 29        |
| 101.6.06 Permit and Assurances.....                                                     | 29        |
| 101.6.07 Insurance Requirements.....                                                    | 29        |
| 101.6.08 Indemnification.....                                                           | 30        |
| <b>101.7.00 CONSTRUCTION PROCEDURAL REQUIREMENTS.....</b>                               | <b>30</b> |
| 101.7.01 General Procedure and Requirements.....                                        | 30        |
| 101.7.02 Testing of Construction.....                                                   | 31        |
| 101.7.03 Right of Entry to Work .....                                                   | 32        |
| 101.7.04 Suspension of Work.....                                                        | 32        |
| 101.7.05 Protection of Existing Facilities.....                                         | 32        |
| 101.7.06 Protection of Property .....                                                   | 33        |
| 101.7.07 Surveying and Land Monuments.....                                              | 33        |
| 101.7.08 Railroad Crossings .....                                                       | 33        |
| 101.7.09 Criteria for Stream-Road Crossings.....                                        | 34        |

|                  |                                                                                    |           |
|------------------|------------------------------------------------------------------------------------|-----------|
| <b>101.8.00</b>  | <b>CONSTRUCTION.....</b>                                                           | <b>34</b> |
| 101.8.01         | Construction Commencement.....                                                     | 34        |
| 101.8.02         | Scheduling.....                                                                    | 34        |
| 101.8.03         | City Inspection.....                                                               | 36        |
| 101.8.04         | Change in Plans or Standards.....                                                  | 36        |
| 101.8.05         | Interferences and Obstructions.....                                                | 36        |
| 101.8.06         | Contaminated Soil.....                                                             | 37        |
| 101.8.07         | Guarantee.....                                                                     | 37        |
| 101.8.08         | Substitution of Materials.....                                                     | 38        |
| 101.8.09         | Safety Requirements.....                                                           | 38        |
| 101.8.10         | Traffic Maintenance and Safety.....                                                | 39        |
| 101.8.11         | Access for Police, Fire, and Postal Service.....                                   | 40        |
| 101.8.12         | Compliance with Applicable Laws.....                                               | 40        |
| 101.8.13         | Work in Public Rights-of-Way.....                                                  | 40        |
| 101.8.14         | Easements.....                                                                     | 41        |
| 101.8.15         | Sanitation.....                                                                    | 41        |
| 101.8.16         | Preservation, Restoration, and Cleanup.....                                        | 41        |
| 101.8.17         | Project Closeout.....                                                              | 43        |
| <br>             |                                                                                    |           |
| <b>101.9.00</b>  | <b>ENVIRONMENTAL PROTECTION, EROSION PREVENTION,<br/>AND SEDIMENT CONTROL.....</b> | <b>44</b> |
| 101.9.01         | Introduction.....                                                                  | 44        |
| 101.9.02         | Contaminated Soils or Hazardous Materials.....                                     | 45        |
| 101.9.03         | General Policy.....                                                                | 45        |
| 101.9.04         | Erosion Prevention and Sediment Control.....                                       | 47        |
| 101.9.05         | Maintenance.....                                                                   | 51        |
| 101.9.06         | Inspection.....                                                                    | 51        |
| <br>             |                                                                                    |           |
| <b>SECTION 2</b> | <b>STREET IMPROVEMENT DESIGN &amp; CONSTRUCTION<br/>STANDARDS.....</b>             | <b>53</b> |
| <br>             |                                                                                    |           |
| <b>201.1.00</b>  | <b>ENGINEERING.....</b>                                                            | <b>53</b> |
| 201.1.01         | Introduction.....                                                                  | 53        |
| 201.1.02         | Alternative Design and Construction Standards.....                                 | 53        |
| 201.1.03         | General Requirements.....                                                          | 53        |
| 201.1.04         | Street Plans.....                                                                  | 54        |
| 201.1.05         | Surveying.....                                                                     | 56        |
| <br>             |                                                                                    |           |
| <b>201.2.00</b>  | <b>STREET DESIGN.....</b>                                                          | <b>57</b> |
| 201.2.01         | Subgrade Evaluation.....                                                           | 57        |
| 201.2.02         | Subsurface Drainage.....                                                           | 58        |
| 201.2.03         | Structural Section.....                                                            | 58        |
| 201.2.04         | Asphalt Pavement Design.....                                                       | 59        |
| 201.2.05         | Portland Cement Concrete Design.....                                               | 59        |
| 201.2.06         | Pavement Transition – Portland Cement Concrete to Asphalt.....                     | 60        |

|                 |                                                                        |           |
|-----------------|------------------------------------------------------------------------|-----------|
| 201.2.07        | Pavement Overlay Design.....                                           | 60        |
| 201.2.08        | Horizontal Alignment .....                                             | 60        |
| 201.2.09        | Vertical Alignment.....                                                | 61        |
| 201.2.10        | Transitions.....                                                       | 63        |
| 201.2.11        | Superelevation Cross-Sections.....                                     | 64        |
| 201.2.12        | Intersections .....                                                    | 64        |
| 201.2.13        | Cul-de-Sacs, Eyebrows, Turnarounds.....                                | 65        |
| 201.2.14        | Stub Streets .....                                                     | 66        |
| 201.2.15        | Half-Streets .....                                                     | 66        |
| 201.2.16        | Private Streets .....                                                  | 66        |
| 201.2.17        | Raised Medians.....                                                    | 67        |
| 201.2.18        | Transit Turnout Design .....                                           | 67        |
| 201.2.19        | Sight Distance .....                                                   | 68        |
| 201.2.20        | Driveways .....                                                        | 69        |
| 201.2.21        | Curbs and Grading .....                                                | 70        |
| 201.2.22        | Sidewalks .....                                                        | 71        |
| 201.2.03        | Bikelanes.....                                                         | 71        |
| 201.2.24        | Guardrails.....                                                        | 72        |
| 201.2.25        | Roadside ditches .....                                                 | 72        |
| 201.2.26        | Utilities.....                                                         | 72        |
| <b>201.3.00</b> | <b>MATERIAL SPECIFICATIONS .....</b>                                   | <b>73</b> |
| 201.3.01        | Granular Fill.....                                                     | 73        |
| 201.3.02        | Asphalt Concrete.....                                                  | 74        |
| 201.3.03        | Portland Cement Concrete .....                                         | 75        |
| <b>201.4.00</b> | <b>CONSTRUCTION SPECIFICATIONS.....</b>                                | <b>75</b> |
| 201.4.01        | General Provisions .....                                               | 75        |
| 201.4.02        | Scheduling.....                                                        | 75        |
| 201.4.03        | Environmental Protection, Erosion Prevention, and Sediment Control ... | 75        |
| 201.4.04        | Interferences and Obstructions .....                                   | 75        |
| 201.4.05        | Contaminated Soil or Hazardous Material.....                           | 75        |
| 201.4.06        | Trench Excavation, Preparation, and Backfill .....                     | 75        |
| 201.4.07        | Steel Plates .....                                                     | 76        |
| 201.4.08        | Preservation, Restoration, and Cleanup .....                           | 76        |
| <b>201.5.00</b> | <b>WORKMANSHIP .....</b>                                               | <b>76</b> |
| 201.5.01        | Demolition .....                                                       | 76        |
| 201.5.02        | Clearing and Grubbing.....                                             | 76        |
| 201.5.03        | Subgrade .....                                                         | 76        |
| 201.5.04        | Base and Leveling Course .....                                         | 77        |
| <b>201.6.00</b> | <b>CONSTRUCTION PROCEDURE .....</b>                                    | <b>77</b> |
| 201.6.01        | Asphalt Pavement .....                                                 | 77        |
| 201.6.02        | Portland Cement Concrete Pavement .....                                | 78        |
| 201.6.03        | Sidewalks.....                                                         | 78        |

|                  |                                                                               |           |
|------------------|-------------------------------------------------------------------------------|-----------|
| 201.6.04         | Weather Conditions .....                                                      | 79        |
| 201.6.05         | Protection of Structures.....                                                 | 79        |
| 201.6.06         | Excess Materials and Trench Settlement Repair .....                           | 80        |
| 201.6.07         | Rock Surfacing.....                                                           | 80        |
| <b>201.7.00</b>  | <b>SURFACE RESTORATION .....</b>                                              | <b>80</b> |
| 201.7.01         | Scope.....                                                                    | 80        |
| 201.7.02         | Asphalt Concrete Replacement.....                                             | 80        |
| 201.7.03         | Asphalt Restoration for Streets Listed on 5-Year Moratorium.....              | 81        |
| 201.7.04         | Portland Cement Concrete Replacement .....                                    | 81        |
| <b>201.8.00</b>  | <b>STREET NAMES AND TRAFFIC CONTROL SIGNAGE AND STRIPING .....</b>            | <b>82</b> |
| 201.8.01         | Street Name Signs and Posts.....                                              | 82        |
| 201.8.02         | Traffic Control Signage and Striping.....                                     | 83        |
| <b>201.9.00</b>  | <b>LIGHTING.....</b>                                                          | <b>83</b> |
| <b>201.10.00</b> | <b>STREET ACCEPTANCE POLICY .....</b>                                         | <b>83</b> |
| 201.10.01        | Legal Recordings .....                                                        | 83        |
| 201.10.02        | Project Completion .....                                                      | 84        |
| 201.10.03        | Maintenance Period .....                                                      | 84        |
| <b>SECTION 3</b> | <b>STORMWATER &amp; SURFACE WATER DESIGN AND CONSTRUCTION STANDARDS .....</b> | <b>85</b> |
| <b>301.1.00</b>  | <b>ENGINEERING.....</b>                                                       | <b>85</b> |
| 301.1.01         | Introduction.....                                                             | 85        |
| 301.1.02         | Alternative Design and Construction Standards .....                           | 85        |
| 301.1.03         | Extension of Public Storm Sewer Systems .....                                 | 85        |
| 301.1.04         | Drainage Plans .....                                                          | 86        |
| 301.1.05         | Storm Systems and Fish Passage .....                                          | 88        |
| 301.1.06         | Surveying .....                                                               | 88        |
| 301.1.07         | Hydrologic Analysis .....                                                     | 89        |
| <b>301.2.00</b>  | <b>HYDRAULIC ANALYSIS.....</b>                                                | <b>89</b> |
| 301.2.01         | General .....                                                                 | 89        |
| 301.2.02         | Hydraulic Design .....                                                        | 89        |
| 301.2.03         | Design Criteria .....                                                         | 90        |
| 301.2.04         | System Design Considerations .....                                            | 91        |
| 301.2.05         | Review of Downstream System.....                                              | 91        |
| 301.2.06         | Conveyance System Hydraulic Standards .....                                   | 92        |
| 301.2.07         | Catch Basin System Standards.....                                             | 93        |
| <b>301.3.00</b>  | <b>HYDROLOGY AND HYDRAULICS .....</b>                                         | <b>93</b> |

|                 |                                                         |            |
|-----------------|---------------------------------------------------------|------------|
| 301.3.01        | Hydrologic Analysis .....                               | 93         |
| 301.3.02        | Rational Method.....                                    | 93         |
| 301.3.03        | Unit Hydrograph Methods .....                           | 94         |
| 301.3.04        | Water Quality Volume and Flow .....                     | 99         |
| 301.3.05        | Hydraulics .....                                        | 100        |
| 301.3.06        | Area Drains .....                                       | 100        |
| 301.3.07        | Channel Protection.....                                 | 100        |
| 301.3.08        | Outfall Protection.....                                 | 101        |
| 301.3.09        | Detention/Retention Facility Protection .....           | 102        |
| 301.3.10        | Drainage Report.....                                    | 102        |
| <b>301.4.00</b> | <b>WATER QUANTITY FACILITY DESIGN.....</b>              | <b>104</b> |
| 301.4.01        | Mitigation Requirement for Quantity .....               | 104        |
| 301.4.02        | Criteria for Requiring On-Site Detention/Retention..... | 105        |
| 301.4.03        | Water Quantity Facility Design Criteria .....           | 105        |
| 301.4.04        | Access Road Design .....                                | 107        |
| 301.4.05        | Flood Management Design Standards .....                 | 107        |
| <b>301.5.00</b> | <b>WATER QUALITY FACILITY DESIGN.....</b>               | <b>110</b> |
| 301.5.01        | Water Quality Facility Design Standards .....           | 110        |
| 301.5.02        | General Requirements.....                               | 112        |
| 301.5.03        | Access Road.....                                        | 112        |
| 301.5.04        | Water Quality Treatment Methods .....                   | 112        |
| 301.5.05        | Pretreatment Devices – Water Quality Manholes.....      | 113        |
| 301.5.06        | Proprietary Pretreatment Devices .....                  | 114        |
| 301.5.07        | Filtration.....                                         | 114        |
| 301.5.08        | Ponds.....                                              | 116        |
| 301.5.09        | Wetlands – Constructed Treatment Wetlands.....          | 117        |
| 301.5.10        | Infiltration .....                                      | 118        |
| 301.5.11        | Compost Filters.....                                    | 120        |
| 301.5.12        | Other Water Quality Treatment Facilities.....           | 120        |
| <b>301.6.00</b> | <b>OPERATION AND MAINTENANCE REQUIREMENTS.....</b>      | <b>120</b> |
| 301.6.01        | Inspection Program .....                                | 121        |
| 301.6.02        | Requirements .....                                      | 121        |
| 301.6.03        | Structures .....                                        | 122        |
| 301.6.04        | Planting Bed Soils.....                                 | 122        |
| 301.6.05        | Vegetation Management .....                             | 122        |
| 301.6.06        | Sediment Management/Pollutant Control.....              | 123        |
| 301.6.07        | Insect/Vector Control.....                              | 124        |
| 301.6.08        | Access and Safety .....                                 | 125        |
| <b>301.7.00</b> | <b>CONSTRUCTED CHANNEL DESIGN STANDARDS.....</b>        | <b>125</b> |
| 301.7.01        | Application.....                                        | 125        |
| 301.7.02        | Channel Design.....                                     | 125        |
| 301.7.03        | Channel Construction for New Roadside Ditches .....     | 126        |

|                  |                                                                    |            |
|------------------|--------------------------------------------------------------------|------------|
| <b>301.8.00</b>  | <b>CULVERT DESIGN STANDARDS .....</b>                              | <b>126</b> |
| 301.8.01         | Application.....                                                   | 126        |
| 301.8.02         | Hydraulic Design .....                                             | 126        |
| 301.8.03         | Headwater .....                                                    | 126        |
| 301.8.04         | Inlet .....                                                        | 127        |
| 301.8.05         | Outlets.....                                                       | 127        |
| 301.8.06         | Inlet Control Analysis.....                                        | 127        |
| 301.8.07         | Outlet Control Analysis .....                                      | 127        |
| 301.8.08         | Outfall Design Standards.....                                      | 127        |
| <br>             |                                                                    |            |
| <b>301.9.00</b>  | <b>STORM MANHOLE AND PIPE DESIGN STANDARDS .....</b>               | <b>128</b> |
| 301.9.01         | Manhole Design .....                                               | 128        |
| 301.9.02         | Storm Pipe Design .....                                            | 129        |
| 301.9.03         | Distance Between Structures .....                                  | 131        |
| 301.9.04         | Access .....                                                       | 131        |
| 301.9.05         | Headwalls.....                                                     | 131        |
| 301.9.06         | Trash Racks or Debris Barriers.....                                | 131        |
| 301.9.07         | Drain Inlet Design Standards.....                                  | 132        |
| <br>             |                                                                    |            |
| <b>301.10.00</b> | <b>MATERIAL AND TECHNICAL SPECIFICATIONS.....</b>                  | <b>133</b> |
| 301.10.01        | Manholes and Structures.....                                       | 133        |
| 301.10.02        | Catch Basins and Inlets.....                                       | 138        |
| 301.10.03        | Stormwater Pipe and Fittings.....                                  | 139        |
| <br>             |                                                                    |            |
| <b>301.11.00</b> | <b>CONSTRUCTION SPECIFICATIONS.....</b>                            | <b>145</b> |
| 301.11.01        | General Provisions .....                                           | 145        |
| 301.11.02        | Scheduling.....                                                    | 145        |
| 301.11.03        | Environmental Protection, Erosion Prevention, Sediment Control ... | 145        |
| 301.11.04        | Interferences and Obstructions .....                               | 146        |
| 301.11.05        | Contaminated Soil or Hazardous Material.....                       | 146        |
| 301.11.06        | Trench Excavation, Preparation, and Backfill .....                 | 146        |
| 301.11.07        | Preservation, Restoration, and Cleanup.....                        | 146        |
| 301.11.08        | Bores .....                                                        | 146        |
| <br>             |                                                                    |            |
| <b>301.12.00</b> | <b>TESTING PROCEDURES.....</b>                                     | <b>147</b> |
| 301.12.01        | General.....                                                       | 147        |
| 301.12.02        | Line Cleaning.....                                                 | 147        |
| 301.12.03        | Deflection Test for Flexible Pipe.....                             | 148        |
| 301.12.04        | Video Inspection of Gravity Systems .....                          | 148        |
| <br>             |                                                                    |            |
| <b>301.13.00</b> | <b>WARRANTIES AND ACCEPTANCE .....</b>                             | <b>149</b> |
| 301.13.01        | Stormwater and Surface Water Acceptance Policy .....               | 149        |
| 301.13.02        | Landscaping Inspection for Warranty.....                           | 149        |

|                  |                                                                    |            |
|------------------|--------------------------------------------------------------------|------------|
| <b>SECTION 4</b> | <b>SANITARY SEWER DESIGN AND CONSTRUCTION</b>                      |            |
|                  | <b>STANDARDS</b>                                                   | <b>151</b> |
| <b>401.1.00</b>  | <b>ENGINEERING</b>                                                 | <b>151</b> |
| 401.1.01         | Introduction                                                       | 151        |
| 401.1.02         | General Provisions                                                 | 151        |
| 401.1.03         | Extension of Public Sanitary Sewer Systems                         | 151        |
| 401.1.04         | Sanitary Plans                                                     | 151        |
| 401.1.05         | Surveying                                                          | 153        |
| 401.1.06         | Population Density                                                 | 153        |
| 401.1.07         | Sewage Flow Determination                                          | 153        |
| 401.1.08         | Interceptor Required                                               | 154        |
| 401.1.09         | Interference with City Sewer System Prohibited                     | 154        |
| <b>401.2.00</b>  | <b>SANITARY MANHOLE AND PIPE DESIGN STANDARDS</b>                  | <b>154</b> |
| 401.2.01         | Manhole Design                                                     | 154        |
| 401.2.02         | Sanitary Pipe Design                                               | 155        |
| 401.2.03         | Access                                                             | 158        |
| <b>401.3.00</b>  | <b>PUMP STATION DESIGN STANDARDS</b>                               | <b>158</b> |
| 401.3.01         | General Provisions                                                 | 158        |
| 401.3.02         | Report                                                             | 159        |
| 401.3.03         | Administration                                                     | 160        |
| 401.3.04         | General Design                                                     | 162        |
| 401.3.05         | Operation and Maintenance Manual                                   | 164        |
| <b>401.4.00</b>  | <b>MATERIAL AND TECHNICAL SPECIFICATIONS</b>                       | <b>165</b> |
| 401.4.01         | Manholes and Structures                                            | 165        |
| 401.4.02         | Gravity Sewer Pipe                                                 | 169        |
| 401.4.03         | Pressure Mains                                                     | 177        |
| <b>401.5.00</b>  | <b>CONSTRUCTION SPECIFICATIONS</b>                                 | <b>178</b> |
| 401.5.01         | General Provisions                                                 | 178        |
| 401.5.02         | Scheduling                                                         | 178        |
| 401.5.03         | Environmental Protection, Erosion Prevention, and Sediment Control | 178        |
| 401.5.04         | Interferences and Obstructions                                     | 179        |
| 401.5.05         | Contaminated Soil or Hazardous Material                            | 179        |
| 401.5.06         | Trench Excavation, Preparation, and Backfill                       | 179        |
| 401.5.07         | Preservation, Restoration, and Cleanup                             | 179        |
| 401.5.08         | Bores                                                              | 179        |
| <b>401.6.00</b>  | <b>TESTING PROCEDURES</b>                                          | <b>179</b> |
| 401.6.01         | General                                                            | 179        |
| 401.6.02         | Gravity System Testing                                             | 180        |
| 401.6.03         | Manhole Testing                                                    | 185        |
| 401.6.04         | Pressure Main Testing                                              | 186        |

|                                                                       |                                                                                         |            |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------|
| <b>401.7.00</b>                                                       | <b>SANITARY SEWER LINE ACCEPTANCE POLICY .....</b>                                      | <b>187</b> |
| 401.7.01                                                              | Legal Recordings .....                                                                  | 187        |
| 401.7.02                                                              | Project Completion .....                                                                | 187        |
| 401.7.03                                                              | Maintenance Period .....                                                                | 187        |
| <br><b>SECTION 5 WATER SYSTEM DESIGN, CONSTRUCTION STANDARDS ....</b> |                                                                                         | <b>189</b> |
| <b>501.1.00</b>                                                       | <b>ENGINEERING.....</b>                                                                 | <b>189</b> |
| 501.1.01                                                              | Introduction.....                                                                       | 189        |
| 501.1.02                                                              | Extension of Public Water Systems .....                                                 | 189        |
| 501.1.03                                                              | Water Plans .....                                                                       | 189        |
| 501.1.04                                                              | Surveying.....                                                                          | 190        |
| <b>501.2.00</b>                                                       | <b>DESIGN GUIDELINES.....</b>                                                           | <b>191</b> |
| <b>501.3.00</b>                                                       | <b>OPERATION OF VALVES IN CITY .....</b>                                                | <b>193</b> |
| <b>501.4.00</b>                                                       | <b>MATERIALS AND TECHNICAL SPECIFICATONS - DUCTILE<br/>IRON PIPE AND FITTINGS .....</b> | <b>193</b> |
| 501.4.01                                                              | Joints .....                                                                            | 193        |
| 501.4.02                                                              | Mechanical Joint Fittings.....                                                          | 193        |
| 501.4.03                                                              | Push-On Ductile Iron Pipe.....                                                          | 193        |
| 501.4.04                                                              | Flanged Ductile Iron Fittings.....                                                      | 193        |
| 501.4.05                                                              | Gaskets.....                                                                            | 194        |
| 501.4.06                                                              | Mechanical Couplings .....                                                              | 194        |
| <b>501.5.00</b>                                                       | <b>CONSTRUCTION SPECIFICATIONS.....</b>                                                 | <b>194</b> |
| 501.5.01                                                              | General Provisions.....                                                                 | 194        |
| 501.5.02                                                              | Scheduling.....                                                                         | 194        |
| 501.5.03                                                              | Environmental Protection, Erosion Prevention, and Sediment Control .                    | 194        |
| 501.5.04                                                              | Interferences and Obstructions .....                                                    | 194        |
| 501.5.05                                                              | Contaminated Soil or Hazardous Material.....                                            | 195        |
| 501.5.06                                                              | Trench Excavation, Preparation, and Backfill .....                                      | 195        |
| 501.5.07                                                              | Preservation, Restoration, and Cleanup.....                                             | 195        |
| <b>501.6.00</b>                                                       | <b>DUCTILE IRON PIPE—INSTALLATION.....</b>                                              | <b>195</b> |
| 501.6.01                                                              | Suitable Conditions for Laying Pipe.....                                                | 195        |
| 501.6.02                                                              | Handling.....                                                                           | 195        |
| 501.6.03                                                              | Cleaning Pipe and Fittings .....                                                        | 195        |
| 501.6.04                                                              | Placing Pipe in Trench .....                                                            | 197        |
| 501.6.05                                                              | Cutting Pipe .....                                                                      | 197        |
| 501.6.06                                                              | Permissible Deflection of Joints .....                                                  | 198        |
| 501.6.07                                                              | Alignment .....                                                                         | 198        |
| 501.6.08                                                              | Anchorage and Restraint.....                                                            | 198        |

|                  |                                                                                |            |
|------------------|--------------------------------------------------------------------------------|------------|
| 501.6.09         | Construction of Blow-offs .....                                                | 198        |
| 501.6.10         | Locating Wire Specifications.....                                              | 199        |
| <b>501.7.00</b>  | <b>VALVES AND VALVE BOXES .....</b>                                            | <b>199</b> |
| 501.7.01         | Scope.....                                                                     | 199        |
| 501.7.02         | Materials .....                                                                | 199        |
| 501.7.03         | Workmanship.....                                                               | 201        |
| <b>501.8.00</b>  | <b>FIRE HYDRANTS .....</b>                                                     | <b>202</b> |
| 501.8.01         | Scope.....                                                                     | 202        |
| 501.8.02         | Hydrants.....                                                                  | 202        |
| 501.8.03         | Base Block .....                                                               | 202        |
| 501.8.04         | Workmanship.....                                                               | 202        |
| 501.8.05         | Location and Position .....                                                    | 202        |
| 501.8.06         | Excavation.....                                                                | 203        |
| 501.8.07         | Base Rock .....                                                                | 203        |
| 501.8.08         | Installation of Hydrants.....                                                  | 203        |
| 501.8.09         | Gravel for Drainage .....                                                      | 203        |
| 501.8.10         | Thrust Blocking and Restraint .....                                            | 203        |
| 501.8.11         | Thrust Ties .....                                                              | 204        |
| <b>501.9.00</b>  | <b>HYDROSTATIC TESTING AND STERILIZATION OF NEWLY<br/>INSTALLED PIPE .....</b> | <b>204</b> |
| 501.9.01         | Hydrostatic Testing.....                                                       | 204        |
| 501.9.02         | Sterilization.....                                                             | 205        |
| 501.9.03         | Point of Application.....                                                      | 206        |
| 501.9.04         | Retention Period.....                                                          | 207        |
| 501.9.05         | Disposal of Flushing and Sterilizing Water .....                               | 207        |
| <b>501.10.00</b> | <b>WATER SERVICE CONNECTIONS.....</b>                                          | <b>208</b> |
| 501.10.01        | Scope.....                                                                     | 208        |
| 501.10.02        | Hydrostatic Test and Leakage.....                                              | 208        |
| 501.10.03        | Materials .....                                                                | 208        |
| 501.10.04        | Workmanship.....                                                               | 209        |
| <b>501.11.00</b> | <b>WATER LINE ACCEPTANCE POLICY .....</b>                                      | <b>210</b> |
| 501.11.01        | Water Line Activation.....                                                     | 210        |
| 501.11.02        | Water Line Acceptance.....                                                     | 211        |
| <b>SECTION 6</b> | <b>TRENCH EXCAVATION AND BACKFILL.....</b>                                     | <b>212</b> |
| <b>601.1.00</b>  | <b>DEFINITIONS .....</b>                                                       | <b>212</b> |
| <b>601.2.00</b>  | <b>MATERIALS .....</b>                                                         | <b>213</b> |
| 601.2.01         | Trench Foundation.....                                                         | 213        |

|                 |                                                                   |            |
|-----------------|-------------------------------------------------------------------|------------|
| 601.2.02        | Pipe Area.....                                                    | 213        |
| 601.2.03        | Trench Backfill .....                                             | 213        |
| <b>601.3.00</b> | <b>CONSTRUCTION.....</b>                                          | <b>214</b> |
| 601.3.01        | Excavation.....                                                   | 214        |
| 601.3.02        | Installation (see trench detail drawing of these standards) ..... | 216        |

**APPENDIX A BICYCLE AND PEDESTRIAN FACILITIES ..... App. 1**

|               |                                                          |               |
|---------------|----------------------------------------------------------|---------------|
| <b>A.1.00</b> | <b>INTRODUCTION .....</b>                                | <b>App. 1</b> |
| A.1.01        | Bicycle and Pedestrian Facility System.....              | App. 1        |
| A.1.02        | Playground Facilities.....                               | App. 1        |
| <b>A.2.00</b> | <b>DESIGN OF BICYCLE AND PEDESTRIAN FACILITIES.....</b>  | <b>App. 1</b> |
| A.2.01        | General Design, Location, and Easement Requirements..... | App. 1        |
| A.2.02        | On-Street Design Standards.....                          | App. 2        |
| A.2.03        | Off-Street Design Standards .....                        | App. 3        |
| A.2.04        | Sidewalks .....                                          | App. 7        |
| A.2.05        | Signing and Marking .....                                | App. 7        |
| <b>A.3.00</b> | <b>TRAFFIC CONTROL .....</b>                             | <b>App. 8</b> |
| <b>A.4.00</b> | <b>SUPPORT FACILITIES.....</b>                           | <b>App. 8</b> |

**APPENDIX B LANDSCAPE REQUIREMENTS: STORM WATER QUALITY AND QUANTITY FACILITIES ..... App. 9**

|               |                                          |                |
|---------------|------------------------------------------|----------------|
| <b>B.1.00</b> | <b>INTRODUCTION .....</b>                | <b>App. 9</b>  |
| <b>B.2.00</b> | <b>LANDSCAPE GUIDELINES.....</b>         | <b>9</b>       |
| B.2.01        | Hydrology .....                          | App. 9         |
| B.2.02        | Soil.....                                | App. 10        |
| B.2.03        | Plant Materials .....                    | App. 10        |
| B.2.04        | Maintenance.....                         | App. 11        |
| <b>B.3.00</b> | <b>RECOMMENDED PLANT SPECIES .....</b>   | <b>App. 12</b> |
| <b>B.4.00</b> | <b>SEED MIXES.....</b>                   | <b>App. 16</b> |
| <b>B.5.00</b> | <b>PLANTING SCHEMES.....</b>             | <b>App. 17</b> |
| B.5.01        | Water Quality Swale.....                 | App. 17        |
| B.5.02        | Extended Dry Pond/Extended Wet Pond..... | App. 17        |
| B.5.03        | Constructed Wetland.....                 | App. 18        |

|                                                                                                    |                                                           |                |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------|
| B.5.04                                                                                             | Vegetated Corridors.....                                  | App. 18        |
| <br>                                                                                               |                                                           |                |
| <b>APPENDIX C INFILTRATION REQUIREMENTS, SITE CHARACTERIZATION, SITE SUITABILITY CRITERIA.....</b> |                                                           | <b>App. 20</b> |
| <b>C.1.00</b>                                                                                      | <b>INTRODUCTION .....</b>                                 | <b>App. 20</b> |
| <b>C.2.00</b>                                                                                      | <b>SITE CHARACTERIZATION .....</b>                        | <b>App. 20</b> |
| C.2.01                                                                                             | Surface Features Characterization .....                   | App. 20        |
| C.2.02                                                                                             | Subsurface Characterization .....                         | App. 21        |
| C.2.03                                                                                             | Soil Testing.....                                         | App. 21        |
| C.2.04                                                                                             | Infiltration Rate Determination.....                      | App. 22        |
| C.2.05                                                                                             | Infiltration Receptor.....                                | App. 22        |
| <b>C.3.00</b>                                                                                      | <b>SITE SUITABILITY CRITERIA .....</b>                    | <b>App. 23</b> |
| C.3.01                                                                                             | Setbacks .....                                            | App. 23        |
| C.3.02                                                                                             | Ground Water Drinking Water Protection Areas .....        | App. 24        |
| C.3.03                                                                                             | High Vehicle Traffic Areas.....                           | App. 24        |
| C.3.04                                                                                             | Soil Infiltration Rate/Drawdown Time .....                | App. 24        |
| C.3.05                                                                                             | Depth to Bedrock, Water Table, or Impermeable Layer ..... | App. 25        |
| C.3.06                                                                                             | Soil Physical and Chemical Suitability for Treatment..... | App. 25        |
| C.3.07                                                                                             | Seepage Analysis and Control .....                        | App. 26        |
| C.3.08                                                                                             | Impact of Roadway Deicers.....                            | App. 26        |
| C.3.09                                                                                             | Verification Testing of the Completed Facility .....      | App. 26        |
| <br>                                                                                               |                                                           |                |
| <b>APPENDIX D STORMWATER QUALITY FACILITIES DESIGN .....</b>                                       |                                                           | <b>App. 27</b> |
| <b>D.1.00</b>                                                                                      | <b>INTRODUCTION .....</b>                                 | <b>App. 27</b> |
| <b>D.2.00</b>                                                                                      | <b>FILTRATION .....</b>                                   | <b>App. 27</b> |
| D.2.01                                                                                             | Biofiltration Swale.....                                  | App. 27        |
| D.2.02                                                                                             | Sand Filter.....                                          | App. 28        |
| <b>D.3.00</b>                                                                                      | <b>PONDS.....</b>                                         | <b>App. 32</b> |
| D.3.01                                                                                             | Wet Ponds.....                                            | App. 32        |
| D.3.02                                                                                             | Extended Wet Pond .....                                   | App. 34        |
| D.3.03                                                                                             | Extended Dry Pond.....                                    | App. 35        |
| <b>D.4.00</b>                                                                                      | <b>WETLANDS–CONSTRUCTED TREATMENT WETLANDS ..</b>         | <b>App. 36</b> |
| <b>D.5.00</b>                                                                                      | <b>INFILTRATION.....</b>                                  | <b>App. 38</b> |
| D.5.01                                                                                             | Infiltration Trench.....                                  | App. 38        |
| D.5.02                                                                                             | Infiltration Basin.....                                   | App. 39        |

|                                                                      |                    |
|----------------------------------------------------------------------|--------------------|
| <b>APPENDIX E WATER QUALITY FACILITY LINERS .....</b>                | <b>App. 41</b>     |
| <b>E.1.00 INTRODUCTION .....</b>                                     | <b>App. 41</b>     |
| <b>E.2.00 WATER QUALITY FACILITY LINERS .....</b>                    | <b>App. 41</b>     |
| E.2.01 General Design Criteria .....                                 | App. 41            |
| E.2.02 Interference With Seasonal Groundwater .....                  | App. 43            |
| <b>E.3.00 WATER QUALITY TREATMENT LINERS .....</b>                   | <b>App. 43</b>     |
| <b>E.4.00 LOW-PERMEABILITY LINER OPTIONS .....</b>                   | <b>App. 44</b>     |
| E.4.01 Compacted Till Liners .....                                   | App. 44            |
| E.4.02 Clay Liners.....                                              | App. 44            |
| E.4.03 Geomembrane Liners.....                                       | App. 45            |
| E.4.04 Concrete Liners.....                                          | App. 46            |
| <br><b>APPENDIX F City of Wilsonville FORMS .....</b>                | <br><b>App. 47</b> |
| <b>APPENDIX G City of Wilsonville Standard Detail Drawings .....</b> | <b>App. 54</b>     |

## Table of Tables

|                                                                                                    |            |
|----------------------------------------------------------------------------------------------------|------------|
| <b>Table 2. 1. RELATIONSHIP BETWEEN k AND CBR .....</b>                                            | <b>58</b>  |
| <b>Table 2.2. DESIGN SPEED / CENTERLINE RADIUS—MINIMUMS .....</b>                                  | <b>61</b>  |
| <b>Table 2.3. DESIGN CONTROLS FOR CREST VERTICAL CURVES BASED ON STOPPING SIGHT DISTANCE .....</b> | <b>62</b>  |
| <b>Table 2.4. DESIGN CONTROLS FOR SAG VERTICAL CURVES BASED ON STOPPING SIGHT DISTANCE .....</b>   | <b>63</b>  |
| <b>Table 2.5. MINIMUM TURNING RADII FROM EDGE OF PAVEMENT OR CURB (feet).....</b>                  | <b>65</b>  |
| <b>Table 2.6. INTERSECTIONAL SIGHT DISTANCE .....</b>                                              | <b>69</b>  |
| <b>Table 2.8. ATMOSPHERIC TEMPERATURE REQUIREMENTS.....</b>                                        | <b>79</b>  |
| <b>Table 3.1. RATIONAL METHOD FOR DERIVING RAINFALL INTENSITIES<sup>1</sup> .....</b>              | <b>94</b>  |
| <b>Table 3.2. RAINFALL DISTRIBUTION .....</b>                                                      | <b>95</b>  |
| <b>Table 3.3. DESIGN STORM DISTRIBUTION CHART<sup>1</sup> .....</b>                                | <b>96</b>  |
| <b>Table 3.4. INTAKE FLOW RATE, GRATE ANGLE 30 DEGREES .....</b>                                   | <b>100</b> |
| <b>Table 3.5. CHANNEL PROTECTION, NEW CHANNEL CONSTRUCTION....</b>                                 | <b>101</b> |
| <b>Table 3.6. ROCK PROTECTION.....</b>                                                             | <b>101</b> |
| <b>Table 3.7. BIOFILTRATION SWALE CRITERIA.....</b>                                                | <b>114</b> |
| <b>Table 3.8. SAND FILTER CRITERIA .....</b>                                                       | <b>116</b> |
| <b>Table 3.9. WET POND CRITERIA .....</b>                                                          | <b>116</b> |
| <b>Table 3.10. EXTENDED WET POND CRITERIA .....</b>                                                | <b>117</b> |
| <b>Table 3.11. CONSTRUCTED TREATMENT WETLANDS CRITERIA .....</b>                                   | <b>118</b> |
| <b>Table 3.12. INFILTRATION TRENCH REQUIREMENTS.....</b>                                           | <b>119</b> |
| <b>Table 3.13. INFILTRATION BASIN REQUIREMENTS.....</b>                                            | <b>120</b> |
| <b>Table 3.14. MINIMUM PIPE COVER.....</b>                                                         | <b>131</b> |
| <b>Table 4.1. MINIMUM GRADIENT FOR SANITARY SEWERS .....</b>                                       | <b>157</b> |

|                                                                                                             |                |
|-------------------------------------------------------------------------------------------------------------|----------------|
| <b>Table 4.2. SECURING SEWERS ON SLOPES.....</b>                                                            | <b>157</b>     |
| <b>Table 4.3. TEST LOADS FOR CONCRETE PIPES UNDER DIFFERENTIAL LOAD .....</b>                               | <b>173</b>     |
| <b>Table 4.4. TEST LOADS FOR DUCTILE IRON PIPES UNDER DIFFERENTIAL LOAD .....</b>                           | <b>173</b>     |
| <b>Table 4.5. AIR TESTING OF CONCRETE PIPE .....</b>                                                        | <b>183</b>     |
| <b>Table 4.6. AIR TESTING OF PVC, HDPE, AND DUCTILE IRON PIPE – 1.0 PSIG PRESSURE DROP<sup>1</sup>.....</b> | <b>27</b>      |
| <b>Table 4.7. AIR TESTING OF PVC, HDPE, AND DUCTILE IRON PIPE – 0.5 PSIG PRESSURE DROP<sup>1</sup>.....</b> | <b>27</b>      |
| <b>Table 4.8. VACUUM TESTING OF MANHOLES.....</b>                                                           | <b>186</b>     |
| <b>Table 5.1. MAXIMUM PERMITTED DEFLECTION, 18-FOOT-LONG PIPE..</b>                                         | <b>198</b>     |
| <b>Table 5.2. RATIO OF HYPOCHLORITE TO WATER.....</b>                                                       | <b>206</b>     |
| <b>Table 5.3. METER BOXES AND COVERS .....</b>                                                              | <b>208</b>     |
| <br>                                                                                                        |                |
| <b>Table B.1. PLANTS FOR WET AREAS.....</b>                                                                 | <b>APP. 14</b> |
| <b>Table B.2. PLANTS FOR MOIST AREAS.....</b>                                                               | <b>APP. 15</b> |
| <b>Table B.3. PLANTS FOR DRY AREAS.....</b>                                                                 | <b>APP. 16</b> |
| <b>Table B.4. WET/MOIST AREA SEED MIX .....</b>                                                             | <b>APP. 17</b> |
| <b>Table B.5. DRY AREA SEED MIX .....</b>                                                                   | <b>APP. 17</b> |
| <b>Table D.1. GRADATION REQUIREMENTS, FILTER BED MEDIUM .....</b>                                           | <b>APP. 30</b> |
| <b>Table D.2. GEOFABRIC MATERIAL SPECIFICATIONS.....</b>                                                    | <b>APP. 30</b> |
| <b>Table D.3. DRAINAGE MATTING MATERIAL SPECIFICATIONS .....</b>                                            | <b>APP. 31</b> |
| <b>Table E.1. RECOMMENDED LINERS, STORMWATER FACILITIES .....</b>                                           | <b>APP. 42</b> |
| <b>Table E.2. SOIL GRADATION REQUIREMENTS, COMPACTED TILL LINERS .....</b>                                  | <b>APP. 44</b> |
| <b>Table E.3. SPECIFICATIONS FOR SOIL IN CLAY LINERS .....</b>                                              | <b>APP. 45</b> |

## SECTION 1

### GENERAL CONSTRUCTION REQUIREMENTS & ADMINISTRATIVE PROVISIONS

#### 101.1.00 AVAILABILITY

Copies of these “Public Works Standards – 2006” for the City of Wilsonville, Oregon, or any subsection of the standards are available from the Wilsonville Community Development Department, given reasonable notice and payment of current reproduction costs.

The “Public Works Standards” are subject to change (see [Section 103.00.c](#)); check the City of Wilsonville Engineering website or with the City of Wilsonville Engineering Division for revisions or updates.

#### 101.1.01 Reference to Standards

The design engineer may, at his or her sole discretion, use the standards by direct reference in the contract documents prepared for the construction of public street, drainage, water, and sewer facilities in the City of Wilsonville. If the design engineer incorporates the City’s standards in that way, the contract documents shall contain the following statements:

- a. Material and workmanship shall be in strict accordance with the standard specifications of the City of Wilsonville. No changes from the approved project plans and specifications shall be made without approval of the City’s authorized representative.
- b. The standards are in outline form only, and shall not operate to relieve the design engineer of his or her professional responsibilities during project design and construction.
- c. These standards represent the minimum requirements for construction in a public right-of-way or public easement to protect the public health, safety and welfare. Any deviation from the standards must be approved, in writing, by the City’s authorized representative.

#### 101.2.00 INTENT

#### 101.2.01 Intent of Public Works Standards

These standards for constructing public facilities in the City of Wilsonville are intended to protect the public health, safety, and welfare by:

- a. Setting forth uniform material and workmanship standards.
- b. Supplementing and completing the public health and safety requirements of Chapter 4 of the Wilsonville Code.
- c. Streamlining the administration and construction of public facilities in the City and minimizing repairs to these public facilities.

Nothing in these standards shall relieve any person or organization from the obligation to comply with the applicable laws, rules, and regulations of any federal, state, and local authority.

### 101.2.02 Order of Precedence

If there is a conflict between approval documents, the document highest in precedence shall control. The precedence shall be:

- First:** Permits from other agencies or jurisdictions, as may be required by law.
- Second:** Land use decision-making authority's Conditions of Approval.
- Third:** City of Wilsonville *Standard Detail Drawings*.
- Fourth:** City of Wilsonville *Public Works Standards – 2006*.
- Fifth:** City of Wilsonville *Planning and Land Development Ordinance*.
- Sixth:** Clean Water Services (CWS) *Design and Construction Standards*.
- Seventh:** *Oregon Standard Specifications for Construction* (current edition) (ODOT, Oregon APWA) and any reference specifications and standard practices adopted by nationally recognized professional societies such as ASCE, AWWA, APWA, ACI, and ASTM.
- Eight:** *ODOT Pavement Design Guide*.
- Ninth:** *Uniform Building Code* and City-issued building, mechanical, electrical, and plumbing permits.
- Tenth:** Americans with Disabilities Act of 1990.
- Eleventh:** Plans and details prepared by the design engineer.

Supplemental written agreements, franchise agreements, and approved revision to plans and specifications by the appropriate jurisdictions and conforming to local, state, and federal law will take precedence over documents listed above. Detailed plans shall have precedence over general plans. In any event, the determination of the City Engineer shall be final.

### 101.3.00 SCOPE

These standards for construction of public facilities in the City of Wilsonville:

- a. Cover all public streets, drainage, water, sewer, and appurtenant facilities inside the corporate limits of the City that are to be turned over to the City for maintenance and operation.

- b. Relate only to public facilities constructed in the City and should not be confused with building codes, zoning ordinances, and other regulations for which the City has established separate procedures and standards.
- c. May be amended or updated periodically by ordinance of the City Council on the recommendation of the City Engineer protect the public health, safety, and welfare.
- d. Notwithstanding the foregoing, the City Engineer shall have the authority to modify the Standard Detail Drawings, as provided in Appendix G, as needed to maintain conformance to the periodic changes to national and state design requirements, guidelines, and specifications.

**101.4.00      DEFINITIONS**

The following definitions apply throughout these standards:

|             |                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| AASHTO:     | American Association of State Highway and Transportation Officials                                                                                       |
| AC:         | Asphaltic concrete                                                                                                                                       |
| ACI:        | American Concrete Institute                                                                                                                              |
| ACPA:       | American Concrete Pavement Association                                                                                                                   |
| ADA:        | Americans with Disabilities Act                                                                                                                          |
| ADAAG:      | American with Disabilities Act Accessibility Guidelines and Standards                                                                                    |
| ADT:        | Average daily traffic                                                                                                                                    |
| ANSI:       | American National Standards Institute                                                                                                                    |
| APWA:       | American Public Works Association                                                                                                                        |
| ASTM:       | American Society for Testing and Materials                                                                                                               |
| AWWA:       | American Water Works Association                                                                                                                         |
| Act of God: | Earthquake, flood, cyclone, or other cataclysmic natural phenomenon                                                                                      |
| Addendum:   | Written or graphic modification or interpretation of contract documents                                                                                  |
| Agreement:  | Written agreement covering performance of work and furnishing of labor and materials in construction of work                                             |
| Alley:      | Street or road primarily intended to provide secondary access to road or side of lots or buildings and not intended for normal through vehicular traffic |

|                            |                                                                                                                                                                                                                                                                                                                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant:                 | Person, organization, or duly authorized representative identified as such in specifications and in agreement, and referred to throughout contract documents as if singular in number and masculine in gender; means owner or authorized representatives, including parties acting as designated authority for aspects of work  |
| Approve:                   | “Approved,” “approve,” “approval,” or similar words shall mean to give, in writing, limited, conditional, or qualified permission to use material, equipment, or methods, such conditions being in strict compliance with City’s standards; approval will be by the City’s authorized representative                            |
| ARCPACS:                   | A federation of certifying boards in agriculture, biology, earth, and environmental sciences. Provides professional certification for soil scientists whose education, experience and career path are in some aspect of the soil science profession and can meet the standards of the ARCPAC program                            |
| Authorized representative: | Party or parties authorized or employed by applicant to observe, test, or review quality and sufficiency of work performed, materials used, and determine compliance with plans and specification; for the City of Wilsonville, designated authority shall be the City Engineer or one of the City’s authorized representatives |
| Bid bond:                  | Form of security furnished by contractor, guaranteeing that he/she will enter into a contract in accordance with contract documents if the proposal is accepted                                                                                                                                                                 |
| Bidder:                    | Any individual, firm, or corporation formally submitting a proposal for work contemplated, or any part of it, acting directly or through an authorized representative                                                                                                                                                           |
| Bioengineering:            | A construction methodology used to stabilize and conserve soils through the use of live plants alone or in combination with biodegradable material to produce living, functioning systems that can prevent erosion, control sediment, and provide habitat                                                                       |
| BPMP:                      | City of Wilsonville’s 1993 Bicycle and Pedestrian Master Plan, or latest edition                                                                                                                                                                                                                                                |
| CD:                        | Construction documents                                                                                                                                                                                                                                                                                                          |
| CDF:                       | Control density fill                                                                                                                                                                                                                                                                                                            |
| CEC:                       | Cation exchange capacity                                                                                                                                                                                                                                                                                                        |
| CN:                        | Curve number                                                                                                                                                                                                                                                                                                                    |

|                           |                                                                                                                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Certificate of Insurance: | Evidence of insurance coverage of the contractor, furnished to the City                                                                                                                        |
| Change order:             | Written order to contractor by City Engineer or the City's representative authorizing addition, deletion, or revision of work within general scope of contract, or adjustment in price or time |
| City:                     | City of Wilsonville                                                                                                                                                                            |

**City Boards and Commissions:**

|                                               |                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>City Council:</i>                          | Five-member governing body responsible for identifying community problems and needs, and establishing policies and goals to address those needs                                                                                                                                     |
| <i>Development Review Board:</i>              | Empowered to review and take action on land-use applications; decisions are usually binding, but may be appealed to City Council                                                                                                                                                    |
| <i>Planning Commission:</i>                   | Makes recommendations to City Council regarding City's comprehensive plan, facilities plans, capital improvements program, and planning and zoning ordinances and provide input on traffic-related concerns                                                                         |
| <i>Parks &amp; Recreation Advisory Board:</i> | Aids in planning and developing present and future parks and recreation in City and advises City Council on policy matters regarding parks and recreation services                                                                                                                  |
| City Engineer:                                | Professional Engineer registered in the State of Oregon, designated by the City Manager to carry through with planning, designing, and project supervision of public facilities that will be accepted and owned by the City                                                         |
| Contract:                                     | Binding agreement between contractor and applicant covering performance of work and furnishing of labor and materials for construction of public facilities                                                                                                                         |
| Contractor:                                   | The person or entity that has entered into contract with the applicant; "contractor," though here used to describe an individual, shall mean contractor, agents, employees, officials, subcontractors, or anyone connected with work set forth on behalf of contractor              |
| Contract documents:                           | Agreement, addenda, instructions to bidders, contractor's proposal, bonds, notice of award, notice to proceed, general provisions, technical provisions, plans, change orders, field orders, and all other modifications of such documents entered into in accordance with contract |

|                                     |                                                                                                                                                                                                                                                                      |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contract price:                     | Total amount payable to contractor for work, including all sales, use, and other consumer taxes related to work.                                                                                                                                                     |
| Contract time:                      | Number of calendar days allowed contractor to complete work                                                                                                                                                                                                          |
| Construction maintenance assurance: | A one-year bond for 10% of the cost to construct public improvements                                                                                                                                                                                                 |
| County road:                        | Public road incorporated into county roadway system by formal action of Board of County Commissioners; these roads are assigned numbers and county assumes maintenance responsibility                                                                                |
| DEQ:                                | Oregon Department of Environmental Quality                                                                                                                                                                                                                           |
| Design engineer:                    | Professional Engineer registered in the State of Oregon responsible for planning, designing, and producing record drawings of public facilities that will be accepted and owned by the City                                                                          |
| Detail Drawings:                    | Construction drawings produced by the City of Wilsonville providing details of acceptable construction standards for public facilities. Drawings may be periodically updated or changed, as needed, by approval of the City Engineer                                 |
| Development:                        | Development includes new development, redevelopment, and/or partial redevelopment                                                                                                                                                                                    |
| Directed, required, etc.:           | In these standards, "directed," "required," "permitted," "ordered," "designated," or similar words shall mean at the direction, requirement, permission, order, or designation of applicant or City Engineer                                                         |
| EPSC Plan:                          | Erosion Prevention and Sediment Control Plan following recommendations outlined in the Erosion Prevention and Sediment Control Planning and Design Manual, 2000 or latest edition                                                                                    |
| EPSC Planning and Design Manual:    | Erosion Prevention and Sediment Control Planning and Design Manual developed in partnership between CleanWater Services of Washington County, Water Environment Services of Clackamas County, City of West Linn, ODOT, and Harza Engineering, 2000 or latest edition |
| FEMA:                               | Federal Emergency Management Agency                                                                                                                                                                                                                                  |
| FHWA:                               | Federal Highway Administration                                                                                                                                                                                                                                       |
| Field order:                        | Written order to contractor, approved by applicant, changing work but not affecting contract price or time                                                                                                                                                           |

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Final completion:                | Date when project correction list is completed; a 10% maintenance bond is submitted in accordance with contract documents, as modified by change orders agreed to by parties, or as specified in <u>Section 101.8.17</u> , "Project Closeout;" and the City's authorized representative receives confirmation that all easements and legal documents have been recorded with the County Recorder |
| First party:                     | Applicant or duly authorized representative                                                                                                                                                                                                                                                                                                                                                      |
| Grout:                           | Thin, fast-setting, high-strength, non-shrink mortar used to fill cracks and joints in masonry                                                                                                                                                                                                                                                                                                   |
| HMAC:                            | Hot mixed asphalt concrete                                                                                                                                                                                                                                                                                                                                                                       |
| ICEA:                            | Insulated Cable Engineers Association                                                                                                                                                                                                                                                                                                                                                            |
| Inclement weather:               | Weather conditions so extraordinary that previous climatic conditions in locality of work give no reasonable warning of them; shall be determined by City Engineer                                                                                                                                                                                                                               |
| Indicated, shown, etc.:          | "Indicated," "noted," "shown," "called for," or similar words shall mean indicated, noted, shown, or called for in the contract documents for the work referred to                                                                                                                                                                                                                               |
| Intersection:                    | Area jointed by two or more roads intersecting; for design purposes, intersection is not formed by naming two approaches of continuous street at curve or other point with different street names                                                                                                                                                                                                |
| Landscape maintenance assurance: | A two-year bond for 100% of the cost to install all required landscaping in water quality/quantity facilities and vegetated corridors, plus 100% of the cost to maintain the landscaping in these areas for two years                                                                                                                                                                            |
| Large-diameter pipe:             | Pipe with diameter larger than 24 inches                                                                                                                                                                                                                                                                                                                                                         |
| Maintenance Assurance Bond:      | Maintenance assurances required by the City for work performed to ensure post-construction quality and landscape survivability. May consists of both construction maintenance assurance and landscape maintenance assurance                                                                                                                                                                      |
| Mortar:                          | Plastic building material of cement or lime, sand, and water that hardens in place and is used in masonry or plastering                                                                                                                                                                                                                                                                          |
| MUTCD:                           | <i>Manual on Uniform Traffic Control Devices</i> , 2000 or latest edition                                                                                                                                                                                                                                                                                                                        |
| NAVD 88:                         | North American Vertical Datum of 1988: the vertical control datum established in 1991 by the National Geodetic Survey                                                                                                                                                                                                                                                                            |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Neighborhood Erosion Control Plan: | An approved erosion-prevention and sediment-control plan for multiple lots                                                                                                                                                                                                                                                                                                       |
| NEMA:                              | National Electrical Manufacturers Association                                                                                                                                                                                                                                                                                                                                    |
| NGVD 29:                           | National Geodetic Vertical Datum of 1929: vertical control datum established for vertical control in the United States by the general adjustment of 1929 (formerly called the "Sea Level Datum of 1929")                                                                                                                                                                         |
| NPSH:                              | Net Positive Suction Head, in association with sanitary sewer pumping units                                                                                                                                                                                                                                                                                                      |
| NRCS:                              | National Resource Conservation Service                                                                                                                                                                                                                                                                                                                                           |
| Notice to proceed:                 | Written notice given by designated authority to contractor fixing date when contractor shall begin to perform the obligations under contract documents                                                                                                                                                                                                                           |
| O&M plan:                          | Operation and maintenance plan for mechanical systems to be operated by the City, or plan designed for stormwater facilities and prepared by the responsible party in the Stormwater Maintenance Covenant and Access Easement                                                                                                                                                    |
| ODFW:                              | Oregon Department of Fish and Wildlife                                                                                                                                                                                                                                                                                                                                           |
| ODOT:                              | Oregon Department of Transportation                                                                                                                                                                                                                                                                                                                                              |
| ODOT QPL:                          | Qualified Products List; published twice each year by ODOT's Construction Section                                                                                                                                                                                                                                                                                                |
| ODOT SSC:                          | Oregon Department of Transportation Standard Specifications for Construction, 2002 (in association with the Oregon Chapter of the APWA), or latest edition                                                                                                                                                                                                                       |
| OSHA:                              | Occupational Safety and Health Administration                                                                                                                                                                                                                                                                                                                                    |
| Or equal:                          | "Or equal," "or approved equal," or similar words shall mean to possess same performance qualities and characteristics and fulfill utilitarian function without any decrease in quality, durability, or longevity and shall meet with approval of designated authority (no inference is intended that items must be identical in all respects if above conditions are satisfied) |
| PCA:                               | Portland Cement Association                                                                                                                                                                                                                                                                                                                                                      |
| PCC:                               | Portland cement concrete                                                                                                                                                                                                                                                                                                                                                         |
| Payment bond:                      | Form of security furnished by contractor and their surety guaranteeing payment of all labor, material, equipment, and all other obligations arising from work                                                                                                                                                                                                                    |

|                          |                                                                                                                                                                                                                                                                                                                            |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Performance bond:        | Security furnished by applicant, or such other party acceptable to the City, and their surety guaranteeing complete and faithful performance of all obligations and conditions placed on contractor by contract                                                                                                            |
| Plans:                   | Plans, profiles, and detailed drawings showing locations, character, dimensions, and details of work to be done                                                                                                                                                                                                            |
| PRMP:                    | City of Wilsonville's 1994 Parks and Recreation Master Plan, or latest edition                                                                                                                                                                                                                                             |
| Predevelopment:          | Considered as the natural, unimproved and unaltered state of the land.                                                                                                                                                                                                                                                     |
| Product data:            | Complete catalog data for manufactured items of equipment and all component parts, including specific performance data, material description and source, rating, capacity, working pressure, material gauge thickness, brand name, catalog numbers, and other necessary information                                        |
| Project correction list: | Final project inspection to repair checklist, or punch list, compiled after construction of total project is complete, and after all testing is satisfactorily finished                                                                                                                                                    |
| Proposal:                | Offer for work made out and submitted on prescribed proposal form and properly signed and guaranteed by bidder                                                                                                                                                                                                             |
| PUE:                     | Public Utility Easement                                                                                                                                                                                                                                                                                                    |
| Public road:             | Road dedicated for use by public; for most part maintained by City and funded by road maintenance fee                                                                                                                                                                                                                      |
| Public works facility:   | Any facility constructed in public right-of-way or public easement that is either immediately or eventually to be taken over by City for maintenance and operation; includes but is not limited to streets, sidewalks, curbs, parking lots, driveways, drainage facilities, water system works, and sanitary sewer systems |
| Punch list:              | Final project inspection to repair checklist, or project correction list, compiled after construction of total project is complete, and after all testing is satisfactorily finished                                                                                                                                       |
| Representative:          | City Engineer or authorized representative                                                                                                                                                                                                                                                                                 |
| Reserve strip:           | A 1-foot-long section at terminus of right-of-way at stub streets, to be provided to City                                                                                                                                                                                                                                  |
| Right-of-way:            | Part of ground provided to or required by City for use in constructing and maintaining public facilities                                                                                                                                                                                                                   |

|                          |                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Road:                    | Part of right-of-way used for vehicular traffic, including appurtenances, storm drain system, traffic control devices, etc.                                                                                                                                                                                                                                                 |
| SBUH:                    | Santa Barbara Unit Hydrograph                                                                                                                                                                                                                                                                                                                                               |
| SCS:                     | Soil Conservation Service, U.S. Department of Agriculture                                                                                                                                                                                                                                                                                                                   |
| Sensitive areas:         | Areas sensitive to environmental degradation, such as existing or created wetlands; rivers, streams, and springs with year round or intermittent flow; and impoundments (natural lakes and ponds). Sensitive areas also include any resource protected within the SROZ                                                                                                      |
| Shop drawings:           | Diagrams, drawings, illustrations, brochures, schedules, and all other data submittals required by contractor and furnished by contractor illustrating fabrication, installation, dimensions, and other aspects of work                                                                                                                                                     |
| Specifications:          | Directions, requirements, explanations, terms, and provisions in these standards, supplemented by such special conditions as may be necessary pertaining to various features of work to be done, manner and method of performance, and manner and method of measurement and payment; specifications include directions, requirements, and explanations that appear in plans |
| SROZ:                    | Significant Resource Overlay Zone: the delineated outer boundary of an identified significant natural resource as defined by Wilsonville's Development Code                                                                                                                                                                                                                 |
| Standard specifications: | Codes, rules, and regulations set forth in City of Wilsonville "Public Works Standards" as adopted by City Council and considered to be the latest issue, with all amendments as of date of these standards                                                                                                                                                                 |
| Standards:               | Specifications in the "Public Works Standards" adopted for use in City of Wilsonville.                                                                                                                                                                                                                                                                                      |
| Steel plate:             | A-36 steel meeting AASHTO H-20 loading specifications                                                                                                                                                                                                                                                                                                                       |
| Stock pile:              | Temporary staging of construction and/or excavated materials                                                                                                                                                                                                                                                                                                                |
| Subcontractor:           | Any individual, firm, or corporation having contract with contractor or with any other subcontractor for performance of part of work                                                                                                                                                                                                                                        |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Substantial completion: | In the opinion of the City's authorized representative, construction is to the point of completion where all facilities are usable for their intended purpose: utilities (storm, sanitary, and water) are tested, approved and connected to public lines, all weather access is completed; roadway striping is completed; street lighting is approved and activated; all fire, life, and safety issues meet code |
| Substantial progress:   | In the opinion of the City's authorized representative, construction work is proceeding at a rate close to that of the submitted construction timetable                                                                                                                                                                                                                                                          |
| Traffic coefficient:    | Number used in determining structural section of street                                                                                                                                                                                                                                                                                                                                                          |
| TSP:                    | City of Wilsonville's 2003 Transportation Systems Plan, or latest edition                                                                                                                                                                                                                                                                                                                                        |
| TVF&R:                  | Tualatin Valley Fire and Rescue                                                                                                                                                                                                                                                                                                                                                                                  |
| USCGS:                  | United States Coast and Geodetic Survey                                                                                                                                                                                                                                                                                                                                                                          |
| Wet-season:             | For the purpose of monitoring ground water elevations, the "wet-season" is defined as November 1 through April 30                                                                                                                                                                                                                                                                                                |
| WQV:                    | Water Quality Volume                                                                                                                                                                                                                                                                                                                                                                                             |
| WPWS:                   | Wilsonville "Public Works Standards – 2006"                                                                                                                                                                                                                                                                                                                                                                      |
| Work:                   | Furnishing of all labor, materials, equipment, and other incidentals necessary or convenient to successfully complete project or part of project, and carrying out of all duties and obligations imposed by contract                                                                                                                                                                                             |
| Written notice:         | Written communication delivered in person to individual or to member of firm or to officer of corporation for whom it is intended. If delivered or sent by mail to last business address known to one who gave notice, it shall be duty of each party to advise other parties to contract of any change in business address until contract is complete                                                           |

**101.5.00 CONTROL OF PUBLIC WORKS PROJECTS**

- a. All public system improvements and public works facilities, or improvements or facilities to become public, shall be designed by a Professional Engineer registered in the State of Oregon. All public system improvements and public works facilities shall be designed and constructed in accordance with all applicable rules and regulations of the City and any City interpretations of those rules and regulations, including applicable technical guidance manuals,

and in accordance with all applicable federal, state, and local statutes and rules.

- b. Approval of the plans must be made by the City's authorized representative before construction is permitted. An authorized representative of the City will be available for construction observation during construction of the project.
- c. At the completion of construction, the design engineer shall submit a completion certificate to the City stating that all work has been completed in accordance with the approved project plans and specifications.
- d. All surveys for public works facilities shall be performed under the direction of a Professional Land Surveyor registered in the State of Oregon. All elevations shall be referenced to a U.S. Coast and Geodetic Survey (USCGS) datum. A list of acceptable benchmarks is available at the City.
- e. Materials and workmanship shall meet or exceed the adopted standards and at all times shall be subject to the approval of the City's authorized representative.
- f. On completion of projects to become public works, the applicant or their design engineer shall submit one complete set of reproducible "record drawings" (see Section 101.8.17.a, "Project Closeout") to the City's authorized representative for future reference. The drawings shall show any deviations from the original construction drawings and shall include sufficient information to accurately locate water, sanitary sewer, and storm sewer service extensions. No bond will be released until the City's authorized representative receives an acceptable set of reproducible record drawings from the design engineer, with his or her stamp of certification.
- g. Before the City accepts a public works project for operation and maintenance, a one-year guarantee on all materials and workmanship incorporated in the project shall be provided to the City on one of the acceptable forms described in Section 101.8.17.b, "Maintenance Assurance."

## **101.6.00 DEVELOPMENT PROCESS REQUIREMENTS**

### **101.6.01 Pre-Application Conference**

The City of Wilsonville will hold a pre-application conference with the applicant (owner/developer), unless otherwise waived by the Planning Director, before formal application for public works permits and review of site design and construction plans. The pre-application process allows the applicant and the City to discuss the proposed project and the standards and regulations that will apply while the project is still in a preliminary stage. Any specific development standards, regulations, or problem areas can thus be discussed before the applicant makes a substantial investment in the project or proceeds with a formal application unaware of the issues.

#### **101.6.02 Plan Check and Permits**

- a. Plan checks and/or permits are required and issued on all construction projects within public rights-of-way, or easements, which will eventually be maintained and operated by the City of Wilsonville. Any permits required by federal, state, and local governments shall be obtained by the person proposing the improvements.
- b. Projects requiring permits shall include, but not necessarily be limited to, improvements or upgrades to streets, sidewalks, curbs, driveway approaches, water systems, sanitary sewer systems, and storm drainage systems. Projects that also require plan checks and permits include all private storm drainage, sanitary sewer, and water systems that will be connected to or that will discharge into a system under the jurisdictional control of the City of Wilsonville.
- c. The construction, repair, or replacement of all other utilities located within a public right-of-way or public easement, including, but not exclusively, power, telephone, gas, and cable television, shall be required to submit for plan check and obtain a Utility Construction Permit.

#### **101.6.03 Plan Check Requirements**

At the pre-application conference, the applicant will be given a copy of the Community Development Department Plan Review Checklist, which is to be used as a guide during the review of all proposed new, or improvements to, public works facilities.

Along with the items in the plan review checklist, the following requirements shall be met before the City's authorized representative completes a plan check:

- a. Satisfy all requirements of Chapter 4 of the Wilsonville Code and other ordinances and regulations pertaining to construction in the City of Wilsonville.
- b. Submit minimum of four copies of stamped and signed detailed plans and specifications produced by a Professional Engineer registered in the State of Oregon.
- c. Submit two sets each of stamped and signed design calculations for the water system design, wastewater system design, or storm drainage system design, where applicable or as required.
- d. Submit two sets of other applicable utility installation plans, stamped and signed and prepared by the proper authority. The plans shall also be incorporated in the construction plans and specifications.

- e. Submit two sets of stamped and signed soil-bearing tests, as required by the City for pavement design, to verify street section designs and alternatives. Soil testing to ascertain the strength of the soil is required for all roads to analyze and design the road structural section. Soil tests are needed on samples of the subgrade material that is expected to be within 3 feet of the planned subgrade elevation. Samples are needed for each 1,000 feet of roadway and for each visually observed soil type. Soil tests are required for a minimum of two locations.
- f. A plan check fee must be paid before a plan review will be completed. The amount of the fee will be established by resolution of the City Council.
- g. Plans deemed incomplete by the City's authorized representative may be returned without a full plan review being completed. An explanation will be provided by the City indicating sections of the plans deemed incomplete. Once all items are addressed, plans may be resubmitted for review.

#### **101.6.04 Plan Review**

- a. If all conditions of the plan check requirements as specified in Section 101.6.03, "Plan Check Requirements," are met, and no additional information is requested by the City's authorized representative, a plan review will be completed. The City's authorized representative will prepare a plan review redline comments list, to be sent to the appropriate permit applicant or responsible party. The list will indicate any deficiencies in the construction plans and specifications. The proper party shall then make the corrections and resubmit the plans and specifications.
- b. The plan check fee submitted as per Section 101.6.03.f, "Plan Check Requirements," covers the City's first and second plan reviews. An additional plan review fee shall be required for the third, fifth, and every other plan review performed by the City. A partial plan review or plans deemed incomplete as per Section 101.6.03.g, "Plan Check Requirements," will be considered as a full plan review in respect to the plan check fee. The amount of the additional fee will be established by resolution of the City Council.
- c. Once the plans and specifications are approved for construction, the City's authorized representative shall issue a written notice of plan approval. The written notice of plan approval shall remain in effect for 90 calendar days from the date of approval. If the applicant cannot proceed with the project within the 90-day limit, a 180-calendar-day extension can be applied for. If no substantial progress has been made within the allotted time, no further permit extension will be granted, the permit fee shall be forfeited to the City, and the plan approval will expire. Plans may be resubmitted, subject to payment of new fees.

#### **101.6.05 Record Drawings, Maps, and Plans Not Guaranteed**

Record drawings, maps and plans are provided to the City by the Owner/Developer upon completion of development and/or improvement projects within the City. The City does not guarantee the accuracy of measurements, elevations, locations, or other information on such maps and plans. All information should be independently verified by a registered engineer via survey, potholing, or other appropriate means prior to conducting any improvement or development.

#### **101.6.06 Permit and Assurances**

- a. Before any public construction begins, a letter of credit, performance bond, or cash deposit in form and substance satisfactory to the City's authorized representative shall be submitted by the applicant as a performance assurance for such construction. The amount of the performance assurance shall be 150% of the design engineer's estimate or bid total and shall be conditional on the performance of all terms and conditions of the permit and these standards. The guarantee shall include, but not be limited to, restoration of settled fills, trenches, pavement, and surfaces. The amount of the performance assurance for public projects financed by the City shall be 100% of the successful bid amount.
- b. When all requirements stipulated here are met and the construction plans are stamped and signed by the City's authorized representative, a Public Works Permit can be issued on payment of the Public Works Permit fee. The amount of the fee will be established by resolution of the City Council.
- c. The Public Works Permit shall be valid for one year from the date of issuance. If time elapses on the permit, the applicant can request, in writing, a permit extension from the City Engineer or the City's authorized representative. If the request is approved, the permit holder then has 180 calendar days to begin construction on permitted projects and shall show substantial progress during this permit extension, as determined by the City. If no substantial progress is made within the allotted time, no further permit extension will be granted, the permit will expire, and the permit fees will be forfeited to the City. Plans may be resubmitted, subject to payment of new fees. Resubmitted plans shall be reviewed to determine compliance with the Public Works Standards, including any newly approved codes and/or regulations.

#### **101.6.07 Insurance Requirements**

The City requires additional assurances from the applicant/contractor including, but not limited to, Certificates of Insurance from insurance companies or entities acceptable to the City and authorized to issue insurance in the State. The Certificate shall specify all of the parties who are Additional Insureds. The contractor shall be responsible for paying all deductibles, self-insured retentions

and/or self-insurance included under these provisions. For City financed projects, a Certificate of Insurance shall be executed by the successful bidder and their insurance company prior to the execution of the contract by the applicant (see Appendix G for acceptable form).

#### **101.6.08 Indemnification**

The applicant/contractor shall indemnify and hold harmless the City, its officers and employees, from and against all claims, demands, penalties, damages, losses, expenses, including attorney's fees, and causes of action of any kind or character, including the cost of defense thereof, arising or alleged to have risen in favor of any person on account of personal injury, death, or damage to property arising out of or resulting from, or alleged to have risen out of or resulted from, in whole or in part, any act or omission of the applicant, the applicant's design engineer, the applicant's contractor, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

#### **101.7.00 CONSTRUCTION PROCEDURAL REQUIREMENTS**

##### **101.7.01 General Procedure and Requirements**

- a. During the construction period, the City will maintain two sets of approved plans and specifications. The permit holder or contractor shall retain one set of approved, stamped, and signed plans and specifications at the construction site at all times. Any modification to the approved plans shall be first approved, stamped, and signed by the City's authorized representative.
- b. A pre-construction conference with the City's authorized representative and the applicant, contractor, design engineer, and other parties requested to attend or having an interest in the project will meet to discuss the project before any construction begins. The pre-construction conference will discuss the role of the City's inspection team and the team's relation to the contractor and applicant.
- c. An inspection criteria checklist may be provided to the contractor outlining necessary inspections, if requested. The customary inspections are generally as follows:
  1. All underground utilities, including water, sanitary sewers, and storm sewers.
  2. All subgrade preparation, fill placement, base rock, and leveling rock.
  3. All concrete pours, such as curbs, catch basins, manholes, and cleanouts.
  4. Asphaltic or Portland cement concrete pavement.

- d. The City's authorized representative shall at all times have access to the project and will make routine inspections. Should any inspection reveal that the construction of the improvements is not proceeding according to the approved plans and the specifications in this document, the City Engineer may order all work stopped, all defective work removed, or both.
- e. The contractor shall give the City's authorized representative a minimum of 24 hours' (one working day) advance notice before a required inspection. It is the responsibility of the permit holder or contractor to obtain inspections and approvals for all work installed.
- f. Failure to give advance notice to the City's authorized representative for inspections, receive adequate inspections, or violation of other regulations, ordinances, resolutions, rules, and City codes as outlined in these standards can result in one or more of the following, as determined by the City:
  - 1. Stoppage of work until problem is resolved.
  - 2. Suspension of future inspections.
  - 3. Withholding certification of projects as complete, which is required to begin warranty period and eventual City acceptance for maintenance and operation.
  - 4. Citation for violation of the Wilsonville Code and its penalties and provisions.
  - 5. Uncovering or removal of work not inspected.

**101.7.02 Testing of Construction**

- a. The applicant shall be responsible for providing the name of a compaction-testing firm that will be paid by the permit applicant and that will supply the City's authorized representative with the compaction tests needed to certify that the soils, aggregate, and surface materials meet the minimum requirements of these standards. The testing firm hired by the permit applicant shall be required to be under the direct supervision of a Professional Engineer registered in the State of Oregon whose area of expertise is geotechnical engineering.
- b. The applicant shall also be responsible for providing the name of a materials-testing firm that will be paid by the permit applicant and that will supply the City's authorized representative with the concrete-strength tests and other materials tests required to certify that the materials meet the minimum requirements of these standards. The testing firm hired by the permit applicant shall be required to be under the direct supervision of a Professional Engineer registered in the State of Oregon.

### **101.7.03 Right of Entry to Work**

Representatives of the City and any federal, state, or local agencies having jurisdiction over the work shall have right of entry to any and all parts of the work at reasonable times. The contractor shall cooperate in all respects with such agencies and shall provide proper facilities for access and inspection.

### **101.7.04 Suspension of Work**

The City Engineer may suspend the work and give written notice to the applicant/contractor of such suspension when the contractor is using material that does not conform to the requirements of the contract documents or when the contractor is improperly performing the work, and neglects or refuses to replace or reconstruct such work. The suspension shall remain in effect until appropriate corrections are made. Review of the City Engineer's decision shall be made, on request, by the City Manager within 48 hours of the initial suspension. Regardless of the decision, the City shall not incur pecuniary liability for an incorrect suspension of work, unless such suspension was a willfully malicious act of the City.

### **101.7.05 Protection of Existing Facilities**

- a. The approximate location of underground City water, sewer, and storm drainage facilities are available at the City Engineer's office. The approximate locations of underground power, gas, telephone, and cable facilities are available from the serving utility companies. The location of existing facilities shall be shown on the construction drawings for public works projects.
- b. Appropriate and timely notice shall be given to all public and private utility companies in advance of construction, for the purpose of protecting or relocating existing facilities. The exact location of underground facilities shall be verified in advance of public works construction, in cooperation with the public or private utilities involved.
- c. When the contractor is physically locating underground utilities in roadways, the Portland cement concrete (PCC) or asphalt concrete (AC) roadway surfaces shall be cored and not square-cut.
- d. All existing underground and surface facilities shall be protected from damage or degradation during construction of public works facilities.
- e. Any existing facilities not specifically designated for alteration or removal that are damaged or degraded during construction shall be restored or replaced to an "in kind" or better condition at the contractor's expense.
- f. Turf damaged during utility construction shall be replaced with sod in a timely manner acceptable to the City's authorized representative.

#### 101.7.06 Protection of Property

The contractor shall protect stored materials, cultivated trees and crops, and other items next to proposed construction. Property owners likely to be affected by the construction activities, as determined by the City's authorized representative shall be notified at least 48 hours in advance of the time construction begins. During construction, no person shall be without access to their place of residence or business for a period exceeding 8 hours, unless the contractor has made special arrangements in writing with the affected person(s).

#### 101.7.07 Surveying and Land Monuments

- a. **NAVD 88 Datum:** All elevations on design plans and record drawings shall be based on NAVD 88 Datum. Each page of the plans and drawings shall state the benchmark datum information. Note that City of Wilsonville control points are based on NGVD 29 datum and that necessary adjustments will need to be made to meet NAVD 88 requirements.
- b. **Permanent Survey Markers:** Before beginning any construction activity, the applicant's engineer/surveyor shall adequately reference all permanent survey monuments, property corners, stakes, or benchmarks on the subject site, or markers that may be subject to disturbance in the construction area or during the construction of any off-site improvements. It shall be the responsibility of the contractor to protect survey monuments throughout the construction process. The contractor shall not disturb permanent survey monuments without written consent from the City's authorized representative.
- c. **Disturbed, Destroyed, or Lost Monuments:** If any survey monument is disturbed, moved, relocated, or destroyed as a result of construction activity, the contractor shall, at contractor's cost, retain the services of a Professional Land Surveyor registered in the State of Oregon to restore the monument to its original condition and shall file all documentation required by Oregon law. A copy of the recorded documentation shall be submitted to the City Engineer.

#### 101.7.08 Railroad Crossings

- a. Crossings of railroad rights-of-way shall be done in a manner that conforms to the requirements of the railroad having jurisdiction. If any bonds or certificates of insurance protection are required, they shall be furnished by the contractor or applicant to the railroad company concerned, with the City as an additionally named insured.
- b. Permits or easements for such crossings shall be obtained by the applicant. All the terms of such permits or easement shall be met by the applicant and contractor. In some locations, the railroad may require casing pipe.

**101.7.09        Criteria for Stream-Road Crossings**

- a. Stream crossings shall be avoided whenever possible, whether by roads, utilities, or other development. If streams must be crossed, impacts shall be minimized by preferring bridges to culverts, and by designing bridges and culverts to pass at least the 100-year flood and meet the Oregon Department of Fish and Wildlife (ODFW) *Fish Passage Criteria*, or latest edition.
- b. Before any work may be performed in any stream, the method of operation and the schedule of such work shall be approved in writing by the City's authorized representative. The timing of in-water work shall comply with the guidelines established by the ODFW. Mechanized equipment shall enter streams only when necessary and only within the immediate work area.
- c. The contractor shall comply with the regulatory requirements of the Oregon Department of State Lands, ODFW, U.S. Fish and Wildlife Department, U.S. Army Corps of Engineers, National Marine Fisheries Service, and any other state and federal agencies having jurisdiction.

**101.8.00        CONSTRUCTION**

**101.8.01        Construction Commencement**

- a. The contractor shall not undertake nor instruct the subcontractor(s) to undertake any portion of the work without notifying the City's authorized representative 24 hours in advance of beginning work. At the time of this notice to the City, the applicant shall have submitted to the City a performance assurance, construction permit agreement, appropriate plan check and permit fee, certificate of insurance, and any necessary off-site easements.
- b. Contractor shall conduct construction activities only during the hours of work guidelines established by the City.

**101.8.02        Scheduling**

- a. **Sequence of Operations:** The contractor shall plan construction work and execute operations with a minimum of interference to the operation of existing City facilities and the traveling public. It may be necessary to do certain parts of the construction work outside normal working hours to avoid undesirable conditions, and it shall be the obligation of the contractor to make this change to the work schedule. Such scheduling, however, is subject to approval of the City's authorized representative, and does not relieve the contractor from making their work available for inspection.
- b. **Progress of Construction**
  - 1. Construction shall proceed in a systematic manner that will result in minimum inconvenience to the public.

2. Contractor shall pothole and verify existing utilities and facilities prior to commencing proposed work.
3. Erosion control measures shall be installed and inspected, as per Section 101.9.06.a, "Inspections," prior to commencing work.
4. Construction staking for the work being performed shall be completed before the start of excavation. The contractor shall limit their operations to a small work area per crew. At no time shall the trenching equipment be farther than 100 feet ahead of the pipe-laying crews, unless advance written permission is given by the City's authorized representative.
5. The trench shall be backfilled in conformance to Section 6, "Trench Excavation and Backfill," so that no section of trench is left open longer than 24 hours. Before the contractor stops construction for the day, trenches located in the right-of-way shall be completely backfilled, unless the trench is covered and with secured Steel Plates.
6. Where Steel Plates are used as a temporary road surface they shall comply with the following:
  - (a) Steel Plates shall be A-36 steel meeting AASHTO H-20 loading specifications.
  - (b) Steel Plates shall be centered over the cut. No more than  $\frac{1}{2}$  of the plate shall span a trench that has been completely backfilled, or no more that  $\frac{1}{3}$  of the plate shall span a trench that has not been completely backfilled.
  - (c) Uneven pavement surfaces must first be leveled with cold mix before laying plates over trench.
  - (d) Plates shall be secured to the roadway with a minimum of two  $\frac{1}{2}$ -inch or larger steel pins driven a minimum of 6 inches below the surface and at least 18 inches from the edge of the roadcut.
  - (e) Cold patch shall be used to ramp up to the Steel Plate edges; minimum 6-inch ramp per  $\frac{1}{2}$ -inch difference in grade change between road surface and Steel Plate.
  - (f) Contractor is responsible for maintaining cold mix around Steel Plates.
  - (g) Use of plates in travel lanes shall require contractor to place a 30-inch by 30-inch "BUMP" warning sign for each affected travel direction.
  - (h) Plates shall not be left in the travel lane for longer than 5 working days unless approved in writing by the City's Authorized Representative.

- c. **Connections:** Connections between existing work and new work shall be made only with approval of the City's authorized representative. Connections shall be made only after all testing is completed on the new work and it is found to conform in all respects to the requirements of the plans and specifications, unless otherwise approved by the City's authorized representative. Prior to making connection(s) to existing facilities, contractor shall have all necessary pipe and fittings available and on-site.
- d. **Cleanup:** Cleanup of all construction debris, excess excavation, and excess materials and complete restoration of all fences, mailboxes, ditches, culverts, signposts, and similar items shall be completed according to Section 101.8.16, "Preservation, Restoration, and Cleanup."

#### **101.8.03 City Inspection**

- a. The City's authorized representative shall inspect the project as necessary and shall check materials, equipment, and the construction of the project to determine whether the work is proceeding in accordance with the City's standards. The contractor shall notify the City's authorized representative at least 24 hours (one working day) to request City inspection. No such inspection, however, shall relieve the contractor of their duties under these standards.
- b. The City's authorized representative shall have the authority to direct replacement of defective material and uncovering work not inspected as required. Material rejected by the City's authorized representative shall be removed from the job site by the contractor immediately after its rejection and shall not be used on the project.
- c. Instructions given by the City's authorized representative shall be respected and executed by the contractor. The City's authorized representative, however, shall not have the power to waive the obligations of the contractor to furnish high-quality equipment, supplies, and materials, or to perform good work.

#### **101.8.04 Change in Plans or Standards**

The City's authorized representative shall have the right to make changes in the plans or in these standards to protect the public interest or the normal operations of the City. Such changes shall be made at the sole discretion of the City's authorized representative and may include, but are not limited to, the allowance of new or different materials for products that are equivalent to, or better than, the products specified in the plans or standards.

#### **101.8.05 Interferences and Obstructions**

- a. **Utility Notification:** The contractor shall comply with the rules and regulations of the Oregon Utility Notification Center: OAR 952-001-0010

through 952-001-0090 and ORS 757.993. At least 48 hours' notice shall be given to all utility offices that may be affected by the construction operation.

- b. **General:** Various obstructions may be encountered during the course of the work. Maps and information regarding underground utilities shall be obtained from the utility owning and operating such utilities, but the location of such utilities is not guaranteed. If the services of any utility are interrupted because of the construction operation, the contractor shall notify the utility owner and the City's authorized representative immediately.
- c. **Protection:** The contractor shall exercise all due care in protecting existing underground and surface facilities and property along the route of the improvement in compliance with City of Wilsonville Code Chapter 4 and Ordinance 464. This protection shall include, but not be limited to, trees, yards, fences, drainage lines, mailboxes, driveways, shrubs, and lawns. Any existing facilities not specifically designated for alteration or removal that are damaged during construction shall be restored or replaced to an "in kind" or better condition, at the expense of the contractor.
- d. **Access:** The contractor shall maintain access to all mail boxes; access to all property entrances shall be in conformance with Section 101.7.06, "Protection of Property."

#### **101.8.06 Contaminated Soil**

If during construction contaminated soil or with hazardous materials or chemicals are encountered, the Contractor shall follow the procedures specified in Section 101.9.02, "Contaminated Soils or Hazardous Materials."

#### **101.8.07 Guarantee**

- a. The applicant/contractor shall furnish high-quality equipment, supplies, and materials and perform the work in accordance with these specifications. Any failure or omission by the City's authorized representative to condemn any defective equipment, supplies, materials, or work shall not be construed as an acceptance thereof nor release the contractor from their obligations.
- b. On notification of any deficiency by the City's authorized representative, the contractor shall properly reconstruct or replace any defective equipment, supplies, materials, or work at their own cost any time on discovery of the defect during the period of construction and for the full guarantee period after acceptance of the work, and shall indemnify the City from any claims resulting from the defect.
- c. The applicant/contractor shall guarantee all materials and equipment furnished and work performed for a minimum period of one year from the date of formal written acceptance by the City's authorized representative in conformance with Section 101.8.17.b, "Maintenance Assurance."

- d. The applicant/contractor shall further warrant and guarantee for a minimum period of one year from the date of formal written acceptance of the system that the completed system is free from all defects due to faulty materials or workmanship. The applicant/contractor shall promptly make such corrections as may be necessary by reason of such defects, including the repair of any damage to other parts of the system resulting from such defects.
- e. If the applicant/contractor, after notice, fails within 10 days to proceed to comply with the terms of this guarantee, the City may have the defects corrected, and the applicant and the applicant's surety shall be liable for all expense incurred. However, in case of an emergency where, in the opinion of the City Engineer, delay would cause serious loss or damage, repairs may be made without notice being given to the applicant/contractor and the applicant/contractor shall pay the cost thereof.

#### **101.8.08 Substitution of Materials**

Whenever any material, article, device, product, fixture, form, type of construction, or process is indicated or specified by patent or proprietary name, by name of manufacturer, or by catalog number, such specifications shall be for the purpose of establishing a standard of quality and facilitating the description of the material or process desired. Such specification is not to be construed as eliminating from competition other products of equal or better quality made by other manufacturers and that are fully suitable in design, and shall be deemed to be followed by the words "or as approved" or "approved equal." The contractor may, in such cases, submit complete data to the City Engineer for consideration of another material, type, or process that shall be substantially equal in every respect to the one indicated or specified. Substitute materials shall not be used unless approved in writing by the City's authorized representative.

#### **101.8.09 Safety Requirements**

- a. The contractor shall at all times conduct work in such a manner as to comply with all Occupational Safety and Health Administration (OSHA) requirements, shall minimize the possibility of accident or injury of any workers or the general public, and shall conduct the work, maintain operations, and provide all reasonable safeguards so as to protect public and private property as well as to protect persons from injury.
- b. If in the opinion of the City's authorized representative the contractor is in violation of the above safety practices, the City's authorized representative may issue and post a stop-work order if the contractor, after being informed of such violation, refuses to comply immediately. The City's authorized representative will also notify the State of Oregon Workers' Compensation Division of such action.

- c. The City's authorized representative's role is not one of supervision or safety management, but of observation only, as specified in Section 101.8.10.g., "Traffic Maintenance and Safety."

**101.8.10 Traffic Maintenance and Safety**

- a. The contractor shall comply with all rules and regulations of City, county, or state authorities and applicable fire protection and law enforcement agencies regarding the closure of public streets or highways to public traffic. No public road shall be closed to the public except by express permission of the public agency responsible for the road.
- b. The contractor shall conduct their operations so as to assure the least possible obstruction to traffic and normal commercial pursuits. Traffic control in work zones shall conform to the *Manual on Uniform Traffic Control Devices* (MUTCD 2000, or latest edition), published by the Federal Highway Administration, U.S. Department of Transportation.
- c. The contractor shall be required to submit a traffic control plan to the appropriate jurisdiction for review and approval before beginning construction.
- d. The contractor shall provide and be responsible at all times for flaggers, signs, and other devices not otherwise specified to be furnished by the applicant. The contractor shall erect and maintain all barricades, guards, lights, variable message boards, standard construction signs, warning signs, and detour signs as are necessary to warn and protect the public at all times from injury or damage as a result of work operations on highways, roads, streets, sidewalks, multi-use paths, or recreational trails affected by such operations.
- e. If the applicant or contractor fails to immediately provide the necessary flaggers or to provide, erect, maintain, and remove barricades, guards, lights, variable message boards, standard construction signs, warning signs, and detour signs when so ordered, the City Engineer shall be at liberty, without further notice to the contractor or applicant, to do so and to deduct all costs from the applicant's/contractor's performance assurance.
- f. When traffic will pass over backfilled trenches before they are paved, the top of the trench shall be maintained with cold patch and shall allow normal vehicular movement to continue. Access driveways shall be provided where needed. Cleanup operations shall follow immediately behind backfilling. The work site shall be kept orderly at all times.
- g. The City's authorized representative's role is not one of supervision or safety management, but of observation only. Nothing contained in this section or elsewhere in this document shall be interpreted to obligate the City to act in any situation, nor shift the applicant's responsibility for safety compliance to

the City. No responsibility for the safety of the work or for construction means, methods, techniques, sequences, or procedures shall attach to the City by virtue of its action or inaction under this section.

**101.8.11 Access for Police, Fire, and Postal Service**

- a. No closure of a part of a street shall be made without first requesting and receiving approval from the City's authorized representative. Closure of public streets shall be in conformance with Section 101.8.10.a, "Traffic Maintenance and Safety." The contractor shall conduct operations so as to cause the least interference with emergency vehicle access.
- b. The contractor shall comply with all requirements of the U.S. Postal Service with regard to the location of mailboxes that must be disturbed during construction. Mailboxes may be moved to temporary locations designated by the Postal Service. At the completion of work in each area, the contractor shall replace the mailboxes in their original location and in a condition satisfactory to the Postal Service.

**101.8.12 Compliance with Applicable Laws**

- a. The contractor shall keep fully informed of all local ordinances, including those of Tualatin Valley Fire and Rescue (TVF&R) and state and federal laws and regulations that in any manner affect the work specified here.
- b. The contractor shall at all times comply with said ordinances, laws and regulations, and shall protect and indemnify the applicant and his/her officers and agents against any claim or liability arising from or based on the violation of any such laws, ordinances, or regulations.
- c. All permits, licenses, and inspection fees necessary for prosecution and completion of the work shall be secured by the applicant/contractor.

**101.8.13 Work in Public Rights-of-Way**

- a. Closure of public streets shall be in conformance with Sections 101.8.10.a , "Traffic Maintenance and Safety," and 101.8.11.a, "Access for Police, Fire, and Postal Service." Construction operations and traffic control shall be in conformance with Section 101.8.10.b, "Traffic Maintenance and Safety."
- b. The contractor shall use every reasonable precaution to safeguard the persons and property of the traveling public. It shall be the sole responsibility of the contractor to furnish, place, and maintain barricades, barriers, lights, flares, danger signals, signs, and security guards as necessary to protect the persons and property of the traveling public. All barricades and obstructions shall be protected at night by signal lights that shall be suitably distributed and kept burning from sunset to sunrise.

- c. In the event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental breakage, or as the result of being exposed or unsupported, the contractor shall promptly notify the proper authority, cooperate with said authority in restoring the service as promptly as possible, and bear all costs of providing temporary service measures and repairs. In no case shall interruption of any water or utility services be allowed to exist outside working hours, unless prior approval by the City's authorized representative is received.
- d. Work site cleanup shall conform to Section 101.8.16, "Preservation, Restoration, and Cleanup."

**101.8.14 Easements**

- a. The minimum utility and drainage easements for residential subdivisions shall be as follows:
  - 1. A 6-foot public utility easement along all front lot lines, as shown on approved plans.
  - 2. A 20-foot wide easement with an all-weather surface for maintenance access, as shown on approved plans. Lateral access shall not be greater than 800 feet.
- b. Public sanitary, storm sewer, and water lines on private property shall be centered in a permanent easement granted to the City, with a minimum width of 15 feet along its entire length. Such easements, when directed by the City, shall be accompanied by temporary easements granted to the City of adequate width to allow construction of water, storm, and sanitary sewers. The surveyor shall provide the City with the documents necessary to grant easements. The width of combination easements will be evaluated at the site development permit stage, but in no case shall they be less than 20 feet wide.

**101.8.15 Sanitation**

Contractors shall provide and maintain adequate sanitary facilities for employees.

**101.8.16 Preservation, Restoration, and Cleanup**

- a. **Site Restoration and Cleanup**
  - 1. The contractor shall keep the premises clean and orderly at all times during the construction period and leave the project free of rubbish or excess materials of any kind on completing the work. The contractor shall immediately replace mailboxes and signposts disturbed by construction activities.
  - 2. During construction, the contractor shall stockpile the excavated trench materials so as to do the least damage to adjacent lawns, grassed areas,

gardens, shrubbery, trees, or fences, regardless of the ownership of these areas. These surfaces shall be left in a condition equivalent to their original condition and free from all rocks, gravel, boulders, or other foreign material.

3. If damaged or altered during construction, existing trenches, drainage ditches, and culverts shall be regraded, and original drainage tiles and sewer laterals shall be repaired expeditiously. Within 500 feet of pipe-laying and backfilling operations in any trench section, the contractor shall rake and drag all disturbed areas and leave them free of rocks, gravel, clay, or any other foreign material and ready, in all respects, for seeding. The finished surface shall conform to the original surface, and shall be free-draining and free from holes, rough spots, or other surface features detrimental to a seeded area.
4. After backfilling the trenches, the contractor shall restore all public and private irrigation and/or utility systems that were destroyed, damaged, or otherwise modified during construction to their original condition.
5. All areas disturbed by the contractor's operations inside dedicated rights-of-way or easements shall be returned to their original condition. Areas outside the easements or rights-of-way that are disturbed by the contractor's operations shall be returned to their original condition.

**b. Street Cleanup**

1. The contractor shall clean spilled soil, mud, rock, gravel, or other foreign material caused by construction operations from all sidewalks, gutters, streets, and roads at the conclusion of each day's operation.
2. Within five days of substantial completion of the project, including all paving, gravel shoulder resurfacing, and/or utility work, the contractor shall thoroughly remove all soil, mud, rock, gravel, and other foreign material from sidewalks, gutters, and paved surfaces.
3. Cleaning shall be by grader and front-end loader, power brushing, vacuuming, and hand labor, unless otherwise approved by the City's authorized representative. If the contractor does not follow these standards, the City may exercise its option to have the street(s) cleaned and bill the contractor for such service.
4. Within five days of final completion of the project, the contractor shall remove all erosion-control materials and thoroughly remove all dirt, mud, rock, gravel, and other foreign material from sidewalks, gutters, and paved surfaces.

**c. Preservation of Irrigation and Drainage Ditches**

1. The contractor shall arrange schedules so that construction will not interfere with the irrigation of cultivated lands or pasturelands. Construction may proceed during the irrigation season provided the contractor constructs, at their own expense, temporary irrigation ditches, turnouts, and miscellaneous structures acceptable to the owner of the land in question that shall permit the land to be irrigated by others during construction.
2. After backfilling the trenches, the contractor shall restore all irrigation and storm drain ditches destroyed, damaged, or otherwise modified during construction to a condition equivalent, in the opinion of the City's authorized representative, to the condition of the ditches before construction. Ditches shall be built in their original locations.

#### **101.8.17 Project Closeout**

- a. **Project Completion:** At the conclusion of the project, the applicant shall notify the City's authorized representative in writing that the project is ready for final inspection. On receipt of this notice, the City's authorized representative will request the following:
  1. **Record Drawings:** At the completion of construction, the design engineer shall perform a record survey. That survey shall be the basis for the preparation of record drawings that will serve as the physical record of changes made to the approved plans or specifications during construction. Using the record survey as a guide, the appropriate changes shall be made and a complete set of record drawings shall be submitted on approved Mylar™ material (minimum 3-mil thickness) using a photo printing method; Xerox printed drawings are not acceptable. Record drawings must be received before the City's authorized representative issues a project correction list (punch list). Record drawings shall include all work done within the public right-of-way or public easements.
  2. **AutoCAD Drawing:** An electronic copy of the record drawings in AutoCAD format (check with City for acceptable versions) shall be submitted to the City's authorized representative on a 3½-inch floppy diskette or compact diskette. Electronic record drawings must be received before the City's authorized representative issues a project correction list.
  3. **Final Inspection:** Once the City's authorized representative receives the Mylar and electronic record drawings, a final inspection of the project will be conducted with representatives from the City, the design engineering firm, and the contractor.
  4. **Project Correction List:** After this inspection, a project correction/repair list (punch-list) will be issued by the City's authorized representative to the applicant and contractor. The project correction/repair list will include

any items either damaged or improperly placed during construction, and any item(s) that, in the opinion of the City's authorized representative, need repair.

5. **Completion:** Contractor shall perform correction/repair work as required on the project correction/repair list. When all items of the project correction list have been completed, and inspected and approved by the City's authorized representative, and the contractor submits all maintenance and landscape maintenance assurances (see Section 101.8.17.b, "Project Closeout"), the City's authorized representative will consider the project complete and shall so state in writing. At this time, the one-year warranty period will go into effect, on written notice from the Engineering Division.
- b. **Maintenance Assurance:** Maintenance assurances shall be required for work to ensure post-construction quality and landscape survivability. Assurances shall be in the form of a letter of commitment, bond, or cash deposit, in form and substance satisfactory to the City.
  1. **Construction maintenance assurance:** a one-year bond for 10% of the cost to construct public improvements. Released one year after acceptance of construction and after correction of all defects identified during the maintenance assurance period.
  2. **Landscape maintenance assurance:** a two-year bond for 100% of the cost to install all required landscaping in water quality/quantity facilities and vegetated corridors, *plus* 100% of the cost to maintain the landscaping in these areas for two years. The assurance shall be released two years after acceptance of construction, providing the landscaping meets the 90% survival level (see Section 301.13.02, "Landscape Inspection for Warranty").
- c. **Final Completion:** A project shall meet final completion when the City's authorized representative receives confirmation that all easements and legal documents have been recorded with the County Recorder.

**101.9.00 ENVIRONMENTAL PROTECTION, EROSION PREVENTION,  
AND SEDIMENT CONTROL**

**101.9.01 Introduction**

This section identifies requirements for erosion prevention and sediment control. The provisions are intended to prevent or reduce adverse impacts to the City's drainage system and water quality. In combination with other federal, state, and local laws and ordinances, the requirements are intended to protect the beneficial uses of state waters.

## **101.9.02 Contaminated Soils or Hazardous Materials**

If construction reveals soils contaminated with hazardous materials or chemicals, or if soil is suspected to be contaminated, the contractor shall cease earthwork activity immediately, ensure that no contaminated material is hauled from the site, remove their workforce from the immediate vicinity of the contaminated area (leaving all machinery and equipment), and secure the area from access by the public until an OSHA certified HAZMAT response team has relieved them of that responsibility. The contractor shall immediately notify the City's authorized representative, the design engineer, and the Oregon Department of Environmental Quality (DEQ) of the situation.

## **101.9.03 General Policy**

### **a. Erosion Prevention Techniques and Measures**

1. The use of erosion prevention techniques shall be emphasized, rather than measures to control sediment. This shall be especially important on construction sites immediately before and during the rainy season. Erosion prevention techniques are designed to protect soil particles from the force of rain and wind so they shall not erode. When land is disturbed at a construction site, the erosion rate accelerates dramatically.
2. Erosion prevention techniques include, but are not limited to, construction scheduling, ground cover, and matting. Sediment control measures are designed to capture soil particles after they are dislodged and to retain the soil particles on site.
3. Erosion prevention measures include, but are not limited to, silt fences, sediment barriers, and settling basins. Both erosion prevention techniques and sediment control measures have appropriate uses. Studies have shown, however, that sediment control measures are less effective than erosion prevention techniques in preventing soil movement.
4. Permanent vegetation or seeding shall be established only between March 1 through May 15 and September 1 through October 15. If an irrigation system is installed, vegetation or seeding may be established from March 1 through November 15. If an area falls under definition of a wetland, permanent vegetation or seeding shall be established only between March 1 through April 30 and September 1 through October 15 and in a manner satisfying applicable local, state and federal requirements.
5. Permanent vegetation or seeding shall meet the 90% survival level as detailed in Sections 301.13.02.c and 301.13.02.d, "Landscape Inspection for Warranty".

### **b. Existing Vegetation**

1. Existing vegetation shall be protected and left in place whenever practicable. Work areas shall be carefully located and marked to reduce potential damage to trees and existing vegetation. Trees shall not be used as anchors for stabilizing working equipment. Where required, trees and existing vegetation shall be protected with a non-movable, chain link fence (see Detail No. R-1155 of these standards).
2. Where existing vegetation has been removed, or the original land contours have been disturbed, the site shall be revegetated, and the vegetation established, as soon as practicable.

**c. Enforcement**

Failure to comply with any provision of this section or with any term of an erosion-prevention and sediment-control permit shall be deemed a violation and subject to enforcement action pursuant to applicable City ordinance and resolutions and orders, including all implementing rules and regulations.

**101.9.04 Erosion Prevention and Sediment Control**

**a. Application and Purpose**

1. It is a City requirement to reduce the amount of sediment and other pollutants reaching the public storm and surface water system resulting from development, construction, grading, excavating, clearing, and any other activity that accelerates erosion, to the limits prescribed in these standards.
2. It is the policy of the City to require temporary and permanent measures for all construction projects to lessen the adverse effects of construction on the environment. All projects shall include properly installed, operated, and maintained temporary and permanent erosion-control measures as provided in these standards or in an approved plan, designed to protect the environment during the term of the project. Compliance with the measures prescribed here or in an approved plan do not lessen the necessity to provide effective and comprehensive erosion prevention and sediment control.
3. Nothing in this section shall relieve any person of the obligation to comply with the regulations or permits of any federal, state, or local authority.

**b. Erosion Prohibited**

1. Visible or measurable erosion that enters, or is likely to enter, the public or private stormwater and surface water system or other properties is hereby prohibited, and is a violation of these standards. An offsite sedimentation control facility may be utilized if it has been identified and approved in writing by the City's authorized representative, written approval is obtained from the respective property owner, and a written agreement for rehabilitation of the facility by the applicant or contractor is submitted to the City. The owner of the property or the applicant under a Public Works Permit, together with any person or persons, including but not limited to the contractor or the design engineer causing such erosion, shall be held responsible for violation of the City's standards.
2. No person shall create physical erosion by dragging, dropping, tracking, or otherwise placing or depositing, or permitting to be deposited, mud, dirt, rock, or other such debris on a public street, or into any part of the public stormwater and surface water system, or into any part of a private

stormwater and surface water system that drains or connects to the public stormwater and surface water system. Any such deposited material shall be immediately removed by hand labor or mechanical means. No material shall be washed or flushed into any part of the stormwater and surface water system until all mechanical means to remove the debris are exhausted and preventive sediment filtration is in place.

3. The owner of the property or the applicant under a Public Works Permit, together with any person or persons, including but not limited to the contractor or the design engineer who causes such erosion, shall be held responsible for violation of these Standards.

**c. Erosion-Prevention Techniques and Methods**

The techniques and methods described in the latest edition the "Erosion Prevention and Sediment Control Planning and Design Manual" may be used to control and prevent erosion in addition to the following procedures:

**1. Gravel Construction Entrance**

- (a) A gravel construction entrance is required. If there is more than one vehicle access point, a gravel construction entrance shall be required at each entrance.
- (b) The responsibility for design and performance of the driveway remains with the applicant. Vehicles or equipment shall not enter a property next to a stream, watercourse, stormwater or surface water facility, or wetlands unless adequate measures are installed to prevent physical erosion into the water or wetland.

**2. Erosion Control**

- (a) During periods of wet weather, disturbed areas of the site and/or stockpiled soil shall be covered by tarps or straw at the end of each day's operations; all disturbed, unworked areas of the site shall be protected from erosion.
- (b) Temporarily seed disturbed soils and slopes that are not at finished grade and which will be exposed for two months or longer before being disturbed again.
- (c) Where seeding is used for erosion control, Regreen<sup>®</sup> or equivalent, or sterile wheat shall be used to stabilize slopes until permanent vegetation is established.
- (d) Temporary seeding shall establish a minimum of 70% coverage of the ground surface with uniform healthy plants. If this coverage is not achieved, or if the City determines that it is not effective in stabilizing

the soil from erosion, the contractor, at their expense, shall stabilize the area with other temporary stabilization methods as approved by the City's authorized representative.

- (e) Biodegradable fabrics (Coir/Jute Matting), reinforced turf mats, or straw mulch can be used to stabilize slopes and channels. The fabrics can also be used to hold plugs in place and discourage floating upon inundation. Consult the *Erosion Prevention and Sediment Control (EPSC) Planning and Design Manual* for additional information.
- (f) Permanent vegetation shall be established as outlined in Section 101.9.03.a.4, "Erosion Prevention."

### 3. **Bioengineering Techniques**

- (a) Any person performing work in a watercourse or in an environmentally sensitive area (e.g., essential salmonid habitat, wetlands, steep slopes) shall employ bioengineering techniques whenever feasible.
- (b) Bioengineering techniques include, but are not limited to, contour wattling, brush layering or matting, live cuttings, fascines, and stakes.

### 4. **Sediment filters/barriers**

- (a) Using straw bales as a sediment filter or barrier is not allowed.
- (b) A filter system may not be used on catch basins in public streets as part of erosion-prevention and sediment-control plans for single-family dwellings.

5. **Plastic Sheeting:** Plastic sheeting shall generally not be used as an erosion-control measure for single-family house construction. Plastic sheeting may be used to protect small, highly erodible areas or temporary stockpiles of material. If plastic sheeting is used, the path of concentrated flow from the plastic must be protected.

6. **Protection Measure Removal:** The erosion-prevention and sediment-control measures shall remain in place and be maintained in good condition until all disturbed soil areas are permanently stabilized by installation and establishment of landscaping, grass, or mulching, or are otherwise covered and protected from erosion.

7. **Wet Weather Measures:** On sites where vegetation and ground cover have been removed, vegetative ground cover shall be planted on or before September 1, with the ground cover established by October 15. As an alternative if ground cover is not established by October 15, the open areas

shall be protected through the winter with mulch, erosion blankets, or other method(s) approved by the City's authorized representative.

8. **Exceptions to Sediment Barrier Requirements:** Sediment barriers are not required on a site in the following circumstances:

- (a) Where a Neighborhood Erosion Control Plan is in effect, for a maximum of four lots.
- (b) Where there are no concentrated flows and the slope being protected has a grade of less than 2%.
- (c) Where flows are collected by using temporary or permanent grading or other means, such that the flows are routed to an approved settling pond, filtering system, or sediment barrier.
- (d) Where there are no concentrated flows, where slopes are less than 10%, and where the runoff passes through a grassed area that is either owned by the applicant or where such use is allowed, by written agreement, by the owner of the grassed area. The grass area shall be at least equal in dimension to the project area.
- (e) Where the surface is protected by ground cover or matting approved by the City's authorized representative.

d. **Dust Prevention**

During all phases of the work, the contractor shall take precautions to abate any dust nuisance. Dust-prevention measures shall be continuous until final inspection by the City's authorized representative. Dust shall be minimized to the extent practicable, using all measures necessary to accomplish results satisfactory to the City's authorized representative, including, but not limited to:

- 1. Sprinkling haul and access roads and other exposed dust-producing areas with water.
- 2. Applying City-approved dust palliatives on access and haul roads.
- 3. Establishing temporary vegetative cover.
- 4. Placing wood chips or other effective mulches on vehicle- and pedestrian-use areas.
- 5. Maintaining proper moisture conditions on all fill surfaces.
- 6. Prewetting cut and borrow area surfaces.

7. Using covered haul equipment

e. **Neighborhood Erosion Control Plan**

1. Any individual or group may submit an erosion-prevention and sediment-control plan for multiple lots. Plans shall be submitted to City of Wilsonville for review and approval. This shall be referred to as a "Neighborhood Erosion Control Plan." In such case, the group of lots will be evaluated as if they were one lot.
2. If an individual lot in a Neighborhood Erosion Control Plan is sold to new owners, the new owners may either join the neighborhood plan (with the approval of the other neighborhood owners), or will need to submit their own erosion control plan if erosion potential still exists on the parcel. If a lot is sold and the new owner does not join the Neighborhood Erosion Control Plan, then the plan must be revised and the new owner must submit an individual plan.

**101.9.05 Maintenance**

- a. The applicant shall maintain the facilities and techniques contained in the approved erosion-prevention and sediment-control plan so they will continue to be effective during the construction phase, post construction phase, establishment of permanent vegetation, or any other permitted activity.
- b. If the facilities and techniques approved in an erosion-prevention and sediment-control plan are not effective or sufficient as determined by the City site inspection, the applicant shall submit a revised plan within three working days of written notification by the City's authorized representative. On approval of the revised plan by the City's authorized representative, the applicant shall immediately implement the additional facilities and techniques included in the revised plan.
- c. In cases where erosion is likely to occur, the City's authorized representative may require the applicant to install interim control measures before submitting a revised erosion-prevention and sediment-control plan.

**101.9.06 Inspection**

- a. **City Initial Inspection:** On a site development or any other type of project, the erosion-prevention and sediment-control measures shall be installed before the start of any permitted activity. The applicant shall call the City's authorized representative for a pre-construction conference before beginning any site clearing or grading.
- b. **Applicant Inspections:** The applicant shall be required to inspect erosion-prevention and sediment-control measures as outlined in the approved Grading and Erosion Control Plan (as required by City's current erosion

control ordinance) and to provide information to the City's authorized representative. Inspections shall be completed as required by the latest edition of the *Erosion Prevention and Sediment Control Planning and Design Manual* and the Minimum Erosion Prevention and Sediment Control Plan Monitoring Requirements (see Appendix G). Inspection information is to be maintained on-site and available to City's authorized representative on request.

- c. **Final Inspection:** A final erosion control inspection shall be required before the sale or conveyance to new property owner(s) or before the removal of erosion-prevention and sediment-control measurements.

## SECTION 2

### STREET IMPROVEMENT DESIGN & CONSTRUCTION STANDARDS

#### 201.1.00 ENGINEERING

##### 201.1.01 Introduction

This section outlines design and construction requirements for all public street construction. The provisions and technical specifications herein set forth the requirements of the City of Wilsonville for roadway construction and improvements. Interpretations of such provisions and their application in specific circumstances shall be made by the City's authorized representative. Refer to Section 1 of the "Public Works Standards" for general provisions and requirements.

##### 201.1.02 Alternative Design and Construction Standards

- a. If approved by the Development Review Board and City Engineer, alternative roadway design standards may be substituted for the standards specified herein. Metro's "2000 Regional Transportation Plan" (RTP) provides street design policies and concepts (such as *Green Streets*, *Livable Streets*, and *Skinny Streets*) that address federal, state, and regional transportation mandates with respect to local implementation of Metro's "2040 Growth Concept." While this section provides for the consideration of alternative standards that may conflict with the City's adopted Fire Prevention Code, it is understood that alternative standards will be considered and applied on a case-by-case basis, with due regard to the Fire Prevention Code. Any requests for substitution must be in writing, stamped by a Professional Engineer registered in the State of Oregon at the time of submittal, and submitted as part of the Land Use process.
- b. If approved by the City Engineer, alternative construction standards may be substituted for the standards specified herein. Any requests for substitution must be in writing, stamped by a Professional Engineer registered in the State of Oregon at the time of submittal, and submitted at least three weeks prior to the Engineering Plan Review submittal process.

##### 201.1.03 General Requirements

- a. **Functional Classification:** The functional classification of existing and proposed roads is established by the City of Wilsonville's Transportation Systems Plan (TSP). Where the functional classification of a road is not defined by the TSP, the existing land use and existing operational

characteristics shall be used by the City's authorized representative to determine the functional classification of the road in question.

- b. **Access:** Access to city, county, and public roads shall conform to the City of Wilsonville TSP.
- c. **Width:** The width of the streets shall be in compliance with the City of Wilsonville TSP.
- d. **Number of Lanes:** The number of lanes for each class of road is defined by the City of Wilsonville TSP.
- e. **Sidewalks and Planter Strips:** Streets shall be provided with sidewalks and planter strips as specified in the City of Wilsonville TSP.
- f. **Design Speed:** The posted vehicle speed can be 85% of design speed, unless the road improvement will increase the 85% speed. If road improvement is likely to increase the 85% speed, the design speed will be based on the City Engineer's recommendation.

#### 201.1.04 Street Plans

- a. It is the design engineer's responsibility to ensure that engineering plans are sufficiently clear and concise to construct the project in proper sequence, using specified methods and materials, with sufficient dimensions to fulfill the intent of the design guidelines in these standards.
- b. All elevation on design plans and record drawings shall be based on the applicable NAVD datum specified in Section 101.7.07.a, "Surveying and Land Monuments."
- c. All engineering street plans shall be stamped by a Professional Engineer registered in the State of Oregon. At a minimum the street plan shall contain the following:
  - 1. At least one sheet showing a plan view of the entire project site. If the project site is sufficiently large that detailed street plans on any given sheet do not encompass the entire project site, then a sheet showing the plan view of the entire site must serve as an index to subsequent detailed plans sheets.
  - 2. A topographic map showing existing conditions for the site, including:
    - (a) Existing topography for the site.
    - (b) Adjacent streets, including street names.

- (c) Existing utilities, including franchised utilities above or below ground and drainage facilities that transport surface water onto, across, or from the project site. Existing drainage pipes, culverts, and channels shall include the invert or flowline elevations.
  - (d) Existing sensitive areas (e.g., ravines, swales, steep slopes, wells, springs, wetlands, creeks, lakes). For natural drainage features, show direction of flow, drainage hazard areas, and 100-year floodplain boundary (if applicable).
3. Plans for proposed street improvements shall include the following:
- (a) Grading and erosion control plan.
  - (b) Finished grades, showing the extent of cut and fill by existing and proposed contours, profiles, or other designations.
  - (c) Proposed structures, including roads and road improvements, parking surfaces, building footprints, walkways, landscaped areas, street lighting, public and private utilities, etc.
  - (d) Signing and striping plan.
  - (e) Applicable detail drawings.
  - (f) Existing and proposed easements.
  - (g) Setbacks from environmentally sensitive areas or resource areas protected within the Significant Resource Overlay Zone (SROZ).
  - (h) Any proposed phasing of construction. (Note: water quality and quantity facilities must be constructed before completion of any phased construction)
4. Detailed grading and landscape plans will be provided. The plans shall include the following:
- (a) Existing ground contours (shaded) and proposed ground contours at a minimum of a 1-foot contour interval. Slopes steeper than 6H:1V shall be identified.
  - (b) Location of all drainage structures as well as any other piped utilities in vicinity (i.e., at 0.1-foot detail).
  - (c) Landscape planting plan. Show all sewer laterals, water services, fire hydrants, and street lighting as per Detail No. R-1157 of these standards.

- (d) Irrigation plan to achieve the required plant survival rate.
  - (e) Maintenance access, as applicable.
5. Cross-sections shall be provided for at least the following:
- (a) All street sections or amended soil sections, as applicable.
  - (b) Proposed ditches and swales, including vegetated swales.

**201.1.05      Surveying**

- a. The design engineer shall be responsible for establishing the location of the street by means of reference stakes offset along the centerline. No construction shall be allowed to begin before construction staking. All staking shall be performed by or under the direction of a Professional Land Surveyor registered in the State of Oregon.
- b. Reference stakes shall be set at 25-foot station intervals along the centerline. Stakes shall, at a minimum, reference the following:
  - Point of Curvature (PC), midpoint, Point of Tangency (PT) for horizontal curves.
  - Begin Vertical Curve (BVC) point, low/high point, End Vertical Curve (EVC) point for vertical curves.
  - Beginning and ending point of super-elevation.
  - Beginning and ending of full super-elevation.
  - Centerline of intersecting street.
  - PC, midpoint, and PT for curb returns.
  - Centerline of access (wheelchair) ramp.
  - Centerline of driveways.
  - Curb scoring for match into concrete street joints.
- c. The design engineer shall also be responsible for identifying easements during construction.

**201.2.00 STREET DESIGN**

**201.2.01 Subgrade Evaluation**

- a. Subgrade evaluation and recommendations shall be prepared by a Professional Engineer registered in the State of Oregon whose area of expertise is geotechnical engineering and shall be summarized in a Geotechnical Report.
- b. Soil testing to obtain the strength of the soil is required for all roads to analyze and design the road structural section. Soil tests are needed on samples of subgrade materials that are expected to be within 3 feet of the planned subgrade elevation. Samples are needed for each 1,000 feet of roadway and for each visually observed soil type. Soil tests are required for at least two locations.
- c. The selected design structural strength of the soil must be consistent with subgrade compaction requirements. That is, the strength and compaction moisture content at optimum to slightly over optimum must be specified. The Geotechnical Report shall address subgrade drainage and groundwater considerations for year-round conditions. Recommendations for both dry-weather and wet-weather construction shall be included.
- d. Test the subgrade and determine the modulus of subgrade reaction,  $k$ , or the resilient modulus ( $M_R$ ) to design the street structure. The procedure for determining  $M_R$  is given in AASHTO T-292. Alternately, these soil strength criteria can be based on either the California Bearing Ratio (CBR) or H-veem resistance testing (R-value). The CBR will be determined in accordance with AASHTO T-193, based on the modified proctor (AASHTO T-180). R-values shall be determined at 300-psi exudation pressure in accordance to AASHTO T-190.
  1. A correlation of  $M_R$  to CBR is given by the following relationship (Heukelom and Klomp, 1962):

$$M_R \text{ (psi)} = 1,500 \times \text{CBR}$$

2. A correlation of  $M_R$  to R-value is given by the following relationship (Asphalt Institute, 1982):

$$M_R \text{ (psi)} = A + B \times (\text{R-value})$$

Where  $A = 772$  to  $1,155$ ,  $B = 369$  to  $555$

3. A correlation of  $M_R$  to R-value for fine-grained soils ( $\text{R-value} \leq 20$ ) is given by the following correlation (AASHTO, 1993):

$$M_R = 1,000 + 555 \times (\text{R-value})$$

4. A correlation of CBR to k may be made using **Table 2.1**.

**Table 2. 1. RELATIONSHIP BETWEEN k AND CBR**

| CBR Value | Modulus of Subgrade Reaction (k)<br>(psi/in.) |
|-----------|-----------------------------------------------|
| 3         | 100                                           |
| 5.5       | 150                                           |
| 10        | 200                                           |
| 20        | 250                                           |
| 50        | 500                                           |
| 80        | 710                                           |

SOURCE: Portland Cement Association (PCA).

**201.2.02 Subsurface Drainage**

Subsurface street drainage must be considered in the design of each street:

- a. Subsurface drains shall be designed and constructed according to the recommendations of the Geotechnical Report. In the event that no subsurface drainage is required based on the Geotechnical Report, a transverse perforated drainpipe with a minimum diameter of 4 inches shall be installed below the base rock at the point of each sag vertical curve.
- b. The subsurface drains are for the purpose of collecting and conveying subsurface water only, not surface runoff. They are not to be considered part of the storm drainage system for purposes of sizing storm drain pipe.
- c. Subsurface drains shall connect and drain into the storm drainage system at catch basins, gutter inlets, manholes, or roadside ditches. Surcharge from the storm drainage system shall not be allowed to back up into the subsurface drains.
- d. Alternative subsurface drainage measures may be used if approved by the City's authorized representative.

**201.2.03 Structural Section**

Streets may be constructed of:

- Full depth AC, or AC with crushed aggregate base and/or treated bases, or
- PCC with cushion course of crushed aggregate.

**201.2.04 Asphalt Pavement Design**

- a. AC pavement shall be designed using nationally recognized procedures: the AASHTO method or the Asphalt Institute method.
- b. The wearing surface of AC pavement shall conform to the Oregon Department of Transportation Standard Specifications for Construction (ODOT SSC) Section 00745, "Hot Mixed Asphalt Concrete," for either Level 2 or Level 3 HMAC, as determined by the City's authorized representative. Minimum total thickness of AC shall be 4 inches placed in at least two lifts. If the thickness is more than 6 inches, place the asphalt in three lifts. The base courses for AC pavement shall conform to ODOT SSC Section 00745, "Hot Mixed Asphalt Concrete," for either Level 2 or Level 3 HMAC, as determined by the City's authorized representative.
- c. Pavement thickness design criteria shall be accomplished in accordance with the AASHTO method or the Asphalt Institute method, using soil strength criteria based on either the CBR or R-value (see Section 201.2.01, "Subgrade Evaluation," City of Wilsonville "Public Works Standards").
- d. AC pavement shall be compacted to a minimum of 92% relative density, based on the theoretical maximum density determined in accordance with American Society for Testing and Materials (ASTM) D-2041 (Rice Gravity).
- e. Use a minimum 20-year design period.

**201.2.05 Portland Cement Concrete Design**

- a. At the direction of the City's authorized representative, certain streets may be required to be designed and constructed using PCC.
- b. PCC pavement shall be designed using nationally recognized procedures: the PCA method or the AASHTO method.
- c. Use a minimum 20-year design period.
- d. Minimum thickness of PCC shall be 7 inches.
- e. Minimum thickness of crushed rock base shall be 6 inches.
- f. PCC for pavement construction shall conform to ODOT Class 4350 – 1½, Structural Concrete or Structural Concrete Option A.
- g. Design of concrete joints shall follow the guidelines and requirements outlined in the American Concrete Pavement Association (ACPA) publication, "Design and Construction of Joints for Concrete Streets," except for the following:

1. Maximum joint spacing shall be 12 feet.
  2. Joints shall be designed to be skewed 6:1 when meeting the edge of pavement.
  3. For doweled contraction joints, do not lubricate the dowels.
  4. Isolation joints shall be used around manhole covers. Isolation joints shall be circular with a 2-foot spacing from the manhole cover.
- h. All castings for manholes in concrete streets shall be standard type.
- i. PCC for curbs, sidewalks, and miscellaneous construction shall conform to ODOT Class 3000 – ¾, Commercial Grade Concrete.

**201.2.06 Pavement Transition – Portland Cement Concrete to Asphalt**

Where PCC paving abuts AC paving, there shall be a lateral transition zone extending 4 feet, with a cross-section designed according to Detail No. R-1090 of these standards.

**201.2.07 Pavement Overlay Design**

Pavement overlays shall be designed using nationally recognized procedures: the Asphalt Institute method, PCA method, or AASHTO method.

**201.2.08 Horizontal Alignment**

Alignments shall meet the following requirements:

- a. Centerline alignment of improvements should be parallel to the centerline of the right-of-way. The centerline of a proposed street extension shall be aligned with the existing street centerline
- b. Horizontal curves in alignments shall meet the minimum radius requirements shown in **Table 2.2**, except as noted in c. below.
- c. Minimum centerline radius street curves in residential neighborhoods shall be as follows:
  1. (a). Residential collectors: 100 feet.
  2. (b). Residential streets: 75 feet.

**Table 2.2. DESIGN SPEED / CENTERLINE RADIUS—MINIMUMS**

**Major Collector / Arterial Streets / All Rural Roads**

| Design Speed (mph) | Friction Factor (F) | Slope/R min. |               |           |               |             |             |
|--------------------|---------------------|--------------|---------------|-----------|---------------|-------------|-------------|
|                    |                     | (e*)<br>- 4% | (e)<br>- 2.5% | (e)<br>0% | (e)<br>+ 2.5% | (e)<br>+ 4% | (e)<br>+ 6% |
| 25                 | 0.165               | 335'         | 300'          | 255'      | 220'          | 205'        | 185'        |
| 30                 | 0.160               | 500'         | 445'          | 375'      | 325'          | 300'        | 275'        |
| 35                 | 0.155               | 710'         | 630'          | 530'      | 455'          | 420'        | 380'        |
| 40                 | 0.150               | 970'         | 855'          | 710'      | 610'          | 560'        | 510'        |
| 45                 | 0.145               | 1285'        | 1125'         | 930'      | 795'          | 730'        | 660'        |
| 50                 | 0.140               | 1665'        | 1450'         | 1190'     | 1010'         | 925'        | 835'        |
| 55                 | 0.130               | 2240'        | 1920'         | 1550'     | 1300'         | 1190'       | 1060'       |
| 60                 | 0.120               | 3000'        | 2525'         | 2000'     | 1655'         | 1500'       | 1335'       |

**Minor Collector**

| Design Speed (mph) | Friction Factor (F) | Slope/R min. |               |           |               |             |             |
|--------------------|---------------------|--------------|---------------|-----------|---------------|-------------|-------------|
|                    |                     | (e*)<br>- 4% | (e)<br>- 2.5% | (e)<br>0% | (e)<br>+ 2.5% | (e)<br>+ 4% | (e)<br>+ 6% |
| 25                 | 0.252               | 195'         | 185'          | 165'      | 150'          | 145'        | 135'        |
| 30                 | 0.221               | 330'         | 305'          | 270'      | 245'          | 230'        | 215'        |
| 35                 | 0.197               | 520'         | 475'          | 415'      | 370'          | 345'        | 320'        |

- NOTE: \* e = rate of superelevation (tan B)
- (1) Off right-of-way runoff shall be controlled to prevent concentrated cross-flow in superelevated sections.
  - (2) Where superelevation is used, street curves shall be designed for a maximum superelevation rate of 0.04.
  - (3) If terrain dictates sharp curvature, a maximum superelevation of 0.06 is justified if the curve is long enough to provide an adequate superelevation transition.

**201.2.09 Vertical Alignment**

Alignments shall meet the following requirements:

- a. Minimum tangent street gradients shall be 1% along the crown and curb.
- b. Maximum street gradients shall be 8% for collector and local streets, and 6% percent for arterial streets. Grades in excess of 8% but not more than 12% may be permitted for short distances and must be approved by the City's authorized representative on an individual basis.

- c. Local streets intersecting with a minor collector or greater functional classification street or streets intended to be posted with a stop sign shall provide a landing that averages 5% gradient or less. Landings are that portion of the street within 20 feet of the edge of the intersecting street at full improvement.
- d. Grade changes of more than 1% shall be accomplished with vertical curves.
- e. Street grades, intersections, and superelevation transitions shall be designed not to allow concentrations of storm water to flow over the pavement.
- f. Offset crowns may be allowed and must be approved by the City's authorized representative on an individual basis.
- g. Streets intersected by streets not constructed to full urban standards shall be designed to match both present and future vertical alignments of the intersecting street. The requirements of these standards shall be met for both present and future conditions.
- h. Vertical curves shall conform to the values listed in **Tables 2.3 and 2.4**.
- i. Slope easements shall be dedicated or obtained for the purposes of grading outside the right-of-way.

**Table 2.3. DESIGN CONTROLS FOR CREST VERTICAL CURVES BASED ON STOPPING SIGHT DISTANCE**

| Design Speed | K         |
|--------------|-----------|
| 25           | 20 – 30   |
| 30           | 30 – 40   |
| 35           | 40 – 50   |
| 40           | 60 – 80   |
| 45           | 80 – 120  |
| 50           | 110 – 160 |
| 55           | 150 – 220 |

Where:  $K = L / A = \text{feet} / \text{percent}$ .  
 $L = \text{length of vertical curve (feet)}$ .  
 $A = \text{algebraic difference in grades (percent)}$ .

**Table 2.4. DESIGN CONTROLS FOR SAG VERTICAL CURVES  
BASED ON STOPPING SIGHT DISTANCE**

| Design Speed | K         |
|--------------|-----------|
| 25           | 30 – 40   |
| 30           | 40 – 50   |
| 35           | 50 – 60   |
| 40           | 60 – 70   |
| 45           | 70 – 90   |
| 50           | 90 – 110  |
| 55           | 100 – 130 |

Where:  $K = L / A = \text{feet} / \text{percent}$ .

L = length of vertical curve (feet).

A = algebraic difference in grades (percent).

**Note:** Values may be reduced if street lighting is present for sag vertical curves. AASHTO publication, "An Informational Guide for Roadway Lighting" (1984), shall serve as a guide.

**201.2.10 Transitions**

The following specify the minimum requirements for street transitions:

- a. Street width transitions from a narrower width to a wider width shall be designed with a 5:1 taper. Delineators, as approved by the City's authorized representative, shall be installed to define the configuration.
- b. For street width transitions from wider to narrower, the length of the transition taper shall be determined as follows:

$$L = S \times W, \text{ for } S \geq 45 \text{ mph}$$

$$L = \frac{W \times S^2}{60}, \text{ for } S \text{ less than } 45 \text{ mph}$$

Where L = minimum length of taper (feet).

S = design speed (mph).

W = edge of pavement offset (feet).

- c. Delineators, as approved by the City's authorized representative, shall be installed to define the configuration. Maximum spacing of delineators shall be the numerical value of the design speed, in feet (i.e., a 35-foot spacing for a 35 mph speed).
- d. In situations where a tapered transition cannot be provided, a Type III barricade shall be installed at the end of the wider section of the street and a

taper shall be appointed and delineated as approved by the City's authorized representative. The barricade shall conform to Detail No. R-1145 of these standards; diagonal striping shall slope down in the direction of the taper. If the wider section does not provide an additional travel lane, only a barricade is required without the transition.

#### **201.2.11      Superelevation Cross-Sections**

- a. Design elements for superelevation shall be based on AASHTO design guidelines.
- b. Offset crown cross-sections are not acceptable as superelevation sections.

#### **201.2.12      Intersections**

The following specifies the minimum requirements for intersections:

- a. The interior angle at intersecting streets shall be kept as near 90 degrees as possible, unless existing development or topography make it impracticable. Where intersecting streets cannot be kept at right angles, the interior angle shall in no case be less than 75 degrees, unless approved by the City's authorized representative after consultation with TVF&R. A tangent section shall be carried a minimum of 25 feet each side of intersecting right-of-way lines.
- b. Opposing intersections shall be designed so that no offset dangerous to the traveling public is created.
  1. Intersections on major arterial streets shall be separated by at least 500 feet.
  2. Intersections on minor arterial streets shall be separated by at least 250 feet.
  3. Intersections on collector, residential, and rural streets shall be separated by at least 100 feet.
- c. Curb radii at intersections shall be as shown in **Table 2.5** for the various function classifications with exceptions subject to approval by the City's authorized representative. The right-of-way radii at intersections shall be sufficient to maintain at least the same right-of-way-to-curb spacing as the lower classified street.
- d. Where Minor Collector and/or Rural Streets carry transit traffic, the radii indicated for Residential Streets shall take precedence.
- e. Sidewalk access (wheelchair) ramps conforming to the Americans with Disabilities Act (ADA) Standards for Accessible Design shall be provided at

all corners of all intersections, regardless of curb type, and shall conform to Section 201.2.22, "Sidewalks," and to Detail No. R-1075 of these standards.

**Table 2.5. MINIMUM TURNING RADII FROM EDGE OF PAVEMENT OR CURB (feet)**

| Street Classification       | Major/Minor Arterial Street | Major Collector Street | Minor Collector Street | Residential Street | Rural Street |
|-----------------------------|-----------------------------|------------------------|------------------------|--------------------|--------------|
| Major/Minor Arterial Street | 55                          | 40                     | 30                     | 25                 | 25           |
| Major Collector Street      | 40                          | 40                     | 30                     | 25                 | 25           |
| Minor Collector Street      | 30                          | 30                     | 30                     | 25                 | 25           |
| Residential Street          | 25                          | 25                     | 25                     | 25                 | 25           |
| Rural Street                | 25                          | 25                     | 25                     | 25                 | 25           |

**201.2.13 Cul-de-Sacs, Eyebrows, Turnarounds**

The design engineer’s plans must be approved by TVF&R and the City’s authorized representative. The following specifies the minimum requirements for cul-de-sacs, eyebrows, and turnaround areas. Other turnaround geometrics may be used when conditions warrant and when the City’s authorized representative approves the design and application of its use.

- a. Cul-de-sacs and other turnaround areas shall be allowed only on residential streets and commercial/industrial streets. Cul-de-sacs shall not be more than 200 feet long, unless approved by the Development Review Board. The length of cul-de-sacs shall be measured along the centerline of the roadway from the nearside right-of-way of the nearest through-traffic intersecting street to the farthest point of the cul-de-sac right-of-way.
- b. The minimum curb radius for cul-de-sac bulbs shall be 45 feet, and the right-of-way radius shall be sufficient to maintain at least the same right-of-way-to-curb spacing as in the adjacent part of the road.
- c. Cul-de-sacs and other turnaround areas shall have a 6-foot public utility easement extending outside the right-of-way around the cul-de-sac continuously. The minimum curb radius for transitions into cul-de-sac bulbs shall be 25 feet. The right-of-way radius shall be sufficient to maintain the same right-of-way-to-curb spacing as in the adjacent part of the road.

- d. An eyebrow corner may be used on a local street where expected average daily traffic (ADT) counts will not exceed 500 vehicles.

**201.2.14 Stub Streets**

Stub streets allow for future extensions. A reserve strip at the terminus of the right-of-way shall be provided. The reserve strip shall be at least one foot long and extend the full width of the right-of-way, and be provided to the City. A Type III Street Barricade conforming to Detail No. R-1145 shall be erected at the edge of pavement of the stub street. Additionally, a sign shall be installed stating the street will be extended in the future and to contact the City of Wilsonville Engineering Department (503-682-4960) for further information. Streets 50 feet in length or greater shall provide a garbage/recycling vehicle turn around approved by the City's authorized representative.

**201.2.15 Half-Streets**

To allow for reasonable development, half-street improvements may be approved by the Planning Commission and the Development Review Board. Whenever a half-street improvement is approved, it shall conform to the following:

- a. Street section design and construction shall be in conformance with these standards
- b. Minimum pavement width shall be 24 feet for arterial and collector streets, and 20 feet for residential and rural streets.
- c. Intersectional improvements shall be adequate to provide turn lanes.
  - 1. Arterials and collectors: 40 feet paved for 250 feet as measured from centerlines of intersecting streets.
  - 2. Residential and rural: 36 feet paved for 150 feet as measured from centerlines of intersecting streets.
- d. A reserve strip at the limits of the right-of-way shall be provided to the City. The reserve strip shall be at least one foot wide and extend the full length of the half street improvement.

**201.2.16 Private Streets**

Approval for private streets shall come from the Development Review Board and shall meet the requirements of the City of Wilsonville Planning Division and TVF&R. Private streets shall be signed with a blue sign stating, "Not maintained by the City of Wilsonville."

#### **201.2.17 Raised Medians**

The following specify the minimum requirements for raised medians:

- a. Raised medians are allowed on certain streets as defined in the City of Wilsonville TSP.
- b. Where raised medians are allowed, the following criteria must be met:
  1. Street lighting shall be sufficient to provide illumination of the raised median.
  2. Objects, such as trees, shrubs, signs, light poles, etc., shall not physically or visually interfere with vehicle or pedestrian traffic in the travel way.
  3. The style and design of the raised median shall be site specific. The raised median shall be safe for the design speed. Raised medians shall be designed in conformance with AASHTO guidelines. Design shall consider the use of rolled curbs and appropriate surface loading for emergency vehicle left-turn access. Raised median designs shall be subject to City approval.

#### **201.2.18 Transit Turnout Design**

Transit turnouts shall be provided where required by the City of Wilsonville.

- a. Transit turnouts shall conform to Detail No. R-1195 of these standards.
- b. Transit pad sections shall be a minimum thickness of 9 inches of PCC over 6 inches of compacted base rock.
- c. Transit pad shall be reinforced with No. 4 reinforcement steel bar, placed 1-foot on center each way, 2 inches above base rock.
- d. Transit pad shall be doweled into adjacent PCC gutter; dowels spaced 3-feet on center and centered on face of gutter. If adjacent street is PCC, transit pad shall be doweled into the street as shown in Detail No. R-1095.
- e. Minimum concrete specifications shall be 4,000-psi compressive strength and design modulus of rupture ( $M_R$ ) shall be 525 psi in 28 days. A higher value of  $M_R$  shall be allowed if adequately supported by test data.
- f. Base rock shall conform to Section 201.3.01, "Granular Fill."
- g. Design of concrete joints shall follow the guidelines and requirements outlined in the ACPA publication, "Design and Construction of Joints for Concrete Streets," except for the following:
  1. Maximum joint spacing shall be 12 feet.

2. Joints shall be designed to be skewed 6:1 when meeting the edge of pavement.
3. For transit pads adjoining PCC streets, joints shall match street jointing.
4. For doweled contraction joints, do not lubricate the dowels.
5. Isolation joints shall be used around manhole covers. Isolation joints shall be circular with a 2-foot spacing from the manhole cover.

#### **201.2.19 Sight Distance**

A clear vision area shall be maintained on each corner of property at the intersection of any two streets, a street and a railroad, or a driveway and a street. Clear vision area shall be in conformance with Section 4.177 of the City Code and this standard. The following specifies the minimum requirements for sight distance for roads that intersect each other, and for driveways that intersect roads:

- a. The minimum intersectional sight distances shall be based on the posted speed of the road. The intersectional sight distance shall be
  - Based on an eye height of 3.5 feet and an object height of 2.0 feet above the road.
  - Measured from the center of the drive lane 10 feet from the extended curb line or edge of pavement of the crossroads.
- b. No structures, plantings, or other obstructions shall be allowed that would impede visibility between the height of 30 inches and 10 feet, as measured from the top of curb, or in absence of a curb, from the established street centerline elevation.
- c. Trees placed in sidewalk planting areas must be located at least 30 feet from the nearest intersection and 10 feet from driveways.
- d. Minimum intersectional sight distance for railroad and street intersections shall be in conformance with AASHTO design guidelines.
- e. Minimum intersectional sight distance shall be equal to 10 times the posted speed of the road for grades of 3% or less, as shown in **Table 2.6**. For grades in excess of 3%, sight distances must be adjusted and shall be in conformance with AASHTO design guidelines. For significant road improvement projects, the following intersectional standards shall be met in addition to the AASHTO remaining sight distance standards.

**Table 2.6. INTERSECTIONAL SIGHT DISTANCE**

| <b>Design Speed (mph)</b> | <b>Distance Along Crossroads (feet)</b> |
|---------------------------|-----------------------------------------|
| 25                        | 250                                     |
| 30                        | 300                                     |
| 35                        | 350                                     |
| 40                        | 400                                     |
| 45                        | 450                                     |
| 50                        | 500                                     |

**201.2.20 Driveways**

The following specifies the minimum requirements for driveways:

- a. Driveways shall conform to Detail No. R-1115 or R-1120 of these standards.
- b. Driveways shall not be permitted on streets with existing or proposed non-access reserve strips or as set forth in the Planning Code.
- c. For commercial or industrial developments, driveway access shall be a minimum of 100 feet from the nearest intersection (as measured from centerline of driveway to near face of curb at intersection), unless otherwise approved in writing by the City's authorized representative.
- d. For residential developments, driveway access from the nearest intersection shall be established by the City of Wilsonville Building and Planning Departments, in coordination with the City's authorized representative.
- e. Access driveways shall have a minimum width of 12 feet for one way traffic and 20 feet for two way traffic. Driveway widths shall meet requirements of TVF&R.
- f. Concentrated surface runoff shall not be allowed to flow over commercial driveways or sidewalks.
- g. Driveways intersecting with roads shall meet the minimum sight distance requirements as specified in Section 201.2.19, "Sight Distance."

## 201.2.21 Curbs and Grading

The following specifies the requirements for curbs and cross-slope grading for streets:

- a. **Location and Design:** urban arterial and major collector roads shall include curbs on both sides, except in situations of interim width improvements. Interim designs shall have shoulders and ditches. Nonmountable curbs shall be required on urban arterial and major collector roads.
- b. **Shoulders:** rural streets or interim width urban streets shall have 6-foot-wide shoulders next to the street, at 2% cross-slope, and roadside ditches on each side of the shoulder, with a maximum sideslope of 2H:1V. The 6-foot shoulder area may consist of a section of pavement and a section of crushed aggregate. The pavement section shall be a minimum of 2 feet wide and a maximum of 6 feet wide.
- c. **Curb Stamping:** newly constructed curbs or replaced curbs shall be stamped with the capitol letters "SS" at the location of each sanitary lateral crossing, the capitol letters "SD" at the location of each storm drain lateral crossing, the capitol letter "W" at the location of each water line crossing, and the capitol letter "C" at the location of each conduit crossing. Letters shall be 3 inches in height and embossed a minimum of 1/8-inch deep.
- d. **Root Barriers:** where trees are located within 8 feet of public curbs, the curb shall be protected from root intrusion with a root control barrier system designed by a Professional Landscape Architect registered in the State of Oregon; root control barrier shall be approved by the City's authorized representative before installation. Generally, the root control system should be installed a minimum of 24 inches deep, with a minimum 20-foot length centered on the root source. Installation of such systems shall be done so as to not disturb the curb or base rock previously installed. Provide landscaping plan showing location of root control barrier system.
- e. **Grading, Collector and Arterial Streets:** grading outside the improved areas shall be as follows: Minor collector or higher functional classification shall have a 2% upward grading to the right-of-way line, a 5H:1V upward or downward grading within the public utility easement, and no steeper than 1½H:1V up or 2H:1V down outside the right-of-way. Retaining walls shall be used if slopes are greater than the 1½H :1V to a height where the slope is no more than 1½H:1V.
- f. **Grading, Residential and Rural Streets:** residential streets and rural roads shall have a 2% upward grading to the right-of-way line, a 5H:1V upward or downward grading within the public utility easement, and no steeper than 1½H:1V up or 2H:1V down, outside the public utility easement. Retaining

walls shall be used if slopes are greater than the 1½H :1V to a height where the slope is no more than 1½H:1V.

- g. **Cross- slope:** cross-slope of the street section shall be no less than 2% and no greater than 5%.

#### 201.2.22 Sidewalks

The following specifies the requirements for sidewalks:

- a. **Location and Design:** The location of sidewalks shall be based on the City of Wilsonville TSP, the City's Bicycle and Pedestrian Master Plan, and as required by the Planning Department, in accordance to subsection 4.178, "Sidewalk and Pathway Standards," of the Wilsonville Code.

Sidewalks shall be designed with a minimum width of 5 feet or as designated in the TSP, whichever is greater, exclusive of curb and obstructions. Sidewalk thickness, slope, and location of expansion and contraction joints shall be as specified in Detail No. R-1080 of these standards. Final facility location and design are subject to the approval of the City's authorized representative. Sidewalk joints in new construction shall be finished with a 3-inch wide shine, or if construction is fill-in work, finish shall match existing pattern.

- b. **Easements:** All public-owned pedestrian facilities shall be constructed within a public right-of-way or an easement. All new development or redevelopment shall consider access to adjacent properties in their development plans, especially schools, retail, and commercial areas. Easements shall be provided as necessary for compliance with the ADA Standards for Accessible Design.
- c. **Access Ramps:** Access ramps shall be included in the design of sidewalks at all intersections. Access ramp design shall meet the criteria established in the ADA Standards for Accessible Design. On streets classified as collector or above and at intersections that have a major street classification, double access ramps shall be installed. Ramps shall have a smooth transition at the gutterline.
- d. **Thickened Design:** At all intersections, adjacent to the curb radius, curb-tight sidewalks and sidewalk ramps shall be constructed with a similar section as shown for a residential driveway (see Detail No. R-1115 of these standards).
- e. **Root Barriers:** Where trees are located within 8 feet of public sidewalks, the sidewalk shall be protected from root intrusion with a root control barrier system designed by a Professional Landscape Architect registered in the state of Oregon; root control barrier shall be approved by the City's authorized representative before installation. Generally, the root control system should be installed a minimum of 24 inches deep, with a minimum 20-foot length

centered on the root source. Installation of such systems shall be done so as to not disturb the sidewalk, curb or base rock previously installed. Provide landscaping plan showing location of root control barrier system.

#### **201.2.23 Bike Lanes**

The need for bike lanes shall be determined by the City, based on the TSP. Bike lanes, bike paths, and multi-use paths shall meet the requirements of the City of Wilsonville "Public Works Standards," as described in Appendix A, "Bicycle and Pedestrian Facilities."

#### **201.2.24 Guardrails**

The following specify the minimum requirements for the location and type of guardrails:

- a. The decision whether to install a guardrail shall be based on information in the AASHTO publication, "Guide for Selecting, Locating, and Designing Traffic Barriers," or most recent edition.
- b. Guardrails shall be designed in conformance with AASHTO design guidelines and constructed according to ODOT SSC Section 00810, "Metal Guardrail."

#### **201.2.25 Roadside ditches**

Roadside ditches shall be designed in conformance with Section 301.7.03, "Channel Construction for New Roadside Ditches."

#### **201.2.26 Utilities**

The following specifies the minimum requirements for utilities:

- a. Franchised utilities shall be located underground, outside the paved road if possible, to avoid future cuts in paved roads.
- b. A 6-foot wide Public Utility Easement (PUE) shall be required adjacent to right-of-ways on all frontages to public roadways. PUE's shall be graded as per Section 201.2.21, "Curbs and Grading," from back of curb or sidewalk unless otherwise approved by the City's authorized representative. Earthen berms or any other encroachments are not allowed within a PUE.
- c. On all phased (interim) road improvements, the necessary utilities shall be stubbed across the interim improvement to assure that cuts are not necessary when the road is expanded to its full width. A 5-year moratorium will prohibit street cuts on all projects. The moratorium begins when a project is complete and the warranty begins. Check with the City Engineering Division for a current list of streets on the 5-year moratorium.

- d. Except for sanitary sewers and water mains, underground utilities intended to provide direct service to adjacent properties with future connections shall not be located in the full-width paved section of a street to be constructed. If all service connections are installed and extended beyond the full-width section before the street is paved, franchised utilities can be located in the paved section, if approved by the City's authorized representative.
- e. Underground utilities being constructed along existing paved streets shall not be located under the existing pavement, unless approved by the City's authorized representative. Underground utilities that must cross an existing paved street shall not be installed by any method that cuts the pavement, unless approved by the City's authorized representative.
- f. Underground utilities shall be buried a minimum depth of 36 inches, measured from finished grade to top of utility.
- g. Streetlights shall be located as required to provide proper illumination but shall not physically or visually interfere with vehicle or pedestrian traffic. All installation of streetlights shall be done in accordance with the "Statement of Streetlight Installation Responsibilities," Option B, by PGE, revised March 1, 2001, or latest edition.

### **201.3.00 MATERIAL SPECIFICATIONS**

#### **201.3.01 Granular Fill**

- a. Crushed aggregate for base rock, leveling course, and surface replacement shall consist of an aggregate base as specified by the design engineer, with approval of the City's authorized representative, and shall be in conformance with ODOT SSC Section 02630, "Base Aggregate," for gradation, fractured faces, and durability. The leveling course shall consist of ¾"-0" grade crushed aggregate material, and be a minimum thickness of 2 inches when compacted.
- b. The aggregate shall consist of uniform-quality, clean, tough, durable fragments of rock or gravel, free from flat, elongated, soft, or disintegrated pieces, and other objectionable matter occurring either free or as a coating on the stone.
- c. Gradation requirements of the crushed aggregate shall be as indicated in **Table 2.7**. Sieve analysis shall be determined according to AASHTO T-27.

**Table 2.7. GRADATION REQUIREMENTS FOR GRANULAR FILL**

| Sieve Size                          | 2 ½" - 0        | 2" - 0   | 1 ½" - 0 | 1" - 0   | ¾" - 0   |
|-------------------------------------|-----------------|----------|----------|----------|----------|
|                                     | Percent Passing |          |          |          |          |
| 2 ½"                                | 95 - 100        | 100      |          |          |          |
| 2"                                  | --              | 95 - 100 | 100      |          |          |
| 1 ½"                                | --              | --       | 95 - 100 | 100      |          |
| 1 ¼"                                | 55 - 75         | --       | --       | --       |          |
| 1"                                  | --              | 55 - 75  | --       | 90 - 100 | 100      |
| ¾"                                  | --              | --       | 55 - 75  | --       | 90 - 100 |
| ½"                                  | --              | --       | --       | 55 - 75  | --       |
| 3/8"                                | --              | --       | --       | --       | 55 - 75  |
| ¼"                                  | 30 - 45         | 30 - 45  | 35 - 50  | 40 - 55  | 40 - 60  |
| U.S. No. 10 sieve                   | 12 - 27         | 12 - 27  | 14 - 30  | 16 - 33  | 16 - 36  |
| U.S. No. 40 sieve                   | 0 - 16          | 0 - 16   | 3 - 18   | 8 - 24   | 8 - 24   |
| U.S. No. 200 sieve<br>(wet sieving) | 0 - 9           | 0 - 9    | 0 - 8    | 0 - 8    | 0 - 10   |

**Note:** All percentages are by weight. Material passing the U.S. No. 100 sieve shall have a maximum plasticity index of 6 when tested according to AASHTO T-90.

**201.3.02 Asphalt Concrete**

- a. The wearing surface of AC pavement shall conform to ODOT SSC Section 00745, "Hot Mixed Asphalt Concrete" for either Level 2 or Level 3 HMA, as determined by the City's authorized representative. The base courses for AC pavement shall conform to ODOT SSC Section 00745, "Hot Mixed Asphalt Concrete," for either Level 2 or Level 3 HMA, as determined by the City's authorized representative.
- b. Asphalt cement shall be 85-100 penetration paving asphalt conforming to ASTM D-946.
- c. Liquid asphalt for use as a prime coat under AC shall be RC-70 rapid-curing liquid asphalt conforming to AASHTO M-81, or MC-70 medium-curing liquid asphalt conforming to AASHTO M-82.
- d. The temperature of the AC during mixing, placement, or while in storage shall not exceed 350°F and shall not be less than 240°F as per ODOT SSC Section 00745.43, "Drying and Heating Aggregates for HMA." Asphalt storage shall meet requirements of ODOT SSC Section 00745.45, "HMA Storage."

### **201.3.03 Portland Cement Concrete**

- a. PCC for concrete pavement shall conform to Section 201.2.05.f.
- b. PCC for curbs, sidewalks, and miscellaneous construction shall conform to Section 201.2.05.i.
- c. All forms for curbs and sidewalks shall be 2-inch dimensioned lumber, plywood, or metal forms. Forms on the face of the curb shall have no horizontal form joints within 7 inches of the top of the curb. All forms shall be approved by the City's authorized representative.
- d. Reinforcement steel shall conform to ASTM A-615, Grade 40, deformed bars.

### **201.4.00 CONSTRUCTION SPECIFICATIONS**

#### **201.4.01 General Provisions**

The specifications in this chapter and any other applicable requirements of the City shall govern the character and quality of material, equipment, installation, and construction procedures for roadway construction or improvements.

#### **201.4.02 Scheduling**

The contractor shall plan their construction work in conformance with Section 101.8.02, "Scheduling."

#### **201.4.03 Environmental Protection, Erosion Prevention, and Sediment Control**

The contractor shall take all appropriate measures and precautions to minimize their impact on the environment and control erosion, as outlined in Section 101.9.00, "Environmental Protection, Erosion Prevention, and Sediment Control."

#### **201.4.04 Interferences and Obstructions**

Various obstructions may be encountered during the course of the work. The contractor shall follow the guidelines established in Section 101.8.05, "Interferences and Obstructions."

#### **201.4.05 Contaminated Soil or Hazardous Material**

If during construction contaminated soil or with hazardous materials or chemicals are encountered, the Contractor shall follow the procedures specified in Section 101.9.02, "Contaminated Soils or Hazardous Materials."

#### **201.4.06 Trench Excavation, Preparation, and Backfill**

Trench excavation, preparation, and backfill shall conform to the requirements of Section 6, "Trench Excavation and Backfill."

**201.4.07 Steel Plates**

Where excavated trenches located in the right-of-way are not backfilled at the end of the construction day, the trench shall be covered with Steel Plates. Use of Steel Plates shall conform to Section 101.8.02.b.5, "Progress of Construction."

**201.4.08 Preservation, Restoration, and Cleanup**

Cleanup of all construction debris, excess excavation, and excess materials and complete restoration of all fences, mailboxes, ditches, culverts, signposts, and similar items shall be completed according to Section 101.8.16, "Preservation, Restoration, and Cleanup."

**201.5.00 WORKMANSHIP**

**201.5.01 Demolition**

Debris from the demolition of pavement, sidewalks, curbs, or gutters shall be hauled off site and disposed of in a manner approved by the City's authorized representative.

**201.5.02 Clearing and Grubbing**

- a. Brush shall be cut as near to the ground surface as practicable and removed to a disposal site approved by the City's authorized representative. Under no condition shall excavated materials be permitted to cover brush before the brush is cleared and disposed of. Ground surface shall be stripped of all organic soil and unsuitable material as recommended in the Geotechnical Report. Stripping operations shall be approved by the City's authorized representative prior to proceeding with any construction activity.
- b. Erosion-prevention and sediment-control measures shall be installed before the start of clearing and grubbing (see Section 101.9.00, "Environmental Protection, Erosion Prevention, and Sediment Control"). The applicant shall call the City's authorized representative for inspection and approval of all erosion-prevention and sediment-control measures before beginning any site clearing, grubbing, or grading.

**201.5.03 Subgrade**

Subgrade shall be prepared according to the recommendations in the Geotechnical Report and must be approved by the City's authorized representative. The subgrade shall be compacted to 95% of the maximum dry density, as determined by AASHTO T-180. In periods of dry weather, a proof-roll of the subgrade shall be observed by the City's authorized representative. Soft areas shall be repaired or replaced.

#### 201.5.04 Base and Leveling Course

Base and leveling course shall consist of crushed aggregate as specified in Section 201.3.01, "Granular Fill." Base and leveling aggregate material shall be placed and compacted to the required depth of finished pavement and for proper matching with the adjacent existing pavement. Material shall be compacted to 95% of the maximum dry density, as determined by AASHTO T-180. A proof-roll of the base and leveling course shall be observed by the City's authorized representative. Soft areas shall be repaired or replaced.

#### 201.6.00 CONSTRUCTION PROCEDURE

The geotechnical engineer reserves the right to vary the classes of backfill and the type of resurfacing as best serves the interest of the City, with the approval of the City's authorized representative.

#### 201.6.01 Asphalt Pavement

- a. After the leveling course is compacted, an asphalt prime coat, specified above, shall be applied to the edges of the existing pavement. Also, cast iron manhole frames and cleanout frames shall be tack-coated below grade.
- b. Asphalt Concrete
  1. **Thickness:** Minimum total thickness of AC shall be 4 inches placed in at least two lifts. Place AC after the prime coat has set. If the thickness is greater than 6 inches, place the asphalt in three lifts. Spread and level the AC with use of a self-propelled machine or hand tools, depending on the area to be paved. Bring the AC to the proper grade and compact by rolling, or use hand tampers where rolling is not possible. Temperature of the AC material shall be in conformance with Section 201.3.02.d.
  2. **Placement:** Lay the AC mixture in strips of such width as to hold to a practical minimum the number of longitudinal joints required. The longitudinal joints in any layer of pavement shall be offset from those joints in layers below by not less than 6 inches. Joints shall not be located in wheel paths.
  3. **Compaction:** Roll with power rollers capable of providing compression of 350 pounds per linear inch. Begin rolling from the outside edge of the replacement and progress toward the existing surfacing, lapping the existing surface at least half the width of the roller. If the existing surfacing bounds both edges of the replacement, begin rolling at the edges of the replacement, lapping the existing surface at least half the width of the roller and progressing toward the center of the replacement area. Overlap each proceeding track by at least half the width of the roller and make sufficient passes over the entire area to produce the desired result. AC pavement shall be compacted to a

minimum of 92% relative density, based on the theoretical maximum density determined in accordance with ASTM D-2041, "Rice Gravity."

4. **Finished surface:** The finished surface of the new compacted paving shall be flush with the existing surface and shall conform to the grade and crown of the adjacent pavement.

#### **201.6.02 Portland Cement Concrete Pavement**

- a. Construction of PCC pavement shall be in conformance with the guidelines in ODOT SSC Section 00756, "Plain Concrete Pavement."
- b. Construction of concrete joints shall follow the guidelines and requirements outlined in the ACPA publication, "Design and Construction of Joints for Concrete Streets," except for the following:
  1. Maximum joint spacing shall be 12 feet.
  2. Transverse joints shall be designed to be skewed 6:1 when meeting the edge of pavement, at the gutterline.
  3. For doweled contraction joints, do not lubricate the dowels.
  4. Staking of curb joints shall be required and performed by or under the direction of a Professional Land Surveyor registered in the State of Oregon.
  5. Isolation joints shall be used around manhole covers. Isolation joints shall be circular with a 2-foot spacing from the manhole cover.
- c. All joints shall be sealed in conformance with the ACPA publication, "Design and Construction of Joints for Concrete Streets."
- d. The surface finishing and smoothness of PCC surfaces shall follow the guidelines outlined in ODOT SSC Section 00756.49, "Surface Finishing" and Section 00756.55, "Surface Tolerance, Testing, and Correction."
- e. At no time shall construction equipment or traffic be allowed on the new pavement until laboratory tests indicate that at least 90% design strength has been attained and the City's authorized representative and the design engineer agree that the street is ready for traffic and construction loads.

#### **201.6.03 Sidewalks**

Construct sidewalks in accordance to Section 201.2.05.i, "Portland Cement Concrete Design" and Detail No. R-1080 of these standards.

**201.6.04 Weather Conditions**

- a. AC pavement shall not be placed during periods of rainfall, sand or dust storms, or any imminent storms that might adversely affect the finished pavement quality. AC material shall not be applied over frozen surfaces or standing water. AC shall be placed at temperatures not colder than the minimum atmospheric temperatures specified in **Table 2.8**. Temperature of the AC material shall be in conformance with Section 201.3.02.d.

**Table 2.8. ATMOSPHERIC TEMPERATURE REQUIREMENTS**

| Individual Lift Thickness | Atmospheric Temperature |
|---------------------------|-------------------------|
| Less than 1½”             | 60° F                   |
| 1½” – 2½”                 | 50° F                   |
| 2½” – 3”                  | 40° F                   |

- b. PCC pavement shall not be placed during periods of rain or on frozen bases. Placement shall not occur when descending air temperature falls below 40°F, nor shall it resume until ascending air temperature reaches 35°F. The contractor shall protect PCC pavement from weather damage. The contractor shall protect unhardened PCC from precipitation with protective material. If PCC is being placed during cold weather, and the air temperature is forecast to drop below 35°F, the contractor shall prevent the PCC from freezing for at least 7 days.

**201.6.05 Protection of Structures**

- a. Provide whatever protective coverings may be necessary to keep oil or asphalt from splashing on the exposed parts of bridges, culverts, curbs, gutters, posts, guardrails, road signs, and any other structures during paving operations. Remove any oil, asphalt, dirt, or any other undesirable matter from these structures that resulted from the paving operations.
- b. Where water valve boxes, manholes, catch basins, or other underground utility appurtenances are situated in the area to be surfaced, the resurfacing shall be level with the top of the existing finished elevation of the appurtenances. If it is evident that an appurtenance does not match the proposed finished grade, notify the proper authority to have the item altered before proceeding with the resurfacing around the obstruction, unless otherwise approved by the City’s authorized representative. Protect all covers during asphalt application.

#### **201.6.06 Excess Materials and Trench Settlement Repair**

Contractor shall dispose of excess materials. Contractor shall be responsible for repairing all settlement of pavement over trenches for a 1-year period.

#### **201.6.07 Rock Surfacing**

Where gravel shoulders have been disturbed, place  $\frac{3}{4}$ "-0" crushed aggregate backfill (see Section 201.3.01, "Granular Fill") as surfacing material for the full width of all streets, driveways, parking areas, street shoulders, and other areas disturbed by the construction. Spread the material by "tailgating" and supplement by hand labor when necessary. Level and grade the aggregate to conform to existing grades and surfaces.

#### **201.7.00 SURFACE RESTORATION**

##### **201.7.01 Scope**

This section covers the work necessary for all required replacement of pavement, curbs, sidewalks, rock surfacing, and drainage facilities that were removed during construction. Replacement pavement and base course thickness design shall conform to current City standards.

##### **201.7.02 Asphalt Concrete Replacement**

- a. Base, subbase, or subgrade material that has been removed shall be replaced with  $\frac{3}{4}$ "-0" crushed aggregate backfill (see Section 201.3.01, "Granular Fill") or control density fill (CDF, minimum 28 day compressive strength shall be 200 psi). Bring the trench or excavation to a smooth, even grade at the correct distance below the top of the existing pavement surface so as to provide adequate space for AC pavement. Crushed aggregate trench backfill placed within 3 feet of finished grade shall be compacted to 95% of the maximum dry density, as determined by AASHTO T-180. Crushed aggregate backfill placed below 3 feet of finished grade shall be compacted to 90% of the maximum dry density. Place the leveling course for the full width of the trench where pavement was disturbed, including bituminous surface shoulders.
- b. Compact the base rock and leveling course material to 95% of the maximum dry density, as determined by AASHTO T-180. At the conclusion of each day's operation, the contractor shall patch all trench or excavation areas. Cold-patch asphalt mix may be used as a temporary patch.
- c. The contractor shall make a 1-foot T-cut in the existing pavement surrounding a trench or excavation. Trim existing pavement to a straight line to remove any pavement that has been damaged or that is broken and unsound to create a smooth, sound edge for joining the new pavement.

- d. Within 5 days after completion of all paving or utility work, the contractor shall repair all trench or excavation areas with hot-patch asphalt mix and tack and sand all joints and sawcuts. AC pavement shall be compacted to a minimum of 92% relative density, based on the theoretical maximum density determined in accordance with ASTM D-2041, "Rice Gravity."
  1. When the pavement surface has been cored, the area shall be repaired as follows: At the conclusion of each day's operation, the contractor shall patch all cored areas. Cold-patch asphalt mix may be used as a temporary patch.
  2. Within 5 days after completion of all paving or utility work, the contractor shall repair all cored areas with hot-patch asphalt mix.

#### **201.7.03 Asphalt Restoration for Streets Listed on 5-Year Moratorium**

When emergencies or special circumstances require access to underground utilities, the City may allow street cuts in streets listed on the 5-year moratorium (see Section 201.2.26.c, "Utilities"). In addition to the repair work outlined in Section 201.7.02, "Asphalt Concrete Replacement," an additional 1-foot wide, 2-inch grind out around the T-cut perimeter shall be required.

#### **201.7.04 Portland Cement Concrete Replacement**

- a. **Trenching or Excavation in Pavement and Driveways:** The City Engineer encourages directional boring under existing concrete streets and discourages trenching or excavation work in streets or driveways. When this is unavoidable, the contractor shall remove and replace all panels that have been cut or damaged. New panels shall be connected with No. 4 reinforcement tie-bars into the adjacent existing panels. Tie-bars shall be epoxied in place using an epoxy bonding agent as provided in the ODOT QPL. Bring the trench to a smooth, even grade at the correct distance below the top of the existing pavement surface so as to provide adequate space for the base, leveling course, and PCC pavement.
- b. **Coring:** When the pavement surface has been cored, the area shall be repaired as follows:
  1. Base, subbase, or subgrade material that has been removed shall be replaced with  $\frac{3}{4}$ "-0" crushed aggregate backfill (see Section 201.3.01, "Granular Fill") or CDF. Bring to a smooth, even grade at the correct distance below the top of the existing pavement surface so as to provide adequate space for PCC pavement.
  2. At the conclusion of each day's operation, the contractor shall patch all cored areas within roadways with concrete having a minimum 4,000-psi compressive strength at 28 days (concrete with a minimum 3,000-psi compressive strength may be used in driveways).

- c. **Surface Smoothness:** The surface smoothness of the replaced pavement shall be such that when a straightedge is laid across the patched area between the edges of the old surfaces and the surface of the new pavement, the new pavement shall not deviate from the straightedge by more than ¼ inch.
- d. **Sidewalks and Curbs:** Replace concrete sidewalks and curbs to the same section, width, depth, line, and grade as that removed or damaged. Cut the ends of existing curb to a vertical plane. Before replacing the sections, properly backfill and compact the trench to prevent subsequent settlement.
- e. **Catch Basins:** Reinstall catch basins in their original locations and reconnect them to the drainage system in a manner equal to the original. If the existing catch basins are damaged beyond repair by operations, construct new basins of similar size, cross-section, and design as the original.

**201.8.00 STREET NAMES AND TRAFFIC CONTROL SIGNAGE AND STRIPING**

**201.8.01 Street Name Signs and Posts**

All newly platted streets shall be signed with the name approved by the Design Review Board (DRB) and the county. Signs are to conform to Detail No. R-1165 and R-1170 and to these City standards, as follows.

a. Posts

1. **Materials**

- (a) A minimum of 2 x 2-inch x 10-foot, 14-gauge galvanized “quick-punch” or 12-gauge perforated posts, or approved equal, shall be used.
- (b) A 2 x 2-inch x 12-foot, 14-gauge galvanized “quick-punch” or 12-gauge perforated posts, or approved equal, shall be used when a combination of signs is more than 36 inches high.
- (c) Signposts are made of 2-inch square tubing and must be embedded 18 inches into the base.

2. **Base:** The breakaway post base shall consist of a 2.25 x 2.25 inch (I.D.) x 36-inch galvanized base with a 2.5 x 2.5 inch (I.D.) x 18-inch sleeve placed flush with the base. All sleeves and bases shall be 14-gauge “quick punch” or 12-gauge perforated material, or approved equivalent.

3. **Fastening:** Drive rivets shall be used to fasten signs onto metal signposts, except for street name signs, which shall be attached by hex nuts. Washers shall be used behind all drive rivets used to affix signs to posts. Two drive rivets at right angles shall be used to fasten the post to the base.

b. Street Name Signs

In business districts and on principal arterials, street name signs shall be placed in diagonally opposite corners so that they will be on the righthand side of the intersection for traffic on the major street. To optimize visibility at signaled intersections, street name signs shall be mounted overhead. In residential districts, at least one street name sign shall be mounted at each intersection. On T-intersections, the street name signs shall be designated at two locations. One street name sign shall be placed at the end of a T-intersection, and the second placed at the righthand corner of the intersecting street. Signs naming both streets shall be installed at each street sign location.

1. **Materials:** On streets with a speed limit of 35 mph or greater, a street name sign shall consist of 8-inch-high, flat, 0.080-inch thick aluminum. On streets with speed limits of less than 35 mph, a street name sign shall consist of 6-inch high, flat, 0.080-inch thick aluminum. The minimum length is 24 inches. The maximum length is 36 inches.
2. **Sheeting:** Both sides of street signs shall be green 3M Scotchlite brand high-intensity reflective sheeting.
3. **Lettering:** Street name signs consist of 3M Scotchlite brand high-intensity white letters on green background. All letters shall be uppercase.

**201.8.02 Traffic Control Signage and Striping**

Traffic control signing and striping shall be in conformance with Detail No.'s R-1175, R-1180, and R-1185 of these standards and the MUTCD. A "Signage and Striping Plan" shall be included with plan submittals for new street construction and street improvements.

**201.9.00 LIGHTING**

All installation of streetlights shall be done in accordance with "Statement of Streetlight Installation Responsibilities," Option B, by PGE, revised March 1, 2001, or latest edition. The warranty for public works projects shall include streetlights.

**201.10.00 STREET ACCEPTANCE POLICY**

The City of Wilsonville will accept new public street installations or systems built to the "Public Works Standards," providing that the following conditions are met.

**201.10.01 Legal Recordings**

All plats are recorded with the County Surveyor, all easements and dedications are recorded with the County Recorder and the Engineering Department receives a reproducible copy of the recorded documents.

### **201.10.02 Project Completion**

After completion of construction of the total project, and after all testing has been satisfactorily completed, project closeout shall proceed as outlined in Section 101.8.17.a, "Project Completion."

### **201.10.03 Maintenance Period**

- a. The Contractor or Applicant shall be responsible for providing Maintenance Assurance for Public Improvements as outlined in Section 101.8.17.b, "Maintenance Assurance." Public street improvements shall be warranted for a minimum of one year; public landscape improvements shall be warranted for a minimum of two years.
- b. At any time during the warranty period, the City's authorized representative has reason to believe the public street improvements have defects that were the result of faulty workmanship or flaws in construction material, the responsible party shall be required, at that party's own cost, to repair any faults to the public street improvements deemed necessary by the City's authorized representative.
- c. Before the end of the Construction Maintenance period, the City's authorized representative shall inspect the project for any remaining deficiencies. If the deficiencies that remain are determined to be the responsibility of the contractor or the applicant, the contractor or applicant shall then make such repairs.
- d. The Landscape Maintenance assurance shall be released two years after acceptance of construction, providing the landscaping meets the 90% survival level (see Section 301.13.02, "Landscape Inspection for Warranty").

## SECTION 3

### STORMWATER & SURFACE WATER DESIGN AND CONSTRUCTION STANDARDS

#### 301.1.00 ENGINEERING

##### 301.1.01 Introduction

This section outlines design and construction requirements for stormwater and surface water management. The provisions and technical specifications herein set forth the requirements of the City of Wilsonville for constructing stormwater and surface water improvements. Interpretations of such provisions and their application in specific circumstances shall be made by the City's authorized representative. Refer to Section 1 of the "Public Works Standards" for general provisions and requirements.

Design guidelines established here are consistent with the City of Wilsonville Stormwater Master Plan. These provisions are intended to prevent or reduce adverse impacts to the drainage system and water resources of the Willamette River Basin. In combination with other federal, state, and local laws and ordinances, these requirements are intended to protect the beneficial uses of waters in the Willamette River Basin and inside the Wilsonville city limits.

##### 301.1.02 Alternative Design and Construction Standards

If approved by the City's authorized representative, alternative construction standards may be substituted for the standards specified herein. Any requests for substitution must be in writing, stamped by a Professional Engineer registered in the State of Oregon at the time of submittal, and submitted at least three weeks prior to the Engineering Plan Review submittal process.

##### 301.1.03 Extension of Public Storm Sewer Systems

Public storm sewer systems shall be extended to the most distant upstream parcel boundary or boundaries to accommodate current and future storm flows entering the property, unless otherwise approved by the City's authorized representative. Except as otherwise provided, the extension or upsizing of the public stormwater systems to serve any parcel or tract of land shall be done by, and at the expense of, the property owner or permit applicant. The City's authorized representative may require a storm pipeline that serves or may serve more than one property to be a public system.

#### 301.1.04      **Drainage Plans**

- a. It is the design engineer's responsibility to ensure that engineering plans are sufficiently clear and concise to construct the project in proper sequence, using specified methods and materials, with sufficient dimensions to fulfill the intent of the design guidelines in these standards.
- b. All elevation on design plans and record drawings shall be based on the applicable NAVD datum specified in Section 101.7.07.a, "Surveying and Land Monuments."
- c. All engineering drainage plans shall be stamped by a Professional Engineer registered in the State of Oregon. The drainage plan shall contain the following:
  1. At least one sheet showing a plan view of the entire project site. If the project site is sufficiently large that detailed drainage plans on any given sheet do not encompass the entire project site, then a sheet showing the plan view of the entire site must serve as an index to subsequent detailed plan sheets.
  2. A topographic map showing existing conditions for the site, including:
    - (a) Existing topography for the site.
    - (b) Adjacent streets, including street names.
    - (c) Existing utilities, including franchised utilities located above or below ground and drainage facilities that transport surface water onto, across, or from the project site. Existing drainage pipes, culverts, and channels shall include the invert or flowline elevations.
    - (d) Existing sensitive areas (e.g., ravines, swales, steep slopes, wells, springs, wetlands, creeks, lakes). For natural drainage features, show direction of flow, drainage hazard areas, and 100-year floodplain boundary (if applicable).
  3. Plans for proposed drainage improvements shall include the following:
    - (a) Finished grades, showing the extent of cut and fill by existing and proposed contours, profiles, or other designations.
    - (b) Proposed structures, including roads and road improvements, parking surfaces, building footprints, walkways, landscaped areas, etc.
    - (c) Proposed utilities, showing exact line and grade of all proposed utilities at crossings with the proposed drainage system.

- (d) Applicable detail drawings.
  - (e) Existing and proposed easements.
  - (f) Setbacks from environmentally sensitive areas or resource areas protected within the SROZ.
  - (g) Proposed drainage structures, including pipes, open channels, culverts, ponds, vaults, biofiltration swales, infiltration facilities, outfalls, riprap treatment, energy dissipaters, etc.
  - (h) Plan and profile of drainage conveyance facilities, including the following information: pipe sizes, pipe types and materials, lengths, slopes, type of structure (e.g. Type CG-30 catch basin), location of structures, invert elevations in/out of structures, and top elevations of structures. Notes shall be included for referencing details, cross-sections, profiles, etc.
  - (i) Any proposed phasing of construction. (Note: water quality and quantity facilities must be constructed before completion of any phased construction)
4. A detailed grading plan shall be provided for all open stormwater quantity or quality control facilities. The plan shall include the following:
- (a) Existing ground contours (shaded) and proposed ground contours at a minimum 2-foot contour interval. Slopes steeper than 6H:1V shall be identified.
  - (b) Location of top and toe of slope.
  - (c) Limits of embankment designed to impound water.
  - (d) Location of all drainage structures as well as any other piped utilities in vicinity (0.1-foot detail).
  - (e) Flow route of the secondary/emergency overflow system (0.1-foot detail).
  - (f) Maintenance access, as applicable (see Section 301.9.04, "Access").
5. A detailed landscape plan shall be provided for open stormwater quantity or quality control facilities. The plan shall include the following:
- (a) Final ground contours at a minimum 1-foot contour interval.
  - (b) Location of top and toe of slope.
  - (c) Maximum water surface elevations.

- (d) Location of all drainage structures as well as any other piped utilities in vicinity (screened) (0.1-foot detail).
  - (e) Limits of areas to receive amended topsoil.
  - (f) Irrigation plan to achieve the required plant survival rate.
  - (g) Planting species, locations and densities in accordance with the landscape requirements in Appendix B.
6. Cross-sections shall be provided for at least the following:
- (a) Detention/retention ponds (including parking lot ponds and other multiuse facilities), wet ponds, and sediment ponds. Cross-sections shall graphically illustrate the following:
    - (1) Design maximum water surface for the 2-year, 10-year, and 25-year design storms.
    - (2) Proposed dead storage water surface (as applicable).
    - (3) Pavement section or amended soil section, as applicable.
  - (b) Proposed ditches and swales, including vegetated swales.

**301.1.05 Storm Systems and Fish Passage**

For pipe systems that convey flows from a stream or through sensitive areas, a local representative of ODFW or other applicable state or federal agency shall be contacted to determine whether fish passage is required and to identify site-specific design criteria. All culverts shall be designed for fish passage in accordance with ODFW's *Fish Passage Criteria*, or latest edition, unless exempted by ODFW and the City.

**301.1.06 Surveying**

- a. The design engineer shall be responsible for establishing the location of the sewer using reference stakes offset along the sewer. No construction shall be allowed to begin before construction staking. All staking shall be performed by or under the direction of a Professional Land Surveyor registered in the State of Oregon.
- b. Stakes shall locate all public tees, cleanouts, manholes, catch basins, area drains, water quality stations, and pump stations. Maximum spacing for reference stakes is 50 feet. Stakes shall reference cuts or fills to all invert elevations and rim grades. The design engineer shall also be responsible for identifying easements during construction.

### **301.1.07 Hydrologic Analysis**

The hydrologic analysis shall be consistent with Section 301.3.00, "Hydrology and Hydraulics." The design engineer may use various computer models or formulas for the hydrograph analysis, but the City's authorized representative may verify the design flows and volumes based on King County's SBUH program HYD or as alternatively identified in Section 301.3.00, "Hydrology and Hydraulics."

### **301.2.00 HYDRAULIC ANALYSIS**

#### **301.2.01 General**

The method of hydraulic calculations shall be subject to approval from the City's authorized representative and shall be consistent with Section 301.3.00, "Hydrology and Hydraulics."

#### **301.2.02 Hydraulic Design**

- a. Detention/retention design shall be assessed by dynamic flow routing through the basin. Documentation of the proposed design shall be included in the drainage report. Acceptable analysis programs include:
  1. HYD – King County, Washington
  2. HEC-1 – U.S. Army Corps of Engineers
  3. HEC-HMS – U.S. Army Corps of Engineers
  4. SWMM – U.S. Environmental Protection Agency
  5. HYDRA – Pizer Incorporated
  6. HYDROCAD – HydroCAD Software Solutions
  7. Others, as approved
- b. Peak runoff rates shall not exceed predevelopment rates for the specific range of storms. Exemptions to the on-site detention requirements may be considered for situations in which properties discharge directly to the Willamette River or to open bodies of water that have no capacity limitations, or areas where detention in downstream reaches could increase peak stormwater flow rates, and other areas or unique circumstances as identified by the City Engineer.
- c. A pond overflow system shall provide for discharge of the design storm event without overtopping the pond embankment or exceeding the capacity of the

emergency spillway. Vortex valve discharge control shall be considered to optimize effective pond volume.

- d. Provide an emergency spillway sized to pass the 100-year storm event or an approved hydraulic equivalent. The emergency spillway shall be located in existing soils when feasible and armored with riprap embedded in concrete, or other approved erosion protection extending to the toe of the embankment (see Detail No. S-2275 of these standards).

### **301.2.03 Design Criteria**

- a. The facility can be a combined water quality/quantity facility, provided that it meets all relevant criteria.
- b. Interior sideslopes up to the maximum water surface = 4H:1V.
- c. Maximum exterior sideslopes = 2H:1V, unless analyzed for stability by a Professional Engineer registered in the State of Oregon whose area of expertise is geotechnical engineering.
- d. If slopes need to be mowed, maximum sideslope = 4H:1V
- e. Walls in Water Quality/Quantity Facilities
  1. Retaining walls may serve as pond walls if the design is prepared and stamped by a Professional Engineer registered in the State of Oregon and a fence (see Section 301.5.02.b.4) is provided along the top of the wall. At least 25% of the pond perimeter will be vegetated to a maximum side slope of 3:1.
  2. Walls that are 4 feet or higher must meet all of the following criteria:
    - (a) Be approved by a Professional Engineer registered in the State of Oregon whose area of expertise is structural or geotechnical engineering.
    - (b) The City shall not have maintenance responsibility for the wall. The party responsible for maintenance of the walls within the water quantity tract or easement shall be clearly documented in the City's Stormwater Maintenance Covenant and Access Easement.
- f. Overexcavate by a minimum of 20% to allow for sediment deposition.
- g. Minimum freeboard = 1 foot from 25-year design water surface elevation.
- h. Maximum water storage depth in water quality/quantity facilities for the 100-year storm event shall not exceed 4 feet in depth, unless otherwise approved by the City's authorized representative. Where design depth exceeds 4 feet,

the facility shall be constructed in conformance with public safety considerations (see Section 301.3.09.c).

- i. Provide approved outlet structure(s) for all flows up to the 100-year storm event.

#### **301.2.04 System Design Considerations**

Site development improvement projects shall address on-site and off-site drainage concerns, both upstream and downstream of a project, including but not limited to the following:

- a. Modifications to the existing on-site storm drainage facilities shall not restrict flows creating backwater onto off-site property to levels greater than the existing situation, unless approved by the impacted off-site property owners and the City's authorized representative. The off-site property owner(s) shall agree to and sign a permanent easement legally describing the location of the backwater storage and authorizing the use of their property for stormwater drainage and detention/retention purposes. The easement shall be in a form approved by the City.
- b. Storm drainage facilities shall be designed and constructed to accommodate all future full buildout flows generated by the proposed development or improvement and all upstream property based on the most recent approved comprehensive land-use plan.
- c. The design of storm drainage facilities shall analyze the impact of restrictions downstream of the project site, in accordance with Section 301.2.05, "Review of Downstream System." Downstream restrictions that create on-site backwater may be required to be removed by the applicant, at the discretion of the City's authorized representative, or the on-site backwater shall be addressed in the design of the development's storm system. The removal of downstream obstructions shall not be allowed if removal would create downstream capacity problems.
- d. If the projected increase in the surface water runoff from a proposed development will cause or contribute to damage from flooding to existing buildings or dwellings, the downstream stormwater system shall be enlarged to relieve the identified flooding condition before development, or the applicant shall construct an on-site detention/retention facility.

#### **301.2.05 Review of Downstream System**

- a. The design engineer for each development that establishes or increases the impervious surface area by more than 5,000 square feet shall submit documentation for review and approval by the City's authorized representative, of the downstream capacity of any existing storm facilities impacted by the proposed development, except for the construction of a

detached single-family dwelling or duplex. The design engineer must perform a two-stage analysis of the drainage system downstream of the development.

1. The analysis shall extend downstream to a point in the drainage system where the additional flow from the proposed development site constitutes 10% or less of the total tributary drainage flow (for example, the analysis point for a 10-acre site would be analyzed to the nearest downstream point with a drainage area of 100 acres).
2. When the additional flow from the proposed development drops to less than 10% of the total tributary drainage flow, the analysis will continue for the lesser of the following:
  - (a) One-quarter of a mile; or
  - (b) Until the additional flow constitutes less than 5% of the total tributary drainage flow.
- b. When the downstream analysis does not continue for at least  $\frac{1}{4}$  mile, the design engineer shall provide a stamped Certification of Investigation stating that he/she has visually investigated the downstream system for at least  $\frac{1}{4}$  mile and is aware of no observable downstream impacts to structures.

#### **301.2.06 Conveyance System Hydraulic Standards**

- a. The conveyance system shall be designed to convey and contain at least the peak runoff for the 25-year design storm.
- b. Structures for proposed pipe systems must be demonstrated to provide a minimum of 1 foot of freeboard between the hydraulic grade line and the top of the structure or finish grade above pipe for the 25-year post-development peak rate of runoff.
- c. Design surcharge in new pipe systems shall not be allowed if it will cause flooding in a habitable structure, including below-floor crawl spaces.
- d. The 25-year design shall be supplemented with an overland conveyance component demonstrating how a 100-year event will be accommodated. The overland component shall not be allowed to flow through or inundate an existing building.
- e. Flows in streets during the 25-year event shall not run deeper than 4 inches against the curb or extend more than 2 feet into the travel lane.
- f. Open channel systems shall be designed for minimum 1-foot freeboard from bank full, provided that no structures are impacted by the design water surface elevation.

### **301.2.07 Catch Basin System Standards**

Design of catch basins and drain inlets shall follow the specifications provided in Section 301.9.07, "Drain Inlet Design Standards."

- a. **Standard Catch Basin System:** All catch basins shall be sumped. The main storm line shall not pass through any catch basins or sumped manholes unless approved by the City's authorized representative. No more than three catch basins may be connected in a series before connecting to the main storm line. A ditch inlet or field inlet may be connected directly to the end of the main storm line.
- b. **Series Catch Basin System:** Unsumped catch basins are allowed, provided that a sumped manhole is constructed below the unsumped catch basins before the flow enters the main storm line. No more than three unsumped catch basins may be constructed above a water quality or stormwater pretreatment manhole. The main storm line may not pass through the catch basins or sumped manholes. No ditch inlet or field inlet may be part of a series of unsumped catch basins.
- c. **Flow-through Catch Basin System:** This system is allowed within an arterial or collector road, provided that the mainline storm pipe has a design velocity of at least 3 feet per second. Unsumped catch basins, ditch inlets, and field inlets are allowed to connect directly to the main storm line. An adequately sized water quality manhole is required at the downstream end of the flow-through system.

### **301.3.00 HYDROLOGY AND HYDRAULICS**

#### **301.3.01 Hydrologic Analysis**

This section describes acceptable methods of estimating the quantity and characteristics of surface water runoff, as well as the assumptions and data required as input to the methods. These methods shall be used to analyze existing and to design proposed drainage systems and related facilities.

#### **301.3.02 Rational Method**

The rational method for analyzing small drainage basins is allowed, with the following limitations:

- a. Use it only in predicting a conservative peak flow rate to be used in determining the required capacity for conveyance elements.
- b. Drainage subbasin area cannot exceed 25 acres for a single calculation without approval from the City's authorized representative.

- c. The time of concentration shall be five minutes when computed to be less than five minutes.
- d. Rainfall intensities shall be from **Table 3.1**, or an alternative approved by the City's authorized representative.
- e. Rational formula:

$$Q=C*I*A$$

Where: Q = Flow in cubic feet per second  
 C = Runoff coefficient (0.9 for paved surfaces)  
 I = Intensity  
 A = Area in acres

**Table 3.1. RATIONAL METHOD FOR DERIVING RAINFALL INTENSITIES'**  
 (inches per hour)

| Time of Concentration (minutes) | Storm Event (year and probability) |         |          |         |         |          |
|---------------------------------|------------------------------------|---------|----------|---------|---------|----------|
|                                 | 2 (50%)                            | 5 (20%) | 10 (10%) | 25 (4%) | 50 (2%) | 100 (1%) |
| 0                               | 1.90                               | 2.50    | 3.00     | 3.40    | 4.00    | 4.50     |
| 5                               | 1.90                               | 2.50    | 3.00     | 3.40    | 4.00    | 4.50     |
| 10                              | 1.30                               | 1.70    | 2.20     | 2.50    | 3.00    | 3.50     |
| 15                              | 1.10                               | 1.40    | 1.80     | 2.10    | 2.50    | 2.90     |
| 20                              | 0.90                               | 1.20    | 1.50     | 1.80    | 2.10    | 2.40     |
| 30                              | 0.75                               | 0.95    | 1.20     | 1.40    | 1.65    | 1.90     |
| 40                              | 0.60                               | 0.75    | 1.00     | 1.15    | 1.30    | 1.60     |
| 50                              | 0.55                               | 0.70    | 0.85     | 1.00    | 1.15    | 1.35     |
| 70                              | 0.45                               | 0.55    | 0.70     | 0.82    | 0.95    | 1.10     |
| 100                             | 0.40                               | 0.45    | 0.55     | 0.67    | 0.75    | 0.90     |
| 180 or more                     | 0.35                               | 0.40    | 0.50     | 0.60    | 0.70    | 0.85     |

1. Data for east Washington County; data from CleanWater Services.

**301.3.03 Unit Hydrograph Methods**

- a. **Hydrograph Analysis:** To obtain a realistic and consistent hydrologic analysis for each development site, all developments shall use the hydrograph analysis method for drainage planning and design unless otherwise approved in advance by the City's authorized representative. The physical characteristics of the site and the design storm shall be used to determine the magnitude, volume, and duration of the runoff hydrograph. The Santa

Barbara Urban Hydrograph (SBUH) will be the primary acceptable unit hydrograph method.

The HYD computer program, developed by King County, Washington, in its "Surface Water Design Manual," January 1990, uses these methods to generate, add, and route hydrographs. The City's authorized representative may check all hydrologic calculations using the King County HYD program. However, the City will allow the use of the rational method for analysis of drainage basins of 25 acres or less.

- b. **Design Storm:** Return frequency and duration specify the design storm event. The design storms shall be based on two parameters:
  - 1. Total rainfall (depth in inches).
  - 2. Rainfall distribution (dimensionless).
- c. **Design Storm Distribution:** The total depth of rainfall for storms of 24-hour duration is shown in **Table 3.2**. The rainfall distribution to be used in the City is the design storm of 24-hour duration based on the standard National Resource Conservation Service (NRCS), formerly known as the Soil Conservation Service (SCS), type 1A rainfall distribution using **Table 3.3**.

**Table 3.2. RAINFALL DISTRIBUTION**

| Recurrence Interval<br>(years) | Total Precipitation<br>Depth (inches) |
|--------------------------------|---------------------------------------|
| 2                              | 2.50                                  |
| 5                              | 3.10                                  |
| 10                             | 3.45                                  |
| 25                             | 3.90                                  |
| 50                             | 4.20                                  |
| 100                            | 4.50                                  |

**Table 3.3. DESIGN STORM DISTRIBUTION CHART<sup>1</sup>**

| Hour | Percent Rainfall |            | Rainfall Depth (inches) |              |               |               |               |                |
|------|------------------|------------|-------------------------|--------------|---------------|---------------|---------------|----------------|
|      |                  |            | 2-Year Storm            | 5-Year Storm | 10-Year Storm | 25-Year Storm | 50-Year Storm | 100-Year Storm |
|      | Incremental      | Cumulative | 2.50                    | 3.10         | 3.45          | 3.90          | 4.20          | 4.50           |
| 1    | 2.40             | 2.40       | 0.06                    | 0.07         | 0.08          | 0.09          | 0.10          | 0.11           |
| 2    | 2.60             | 5.00       | 0.07                    | 0.08         | 0.09          | 0.10          | 0.11          | 0.12           |
| 3    | 3.20             | 8.20       | 0.80                    | 0.10         | 0.11          | 0.12          | 0.13          | 0.14           |
| 4    | 3.80             | 12.00      | 0.10                    | 0.12         | 0.13          | 0.15          | 0.16          | 0.17           |
| 5    | 4.44             | 16.44      | 0.11                    | 0.14         | 0.15          | 0.17          | 0.19          | 0.20           |
| 6    | 5.18             | 21.62      | 0.13                    | 0.16         | 0.18          | 0.20          | 0.22          | 0.23           |
| 7    | 6.48             | 28.10      | 0.16                    | 0.20         | 0.22          | 0.25          | 0.27          | 0.29           |
| 8    | 16.44            | 44.54      | 0.41                    | 0.51         | 0.57          | 0.64          | 0.69          | 0.74           |
| 9    | 7.58             | 52.12      | 0.19                    | 0.23         | 0.26          | 0.30          | 0.32          | 0.34           |
| 10   | 5.28             | 57.40      | 0.13                    | 0.16         | 0.18          | 0.21          | 0.22          | 0.24           |
| 11   | 4.96             | 62.36      | 0.12                    | 0.15         | 0.17          | 0.19          | 0.21          | 0.22           |
| 12   | 4.32             | 66.68      | 0.11                    | 0.13         | 0.15          | 0.17          | 0.18          | 0.19           |
| 13   | 4.02             | 70.70      | 0.10                    | 0.12         | 0.14          | 0.16          | 0.17          | 0.18           |
| 14   | 3.42             | 74.12      | 0.09                    | 0.11         | 0.12          | 0.13          | 0.14          | 0.15           |
| 15   | 3.28             | 77.40      | 0.08                    | 0.10         | 0.11          | 0.13          | 0.14          | 0.15           |
| 16   | 3.00             | 80.40      | 0.08                    | 0.09         | 0.10          | 0.12          | 0.13          | 0.14           |
| 17   | 2.80             | 83.20      | 0.07                    | 0.09         | 0.10          | 0.11          | 0.12          | 0.13           |
| 18   | 2.40             | 85.60      | 0.06                    | 0.07         | 0.08          | 0.09          | 0.10          | 0.11           |
| 19   | 2.40             | 88.00      | 0.06                    | 0.07         | 0.08          | 0.09          | 0.10          | 0.11           |
| 20   | 2.40             | 90.40      | 0.06                    | 0.07         | 0.08          | 0.09          | 0.10          | 0.11           |
| 21   | 2.40             | 92.80      | 0.06                    | 0.07         | 0.08          | 0.09          | 0.40          | 0.11           |
| 22   | 2.40             | 95.20      | 0.06                    | 0.07         | 0.08          | 0.09          | 0.10          | 0.11           |
| 23   | 2.40             | 97.60      | 0.06                    | 0.07         | 0.08          | 0.09          | 0.10          | 0.11           |
| 24   | 2.40             | 100.00     | 0.06                    | 0.07         | 0.08          | 0.09          | 0.10          | 0.11           |

1. Source: *Subbasin Hydrologic Modeling Criteria*, Kramer, Chin, & Mayo, Inc. 1991.

- d. **Runoff Parameters:** The physical drainage basin characteristics listed below shall be used to develop the runoff hydrograph.

**1. Area**

- (a). To obtain the highest degree of accuracy in hydrograph analysis requires the proper selection of homogeneous basin areas. Significant differences in land use in a given basin must be addressed by dividing the basin area into subbasin areas of similar land use or runoff characteristics. Hydrographs shall be computed for each subbasin area and superimposed to form the total runoff hydrograph for the basin.
- (b). All pervious and impervious areas within a given basin or subbasin shall be analyzed separately. This may be done by either computing separate hydrographs or computing the precipitation excess. The total precipitation excess is then used to develop the runoff hydrograph. By analyzing pervious and impervious areas separately, the cumulative errors associated with averaging these areas are avoided, and the true shape of the runoff hydrograph is better approximated.

**2. Selection of Curve Number**

- (a) The NRCS has developed CN values based on soil type and land use. The combination of these two factors is called the "soil-cover complex."
- (b) Soil-cover complexes have been assigned to one of four hydrologic soil groups, according to their runoff characteristics. Soil hydrologic groups may be found in Table 14, *Soil Survey of Clackamas County, Oregon* (SCS, November 1985) or Table 13, *Soil Survey of Washington County, Oregon* (SCS July 1982).
- (1) Many factors can affect the CN value for a given land use. For example, the movement of heavy equipment over bare ground may compact the soil so that it has a lower infiltration rate and greater runoff potential.
- (2) CN values can be area-weighted when they apply to pervious areas of similar CN (within 20 CN points). However, high CN areas shall not be combined with low CN areas (unless the low CN areas are less than 15% of the subbasin).
- (3) Antecedent soil moisture values shall be considered. Soil shall be considered to be saturated before the start of a precipitation event.

### 3. NRCS Curve Number Equations:

- (a) The rainfall-runoff equations of the NRCS curve number method relate a land area's runoff depth (precipitation excess) to the precipitation it receives and to its natural storage capacity, as follows:

$$Q_d = (P_R - 0.2S)^2 / (P_R + 0.8S), \text{ for } P_R > 0.2S$$

and

$$Q_d = 0, \text{ for } P_R < 0.2S$$

where  $Q_d$  = runoff depth in inches over the area.

$P_R$  = precipitation depth in inches over the area.

$S$  = potential maximum natural detention/retention, in inches over the area, due to infiltration, storage, etc.

The area's potential maximum detention/retention,  $S$ , is related to its curve number,  $CN$ :

$$S = (1000/CN) - 10$$

The computed runoff represents inches over the tributary area. Therefore, the total volume of runoff is found by multiplying  $Q_d$  by the area (with necessary conversions):

$$\text{Total runoff volume (cf)} = Q_d \text{ (in)} \times A \text{ (ac)} \times 3,630 \text{ (ft}^3\text{/(ac-in))}$$

- (b) **Time of Concentration:** Time of concentration ( $T_c$ ) is the time for runoff to travel from the hydraulically most distant point of the watershed to the point where the hydrograph is to be calculated. Travel time ( $T_t$ ) is the time it takes water to travel from one location to another in a watershed.  $T_t$  is a component of  $T_c$ .  $T_c$  is computed by summing all the travel times for consecutive components of the drainage conveyance system.  $T_c$  influences the shape and peak of the runoff hydrograph.

- (1) **Sheet Flow:** Sheet flow is flow over plane surfaces. It usually occurs in the headwater of streams. For sheet flow up to 300 feet, use the kinematics solution below to directly compute  $T_t$ :

$$T_1 = (0.93L^{0.6} \times n^{0.3}) / (I^{0.4} \times S^{0.3})$$

where  $T_1$  = travel time (minutes).

$n$  = Manning's effective roughness coefficient for sheet flow.

$L$  = flow length (feet).

$I$  = rainfall intensity (inches per hour).

$S$  = slope of hydraulic grade line (feet per foot [ft/ft])

Sheet flow shall not be used for distances over 300 feet.

(2) **Shallow Concentrated Flow:** For slopes less than 0.005 ft/ft (0.5%), the following equations can be used:

(a) For unpaved surfaces:  $V = 16.1345 (S)^{0.5}$

(b) For paved surfaces:  $V = 20.3282 (S)^{0.5}$

where  $V$  = velocity (feet per second).

$S$  = slope (ft/ft).

(3) **Channel Flow:** A commonly used method of computing average velocity of flow, once it has measurable depth, is the following equation:

$$V = (1.486/n) \times R^{0.6} \times S^{0.5}$$

where  $V$  = velocity (ft/s).

$n$  = Manning's roughness coefficient.

$S$  = slope of flow path (ft/ft).

$R$  = area/perimeter.

### 301.3.04 Water Quality Volume and Flow

The water quality storm is the storm required by regulations to be treated. The storm defines both the volume and rate of runoff.

- a. Water Quality Storm: Total precipitation of 0.36 inches falling in four hours, with a storm return period of 96 hours.
- b. Water Quality Volume (WQV) is the volume of water that is produced by the water quality storm. WQV is equal to 0.36 inches of rainfall over 100% of the new impervious area:

$$\text{Water quality volume (cf)} = \frac{0.36(\text{in}) \times \text{area (sf)}}{12 (\text{in./ft})}$$

- c. Water Quality Flow (WQF) is the average design flow anticipated from the water quality storm:

$$\text{Water quality flow (cfs)} = \frac{\text{Water quality volume (cf)}}{14,400 \text{ sec}}$$

or

$$\text{Water quality flow (cfs)} = \frac{0.36(\text{in}) \times \text{area (sf)}}{12(\text{in/ft})(4 \text{ hr})(60 \text{ min/hr})(60 \text{ sec/min})}$$

### 301.3.05 Hydraulics

Catch Basins and inlets collect water from an adjacent ditch, gutter line, or pavement and convey the water to a storm sewer or culvert. The inlet systems are to be designed in accordance with the following criteria:

- a. Section 301.9.07, "Drain Inlet Design Standards."
- b. The following sources shall be used to locate catch basins and inlets:
  1. ODOT's "Hydraulics Manual."
  2. Hydraulic Engineering Circular 12 (Federal Highway Administration, FHWA-84-202), "Drainage of Highway Pavements."

### 301.3.06 Area Drains

The maximum acceptable intake flow rate for Type II area drains (see Detail No. S-2110 and S-2115 of these standards) and ditch inlets is shown in **Table 3.4**.

**Table 3.4. INTAKE FLOW RATE, GRATE ANGLE 30 DEGREES**

|                                  |     |     |      |      |      |      |      |      |      |      |
|----------------------------------|-----|-----|------|------|------|------|------|------|------|------|
| Hydraulic Head (ft) <sup>1</sup> | 0.5 | 1.0 | 1.5  | 2.0  | 2.5  | 3.0  | 4.0  | 5.0  | 7.0  | 10.0 |
| Flow Rate (cfs) <sup>2</sup>     | 2.0 | 5.6 | 10.3 | 11.9 | 13.3 | 14.6 | 16.8 | 18.8 | 22.3 | 26.6 |

<sup>1</sup>Measured from bottom of grate to headwater.

<sup>2</sup>Cubic feet per second.

### 301.3.07 Channel Protection

Open channels shall be designed to prevent long-term scouring of the channel. Where rip rap protection is specified, rip rap protection shall be placed over a filter fabric base or a minimum 6-inch thick gravel base. **Table 3.5** provides additional design guidance for the design engineer; however, the design engineer is, as always, responsible for the final design.

**Table 3.5. CHANNEL PROTECTION, NEW CHANNEL CONSTRUCTION**

| Velocity at Design Flow<br>(feet per second) |                          | Required Protection                                                       | Thickness<br>(feet) | Minimum<br>Height Above<br>Design Water<br>Surface (feet) |
|----------------------------------------------|--------------------------|---------------------------------------------------------------------------|---------------------|-----------------------------------------------------------|
| Greater<br>Than                              | Less Than or<br>Equal to |                                                                           |                     |                                                           |
| 0                                            | 5                        | Vegetation lining                                                         | N/A                 | 0.5                                                       |
| 5                                            | 8                        | Bioengineered lining <sup>1</sup> or<br>ODOT Class 50 riprap <sup>2</sup> | N/A<br>1.5          | 1                                                         |
| 8                                            | 12                       | ODOT Class 200 riprap <sup>2</sup>                                        | 2.5                 | 2                                                         |
| 12                                           | 20                       | Slope mattress, etc. <sup>3</sup>                                         | Varies              | 2                                                         |

<sup>1</sup>Bioengineered lining allowed for flows between 5 and 8 feet per second.

<sup>2</sup>ODOT riprap class in English units

<sup>3</sup>For high-velocity channels, engineering calculations are to be submitted to the City's authorized representative for review and approval.

**301.3.08 Outfall Protection**

Storm system outfalls shall be designed to prevent scouring at, or in association with, the outfall discharge and provide velocity reduction before discharge to the receiving channel. Engineered energy-dissipaters shall be required for outfalls with design flow discharge velocities greater than 3 feet per second (fps). **Table 3.6** provides design guidance for the design engineer; however, the design engineer is, as always, responsible for the final design.

**Table 3.6. ROCK PROTECTION**

| Discharge<br>Velocity at<br>Design<br>Flow<br>(fps) | Required Protection (Minimum Dimension) |                        |                                                          |                                             |                 |
|-----------------------------------------------------|-----------------------------------------|------------------------|----------------------------------------------------------|---------------------------------------------|-----------------|
|                                                     | Type                                    | Thickness <sup>2</sup> | Width                                                    | Length                                      | Height          |
| 0 to 5                                              | ODOT Class<br>50 riprap <sup>1</sup>    | 1.5 ft                 | Diameter + 6 ft                                          | 8 ft or 4 x diameter,<br>whichever greater  | Crown<br>+ 1 ft |
| 5 to 10                                             | ODOT Class<br>200 riprap <sup>1</sup>   | 2.5 ft                 | Diameter + 6 ft or<br>3 x diameter,<br>whichever greater | 12 ft or 4 x diameter,<br>whichever greater | Crown<br>+ 1 ft |
| Greater<br>than 10                                  | Designed<br>system <sup>3</sup>         | As required            | As required                                              | As required                                 | Crown<br>+ 1 ft |

<sup>1</sup>ODOT riprap class in English units.

<sup>2</sup>Riprap shall be grouted in place (see Detail No. S-2225 or S-2275 of these standards).

<sup>3</sup>For high-velocity outfalls, engineering calculations are to be submitted to the City's authorized representative for review and approval.

### **301.3.09 Detention/Retention Facility Protection**

- a. Stormwater quantity detention/retention facilities and stormwater quality facilities shall be designed to prevent scouring at the inflow structure(s) by use of an engineered energy-dissipating device such as a Swale Inflow Spreader (see Detail No. S-2225 of these standards) or other method approved by the City's authorized representative.
- b. The nearest upstream manhole from a stormwater quantity detention/retention pond or swale shall be a stormwater pretreatment manhole conforming to Detail No. S-2050 of these standards.
- c. Safety
  1. Stormwater facilities shall include a vegetated buffer or a safety bench.
  2. Sideslopes in stormwater facilities shall not exceed 4H:1V up to the maximum design water elevation.
  3. Stormwater facilities shall be posted with warning signs that prohibit swimming or wading.
  4. Where fencing is required by federal, state, and local laws and ordinances for public safety considerations or security reasons, the fencing shall be aesthetically designed. No barbed wire fencing shall be used.

### **301.3.10 Drainage Report**

- a. The drainage report shall be on 8½-by-11 paper. Maps shall be folded to 8½-by-11 size unless another format is approved before the report is submitted.
- b. The drainage report shall be prepared by and bear the seal and original signature of a Professional Engineer registered in the State of Oregon and shall contain the following information:
  1. Cover sheet, including the project name, project tracking number (Planning DB No.), applicant's name, address, and telephone number, design engineer's name, and date of submittal.
  2. Table of contents, with page numbers for each section of the report, including exhibits, appendices, and attachments.
  3. Vicinity Map.
  4. Project description, specifying type of permit(s) for which the applicant is applying, size and location of the project site, address or parcel number, legal description of the property, and property zoning. Also describe other permits required (e.g., Corps of Engineers 404 fill permit). Describe the

project, including proposed land use, proposed site improvements, proposed construction of impervious surfaces, proposed landscaping, and special circumstances.

5. Existing Conditions

- (a) Describe existing site conditions and relevant hydrological conditions, including but not limited to the following:
  - (1) Project site topography.
  - (2) Land cover and land use.
  - (3) Abutting property land cover, land use, and ownership information.
  - (4) Off-site drainage to the property.
  - (5) Natural and constructed channels.
  - (6) Wetlands, creeks, ravines, gullies, steep slopes, springs, and other sensitive areas on or adjacent to the project site.
- (b) General soil conditions in the project site, using SCS soil designations.
- (c) Points of discharge for existing drainage from the project site.
- (d) References to relevant reports, such as basin plans, flood studies, groundwater studies, wetland designations, watershed plans, subbasin master plans, sensitive area designation, environmental assessments, water quality reports, or other relevant documents. Where such reports impose additional conditions on the applicant, those conditions shall be included in the report.
- (e) Soils report(s), where applicable.
- (f) Hydrologic analysis, pursuant to Section 301.3.01, "Hydrologic Analysis."
- (g) Basin map(s), showing boundaries of project, any off-site contributing drainage basins, on-site drainage basins, approximate locations of all major drainage structures in the basins, and depicting the course of stormwater originating from the subject property and extending to the closest receiving body of water. Reference the source of the topographic base map (e.g., USGS), the scale of the map, and include a north arrow.

- (h) Description of drainage basin(s) to which the project site contributes runoff, and identification of the receiving waters for each basin.

## 6. Developed Conditions

- (a) Developed site drainage conditions: Describe the land cover resulting from the proposed project; describe the potential stormwater quantity and quality impacts resulting from the proposed project; describe the proposed methods for collection and conveyance of runoff from the project site, for the control of any increase in stormwater quantity resulting from the development, and for maintaining stormwater quality.
- (b) Description of upstream and downstream basins, identifying any sources of runoff to the project site. Description shall be based on field investigation. Any existing drainage or erosion issues upstream that may affect the proposed development shall be noted.
- (c) Downstream analysis.
- (d) Hydraulic design computations, supporting the design of all proposed stormwater conveyance, quantity and quality control facilities, and verifying the capacity of existing and proposed drainage facilities. These computations may include capacity and backwater analysis required either as part of the proposed drainage design or as part of the downstream drainage investigation, and flood routing computations required for the design of detention/retention storage facilities, for wetland impact analysis, or for floodplain analysis. Include a description of how the stormwater system will function during the water quality storm, 2-year storm, 10-year storm, 25-year storm, and 100-year storm.
- (e) Operation and maintenance manual, required for privately owned and maintained stormwater quantity and quality control facilities. The manual will be an attachment to the City's Stormwater Maintenance Covenant and Access Easement.
- (f) Appendices shall include necessary technical information.

### **301.4.00 WATER QUANTITY FACILITY DESIGN**

#### **301.4.01 Mitigation Requirement for Quantity**

Each new development is responsible for mitigating its impacts on the public stormwater system. The City's authorized representative shall determine which of the following techniques may be used to satisfy this requirement. Mitigation requirements shall meet applicable federal, state, and local standards and regulations.

- a. Construction of permanent on-site stormwater quantity detention/retention facilities, designed in accordance with Section 301.5.00, "Water Quality Facility Design."
- b. Enlargement or improvement of the downstream conveyance system shall be done in accordance with Section 301.5.00, "Water Quality Facility Design."

#### **301.4.02 Criteria for Requiring On-Site Detention/Retention**

On-site facilities shall be constructed when any of the following conditions exist:

- a. The proposed development establishes or increases the impervious surface area by more than 5,000 square feet. Development includes new development, redevelopment, and/or partial redevelopment.
- b. There is an identified downstream deficiency, and detention/retention rather than conveyance system enlargement is determined to be the more effective solution.
- c. There is an identified regional detention/retention site within the boundary of the development.
- d. A site within the boundary of the development would qualify as a regional detention/retention site under the criteria or capital plan adopted by the City.
- e. Water quantity facilities are required by City-adopted stormwater master plans or adopted subbasin master plans.

#### **301.4.03 Water Quantity Facility Design Criteria**

- a. When required, stormwater quantity on-site detention/retention facilities shall be designed to capture runoff so the post-development runoff rates from the site do not exceed the predevelopment runoff rates, based on a 2- through 25-year, 24-hour return storm. Specifically, the 2-, 10-, and 25-year post-development runoff rates shall not exceed their respective 2-, 10-, and 25-year predevelopment runoff rates; unless other criteria are identified in an adopted stormwater master plan or subbasin master plan.
- b. Water quantity facilities shall be designed to include inlet energy dissipation (in conformance with section 301.3.09.a) and a sediment forebay. The sediment forebay shall consist of an area in which heavier sediments can accumulate and receive periodic maintenance to remove these sediments. The forebay size shall be engineered with respect to the anticipated flow rate, and have a durable surface, such as concrete or rock, suitable for periodic maintenance. A minimum size of 20 square feet of water area is anticipated. Some type of barrier shall separate the forebay area from the main area of the water quantity facility. The invert of the incoming storm drain pipe shall be set at or above the top of the forebay barrier elevation and shall consider the

pipe wall thickness. Pond inlets with a drainage area of less than one third-acre ( $\frac{1}{3}$  AC) may not require a sediment forebay.

- c. Water quantity facilities shall be designed to allow for proper functioning with full sediment accumulation as allowed in Section 301.6.06.b.2, "Sediment Management/Pollutant Control, Requirements."
- d. When required because of an identified downstream deficiency, stormwater quantity on-site detention/retention facilities shall be designed so the peak runoff rates will not exceed predevelopment rates for the range of storms that cause the downstream deficiency.
- e. The average, wet-season groundwater elevation shall be determined for the proposed stormwater quantity facility. Groundwater elevation may be established through measurements at existing wells, installation of piezometer(s), or other methods approved by the City's authorized representative. The facility shall be designed to exclude detention/retention capacity below the established wet-season groundwater elevation.
- f. Water quantity facilities in which water is in direct contact with the soil must be lined with either a low permeability liner or a treatment liner when the soil does not have properties which reduce the risk of groundwater contamination from stormwater runoff that may infiltrate in the facility. Liners shall be designed in accordance with Appendix E, "Water Quality Facility Liners."
- g. Construction of on-site detention/retention facility shall not be allowed as an option if such a facility would have an adverse effect on receiving waters in the basin or subbasin in the event of flooding, or would increase the chance or severity of flooding problems downstream of the site.
- h. No water quantity facility shall be built in a public easement or right-of-way unless approved by the City's authorized representative, or be located in an area designed or used for vehicular parking.
- i. Vegetation shall be planted in accordance with Appendix B, "Landscape Requirements."
- j. Water Quantity Facilities shall be constructed in conformance with Section 301.2.03 .
- k. Water Quantity Facilities shall be constructed in conformance with public safety considerations (see Section 301.3.09.c).
- l. Stormwater quantity facilities shall be protected in conformance with Section 301.3.09, "Detention/Retention Facility Protection."
- m. Access roads to stormwater facilities shall be in conformance with Section 301.4.04, "Access Road Design."

#### 301.4.04 Access Road Design

Access roads are for maintenance and inspection purposes. All-weather access shall be provided for the entire perimeter of the stormwater facility, unless otherwise approved by the City's authorized representative. At a minimum, access shall be provided for maintenance and inspection of the inflow and outflow structures of the facility. The following criteria are the minimum City requirements:

- a. Three inches of Class C AC; over 8 inches of ¾"-0" compacted crushed aggregate; over firm subgrade. Crushed aggregate and subgrade shall be compacted to 95% of maximum dry density, as determined by AASHTO T-180.

*or*

The design engineer may submit a certified road design capable of supporting a 30-ton maintenance vehicle in all weather conditions.

- b. The plan shall include design of strengthened sidewalk sections where maintenance vehicles will cross.
- c. Maximum grade: 15% with a maximum 3% cross-slope.
- d. Minimum width: 15 feet on straight runs and curves. Curves shall be designed with a minimum 40-foot interior radius.
- e. A 2-foot wide gravel shoulder shall be provided on the facility side of the access road.
- f. Access shall extend to within 10 feet of all control structures, unless otherwise approved by the City's authorized representative.
- g. If fencing is required for public safety or security reasons (see Section 301.3.09.c.4), the fence shall include a 12-foot-wide lockable gate for maintenance access.

#### 301.4.05 Flood Management Design Standards

- a. **Purpose:** The purpose of these standards is to reduce the risk of flooding, prevent or reduce the risk to human life and property, and maintain the functions and values of floodplains, such as allowing for the storage and conveyance of stream flows through existing and natural flood conveyance systems.
- b. **Flood Management Areas Defined:** Flood management areas shall include, but are not limited to, the following:

1. Land identified within the 100-year floodplain and floodway, as shown on the Federal Emergency Management Agency (FEMA) flood insurance maps.
  2. Land identified in updated flood studies or any other authoritative data documenting flood elevations, as approved by the City. The design engineer shall use the most recent and technically accurate information available to determine flood areas.
- c. **Flood Plain Delineation:** In areas of the City where the 100-yr flood plain has not been defined as per Section 301.4.05.b, "Flood Management Areas Defined," the City Engineer may require a study to delineate the 100-yr flood plain prior to development of a site to access the potential impact to upstream or downstream properties.
- d. **Design Criteria:** Design and construction of improvements within the 100-yr flood plain shall be in conformance with these Standards, Section 4.172, "Flood Plain Regulations" of the Wilsonville City Code, and all applicable federal, state, and local statutes and rules governing floodplains and flood hazard areas.
1. All fill placed in a floodplain shall be balanced with an equal amount of removed soil material and shall not decrease the floodplain storage capacity at any stage of a flood (2-, 10-, 25-, or 100-year event). No net fill in any floodplain is allowed except when all of the following conditions are met:
    - (a) When an area has received special protection from floodplain improvement projects that lower the floodplain or otherwise protect affected properties.
    - (b) Where the exceptions comply with adopted master plans, watershed management plans, or subbasin plans, if any.
    - (c) When all required permits and approvals have been obtained in compliance with FEMA rules and other local, state, and federal laws regarding fill in floodplains.
  2. Large areas may not be excavated to gain a small amount of fill in a floodplain. Excavation areas shall not exceed the fill areas by more than 50% of the square footage, unless approved by the City's authorized representative.
  3. Any excavation dug below the winter low-water elevation shall not count toward compensating for fill, because those areas would be full of water in the winter and not available to hold stormwater after a rain. Winter low-water elevation is defined as the water surface elevation during the winter when it has not rained for at least three days, and the flows resulting from

storms have receded. The elevation can be determined from records, studies, or field observation. Any fill placed above the 100-year floodplain will not count toward the fill volume.

4. The excavated area must be designed to drain if it is an area identified to be dry in the summer, e.g., if it is used for a park or mowed in the summer. Excavated areas identified to remain wet in the summer, such as a constructed wetland, shall be designed not to drain. For areas that are to drain, the lowest elevation shall be at least 6 inches above the winter low-water elevation, and sloped to drain. Slopes of 1% will be allowed in areas of less than 1,000 square feet.
5. Excavation to balance a fill shall be on the same parcel as the fill unless it is not reasonable or practicable to do so. In such cases, the excavation shall be in the same drainage basin, within points of constriction on the conveyance system, if any, as near as practical to the fill site, and shall be constructed as a part of the same development project.
6. Temporary fills permitted during construction shall be removed at the completion of construction and before the close of the in-stream work window, as defined by the ODFW or federal, state, or other local authority.
7. Excavation and fill required for the construction of detention/retention facilities or other facilities, such as levees, shall be specifically designed to reduce or mitigate flood impacts. Levees shall not be used to create vacant buildable land.
8. Excavation and fill required to restore or enhance floodplains, riparian areas, wetlands, uplands, and streams, including but not limited to the planting of vegetation and daylighting of existing storm pipes, shall be permitted as long as the design complies with applicable federal, state, and local standards.
9. The floodplain may not be modified to increase water velocities such that streambank erosion will be increased, unless the streambanks are protected to prevent the increased erosion.
10. Uncontained areas of hazardous materials, as defined by the Oregon DEQ, are prohibited in flood management areas.
11. Any proposed work within, or modification to, a floodway must be certified by a Professional Engineer registered in the State of Oregon as to how it conforms to these standards and FEMA regulations.
12. For streams, creeks, rivers, and other watercourses where the floodway has not been identified, the entire floodplain shall be treated as a floodway unless a study has been prepared by a Professional Engineer registered in

the State of Oregon and approved by the City's authorized representative to define the floodway limits for a stream section.

### **301.5.00 WATER QUALITY FACILITY DESIGN**

This section describes methods of designing water quality facilities. Water quality facilities are designed to remove pollutants from stormwater runoff. The pollutants of concern include, but are not limited to, sand, silt, and other suspended solids; metals such as copper, lead, and zinc; nutrients such as nitrogen and phosphorus; certain bacteria and viruses; and organics such as oil, grease, petroleum hydrocarbons, and pesticides. Methods of removing pollutants include sedimentation or settling, filtration, plant uptake, ion exchange, adsorption, and bacterial decomposition. Floatable pollutants such as oil, debris, and scum can be removed with separators.

#### **301.5.01 Water Quality Facility Design Standards**

a. Purpose: New development and other activities that create new impervious surfaces or increase the amount of stormwater runoff or pollution leaving the site are required to construct or fund permanent water quality facilities to reduce contaminants entering the stormwater and surface water system. Water quality volume and flow shall be determined as described in Section 301.3.04, "Water Quality Volume and Flow."

b. Criteria for requiring construction of water quality facility

A water quality facility shall be constructed on site unless, in the judgment of the City's authorized representative, any of the following conditions exist:

1. The site location, size, gradient, topography, soils, or presence of an SROZ make it impractical or ineffective to construct an on-site facility.
2. The subbasin has a more effective, existing regional site designed to incorporate the development or which has the capacity to treat the site stormwater.
3. The development is for construction of one- or two-family (duplex) dwellings on existing lots of record which will establish or create less than 5,000 square feet of impervious surface.

c. Design standards

1. Stormwater quality facilities shall be designed to remove 70% of the total suspended solids (TSS) from the runoff of 100% of the newly constructed impervious surfaces. Impervious surfaces shall include pavement, gravel roads, buildings, public and private roadways, and all other surfaces with similar runoff characteristics.

2. The removal efficiency standard for TSS specifies only the design requirements. It is not intended as a basis for performance evaluation or compliance determination of a stormwater quality control facility installed or constructed pursuant to this section.
3. If an on-site water quality facility cannot be constructed to treat the runoff from the development's impervious surface, then with the approval of the City's authorized representative, an on- or off-site water quality facility may be designed to treat runoff from an equivalent area of adjacent untreated impervious surfaces. The water quality facility shall meet all applicable requirements of these standards.
4. Water quality facilities shall be designed for a dry weather storm event totaling 0.36 inches of precipitation falling in four hours, with an average storm return period of 96 hours.
5. Water quality facilities shall be sized for impervious area, as outlined in Section 301.5.01.d, "Impervious Area Used in Design," below.
6. Water quality facilities shall be designed to include inlet energy dissipation and a sediment forebay in conformance to Section 301.4.03.b.
7. Water quality facilities shall be designed to allow for proper functioning with full sediment accumulation as allowed in Section 301.6.06.b.2, "Sediment Management/Pollutant Control, Requirements."
8. Water quality facilities shall be constructed as part of the development's public improvements.
9. Other design options for meeting the requirements of this section may be considered by the City's authorized representative for approval, as referenced in Section 301.1.02, "Alternative Design and Construction Standards."
10. Water quality facilities in which water is in direct contact with the soil must be lined with either a low permeability liner or a treatment liner when the soil does not have properties which reduce the risk of groundwater contamination from stormwater runoff that may infiltrate in the facility. Liners shall be designed in accordance with Appendix E, "Water Quality Facility Liners."
11. Water Quantity Facilities shall be constructed in conformance with Section 301.2.03 .
12. Stormwater quality facilities shall be protected in conformance with Section 301.3.09, "Detention/Retention Facility Protection."

- d. Impervious area used in design
  1. Water quality facilities are required when proposed development establishes or increases the impervious surface area by more than 5,000 square feet. Development includes new development, redevelopment, and/or partial redevelopment.
  2. For single-family and duplex residential subdivisions, water quality facilities shall be sized for all impervious areas created by the subdivision, including all residences on individual lots at the current rate of 2,750 square feet of impervious surface area per dwelling unit.
  3. For all developments other than single-family and duplex dwellings, including rowhouses and condominiums, the sizing of water quality facilities shall be based on the impervious area to be created by the development, including structures and all roads and impervious areas. Impervious surfaces shall be based on building permits, construction plans, or other appropriate methods of measurement deemed reliable by the City's authorized representative.
  4. The City encourages design initiatives that reduce the effective impervious area. For developments other than single-family and duplex dwellings, a smaller water quality facility may be possible.

#### **301.5.02 General Requirements**

- a. No water quality facility shall be built in a public easement or right-of-way, unless approved by the City's authorized representative
- b. Vegetation shall be planted in accordance with Appendix B, "Landscape Requirements."
- c. Safety of stormwater quality facilities shall be in conformance with Section 301.3.09, "Detention/Retention Facility Protection."

#### **301.5.03 Access Road**

Access roads to stormwater quality facilities shall be in conformance with Section 301.4.04, "Access Road Design."

#### **301.5.04 Water Quality Treatment Methods**

Methods used for water quality treatment facilities form several general categories:

- a. **Pretreatment Devices:** Pretreatment often must be provided for filtration and infiltration facilities to protect them from clogging or to protect groundwater.

Appropriate pretreatment devices include a presettling basin, wet pond or vault, water quality manhole, or oil/water separator.

- b. **Filtration:** Filtration entails capturing and temporarily storing stormwater and then passing it through a filter bed of sand, organic matter, soil, or other acceptable treatment media. Specific media such as activated carbon or zeolite can remove hydrocarbons and soluble metals.
- c. **Ponds:** Ponds treat stormwater by settling particulates during quiescent conditions (sedimentation), by biological uptake, and by vegetative filtration. Ponds may be single-purpose facilities, providing only stormwater treatment, or they may be combined with a detention pond or vault to also control flow.
- d. **Wetlands:** Constructed wetlands, like natural wetlands, remove pollutants through sedimentation, filtration, and biologic processes. Wetlands typically have shallower water than ponds. They may also incorporate small permanent pools and extended detention storage.
- e. **Infiltration:** Infiltration refers to the use of the filtration, adsorption, and biological decomposition properties of soils to remove pollutants. Infiltration can provide multiple benefits, including pollutant removal, peak flow control, groundwater recharge, and flood control. Groundwater protection issues must be evaluated when considering infiltration facilities. The DEQ has identified drywells, sumps, and other infiltration-type facilities that inject untreated stormwater below the ground surface as Class V injection wells under the federal underground injection control program.
- f. **SROZ:** With approval of the City's authorized representative, certain water quality treatment facilities may be allowed within SROZ resource areas. However, natural SROZ's are not acceptable as a method for water quality treatment.

### **301.5.05 Pretreatment Devices – Water Quality Manholes**

- a. Hydraulic criteria
  - 1. Minimum design flow = water quality flow.
  - 2. An upstream flow splitter may be used to bypass conveyance flows in excess of the Water Quality flow.
- b. Design criteria
  - 1. Shall be required immediately upstream of all detention/retention facilities, all water quality treatment facilities, or any release point to a natural drainage.

2. Shall conform to Detail No.S-2050, "Stormwater Pretreatment Manhole," or an equivalent detail approved by the City's authorized representative.
3. Minimum manhole diameter shall be 60 inches.
4. Sump depth shall be no deeper than 5 feet from invert to bottom of sump, unless approved by City's authorized representative.
5. Volume of sump shall be 20 cubic feet per 1.0 cfs of flow into the water quality manhole, up to the 25-year flow. Flow calculations shall include the effect of an upstream flow splitter.
6. Maintain a 3-foot clear access zone between the inside structure wall and the interior outlet structure.
7. Orient access to structure in a clear zone.

**301.5.06 Proprietary Pretreatment Devices**

- a. Proprietary pretreatment devices are permitted on a case-by-case basis, with approval of the City's authorized representative.
- b. The devices shall be sized in accordance with the manufacturer's recommendations. However, the minimum treatment flow must be the water quality flow.
- c. Technical submittals from the manufacturer are required, including hydraulic design criteria, particulate removal efficiency, and maintenance requirements and schedule.

**301.5.07 Filtration**

**a. Biofiltration Swale**

Biofiltration swales are vegetated open channels that trap pollutants through filtration. General design requirements for biofiltration swales are given in **Table 3.7**. For more specific design criteria refer to Appendix D.2.01, "Biofiltration Swale."

**Table 3.7. BIOFILTRATION SWALE CRITERIA**

| Parameter                                   | Requirement                                                         |
|---------------------------------------------|---------------------------------------------------------------------|
| Area to be served                           | Less than 10 acres                                                  |
| Soils requirements<br>(NRCS classification) | A, B, C, or D (A and B may require liners in certain circumstances) |

|                               |                                        |
|-------------------------------|----------------------------------------|
| Maximum ground slopes         | 10H:1V                                 |
| Maximum maintained sideslopes | 4H:1V                                  |
| Water application rate        | Peak flow rate from water quality flow |

**b. Sand Filter**

Sand filters are a layer of sand in a sedimentation chamber used to trap pollutants. The water runs into an underdrain system that conveys the filtered stormwater to the discharge point. General design requirements for sand filters are given in **Table 3.8**. For more specific design criteria refer to Appendix D.2.02, “Sand Filter.”

**Table 3.8. SAND FILTER CRITERIA**

| Parameter                                | Requirement                                  |
|------------------------------------------|----------------------------------------------|
| Maximum area to be served                | 80 acres                                     |
| Soils requirements (NRCS classification) | A, B, C, or D with limitations               |
| Maximum ground slope                     | Not applicable                               |
| Maximum maintained sideslope             | 4H:1V                                        |
| Water application rate                   | 2,000 sq ft of filter per cfs of design flow |

**301.5.08 Ponds**

Inlet and outlet structures constructed in stormwater ponds shall follow the guidelines provided in Sections 301.8.04, "Inlets," and 301.8.05, "Outlets."

Ponds safety shall be in conformance with Section 301.3.09.c, "Safety."

a. Wet Ponds

Wet ponds are constructed ponds with a permanent pool of water (called pool storage or dead storage). Pollutants are removed from stormwater by gravitational settling, biologic processes, and vegetative filtration. General design requirements for wet ponds are given in **Table 3.9**. For more specific design criteria refer to Appendix D.3.01, "Wet Ponds."

**Table 3.9. WET POND CRITERIA**

| Parameter                                | Requirement                |
|------------------------------------------|----------------------------|
| Area to be served                        | 2 to 150 acres             |
| Soils requirements (NRCS classification) | C, D (A and B with liners) |
| Maximum ground slopes                    | 10H:1V                     |
| Maximum maintained sideslopes            | 4H:1V                      |

b. Extended Wet Pond

Extended wet ponds are constructed ponds that have both a permanent pool of water and extended detention above the permanent pool. General design

requirements for extended wet ponds are given in **Table 3.10**. For more specific design criteria refer to Appendix D.3.02, “Extended Wet Pond.”

**Table 3.10. EXTENDED WET POND CRITERIA**

| Parameter                                | Requirement                |
|------------------------------------------|----------------------------|
| Area to be served                        | 3 to 150 acres             |
| Soils requirements (NRCS classification) | C, D (A and B with liners) |
| Maximum ground slopes                    | 8 percent                  |
| Maximum maintained sideslopes            | 4H:1V                      |

c. Extended Dry Pond

Extended dry ponds are designed to drain completely between storm events. This allows the pond to detain stormwater runoff longer than a standard detention pond and provides some treatment for water quality.

Dry ponds alone seldom meet the design TSS removal requirements established in Section 301.5.01.c, “Water Quality Facility Design Standards,” and shall be considered only when combined with other water quality facilities. For more specific design criteria refer to Appendix D.3.03, “Extended Dry Pond.”

**301.5.09 Wetlands – Constructed Treatment Wetlands**

Constructed treatment wetlands remove pollutants through several processes, including sedimentation, filtration, and biologic uptake. When enough volume is provided, constructed treatment wetlands can also provide a significant level of flow control. General design requirements for constructed treatment wetlands are given in **Table 3.11**. For more specific design criteria refer to Appendix D, “Stormwater Quality Facilities – Design Criteria.” Inlet and outlet structures constructed in wetland areas shall follow the guidelines provided in Sections 301.8.04, “Inlets,” and 301.8.05, “Outlets.”

**Table 3.11. CONSTRUCTED TREATMENT WETLANDS CRITERIA**

| Parameter                                   | Requirement                |
|---------------------------------------------|----------------------------|
| Area to be served                           | No less than 10 acres      |
| Soils requirements<br>(NRCS classification) | C, D (A and B with liners) |
| Maximum ground slopes                       | Not applicable             |
| Maximum maintained sideslopes               | 5H:1V                      |

**301.5.10 Infiltration**

- a. A first step in siting and designing infiltration treatment facilities is to conduct a characterization study. Information gathered during initial geotechnical investigations can be used for the site characterization. Key data and issues to be characterized include the following:
  - 1. Surface features.
  - 2. Subsurface features.
  - 3. Infiltration rate determination.
  - 4. Soil testing.
  - 5. Infiltration receptor.
  
- b. Site suitability criteria must also be considered for siting infiltration treatment systems, as follows:
  - 1. Setbacks.
  - 2. Groundwater protection areas.
  - 3. High vehicle traffic areas.
  - 4. Soil infiltration rate/drawdown time.
  - 5. Depth to bedrock, water table, or impermeable layer.
  - 6. Soil physical and chemical suitability for treatment.
  - 7. Seepage analysis and control.
  - 8. Cold climate and impact of roadway deicers.

9. Verification testing of the completed facility.

Note: Refer to Appendix C for a detailed description of site characterization and site suitability criteria. All infiltration systems shall comply with the requirements of the Oregon DEQ UIC (Underground Injection Control) Program.

c. Infiltration Trench

1. An infiltration trench is a shallow trench in permeable soil that is backfilled with sand and coarse stone and lined with filter fabric. The trench surface may be covered with grating, stone, gabion, sand, or a grassed cover with a surface inlet. General design requirements for infiltration trenches are given in **Table 3.12**. For more specific design criteria refer to Appendix D.5.01, "Infiltration Trench."

**Table 3.12. INFILTRATION TRENCH REQUIREMENTS**

| Parameter                                | Requirement                                                                                                                       |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Maximum area to be served                | 1 acre per trench                                                                                                                 |
| Soils requirements (NRCS classification) | A or B only for publicly maintained facilities; C soils may be used for privately owned facilities if drawdown standards are met. |
| Maximum ground slopes:                   | 5 percent                                                                                                                         |
| Soil test requirement                    | ASTM D 3385                                                                                                                       |

b. Infiltration Basin

1. An infiltration basin is a depression created by excavation, berms, or small dams to provide for short-term ponding of surface water until it percolates into the soil. General design requirements for infiltration basins are given in **Table 3.13**. For more specific design criteria refer to Appendix D.5.02, "Infiltration Basin."

**Table 3.13. INFILTRATION BASIN REQUIREMENTS**

| <b>Parameter</b>                            | <b>Requirement</b>                                                                                                               |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Maximum area to be served                   | 50 acres                                                                                                                         |
| Soils requirements<br>(NRCS classification) | A or B only for publicly maintained facilities; C soils may be used for privately owned facilities if drawdown standards are met |
| Maximum ground slopes                       | 5%                                                                                                                               |
| Maximum maintained sideslopes               | 4H:1V                                                                                                                            |
| Soil test requirement                       | ASTM D 3385                                                                                                                      |

**301.5.11 Compost Filters**

Compost stormwater filters or CSFs, work by percolating stormwater through compost, which traps particulates and adsorbs dissolved materials such as metals and nutrients. Compost filters may be considered as a part of a private water quality treatment facility, but will not be allowed as part of a publicly maintained water quality treatment facility.

**301.5.12 Other Water Quality Treatment Facilities**

The use of other forms of water quality treatment is allowed with the approval of the City's authorized representative. However, the applicant must provide evidence of the ability of the facility to meet the City's design standards criteria and long-term maintenance requirements. Grass swales will not be allowed.

Information, recommendations, and specific design criteria for facility liners can be found in Appendix E, "Water Quality Facility Liners."

**301.6.00 OPERATION AND MAINTENANCE REQUIREMENTS**

This section describes operation and maintenance requirements that are generally applicable to all private stormwater facilities. The person designated as the responsible party in the Stormwater Maintenance Covenant and Access Easement shall be responsible for operation and maintenance of private stormwater facilities. An operation and maintenance plan (O&M plan) shall be prepared by the responsible party for the stormwater facility and shall be submitted to the City of Wilsonville Environmental Services Division for review and approval. Maintenance activities shall be documented annually by sending a report of what was completed to the City of Wilsonville Environmental Services Division, by May 1<sup>st</sup> of each year.

### **301.6.01 Inspection Program**

- a. Routine facility inspection will provide three major benefits:
  - 1. Development of a condition history.
  - 2. Improved scheduling efficiency.
  - 3. Preventive maintenance opportunities.
- b. Inspection records shall be used to:
  - 1. Determine where special maintenance conditions exist.
  - 2. Determine optimal frequencies for future inspection and maintenance.
  - 3. Generate scheduled and unscheduled (i.e., repair) work orders.
  - 4. Assure facility operation and aesthetics.

### **301.6.02 Requirements**

- a. The applicant shall be responsible for having inspections conducted, maintaining stormwater facilities, and submitting yearly reports documenting inspection and maintenance activities to the City of Wilsonville Environmental Services Division.
- b. Inspect the facility, with the record drawing plans in hand, on a quarterly basis for the first two years, and a minimum of semiannually thereafter. Inspections may be required more frequently, depending on site-specific conditions.
- c. All required inspections and any maintenance activities performed shall be documented in the annual report as required by the City's "Stormwater Maintenance Covenant and Access Easement."
- d. Inspection reports shall be in a format and accuracy approved by the City of Wilsonville Environmental Services Division. Inspection reports shall be stamped by a Professional Engineer registered in the State of Oregon and shall be submitted to the City by May 1<sup>st</sup> of each year.
- e. The applicant shall keep inspection records to track the progressive development of the system over time. The inspection records shall include:
  - 1. General condition of vegetative area(s), predominant plant species, distribution, and success rate (where applicable).
  - 2. Sediment condition and depth in forebay (or other pretreatment structure), treatment facility, bench planting zones, and other sediment-removal components.

3. Water elevations and other observations (sheen, smell, etc.).
4. Condition of the inlet, outlet, and overflow structures and devices, diversion structures, trash-removal devices, risers, spillway, embankments, and remaining storage capacity.
5. Unscheduled maintenance needs.
6. Components that do not meet the performance criteria and require immediate maintenance.
7. Common problem areas, solutions, and general observations.
8. Aesthetic conditions.

### **301.6.03 Structures**

Applicant shall be responsible for maintaining all facility structures in good working order. Stormwater facility structures include, but are not limited to, the following: stormwater pipes, stormwater manholes, sand/oil separators, monitoring manholes, flow control devices, energy dissipaters, headwalls, trash grates, underground detention facilities, catch basins, ditch inlets, area drains, clean-outs, access roads, safety fences, sediment fences, and biofiltration bags. Maintenance may consist of cleaning, repairing, and/or replacing structures or portions of structures as needed to maintain their functional purpose.

### **301.6.04 Planting Bed Soils**

- a. In areas where greater than 10% of planting bed vegetation has died, have soil tested as recommended by a Professional Landscape Architect registered in the State of Oregon.
- b. Amend soil as per recommendations of a Professional Landscape Architect registered in the State of Oregon; if needed redesign plantings to correct problems, and reestablish soil coverage.

### **301.6.05 Vegetation Management**

- a. Vegetated stormwater facilities may require a number of control practices during their initial 2-year period in order to meet the requirements for establishing healthy vegetation.
- b. Requirements
  1. Maintain plantings for a period of two years after the date of final construction approval by the City's authorized representative. During the establishment period, remove undesired vegetation with minimal (or preferably no) use of toxic herbicides and pesticides at least three times in

year 1, and once or twice in the summer of year 2, unless otherwise approved by the City's authorized representative. Replace plants that die during this period as per recommendations and planting time frame given in Appendix B.2.00, "Landscape Guidelines."

2. At the end of the two-year warranty period, healthy plant establishment shall be achieved for at least 90% of the vegetation (see Section 301.13.02, "Landscape Inspection for Warranty," for landscape survival criteria). The O&M plan shall specify the long-term maintenance schedule after the warranty period.
3. Selectively irrigate if necessary during the establishment period, during times of drought, or until the vegetation becomes established. It is preferred that the facility be designed to sustain its function without a permanent irrigation system.
4. Replenish mulch at least annually, and specify the mulching schedule in the O&M plan. Mulching shall be done to retain topsoil, heat, and moisture, and to inhibit weed growth. Use temporary fencing to protect seedlings from foraging animals.
5. Schedule maintenance outside sensitive wildlife and vegetation seasons. Minimize plant disturbance during maintenance activities.
6. Do not use fertilizers, herbicides, or pesticides for vegetation maintenance, unless it is specifically called for in the O&M plan.
7. Use replacement plants that conform to the initial planting plan and to Appendix B, "Landscape Requirements."

**301.6.06 Sediment Management/Pollutant Control**

- a. Sediment and other pollutants that degrade water quality will accumulate in stormwater facilities. The contractor shall remove all accumulated pollutants and sediment to maintain proper facility operation. Periodic testing will help determine appropriate sediment-removal schedules.
- b. Requirements:
  1. Place a sediment marker (see Detail No. S-2260 of these standards) in the forebay or in an area not likely to be damaged by incoming storm flows and where it can be easily seen by maintenance personnel.

2. Remove sediment when accumulations reach 1 foot in depth, 50% of the designed sediment storage depth, or if sediment accumulation inhibits facility operation. The 50% full capacity shall be identified and marked on sediment marker during facility construction.
3. Test sediment before removing it if the stormwater facility serves a commercial/industrial site or a multifamily structure or development. Sediment shall be tested according to protocol established in the O&M plan, and any additional information resulting from site-specific conditions and use. Testing could include parameters such as oil and grease, heavy metals (lead, zinc, and cadmium), nutrients (e.g., phosphorus), and organics such as pesticides that may accumulate. Testing must be site specific if a commercial/industrial discharger is being served; City of Wilsonville reserves the right to require testing of specific contaminants. Applicant shall provide the test results to the City of Wilsonville Environmental Services Division prior to excavation and disposal of sediment.
4. Dispose of sediments at the time of excavation in a manner meeting applicable state and federal requirements. If sediment disposal requires special handling, disposal documentation shall be provided to the City of Wilsonville Environmental Services Division.
5. Investigate and control, or report the pollutant source, if sediment or other pollutants are accumulating more rapidly than assumed when the O&M plan was formulated. Direct pollution-control complaints to the City of Wilsonville Environmental Services Division.

**301.6.07 Insect/Vector Control**

- a. Standing water associated with some types of treatment systems can attract insects.
- b. The following measures shall be the primary methods of insect control. The method are not presented in order of implementation, but one or all of these methods shall be used before considering any other measures:
  1. Install predacious bird and bat nesting boxes.
  2. Change the water level of ponds every four days or so to disrupt the larval development cycle of mosquitoes.
  3. Stock ponds and other permanent water facilities with fish or other predatory species.
  4. Use mosquito larvicide, such as Bacillus thurengensis or Altoside<sup>®</sup> formulations, only if absolutely necessary. Any pesticide or larvicide shall be applied by a licensed individual.

- c. Additional assistance with vector monitoring and control may be obtained from the local vector control office.

### **301.6.08 Access and Safety**

O&M programs shall provide for safe and efficient access to a facility and shall be in compliance with Section 101.8.09, "Safety Requirements". The following are general requirements; specific conditions may require site-specific modifications:

- a. Secure easements necessary to provide facility and maintenance access (if applicable).
- b. Use only trained and certified personnel to access confined spaces.
- c. Maintain ingress/egress routes to design standards, in a manner that allows efficient maintenance of the facility.
- d. Ensure that fencing is in good repair.

### **301.7.00 CONSTRUCTED CHANNEL DESIGN STANDARDS**

#### **301.7.01 Application**

This section applies to open channels constructed to convey runoff to the existing public stormwater and surface water conveyance system. For work in existing stream channels, applicant shall follow the recommendation and requirements set forth in ODFW's *Fish Passage Criteria*, or latest edition, or an equivalent study or guideline approved by the City's authorized representative. The applicant shall comply with all applicable requirements of the Army Corps of Engineers and Oregon Department of State Lands for construction activities that may impact wetlands or waterways. Development that regrades existing roadside ditches or constructs new roadside ditches shall meet applicable City codes and standards.

#### **301.7.02 Channel Design**

- a. Channel design shall be in accordance with Section 301.3.00, "Hydrology and Hydraulics."
- b. Vegetation-lined channels shall be used whenever practicable, as determined by the City's authorized representative. Rock-lined channels shall be used only where a vegetative lining will not provide adequate protection from erosion. Channels shall be protected in conformance with Section 301.3.07, "Channel protection."
- c. Constructed open channels shall be sized to pass the required flows and have sideslopes no steeper than 2H:1V. Any proposed constructed channel

improvement that does not meet these requirements shall be piped, unless an exception is approved by the City's authorized representative.

- d. Normal maximum depth for open channels constructed adjacent to roadways shall be 2 feet.
- e. No protruding pipes, culverts, utilities, or other structures will be allowed that reduce or hinder the flow characteristics of the channel. Channels and connections shall be designed to prevent scouring. All pipe connections shall match sideslopes, incorporate a headwall, and be designed with an energy dissipater device (see Sections 301.3.07, "Channel Protection," and 301.3.08, "Outfall Protection").

### **301.7.03 Channel Construction for New Roadside Ditches**

Roadside ditches shall be constructed in conformance with ODOT SSC Section 00330, "Earthwork."

## **301.8.00 CULVERT DESIGN STANDARDS**

### **301.8.01 Application**

- a. Culverts provide for passage of water under or through obstructions placed across streams and drainageways. Culverts shall be designed to pass the required flows without compromising public safety or causing new or additional flooding.
- b. For pipe systems or culverts that convey flows from a stream or through sensitive areas, a local representative of ODFW or other applicable state or federal agency shall be contacted to determine whether fish passage is required and to identify site-specific design criteria. Additionally, ODFW may require fish passage accommodations on any stream that has a history or the potential for fish production.
- c. All culverts shall be designed for fish passage in accordance with ODFW's *Fish Passage Criteria*, or latest edition, unless otherwise exempted by ODFW and the City.

### **301.8.02 Hydraulic Design**

Culverts shall be designed to safely pass the 25-year flow.

### **301.8.03 Headwater**

- a. For new culverts 18 inches in diameter or less, the maximum allowable design storm event headwater elevation (measured from the inlet invert) shall not exceed two times the pipe diameter or three times the pipe diameter with a

seepage collar, unless an exception is approved by the City's authorized representative.

- b. For new culverts larger than 18 inches in diameter, the maximum allowable design storm event headwater elevation (measured from the inlet invert) shall not exceed 1.5 times the pipe diameter, unless an exception is approved by the City's authorized representative.
- c. The maximum headwater elevation of a design storm event for new culverts shall be at least 1 foot lower than the road or parking lot subgrade

#### **301.8.04 Inlet**

The embankment around the culvert inlet shall be protected from erosion by lining around the inlet with rock, bioengineering, or other protection approved by the City's authorized representative. The lining shall extend upstream of the culvert a minimum of 10 feet, be designed to provide a smooth transition for water flow into the culvert, and shall be as high as the designed headwater elevation. Trash racks or debris barriers shall follow the design requirements of Section 301.9.06, "Trash Racks or Debris Barriers."

#### **301.8.05 Outlets**

The receiving channel of the outlet shall be protected from erosion by rock lining, bioengineering, or other energy dissipating devices (Section 301.3.07, "Channel Protection," and Section 301.3.08, "Outfall Protection") as approved by the City's authorized representative.

#### **301.8.06 Inlet Control Analysis**

The headwater depth for pipes under inlet control shall be determined using the nomographs as provided in Detail No. S-2205 and S-2210 of these standards, the ODOT "Hydraulics Manual," or a modeling method consistent with FHWA's HY8 software.

#### **301.8.07 Outlet Control Analysis**

The headwater depth for pipes under outlet control shall be determined using the nomographs as provided in Detail No. S-2220 of these standards, the ODOT "Hydraulics Manual", or a modeling method consistent with FHWA's HY8 software.

#### **301.8.08 Outfall Design Standards**

- a. Outfalls shall be above the mean low-water level, unless an exception is approved by the City's authorized representative. All outfalls shall be provided with a rock splash pad or other approved erosion-control measure. Erosion protection at outfalls shall be designed in accordance with the

guidelines in Section 301.3.08, "Outfall Protection," unless exceptions are approved by the City's authorized representative.

- b. Mechanisms that reduce velocity before water discharges from an outfall are required. The dissipaters shall be designed using published references such as FHWA's "Hydraulic Design of Energy Dissipaters for Culverts and Channels," the ODOT "Hydraulics Manual", and others. Design references shall be cited in the construction plan submittal.
- c. Non-erosive stormwater flow velocities shall be maintained for the entire overland flow from the energy dissipating device to the receiving public waterway. The City's authorized representative shall approve structures and/or methods to maintain non-erosive flow velocities prior to construction or installation.

### **301.9.00        STORM MANHOLE AND PIPE DESIGN STANDARDS**

#### **301.9.01        Manhole Design**

- a. Manholes shall be provided at least every 400 feet, unless otherwise approved by the City's authorized representative. Manholes shall be located at every grade change, change in pipe size, and change in alignment. Unless an exception is approved by the City, manhole lids placed within the paved right-of-way shall have a minimum of 5 feet of clearance from the edge of a curb or gutter and shall not be in a wheel path of the traveled way (see street detail drawings of these standards).
- b. When a manhole is 5 feet or less deep, a flat-top or shallow manhole shall be used, as shown in Detail No. S-2030 of these standards. Flat-top manholes shall be designed to be installed at an elevation to permit construction of the full street section, allowing for the design gradients.
- c. All manholes shall be a minimum of 48 inches in diameter.
- d. Suburban style manholes frames shall not be used in PCC streets.
- e. Detail(s) shall be submitted with the plans where pipes into or out of a manhole are larger than 24 inches or where more than four mainline connections are made. The manufacturer or design engineer shall provide the City's authorized representative with supporting calculations, stamped by a Professional Engineer registered in the State of Oregon, documenting the structural integrity of the manhole.
- f. Connections to an existing manhole, elevation of the existing ledge, location of steps, and elevations of existing inlets and outlets shall be submitted with the plans.

- g. All precast manhole bases shall have smooth, clean openings at the design inlets and outlet points. Openings shall not be sawcut or broken out.
- h. All manhole bases shall be properly channelized. No more than three side laterals are allowed to be connected to a manhole, unless an exception is approved by the City's authorized representative. There shall be a minimum of 8 inches separating connections, measured from the outside diameter of the core holes.
- i. All manholes shall have inlets at a minimum 90-degree angle in relation to the outlet, as measured from the center of the manhole base.
- j. Manholes shall have a minimum freefall of 0.20 feet and a maximum freefall of 1.5 feet.
- k. Drop manholes: The maximum inside drop in a manhole shall be 18 inches. When more than 18 inches of drop exists, an outside drop manhole shall be used. Outside drops shall be constructed of ductile iron pipe (see Detail No. S-2040 of these standards).
- l. An oversize curb inlet manhole as shown in Detail No. S-2090 of these standards may be used in lieu of a manhole, as required by Section 301.9.01.a, when approved as part of a flow-through system. Oversized gutter or curb and gutter catch basins will be allowed in lieu of manholes, with approval of the City's authorized representative.
- m. Water Quality Manhole Design: Refer to Section 301.5.05, "Pretreatment Devices - Water Quality Manholes."

### **301.9.02 Storm Pipe Design**

- a. **Pipe size:** The design size shall be based on hydraulic calculations provided by the design engineer. The minimum diameter of public storm pipe is identified below:
  - 1. Pipe from the catch basin to the mainline in the public right-of-way shall be nominal 10-inch-diameter pipe.
  - 2. Mainline pipe shall be nominal 12-inch-diameter pipe.
  - 3. Storm pipes located out of a public street right-of-way, with no reasonable need to be extended, and with roof drains or area drains connected, shall be a minimum 10-inch-diameter pipe.
- b. **Location:** Storm sewers, wherever possible, shall be installed behind and parallel to the face of curb on either side of the street as indicated in the street detail drawings of these standards. All storm sewer locations shall be approved by the City's authorized representative. Storm drain inlets shall be

designed as per Sections 301.2.07, "Catch Basin System Standards" and 301.9.07, "Drain Inlet Design Standards."

- c. **Easements:** When it is not possible or practical to install the sewer line in a dedicated public street, a minimum 15-foot public pipeline easement shall be provided. Sewer lines shall be located in the center of the easement, unless an exception is approved by the City's authorized representative. The centerline of the pipe shall be at least 7½ feet from an easement side line.
- d. **Alignment:** Public storm pipe shall be laid on a straight alignment and at uniform grade, unless an exception is approved by the City's authorized representative.
- e. **Connections:** Lateral connections on new construction work shall be done using manufactured tees installed at surveyed locations. Lateral connections to existing storm lines may be done using either saddle tees as per Section 401.4.02.b.5(a), or by using Inserta Tee<sup>®</sup> as per Section 401.4.02.b.5(c). Laterals shall be of same material as main.
- f. **Laterals:** Storm laterals shall be provided with a cleanout installed at the public right-of-way or easement as shown in Detail No. S-2175 of these standards. Cleanouts shall not be installed in the driveway or sidewalk, unless approved by the City's authorized representative.
- g. **Curb Marking:** Newly constructed curbs or replaced curbs shall be stamped with the capitol letters "SD" at the location of each storm lateral crossing. Letters shall be 3 inches in height and embossed a minimum of 1/8-inch deep.
- h. **Locating Wire and Tape:** Storm laterals and mains shall have tracer wire (12-gauge with white THNN insulation) installed beside the pipe and plastic caution tape installed 1-foot above the pipe crown as shown in Detail No. S-2175 of these standards. Surface locating wire at right-of-way cleanouts; tape shall be tied off to the 2 x 4 marker.
- i. **Grade:** All storm lines shall have sufficient slope to maintain a minimum flow velocity of 3 feet per second when flowing full.
- j. **Steep Slopes:** Where soil conditions warrant it, storm pipes on slopes in excess of 20% gradient shall be secured with approved anchor walls as shown in Detail No. S-2195 of these standards. Spacing for anchors shall be as shown in Table 4.2.
- k. **Pipe Cover:** Minimum pipe cover shall be in compliance with this section, unless an exception is approved by the City's authorized representative. In paved areas, pipe cover shall be measured from the finished grade to the upper surface of the pipe barrel; the pipe bell shall not intrude into the base rock. In areas without pavement, the pipe cover shall be measured from the finish

grade to the upper surface of the pipe barrel. Minimum cover requirements are shown in **Table 3.14**.

**Table 3.14. MINIMUM PIPE COVER**

| Type of Pipe         | Cover (inches) |
|----------------------|----------------|
| Other Pipe Materials | 36             |
| Nonreinforced        | 36             |
| RCP Class III        | 36             |
| RCP Class IV         | 24             |
| RCP Class V          | 12             |
| AWWA C-900           | 12             |
| AWWA C-905           | 12             |
| Ductile Iron         | 12             |

**301.9.03 Distance Between Structures**

The maximum distance between structures, such as manholes, area drains, and catch basins, but excluding cleanouts, for 10-inch and larger pipe shall be 400 feet.

**301.9.04 Access**

Access roads are for maintenance and inspection purposes. All-weather access shall be provided to every manhole. Access roads shall be constructed as per Section 301.4.04, "Access Road Design."

**301.9.05 Headwalls**

Pipe end protection shall be required where pipe material other than concrete or ductile iron is exposed in the design of an outlet or inlet pipe or where required to stabilize a slope. Details of all headwalls and end protection shall be included in the construction drawings.

**301.9.06 Trash Racks or Debris Barriers**

Trash racks or debris barriers are required by the City on inlets for pipe or culvert systems greater than 18 inches in diameter. The design engineer shall submit the trash rack/debris barrier system design to the City's authorized representative for approval.

### 301.9.07 Drain Inlet Design Standards

All inlets and catch basins shall be designed to accept a 10-year storm event. Grates shall be designed, as far as practical, to avoid failure due to accumulation of debris.

#### a. Design Criteria

1. Precast and poured-in-place-catch basins and curb inlets are allowed.
2. All catch basins shall be constructed with an 18-inch minimum sump unless they are part of a series or a flow-through catch basin system, and approved by the City's authorized representative.
3. A main storm line shall not pass through a sumped catch basin.
4. Avoid placing curb inlets along curb radius at street intersections.
5. Spacing of catch basins shall be determined by the capacity of each to pass a 10-year storm event. In addition, catch basins shall be installed just before the upstream curb radius at all intersections.
6. Catch basins, except for CG-48 (curb inlet), shall be a maximum depth of 6 feet from the top of grate to the flowline of the lowest pipe invert. When depth from top of grate to flowline is greater than 5 feet, catch basins shall be oversized and have steps installed.
7. Between the inlet and the mainline or mainline structure, the maximum length of pipeline shall be 40 feet for 10-inch pipe and 60 feet for 12-inch pipe, unless additional length is required to cross the street right-of-way.
8. Tee connections may be used in street right-of-way only with approval of the City's authorized representative. The lateral shall be no larger than 50% the diameter of the main line, unless otherwise approved by the City's authorized representative. The connecting catch basin shall be oversized.

#### b. Area Drains and Ditch Inlets

1. The standard area drain shall be as shown in Detail No. S-2105 or S-2110 and S-2115 of these standards, and the ditch inlet shall be as shown in Detail No. S-2120 and S-2125 of these standards, unless an exception is approved by the City's authorized representative.
2. Area drains in rear or sideyards shall not be sumped. Ditch inlets shall be equipped with an 18-inch sump unless the inlets are part of a flow-through system.

3. A main storm line shall not pass through an area drain or a ditch inlet.
4. Area drains or ditch inlets may be located at the upper terminus of a main storm line, may connect to the main storm line at a manhole, or may connect to the main storm line through a tee when the lateral is no larger than 50% of the diameter of the main line.

### **301.10.00 MATERIAL AND TECHNICAL SPECIFICATIONS**

#### **301.10.01 Manholes and Structures**

##### a. General

Manholes shall be constructed at locations shown on the plans or as required by the City's authorized representative. The maximum distance between manholes shall be 400 feet, unless otherwise approved by the City's authorized representative. All manholes shall be a minimum of 48 inches in diameter. When a manhole is less than 5 feet deep, a shallow or flat-top manhole shall be used, as shown in Detail No. S-2025 or Detail No. S-2030 of these standards. Flat-top manholes shall be installed at an elevation to allow for construction of the full street section, allowing for the design gradients.

##### b. Materials

1. **Aggregate and Cement:** Aggregate shall meet the standards set forth in ODOT SSC Section 02690, "PCC Aggregates"; Portland cement shall meet the standards set forth in ODOT SSC Section 02010, "Portland Cement."
2. **Concrete:** PCC for poured in place manholes and structures shall conform to ODOT Class 3000 – 1½, Commercial Grade Concrete. Slump shall be between 2 and 4 inches.
3. **Manhole Frames and Covers:**
  - (a) Casting shall be of new material, tough, close-grained gray iron conforming to ASTM A-48, Class 30, and shall be smooth and clean, free of blisters, blowholes, and all defects. Bearing surfaces shall be planed or ground to ensure flat, true surfaces. Covers shall be true and set within rings at all points.
  - (b) Rings shall be grouted in place and made watertight with a high-strength, non-shrink grout meeting ODOT SSC Section 02440.50(b), "Non-Shrink Grout," such as Alcrete Twenty Minute Fast Setting Grout<sup>®</sup>, or approved equal. Unused grout shall be discarded after 20 minutes and shall not be used. Rings shall not be brought to grade with lumber.

- (c) Frames and covers shall be standard or suburban, depending on the manhole location and as approved by the City's authorized representative. Suburban style manhole frames shall not be installed in PCC streets.
  - (d) Manholes installed outside of paved street or sidewalk areas shall be installed with a tamperproof frame and cover as shown in Detail No. S-2060 of these standards.
4. **Manhole Types:** Manholes shall be one of the following types or equal.
- (a) **Precast 48-Inch-Diameter Manholes:** Materials shall conform to the requirements of ASTM C-478. Minimum wall thickness shall be 5 inches. Cones shall be eccentric. Before precast manhole sections of any size are delivered to the job site, the sections shall meet the permeability test requirements of ASTM C-14.
  - (b) **Precast Large-Diameter (60-inch or larger) Manholes:** Materials shall conform to the requirements of ASTM C-478.
  - (c) **Cast-in-Place Large-Diameter Manholes:** Aggregate shall meet the standards set forth in ODOT SSC Section 02690, "PCC Aggregates"; Portland cement shall meet the standards set forth in ODOT SSC Section 02010, "Portland Cement."
  - (d) **Precast Bases:** Precast base sections or manhole bases shall be used, except over existing pipe where poured-in-place bases shall be used (see Section 301.10.01.c.5). Precast manhole bases shall be inspected and approved by the City's authorized representative prior to installation. Where precast bases are not channelized, the contractor shall construct smooth channels to connect the flow from inlet pipe(s) to outlet pipe.
5. **Pipe Stubouts for Future Sewer Connections:** Pipe stubouts shall be the same type as approved for use in the lateral, main, or trunk sewer construction. Strength classifications shall be the same class as in adjacent trenches. Where two different classes of pipe exist at a manhole, the higher-strength pipe shall govern strength classification. Connect stubouts to manholes as specified in Section 301.10.01.d.1, "Connection to Existing Manholes." Rubber-gasketed, watertight plugs shall be furnished with each stubout and shall be adequately braced against air test pressures.
6. **Gaskets:** Manhole sections shall be installed with either preformed rubber gaskets or plastic gaskets. Rubber gaskets shall conform to ASTM C-443. Plastic gaskets shall be Kent-seal No. 2 or Ram Neck, or approved equal, and shall meet all requirements of ASTM C-990.

7. **Manhole Steps:** Steps shall be required and shall be constructed as specified and shown in Detail No. S-2080 of these standards, unless otherwise approved by the City's authorized representative. When pipe is 24 inches in diameter or smaller, steps shall be located as indicated in Detail No. S-2065 of these standards. For pipe larger than 24 inches in diameter, steps shall be located over a bench as coordinated with the City's authorized representative. Maximum drop from rim to first step shall be 27 inches.

c. Workmanship

1. **Foundation Stabilization:** If, in the opinion of the geotechnical engineer or the City's authorized representative, unstable subgrade material exists that will not support the manhole or other structure, the contractor shall excavate below grade and backfill with foundation-stabilization material approved by the City's authorized representative.
2. **Pipe Connections:** All rigid pipes entering or leaving the manhole shall be provided with flexible joints within 1 foot of the manhole structure and shall be placed on firmly compacted bedding. Special care shall be taken to see that the openings through which pipes enter the structure are completely watertight. All flexible pipe shall be connected to manholes according to the manufacturer's recommendations.
3. **Flexible Joints:** Where the last joint of the line laid up to the manhole is more than 1 foot from the manhole base, a 6-inch concrete encasement shall be constructed around the entire pipe, from the manhole base to within 1 foot of the pipe joint, at the discretion of the City's authorized representative. The pipe encasement shall be constructed integrally with the manhole base. Pipes laid out of the manhole shall be shortened to ensure that the first flexible joint is no more than 1 foot from the manhole base.
4. **Manhole Connections:** The contractor shall connect sewer pipe to manholes as specified in Section 301.10.01.d, "Types of Connections."
5. **Concrete Bases (Poured-in-Place):** Poured-in-place bases shall be used over existing pipelines. The contractor shall remove water from the excavated area, provide a minimum 8-inch-thick layer of compacted ¾"-0" crushed aggregate for a base, and construct the concrete base so that the first precast manhole section has a uniform bearing throughout the full circumference. There shall be a minimum of 8 inches of concrete between the compacted gravel and the lowest invert of the manhole. The contractor shall deposit sufficient concrete on the base to assure a watertight seal between base and manhole wall. Twenty-four hours shall be allowed to elapse before the remaining manhole sections are placed on

the base, unless otherwise approved by the City's authorized representative.

**6. Drop Manholes**

- (a) The maximum inside drop in a manhole shall be 18 inches. See Section 301.10.01.d.3, "Shallow Inside Drop Manhole," for construction of this connection.
- (b) When more than 18 inches feet of drop exists, an outside drop manhole shall be used. Outside drop manholes shall use ductile iron pipe (see Detail No. S-2040 of these standards).

- 7. Placing Manhole Section:** The contractor shall clean the end of each sections of foreign material. Manholes shall be installed with either watertight rubber o-rings or preformed plastic gaskets in conformance with the manufacturers' recommendations. If plastic gaskets are used, the inside seams shall be grouted with a high-strength, non-shrink grout meeting ODOT SSC Section 02440.50(b), "Non-Shrink Grout," such as Alcrete Twenty Minute Fast Setting Grout<sup>®</sup>, or approved equal. Unused grout shall be discarded after 20 minutes and shall not be used. Manholes will be visually inspected for water leakage by the City's authorized representative. Any leakage observed shall be repaired at the contractor's expense, and the manhole re-inspected.
- 8. Manhole Inverts:** The contractor shall construct manhole inverts in conformance with Detail No. S-2005 or S-2010 of these standards. Inverts shall have smooth transitions to ensure an unobstructed flow through the manhole. The contractor shall remove all sharp edges or rough sections that tend to obstruct flow.
- 9. Manhole Stubouts:** The contractor shall install stubouts from manholes for sewer extensions, as shown in these standards or as required by the City's authorized representative. A watertight flexible connection shall be used for pipe sizes 6 inches through 18 inches in all new manholes. The contractor shall construct invert channels in accordance with Detail No. S-2005 or S-2010 of these standards. The minimum length of stubouts in existing manholes shall be 12 inches outside the manhole wall. Pipes shall be grouted in precast walls or the manhole base to create a watertight seal around the pipes. The contractor shall add compacted base rock, as specified in these standards, to undisturbed earth under all stubouts.
- 10. Manhole Extensions, Rings, and Covers:** The contractor shall install rings and covers on top of manholes to positively prevent all infiltration of surface water or groundwater into manholes. Rings shall be set in a bed of high-strength, non-shrink grout meeting ODOT SSC Section 02440.50(b), "Non-Shrink Grout," such as Alcrete Twenty Minute Fast Setting Grout<sup>®</sup>,

or approved equal, with the grout carried over the flange of the ring, and shall be set so that tops of covers are flush with the surface of the adjoining pavement, or 1 foot above natural ground, unless otherwise directed by the City's authorized representative. Unused grout shall be discarded after 20 minutes and shall not be used. Total thickness of grade rings shall not exceed 12 inches; rings shall be grouted watertight. Drop from rim to first manhole step shall not exceed 27 inches. In designated floodplain areas, all manholes shall be at an elevation of at least 2 feet greater than the 100-year storm event.

d. Types of Connections

1. **Connection to Existing Manholes:** The contractor shall connect sewers to existing manholes at the locations shown on the plans. Contractor shall submit a plan for diversion control and receive written approval from the City's authorized representative before proceeding with construction. The contractor shall provide all diversion facilities, and shall perform all work necessary to maintain sewage flow in existing sewers while connections are being made to the manholes. Connections to existing manholes shall be core-drilled, and the bases shall be grouted as necessary to allow a smooth flow into and through the existing manholes.
2. **Manholes Over Existing Sewers:** The contractor shall construct manholes over existing operating sewer lines at the locations shown on the plans. The contractor shall construct a poured-in place base under the existing sewer and the precast sections as specified. The contractor shall not cut into any existing lines until the new manhole(s) are grouted and the new lines are balled, flushed, and deflection tested and all portions of the stormline have been approved and accepted by the City's authorized representative. After acceptance, the contractor shall sawcut into the existing line; cut edges of concrete pipe shall be covered with grout and troweled smooth; with ductile iron or plastic pipe, grout shall be applied up to cutout and troweled smooth.
3. **Shallow Inside Drop Manhole:** Where the invert of the connecting pipe is above the manhole shelf and less than 18 inches above the outlet, an inside drop shall be constructed utilizing Portland cement concrete as shown in Detail No. S-2040 of these standards. The stormwater entering the manhole shall follow a smooth concrete channel transitioning evenly from the invert of the inlet pipe into the main channel. Stormwater shall not be allowed to fall freely to the manhole base.

## 301.10.02 Catch Basins and Inlets

### a. Materials

1. Aggregate, Cement, and Concrete: These materials shall meet the requirements of Section 301.10.01.b, "Manholes and Structures, Materials."
2. Frames, Grates, and Covers: All materials shall be flat bar steel (standard grade), cast iron or ductile iron complying with the requirements of ASTM A-36, A-663, or A-709. Drainage grate inlets in paved roadways shall meet the requirements in Appendix A.2.02.b, "Drainage Grates."
7. Forms: All exterior surfaces shall be formed with steel or plywood. Other surfaces shall be formed with matched boards, plywood, or other approved material. Trench walls, rock, or earth will not be acceptable as form material.
8. Metal Reinforcement: All metal reinforcement shall conform to the requirements of ASTM A-615, Grade 60, deformed bars.
9. Precast Concrete Units: All precast units shall conform to the same requirements as manholes (ASTM C-478).

### b. Workmanship

1. Excavation and backfill shall conform to the requirements of Section 301.10.01.c, "Workmanship."
2. Bedding: The contractor shall remove all water and debris from the excavation area, and shall install an 8-inch-minimum layer of compacted  $\frac{3}{4}$ "-0" crushed aggregate for a base.
3. Cast-in-Place: Cast-in-place catch basins shall have a minimum of 6 inches of concrete between the compacted crushed aggregate and the lowest invert. The forms used for cast-in-place catch basins shall be tight and well-braced. The storm pipe material shall extend into the poured concrete of the catch basin. All corners shall be chamfered. Immediately after placement, the concrete shall be consolidated with an approved vibrator. The top surface shall be screed, and exposed surfaces shall be troweled to a smooth finish, free from marks or irregularities. After forms are removed, the contractor shall patch any defects in the concrete with approved material.
4. Precast: After the base is prepared, the contractor shall set the precast catch basin to the proper line and grade. The storm pipe material being used shall connect to the precast catch basin.

5. Inverts, Stubouts, and Sections: Contractor shall clean the ends of all pipes and sections that contact the catch basin. All inverts, stubouts, and sections shall be installed according to Detail No. S-2085, S-2090, S-2095, or S-2120 of these standards, using a high-strength, non-shrink grout meeting ODOT SSC Section 02440.50(b), "Non-Shrink Grout," such as Alcrete Twenty Minute Fast Setting Grout<sup>®</sup>, or approved equal, making sure all sharp edges or rough sections are removed, to prevent obstruction of the flow. Unused grout shall be discarded after 20 minutes and shall not be used.
6. Catch Basin Steps: All catch basins deeper than 5 feet, measured from the top of the frame to the flowline, shall be oversized and have steps.

### **301.10.03 Stormwater Pipe and Fittings**

#### **a. General**

The materials used shall be adequate to carry anticipated dead and live loads within the deflection limits specified by the manufacturer. All pipe and culverts shall have a minimum design service life of 75 years. Joints shall be gasketed, unless otherwise approved by the City's authorized representative.

#### **b. Materials**

Materials shall be the following types or approved equal:

##### **1. Concrete Pipe (NRCP/RCP)**

- (a) Non-reinforced concrete pipe shall conform to requirements of ASTM C-14. Unless otherwise specified, pipe shall conform to Class 3 design requirements.
- (b) Reinforced concrete, nonpressure pipe shall conform to the requirements of ASTM C-76 or C-655 and shall be of the class specified. Unless otherwise specified, pipe shall meet the design requirements of Wall B. Reinforced concrete low-head pressure pipe shall conform to the requirements of ASTM C-361.
- (c) Gaskets shall conform to the requirements of ASTM C-443.
- (d) All steam-cured concrete pipe must be at least seven days old before it can be used. If the pipe has not been steam-cured, it must not be used before it has cured for 28 days.
- (e) Fittings shall be manufactured integrally and be of a class at least equal to that of the adjacent pipe. Field taps shall be machine-drilled.

- (f) Mortar used shall be standard nonshrink premixed mortar conforming to ASTM C-387 or in a proportion of one part Type II Portland cement to two parts clean, well-graded sand that will pass a 1/8-inch screen. Mortar mixed for longer than 30 minutes shall not be used.

## 2. **Ductile Iron Pipe (D.I.)**

- (a) Ductile iron pipe shall conform to the requirements of American Water Works Association (AWWA) C-151 or American National Standards Institute (ANSI) A21.51, cement lined push-on joint. The minimum thickness class shall be Class 50 (up through 12-inch diameter pipe) and Class 51 (for 14-inch diameter and larger pipe).
- (b) Fittings shall be mechanical or push-on. Mechanical joint ductile iron fittings shall conform to AWWA C-110. Push-on joint fittings shall be gray iron, with body thickness and radii of curvature conforming to ANSI A-21.10. Rubber gasket joints shall conform to AWWA C-111/ANSI A-21.11.

## 3. **Polyvinyl Chloride Pipe (PVC)**

- (a) PVC pipe shall conform to the applicable portions of the following specifications: ASTM D-3034, ASTM D-2729, ASTM D-1784, ASTM D-1785, ASTM F-679, ASTM F-794, AWWA C-900, and AWWA C-905.
- (b) PVC fittings shall conform to the applicable portions of the following specifications: ASTM D-3034, ASTM D-2729, ASTM D-1785, ASTM D-2466, and ASTM D-2467. Fitting joints shall be the same as the pipe joints. Threaded connections shall conform to the requirements of ASTM D-2464 for schedule 80 pipe.
- (c) A2000 (PVC): All A2000 PVC pipe and fittings shall conform to ASTM F-949 specifications.
- (d) PVC rib: PVC rib pipe and fittings shall be made of PVC, as defined in ASTM D-1784. The pipe stiffness shall correspond with the series, in accordance with ASTM D-2412. Series 46 and 28 are allowed. Gaskets shall conform to ASTM F-477.

- 4. **Corrugated polyethylene (CPP):** Corrugated polyethylene pipe, double wall, and fittings shall be made of polyethylene compounds that conform with the physical requirements of Type III, Category 3, 4 or 5, P23, P33, P34, Class C, with the applicable requirements defined in ASTM D-1248. Spiral pipe is not acceptable. Corrugated polyethylene pipe shall conform to AASHTO M-294 specifications.

**5. Corrugated Aluminum (CAP) and Corrugated Aluminum Pipe Arches (CAPA)**

- (a) Corrugated aluminum pipe and fittings shall conform to the requirements of AASHTO M-196 and AASHTO M-197.
- (b) The connecting bands shall conform to the requirements of AASHTO M-196, except that the minimum width of bands for 12-inch and larger pipe shall be 12 inches. The minimum width for pipes less than 12 inches shall be 7 inches. The base metal of the connecting bands shall be the same base metal as that of the pipe. The gauge of the connecting bands may be two standard-use thicknesses lighter than that used for the pipe, but not less than 0.060 inch thick. The band couplers shall be connected with stainless steel bolts not less than 0.5 inch in diameter.
- (c) Corrugated aluminum pipe shall not be placed in a ditch in direct contact with hydrating Portland cement or lime.

**6. Fittings**

(a) General

- (1) Manufactured tee fittings shall be provided in the sewer main for side sewers. Fittings shall be of sufficient strength to withstand all handling and load stresses encountered.
  - (2) Fittings shall be of the same materials as the pipe. Material joining the fittings shall be of the same material as the pipe.
  - (3) Material joining the fittings to the pipe shall be free from cracks and shall adhere tightly to each joining surface.
  - (4) All fittings shall be capped or plugged, and shall be gasketed with the same gasket material as the pipe joint, fitted with an approved mechanical stopper, or have an integrally cast knockout lug. The plug shall be able to withstand all test pressures without leaking. When later removed, the plug shall permit continuation of piping with jointing similar to joints in the installed line.
- (b) Mechanical Couplings: Mechanical couplings shall be wrought steel. Installation procedures must meet the manufacturers' recommendations.

**7. Line Tap Saddle**

All saddles approved for sanitary sewer tap installation (see Section 401.4.02.b.5) shall be allowed on storm taps, except the following:

- (a) DFW/HPI saddle—an elastomeric polyvinyl chloride saddle with steel-reinforced edges and stainless-steel bands, series 300. This saddle is allowed on PVC, clay, IPS, concrete, asbestos cement, and PE pipe.
- (b) Saddles installed on corrugated aluminum pipe shall be fabricated and installed using stainless-steel nuts and bolts. Bolts and nuts shall conform to AWWA C-111/ANSI A21.11.

c. Workmanship

1. **Line and Grade**

- (a) Survey control hubs for both line and grade shall be provided by the design engineer in a manner consistent with accepted practice. The contractor shall establish line and grade for pipe by the use of lasers or by transferring the cut from the offset stakes to the trench at a maximum of 50-foot intervals to maintain the line and grade.
- (b) Variance from the established line and grade shall not be greater than  $\frac{1}{4}$  inch for grade and  $\frac{1}{2}$  inch for line, provided that such variation does not result in a level or reverse-sloping invert.
- (c) The contractor shall check line and grade as necessary. If the limits prescribed in these standards are not met, the work shall be immediately stopped, the City's authorized representative notified, and the cause remedied before proceeding with the work.
- (c) Variation in the invert elevation between adjoining ends of pipe, due to nonconcentricity of joining surface and pipe interior surfaces, shall not exceed  $\frac{1}{64}$  per inch of pipe diameter, or  $\frac{1}{2}$  inch maximum.
- (d) Tee stations shall be staked as specified in Section 301.1.06, "Surveying," to enable the contractor to install services at the correct property location.

2. **Pipe Handling**

- (a) The contractor shall unload pipe only by approved means. Pipe shall not be unloaded by dropping it to the ground and pipe shall not be dropped or dumped into trenches.
- (b) The contractor shall inspect all pipe and fittings before lowering them into trenches to ensure that no cracked, broken, or otherwise defective materials are used.

- (c) The contractor shall clean the ends of pipe thoroughly, remove foreign matter and dirt from inside the pipe, and keep it clean during laying and joining.
- (d) The contractor shall lower the pipe into the trench in such a manner as to avoid any physical damage to the pipe.
- (e) The contractor shall remove all damaged pipe from the job site.

### 3. **Foreign Material**

- (a) The contractor shall take all necessary precautions to prevent excavated or other foreign material from entering the pipe during the laying operation.
- (b) At all times, when laying operations are not in progress, the contractor shall use a mechanical plug at the open end of the last laid section of pipe to prevent entry of foreign material or creep of the gasketed joints.

### 4. **Pipe Laying**

- (a) Pipe laying shall proceed upgrade, with the spigot ends pointing in the direction of flow.
- (b) After a section of pipe is lowered into the prepared trench, the contractor shall clean the end of the pipe to be joined, the inside of the joint, and the rubber ring (if required) immediately before joining the pipe.
- (c) At the location of each joint, dig bell (joint) holes of ample dimensions in the bottom of the trench and at the sides, where necessary, to permit the joint to be made properly.
- (d) The joint shall be assembled according to the recommendations of the manufacturer. The contractor shall provide all special tools and appliances required for the joint assembly. After the joint is made, the pipe shall be checked for alignment and grade.
- (e) The trench bottom shall form a continuous and uniform bearing and support for the pipe at every point between joints.
- (f) Do not lay pipe in water or when, in the opinion of the City's authorized representative, trench conditions are unsuitable.

- 5. **Movable Shield:** When pipe is laid in a movable trench shield, the contractor shall take all necessary precautions to prevent the pipe joints from pulling apart when the shield is moved ahead. The bottom of the

shield shall not extend below the springline of the pipe without recompacting the pipe zone.

6. **Cutting Pipe:** When cutting or machining the pipe is necessary, the contractor shall use only the tools and methods recommended by the pipe manufacturer and approved by the City's authorized representative. The contractor shall cut ductile iron pipe using a method approved by the City's authorized representative; all burrs or rough edges shall be removed before joining pipe. The contractor shall not flame-cut the pipe.
7. **Transition Fittings:** Connections of service branches to existing sewers shall be made watertight. Transition couplings between dissimilar pipe materials shall be made using approved commercial adapters with stainless steel bands such as Fernco, Caulder, or equal.
  - (a) PVC couplers or adapters shall meet the specifications for ASTM D-3034, SDR 35 pipe fittings.
  - (b) Ductile iron transition couplings shall be manufactured from ductile iron conforming to ASTM A-536, grade 65-45-12, for center and end rings. Rubber gaskets, bolts, and nuts shall conform to AWWA C-111/ANSI A21.11.
8. **Concrete Closure Collars**
  - (a) The contractor shall pour closure collars against undisturbed earth, remove all water from the excavation, and construct suitable forms to obtain shapes that will provide full bearing surfaces against undisturbed earth, as indicated in Detail No. S-2190 of these standards.
  - (b) Closure collars shall be used only when approved by the City's authorized representative, and then only to make connections between dissimilar pipe or where standard rubber-gasketed joints are impractical.
  - (c) Before the closure collars are installed, the contractor shall wash the pipe to remove all loose material and soil from the surface where they will be placed.
9. **Pipe Zone Material:** The contractor shall install pipe zone material uniformly on both sides of the pipe, up to the springline of the pipe. Material shall be placed in lifts not exceeding 6 inches. Material shall be well worked with hand tools to ensure proper support in the haunching area.

## 10. Line Taps

- (a) Line taps shall be core-drilled unless otherwise approved by the City's authorized representative. Core-drilled holes shall be made using a cylinder-style hole saw for plastic pipe material only, or a diamond core bit for concrete and ductile iron pipes.
- (b) Line tap connections to existing storm lines may be done using either saddle tees as per Section 401.4.02.b.5(a), or by using Inserta Tee<sup>®</sup> as per Section 401.4.02.b.5(c).
- (c) Line taps shall be centered on the spring line of the pipe being tapped.
- (d) The area around the saddle installation site shall be cleaned and free of all rough edges before installing the saddle.
- (e) While installing the saddle, no rock, dirt, or debris shall be allowed to enter the main sewer line from the core hole.
- (f) The contractor shall install ¾"-0" crushed aggregate in the pipe zone around the line tap, from 6 inches below the pipe to 12 inches above the pipe.
- (g) Laterals shall have tracer wire (12-gauge with white THNN insulation) installed beside the pipe and plastic caution tape installed 1-foot above the pipe crown as shown in Detail No. S-2175 of these standards.

### 301.11.00 CONSTRUCTION SPECIFICATIONS

#### 301.11.01 General Provisions

The specifications outlined here, together with the standards established by the Oregon DEQ, the U.S. Environmental Protection Agency, and any other applicable requirements of the City, shall govern the character and quality of material, equipment, installation, and construction procedures for gravity-flow portions of public storm systems.

#### 301.11.02 Scheduling

The contractor shall plan their construction work in conformance with Section 101.8.02, "Scheduling."

#### 301.11.03 Environmental Protection, Erosion Prevention, and Sediment Control

The contractor shall take all appropriate measures and precautions to minimize the work's impact on the environment and shall control erosion, as outlined in Section 101.9.00, "Environmental Protection, Erosion Prevention, and Sediment Control."

#### **301.11.04 Interferences and Obstructions**

Various obstructions may be encountered during the course of the work. The contractor shall follow the guidelines established in Section 101.8.05, "Interferences and Obstructions."

#### **301.11.05 Contaminated Soil or Hazardous Material**

If during construction contaminated soil or with hazardous materials or chemicals are encountered, the Contractor shall follow the procedures specified in Section 101.9.02, "Contaminated Soils or Hazardous Materials."

#### **301.11.06 Trench Excavation, Preparation, and Backfill**

Trench excavation, preparation, and backfill shall conform to the requirements of Section 6, "Trench Excavation and Backfill."

#### **301.11.07 Preservation, Restoration, and Cleanup**

- a. **Cleanup:** Cleanup of all construction debris, excess excavation, and excess materials and complete restoration of all fences, mailboxes, ditches, culverts, signposts, and similar items shall be completed according to Section 101.8.16, "Preservation, Restoration, and Cleanup."
- b. **Preservation of Drainage Ditches:** After backfilling the trenches, the contractor shall restore all public and private storm drain ditches that were destroyed, damaged, or otherwise modified during construction to the condition of the ditch before construction. Ditches shall be built in their original locations unless otherwise redesigned as part of the project.

#### **301.11.08 Bores**

##### a. General

The carrier pipe in all bores shall be installed inside a steel case, unless otherwise approved by the City's authorized representative (see Detail No. S-2165 of these standards).

##### b. Installation

1. **Casing:** The casing shall be smooth steel of a size to permit proper construction to the required line and grade. The steel casing shall be fabricated in sections for field-welded joints. The casing wall thickness shall be a minimum of ¼ inch for pipe diameters of 6 to 12 inches and shall be a minimum of 5/16 inch for pipe diameters of 15 to 24 inches, or in accordance with the requirements of the jurisdiction of the right-of-way.

2. **Pipe Supports:** The sewer pipe shall be continuously supported on three sides by pipe supports, except at joints. Pipe supports shall be No. 2 HDPE plastic block, or approved equal. Strapping and hardware shall be stainless steel.
3. **Placing Fill in Casing:** The annular space shall be completely filled between the casing and pipe with lean grout or sand to prevent pipe flotation.
4. **Concrete Seals and Fill:** After the storm pipe is tested and approved, concrete plugs shall be poured at each end of the casing. The annular space between the casing and pipe shall be completely filled with lean grout or sand to prevent pipe flotation.

c. Railroad Crossings

Prior to beginning any under-track work, applicant shall obtain proper permit(s) from ODOT or present owner of railroad line and written approval of plans from user(s) of railroad line. Install the pipe by tunneling, jacking, boring or similar methods, approved by the Railroad. Install the pipe to the lines and grades established and backfill completely all voids around the installation with specified material, to the satisfaction of the railroad.

### **301.12.00 TESTING PROCEDURES**

#### **301.12.01 General**

- a. The contractor shall furnish all necessary testing equipment and perform the tests in a manner satisfactory to the City's authorized representative.
- b. All gravity storm systems shall be inspected and tested after backfill has passed the required compaction test(s) based on AASHTO T-180 and roadway base rock has been placed, compacted, and approved. All details of testing procedures shall be subject to approval of the City's authorized representative.
- c. If repair work is required on a section of the system, that portion of the system shall be retested.
- d. All testing shall be completed and accepted by the City's authorized representative before paving of overlying roadways will be permitted.

#### **301.12.02 Line Cleaning**

Before testing and City inspection of the system, the contractor shall ball and flush and clean all parts of the system. The contractor shall remove all accumulated construction debris, rocks, gravel, sand, silt, and other foreign material from the system at or near the closest downstream manhole. If

necessary, the contractor shall use mechanical rodding, bucketing or vactor equipment. When the City's authorized representative inspects the system, any foreign matter still present shall be flushed and removed from the system. ***Contractor shall provide screening; no material shall be flushed into the downstream city sewer system.***

#### **301.12.03 Deflection Test for Flexible Pipe**

Storm systems constructed of flexible pipe shall be deflection-tested by pulling an approved mandrel through the completed pipeline. The diameter of the mandrel shall be 95% of the nominal pipe diameter, unless otherwise specified by the City's authorized representative. The mandrel shall be a rigid, nonadjustable, odd-numbered-leg (9 legs minimum) mandrel having an effective length of not less than its nominal diameter. Testing shall be done manhole-to-manhole and after the line is completely balled and flushed with water, and after compaction tests of backfill are completed and accepted. The contractor shall be required to locate and repair any sections that fail the test and to retest those sections. All repairs shall follow and be in compliance with the manufacturer's recommendations.

#### **301.12.04 Video Inspection of Gravity Systems**

All storm systems shall be video-inspected and approved prior to City acceptance. Video inspection shall take place after trench backfill and compaction has been completed and accepted, and channels have been poured in manholes. All pipes shall be thoroughly flushed immediately prior to the video inspection; only that water remaining from flushing shall be present in the system. The camera shall have the ability to tilt up to 90 degrees and rotate 360 degrees on the axis of travel. An inspection of all lateral connections shall be conducted using the tilt capabilities of the camera. A 1-inch target ball shall be placed in front of the camera. Observed sags must be less than 0.5 inch.

The City's authorized representative shall be notified and shall be present during video-inspection of the system, unless otherwise approved by the City's authorized representative. A copy of the video and a written video inspection report, on a City-approved form, shall be supplied to the City's authorized representative. The video shall be recorded in color and in VHS or CD format. Video shall include a visual footage meter recording. Problems revealed during the inspection shall be noted on the video and in the written report. After repairs have been made, the line shall be re-inspected and re-tested. If excessive foreign material, in the opinion of the City's authorized representative, is encountered during video inspection, the line shall be balled and flushed and re-video inspected.

## **301.13.00 WARRANTIES AND ACCEPTANCE**

### **301.13.01 Stormwater and Surface Water Acceptance Policy**

The City of Wilsonville will accept new stormwater and surface water installations or systems built to the "Public Works Standards," providing that the following conditions are met.

- a. Dedication of any required easements or rights-of-way have been recorded with the County Recorder and the Engineering Department receives a reproducible copy of the recorded documents.
- b. After completion of construction of the total project, and after all testing has been satisfactorily completed, project closeout shall proceed as outlined in Section 101.8.17.a, "Project Completion."
- c. The Contractor or Applicant shall be responsible for providing Maintenance Assurance for Public Improvements as outlined in Section 101.8.17.b, "Maintenance Assurance." Public storm improvements shall be warranted for a minimum of one year; public landscape improvements shall be warranted for a minimum of two years.
- d. At any time during the warranty period, the City's authorized representative has reason to believe the public stormwater improvements have defects that were the result of faulty workmanship or flaws in construction material, the responsible party shall be required, at that party's own cost, to video-inspect the sewer line and repair any problems or faults revealed during video inspection by replacing those sections. The video inspection shall be done during the winter, if possible, or during the wet weather months, to identify all leaks.
- e. Before the end of the Construction Maintenance period, the City's authorized representative shall inspect the project for any remaining deficiencies. If the deficiencies that remain are determined to be the responsibility of the contractor or the applicant, the contractor or applicant shall then make such repairs.
- f. The Landscape Maintenance assurance shall be released two years after acceptance of construction, providing the landscaping meets the 90% survival level (see Section 301.13.02, "Landscape Inspection for Warranty").

### **301.13.02 Landscaping Inspection for Warranty**

- a. The City's authorized representative shall inspect the condition of all landscaping located within the public right-of-way and/or the water quality/quantity facility at the end of the first year of the post-construction period. The City's authorized representative shall provide an interim inspection report to the applicant with a specific summary of any deficiencies.

Failure of the City to provide the interim report shall not release the applicant from the responsibility for providing established landscaping at the end of the two-year landscaping maintenance period.

- b. If at any time during the warranty period the landscaping falls below the 90% survival level, the applicant shall reinstall all deficient planting at the next appropriate planting opportunity. The two-year maintenance period shall begin anew from the date of replanting.
- c. The 90% survival level shall meet the following criteria:
  1. In the opinion of the City's authorized representative, landscaping is established and healthy.
  2. Each plant group (trees, shrubs, herbaceous, and aquatics) shall meet the 90% survival level.
  3. Each planting zone (wet, moist, and dry) shall meet the 90% survival level.
- d. Areal coverage shall meet the 90% survival level.

## SECTION 4

### SANITARY SEWER DESIGN AND CONSTRUCTION STANDARDS

#### 401.1.00 ENGINEERING

##### 401.1.01 Introduction

This chapter outlines design and construction requirements for all public sanitary sewers. The provisions and technical specifications herein set forth the requirements of the City of Wilsonville for constructing sanitary sewer improvements. Interpretations of such provisions and their application in specific circumstances shall be made by the City's authorized representative. Refer to Section 1 of the "Public Works Standards" for general provisions and requirements.

A map may be required that shows the drainage basin in which the project is located. The map shall show the major basin that is consistent with the City's current Wastewater Collection System Master Plan, and any applicable amendments and updates to it.

##### 401.1.02 General Provisions

Along with the provisions established in Section 101.5.00, "Control of Public Works Projects," all sanitary sewers shall be designed and constructed so as to conform to the requirements of the Oregon state plumbing laws and rules of the Oregon DEQ. Except as otherwise provided, the extension of the public sewerage facilities to serve any parcel or tract of land shall be done by, and at the expense of, the property owner, although the City reserves the right to perform the work or cause it to be performed and bill the owner for the cost of the work or to pursue special assessment proceedings. Public sewer extensions shall extend to the most distant parcel boundary, to facilitate future extension, unless otherwise approved by the City's authorized representative.

##### 401.1.03 Extension of Public Sanitary Sewer Systems

Except as otherwise provided, the extension or upsizing of the public sanitary systems to serve any parcel or tract of land shall be done by, and at the expense of, the property owner or permit applicant. The City's authorized representative may require a sewer pipeline that serves or may serve more than one property to be a public system.

##### 401.1.04 Sanitary Plans

- a. It is the design engineer's responsibility to ensure that engineering plans are sufficiently clear and concise to construct the project in proper sequence,

using specified methods and materials, with sufficient dimensions to fulfill the intent of the design guidelines contained in these standards.

- b. All elevation on design plans and record drawings shall be based on the applicable NAVD datum specified in Section 101.7.07.a, "Surveying and Land Monuments."
- c. All engineering sanitary plans shall be stamped by a Professional Engineer registered in the State of Oregon. The sanitary plan shall contain the following:
  1. At least one sheet shall show a plan view of the entire project site. If the project site is sufficiently large that detailed sanitary plans on any given sheet do not encompass the entire project site, then a sheet showing the plan view of the entire site must serve as an index to subsequent detailed plan sheets.
  2. A topographic map showing existing conditions for the site, including the following:
    - (a) Existing topography for the site.
    - (b) Adjacent streets, including street names.
    - (c) Existing utilities, including franchised utilities located above or below ground. Existing drainage pipes, culverts, and channels shall include the invert or flowline elevations.
    - (d) Existing environmentally sensitive areas (e.g., ravines, swales, steep slopes, wells, springs, wetlands, creeks, lakes). For natural drainage features, show direction of flow, drainage hazard areas, and 100-year floodplain boundary (if applicable).
  3. Plans for proposed sanitary improvements shall include the following:
    - (a) Finished grades, showing the extent of cut and fill by existing and proposed contours, profiles, or other designations.
    - (b) Proposed structures, including roads and road improvements, parking surfaces, building footprints, walkways, landscape areas, etc.
    - (c) Proposed utilities, showing exact line and grade of all proposed utilities at crossings with the proposed sanitary system.
    - (d) Applicable detail drawings.
    - (e) Existing and proposed easements.
    - (f) Setbacks from environmentally sensitive areas r resource areas protected within the SROZ.

- (g) Proposed sanitary structures.
- (h) Maintenance access, as applicable (see Section 401.2.03, "Access").
- (i) Plan and profile of sanitary systems, including the following information: pipe sizes, pipe types and materials, lengths, slopes, type of structure, location of structures, invert elevations in/out of structures, and top elevations of structures. Notes shall be included for referencing details, cross-sections, profiles, etc.
- (j) Any proposed phasing of construction.

**401.1.05      Surveying**

- a. The design engineer shall be responsible for establishing the location of the sewer by means of reference stakes offset along the sewer. No construction shall be allowed to begin before construction staking. All staking shall be performed by or under the direction of a Professional Land Surveyor registered in the State of Oregon.
- b. Stakes shall locate all public tees, cleanouts, manholes, water line crossings, and pump stations. Maximum spacing for reference stakes is 50 feet. Stakes shall reference cuts or fills to all invert elevations and rim grades. The design engineer shall also be responsible for identifying easements during construction.

**401.1.06      Population Density**

Population density figures shall be obtained from the most recent information available for use by the zoning or planning department of the City of Wilsonville. If those figures vary from those of the applicable master plan estimates, the difference must be noted in the design calculation.

**401.1.07      Sewage Flow Determination**

- a. When required by the City's authorized representative, the design engineer shall prove to the City that all necessary methods of determining present and future capacity of the sanitary sewer have been considered. For flow variations and peaking factor, accepted flow design practice must be employed. A factor must be used, and the method used to obtain the factor must coincide with the method used in the City's Sanitary Sewer Master Plan. Infiltration and inflow must be represented in flow calculations in the design of the sanitary system.
- b. Sewage flows must reflect any reasonably anticipated increase due to the development of the drainage basin upstream of the project being considered. Design engineers are cautioned not to specify sewers of sizes that are obviously larger than necessary to achieve satisfactory carrying capacity, but which are specified to meet grade requirements.

#### **401.1.08      Interceptor Required**

Grease, oil, and sand interceptors shall be required when, in the opinion of the City's authorized representative or Building Official, they are necessary for the proper handling of wastewater containing fats, wax, grease, sand, or oils, whether emulsified or not, and containing any products or substances that may solidify or become viscous at temperatures of between 32° and 150°F (0° to 65°C). Any discharger of such wastewater shall be required to install, use, maintain, and keep in good working condition an interceptor—a device designed and installed so as to adjust, separate, and retain deleterious, hazardous, or undesirable matter from sewage, and to permit normal sewage or liquid wastes to discharge into the disposal terminal.

#### **401.1.09      Interference with City Sewer System Prohibited**

No person shall block, obstruct, or interfere with any portion of the City sanitary sewer system without a plan being submitted and approved by the City's authorized representative. This prohibition includes, but is not limited to, the obstruction of the flow of sewage from, and to any point within, the City sewer system.

#### **401.2.00      SANITARY MANHOLE AND PIPE DESIGN STANDARDS**

##### **401.2.01      Manhole Design**

- a. Manholes shall be provided at least every 400 feet, unless otherwise approved by the City's authorized representative. Manholes shall be located at every grade change, change in pipe size, and change in alignment. Manhole lids shall be centered in the roadway as indicated in the street detail drawings of these standards unless an exception is approved by the City's authorized representative.
- b. When a manhole is 5 feet or less deep, a flat-top or shallow manhole shall be used, as shown in Detail No. S-2030 of these standards. Flat-top manholes shall be designed to be installed at an elevation to permit construction of the full street section, allowing for the design gradients.
- c. All manholes shall be a minimum of 48 inches in diameter.
- d. Suburban style manholes frames shall not be used in PCC streets.
- e. Detail(s) shall be submitted with the plans where pipes into or out of a manhole are larger than 24 inches or where more than four mainline connections are made. The manufacturer or design engineer shall provide the City's authorized representative with supporting calculations, stamped by a Professional Engineer registered in the State of Oregon, documenting the structural integrity of the manhole.

- f. Connections to an existing manhole, elevation of the existing ledge, location of steps, and elevations of existing inlets and outlets shall be submitted with the plans.
- g. All precast manhole bases shall have smooth, clean openings at the design inlets and outlet points. Openings shall not be sawcut or broken out.
- h. All manhole bases shall be properly channelized. No more than three side laterals are allowed to be connected to a manhole, unless an exception is approved by the City's authorized representative. There shall be a minimum of 8 inches separating connections, measured from the outside diameter of the core holes.
- i. All manholes shall have inlets at a minimum 90-degree angle in relation to the outlet, as measured from the center of the manhole base.
- j. Manholes shall have a minimum freefall of 0.20 feet and a maximum freefall of 1.5 feet.
- k. Drop manholes: The maximum inside drop in a manhole shall be 18 inches. When more than 18 inches of drop exists, an outside drop manhole shall be used. Outside drops shall be constructed of ductile iron pipe (see Detail No. S-2040 of these standards).
- l. The contractor shall supply the City with manhole cover inserts, such as Southwestern Packing & Seals Rainstopper<sup>®</sup>, or approved equal, for all public manholes. For public manholes located in natural or landscaped areas or in residential streets, the contractor shall supply manhole cover inserts made of durable plastic. For public manholes located in arterial and collector streets, the contractor shall supply manhole cover inserts made of stainless steel.

#### **401.2.02 Sanitary Pipe Design**

- a. **Pipe size:** No public sanitary sewer shall be less than 8 inches in diameter, unless otherwise specified by the City's authorized representative. Side sewers shall be either 6-inch or 4-inch inside diameter, as required by the City. All side sewer pipes shall be polyvinyl chloride (PVC) and shall conform to ASTM D-3034.
- b. **Location:** Sanitary sewers, wherever possible, shall be installed near the centerline of the public right-of-way. Sanitary pipe shall be located not closer than 5 feet to face of curb, unless an exception is approved by the City's authorized representative. In any event, all sewer locations shall be approved by the City's authorized representative.
- c. **Easements:** When it is not possible or practical to install the sewer line in a dedicated public street, a minimum 15-foot public pipeline easement shall be provided. Sewer lines shall be located in the center of the easement, unless an

exception is approved by the City's authorized representative. The centerline of the pipe shall be at least 7½ feet from an easement side line.

- d. **Alignment:** Public sanitary pipe shall be laid on a straight alignment and at uniform grade, unless an exception is approved by the City's authorized representative.
- e. **Connections:** Lateral connections on new construction work shall be done using manufactured tees installed at surveyed locations. Lateral connections to existing sanitary lines may be done using either saddle tees as per Section 401.4.02.b.5(a), or by using Inserta Tee® as per Section 401.4.02.b.5(c). Laterals shall be of same material as main.
- f. **Laterals:** Sanitary laterals shall be provided with a cleanout installed at the public right-of-way or easement as shown in Detail No. S-2175 of these standards. Cleanouts shall not be installed in the driveway or sidewalk, unless approved by the City's authorized representative.
- g. **Curb Marking:** Newly constructed curbs or replaced curbs shall be stamped with the capitol letter "SS" at the location of each sanitary lateral crossing. Letters shall be 3 inches in height and embossed a minimum of 1/8-inch deep.
- h. **Locating Wire and Tape:** Sanitary mains and laterals shall have tracer wire (12-gauge with green THNN insulation) installed beside the pipe and plastic caution tape installed 1-foot above the pipe crown as shown in Detail No. S-2175 of these standards. Surface locating wire at right-of-way cleanouts; tape shall be tied off to the 2 x 4 marker.
- i. **Grade:** All sanitary sewers shall be laid on a grade that will produce a mean velocity of at least 2 feet per second when flowing full or half-full. The minimum grades for various sizes of pipe are listed in **Table 4.1**.

**Table 4.1. MINIMUM GRADIENT FOR SANITARY SEWERS**

| Inside Pipe Diameter<br>(inches) | Grade (%)<br>(feet per 100 feet) |
|----------------------------------|----------------------------------|
| <b>Sanitary Laterals</b>         |                                  |
| 4                                | 1.00                             |
| 6                                | 0.60                             |
| <b>Sanitary Mains</b>            |                                  |
| 8                                | 0.40                             |
| 10                               | 0.28                             |
| 12                               | 0.22                             |
| 15                               | 0.15                             |
| 18                               | 0.12                             |
| 21                               | 0.10                             |
| 24                               | 0.08                             |
| 27                               | 0.07                             |
| 30                               | 0.06                             |

- j. **Steep Slopes:** Sewers pipes on slopes in excess of 20% gradient shall be secured with approved concrete anchor walls as shown in Detail No. S-2195 of these standards. Spacing for anchors shall be as shown in **Table 4.2**.

**Table 4.2. SECURING SEWERS ON SLOPES**

| <b>Minimum Anchor Spacing<br/>Sewer Gradient &gt;20%</b> |                                |
|----------------------------------------------------------|--------------------------------|
| Grade (%)                                                | Center to Center<br>(feet)     |
| <35                                                      | 35                             |
| 35-50                                                    | 25                             |
| >50                                                      | 15 (or concrete<br>encasement) |

- k. **Pipe Cover:** All sanitary sewers shall have a minimum of 5 feet of cover over the top of the sewer pipe to finish grade. When such minimum cover is not possible, ductile iron pipe, AWWA C-900, or concrete encasement or other material approved by the City's authorized representative shall be used.
- l. **Sewer in Vicinity of Water Supplies:** No existing or proposed pressured sanitary sewer shall be permitted within 100 feet of any well, spring, or other source of domestic water supply. No existing or proposed gravity sewer line shall be permitted within 50 feet of any well, spring, or other source of domestic water supply.

**m. Water and Sewer Lines**

1. Sanitary sewers and domestic water lines shall not be laid in the same trench. Parallel water and sewer lines shall be at least 10 feet apart horizontally (see Detail No S-2150 of these standards).
2. When there is less than 18 inches of vertical clearance between water and sewer, and when physical conditions render that spacing impossible or impractical, then class 50 ductile iron pipe with watertight joints, C-900 PVC pipe, concrete encasement, or pipe approved by the City's authorized representative shall be required.
3. Wherever it is necessary for sewer and water lines to cross each other, the crossing shall be at an angle of approximately 90 degrees. The sewer line shall be located 18 inches or more below the water line or shall be constructed of pipe material approved by the City's authorized representative for a distance of 10 feet on both sides of the water line.

**401.2.03 Access**

Access roads are for maintenance and inspection purposes. All-weather access shall be provided to every manhole. Access roads shall be constructed as per Section 301.4.04, "Access Road Design."

**401.3.00 PUMP STATION DESIGN STANDARDS**

**401.3.01 General Provisions**

**a. Applicability**

These standards are applicable to the construction, installation, or modification of any wastewater pump station system requiring a City of Wilsonville Public Works Permit.

**b. Scope**

Pursuant to the City of Wilsonville Development Code Section (February 2004) 4.262.04 Sanitary Sewers:

In order to accomplish the orderly and desirable development of land within the corporate limits of the City and to limit the costs associated with the operation and maintenance of wastewater pump stations borne by the City, the City Engineer deems it reasonable and necessary to restrict the installation of wastewater pump stations. Therefore, wastewater pump stations will not be allowed in areas: where gravity sewer service is programmed for construction in an applicable capital improvement plan, where improvements are recommended in the City of Wilsonville Wastewater Collection System Master Plan, or where sewers are available within three thousand (3,000) feet.

Temporary pump stations will be allowed in areas where future development will require extension of gravity sewers and the City's authorized representative determines that the temporary station is economically justified. Design life must be less than ten (10) years, as determined in the preliminary engineering report, and have a capacity of less than four hundred (400) gallons per minute (gpm).

Permanent pump stations will be allowed in areas where future development does not require extending gravity sewers, as determined in the preliminary engineering report and the applicable, if any, master plan for the area.

**c. Variance**

When engineering justification satisfactory to the City's authorized representative is provided substantially demonstrating that variation from the design standards or siting criteria will result in either: at least equivalent effectiveness while significantly reducing costs, or improved effectiveness, such a variation from design standards or siting criteria may be accepted by the City's authorized representative.

**d. Reviewing Authority**

The Oregon Department of Environmental Quality is the final reviewing authority. All plans and specifications for a wastewater pump station shall be reviewed and approved by the Oregon Department of Environmental Quality (DEQ.) The basis for review by DEQ review engineers is Oregon Administrative Rule 340 Division 52 (OAR340-52), Review of Plans and Specifications. To that extent, all plans and specifications shall follow the guidelines and criteria set forth in the Oregon Standards for Design and Construction of Wastewater Pump Stations, May 2001. The standards in this Wastewater Pump Station Design Standards chapter of the Public Works Standards are developed as supplemental standards to address local needs, preferences, and existing equipment. Conflicts between the City's established standards and DEQ guidelines shall be resolved by first following that standard or guideline which is more stringent and/or specific; second, by determination of the City's authorized representative as to which standard or guideline is advantageous to or in the best interests of the City.

**401.3.02 General Requirements**

**a. Administration**

The design engineer in charge must be registered in the State of Oregon and have had previous experience designing similar facilities, including mechanical, electrical, telemetry, and control systems. The engineer's qualifications shall be submitted prior to initiation of study and shall be acceptable to the City's authorized representative. An authorized representative of the City will be available for construction observation during construction of the project. The design engineer of the pump station shall

provide startup services. Provisions for maintenance of temporary pump stations may be required.

**b. Flood Protection**

The station's electrical and mechanical equipment, which would be permanently damaged by flooding, shall be located at an elevation that is not subject to a one hundred (100) year flood or shall otherwise be adequately protected against damage from the one hundred (100) year flood. The station shall be designed to remain operational and accessible during the twenty-five (25) year flood. In the absence of official records to establish one hundred (100) year and twenty-five (25) year flood elevations, the best available local information shall be used.

**c. Siting**

Pump stations shall be located as far as practical from present or proposed built-up residential areas and off the traffic way of streets and alleys. Noise control, odor control, station architectural design and other aesthetic items shall be taken into consideration and reviewed by the Design Review Board. Sites for stations shall be of sufficient size for future expansion or addition, if applicable.

**d. Safety**

It is the design engineer's responsibility to ensure that the Occupational Safety and Health Administration (OSHA), the National Electrical Code, and all other applicable building and construction codes and requirements are met during construction. Adequate provision shall be made to protect construction and, subsequently, maintenance and operation personnel from hazards. Equipment and training for confined space entry in accordance with OSHA and regulatory agency requirements shall be provided for all wastewater pumping stations

**401.3.03 Preliminary Engineering Report**

A preliminary engineering report prepared by the design engineer as a basis for design for all wastewater pumping stations shall be submitted to the City's authorized representative for review and approval. The preliminary engineering report shall include, but is not limited to, the following information:

**a. Service Area Study**

1. Population: Present and future population and/or industrial/commercial usage projections. Present, design and ultimate flows of all areas that could be served.
2. Land Use: Type of land use, zoning and comprehensive plan designations.

**b. Design Characteristics**

3. Average and peak flow calculations, unit flows and peaking factors and infiltration/inflow allowances for present and future design conditions.
4. Wet well configuration and size.
5. Number, type, capacity, motor horsepower and Net Positive Suction Head (NPSH) requirements of proposed pumping units. Motor shall be protected from over-current, over-temperature and voltage imbalance. Pumping units shall be duplex.
6. System head curve and head computations for design conditions of pumping system. (Future pumping capacity requirements shall be considered in sizing pumping equipment.)
7. System head calculations shall include the size and length of force main static head, all dynamic losses and assumed "c" (friction) factor. Force main shall be a minimum of four (4) inch diameter.
8. Calculations showing flotation potential and ballasting, if necessary.
9. Description of primary and back-up power sources. All wastewater pump stations shall be supplied with a back-up or alternate power source.
10. Other hydraulic computations shall include, but not limited to, pump cycling time, wet well capacity, flushing velocity and surge analysis.

**c. Preliminary Plans**

Shall be in conformance with Section 401.1.04, "Sanitary Plans," and, in addition, shall show the following:

1. A contour map of the proposed site, service area, and force main.
2. Proposed pump station, including structure, site layout, landscaping street connection, and provisions for future pumps, if necessary.
3. Existing pump station, if applicable.
4. The 100-year flood plain elevation at the site.
5. Maximum elevation of wastewater in the collection system and wet well in the event of a power failure for the estimated duration of the power outage.
6. Worst case overflow drainage pattern and receiving stream.
7. Process and Instrumentation diagrams for electrical and control systems.

8. Force main with both plan and profile views to the connection at the receiving location.

#### **401.3.04 Design Criteria**

##### **a. General**

1. The pump station shall be designed to maintain the liquid level of a wet well by automatically starting and stopping pumping operation as required by wet well conditions.
2. The pump station shall have a firm capacity to pump the peak hourly and peak instantaneous flows associated with the 5-year, 24-hour storm intensity (see **Table 3.2. Rainfall Distribution**) of its service area, without overflows from the station or its collection system.
3. Design shall be consistent with EPA Class I reliability standards for mechanical and electrical components and alarms.
4. Pumping systems shall be duplex with pump sequencing and each pump sized in excess of the expected maximum flow.
5. Aboveground pump stations shall be required unless otherwise approved.
6. The wet well shall have sufficient volume to provide a holding period of 10 minutes between pump operating cycles at maximum design pump station flow. The floor shall be sloped for proper installation and function of the pumps inlets. Influent flow shall enter the wet well above the pump operating level.
7. All-weather access for vehicles shall be provided. The site shall be fenced and the fence shall be six (6) feet high. Landscaping shall be provided that adequately obscure the site from view.
8. A remote telemetry unit shall be installed and integrated with the city's programmable logic controller/SCADA system. Local control shall be provided in case of telemetry failure. All appropriate alarms shall be wired and tested for accuracy before they are accepted.
9. The pump station shall be provided with potable water for wet well washdown. Water shall be metered, at or above finish grade and provided with a reduced principle (rp) backflow device (If outside, a heated enclosure for the rp shall be supplied.)
10. Sufficient back up power to operate the station in case of power outage shall be supplied.
11. Exterior and interior lighting and convenience outlets shall be provided.

12. Adequate piping, valves, and appurtenances for isolation and removal of equipment shall be provided. Capability for bypass pumping shall be provided.
13. Pumps shall be sized to pass a minimum of a three (3) inch sphere. Pump suction, discharge, and force mains shall be at least four (4) inches diameter.
14. Suitable shutoff and check valves shall be placed on the discharge line of each pump. The check valve shall be located between the pump and the shutoff valve. Check valves shall be suitable for the material being handled, and shall be placed on the discharge line in a horizontal position. All shutoff and check valves shall be operable and accessible from floor level. Swing check valves shall have outside levers.
15. Federal and State OSHA regulations and guidelines, and any other relevant state, federal and local safety regulations and guidelines shall be followed and adhered to.

**b. Above Ground Pump Station**

1. The above ground pumping station shall be an enclosure housing a duplex, skid mounted, auto-start station utilizing two electric-motor driven, self-priming centrifugal pumps, motor control panel, system piping, two level control systems and a natural gas standby engine (in addition to back-up electric power.). The pump station shall be a Gorman-Rupp base mounted package pump station.
2. A load-test-certified electric hoist and trolley, or approved equal, shall be provided in the pump room. Overhead crane hoist and other installed equipment shall have adequate horizontal and vertical clearance to allow for lifting and moving motors and pump equipment to the station doors using the monorail.
3. The level control system shall consist of a duplex pump air bubbler wastewater level sensing system with a backup submersible pressure transducer or ultrasonic level sensor. Provision shall be made to automatically/manually alternate the bubbler air pumps. The level control system shall be capable of sensing and activating controls at four (4) wet well levels.
4. The pump station enclosure shall be supplied with adequate ventilation and a thermostatically controlled electric heater. The heater shall be sufficient to prevent the freezing of the pumps and piping within the pump station enclosure at an outside temperature of minus twenty (20) degrees F.

5. The pump equipment compartment shall be above grade or offset and effectively isolated from the wet well to prevent humid and corrosive wastewater gases from entering the equipment compartment.
6. Wet well access shall not be through the equipment compartment.
7. Valving shall not be located in the wet well.

**c. Submersible Pumps**

1. Submersible pumps and motors shall be designed specifically for wastewater use, including totally submerged operation during a portion of the pump cycle.
2. Submersible pumps shall be readily removable and replaceable without de-watering the wet well or disconnecting any piping in the wet well.
3. Valves for submersible pumps shall be located in a separate valve chamber. Accumulated water shall drain to the wet well. Wastewater and gases from the wet well shall be prevented from entering the valve chamber.
4. Electrical supply, power, control, alarm circuits, and lines shall be designed to provide strain relief and to allow for disconnection and de-energizing outside the wet well. Terminals and connectors shall be protected from corrosion by location outside the wet well. All penetrations of the wet well shall be watertight. All conduits shall be sealed to prevent gases from entering outside cabinets and equipment from the wet well.
5. The motor control center shall be located outside of the wet well and protected by conduit seals to prevent gases from the wet well from entering the control cabinet.
6. A stainless steel rail and mounted hoist shall be provided for access to and servicing of the pumps and backup-generator or motor.

**401.3.05 Operation and Maintenance Manual**

Three copies of an operation and maintenance manual shall be provided and shall contain the following information:

- a. Component description, with both simplified and detailed system schematics.
- b. Operation information, including startup, normal, and emergency operation and instructions on common problems.
- c. Maintenance information, including records, lubrication, and scheduling requirements and information on local representatives.
- d. Safety.

- e. Manufacturers' manuals.

#### 401.4.00 MATERIAL AND TECHNICAL SPECIFICATIONS

##### 401.4.01 Manholes and Structures

- a. General

Manholes shall be constructed at locations shown on the plans, or as required by the City's authorized representative. The maximum distance between manholes shall be 400 feet, unless otherwise approved by the City's authorized representative. All manholes shall be a minimum of 48 inches in diameter. When a manhole is less than 5 feet deep, a shallow or flat-top manhole shall be used, as shown in Detail No. S-2025 or Detail No. S-2030 of these standards. Flat-top manholes shall be installed at an elevation to permit for construction of the full street section, allowing for the design gradients.

- b. Materials

1. **Aggregate and Cement:** Aggregate shall meet the standards set forth in ODOT SSC Section 02690, "PCC Aggregates"; Portland cement shall meet the standards set forth in ODOT SSC Section 02010, "Portland Cement."
2. **Concrete:** PCC for poured in place manholes and structures shall conform to ODOT Class 3000 – 1½, Commercial Grade Concrete. Slump shall be between 2 and 4 inches.
3. **Manhole Frames and Covers:**
  - (a) Casting shall be of new material, tough, close-grained gray iron conforming to ASTM A-48, Class 30, and shall be smooth and clean, free of blisters, blowholes, and all defects. Bearing surfaces shall be planed or ground to ensure flat, true surfaces. Covers shall be true and set within rings at all points.
  - (b) Rings shall be grouted in place and made watertight with a high-strength, non-shrink grout meeting ODOT SSC Section 02440.50(b), "Non-Shrink Grout," such as Alcrete Twenty Minute Fast Setting Grout<sup>®</sup>, or approved equal. Unused grout shall be discarded after 20 minutes and shall not be used. Rings shall not be brought to grade with lumber.
  - (c) Frames and covers shall be standard or suburban, depending on the manhole location and as approved by the City's authorized representative. Suburban style manhole frames shall not be installed in PCC streets.

- (d) Manholes installed outside of paved street or sidewalk areas shall be installed with a tamperproof frame and cover as shown in Detail No. S-2060 of these standards.
4. **Manhole Types:** Manholes shall be one of the following types or equal.
- (a) **Precast 48-Inch-Diameter Manholes:** Materials shall conform to the requirements of ASTM C-478. Minimum wall thickness shall be 5 inches. Cones shall be eccentric. Before precast manhole sections of any size are delivered to the job site, the sections shall meet the permeability test requirements of ASTM C-14.
- (b) **Precast Large-Diameter (60-inch or larger) Manholes:** Materials shall conform to the requirements of ASTM C-478.
- (c) **Cast-in-Place Large-Diameter Manholes:** Aggregate shall meet the standards set forth in ODOT SSC Section 02690, "PCC Aggregates"; Portland cement shall meet the standards set forth in ODOT SSC Section 02010, "Portland Cement."
- (d) **Precast Bases:** Precast base sections or manhole bases shall be used, except over existing pipe, where poured-in-place bases shall be used (see Section 401.4.01.c.5). Precast manhole bases shall be inspected and approved by the City's authorized representative prior to installation. Where precast bases are not channelized, the contractor shall construct smooth channels to connect the flow from inlet pipe(s) to outlet pipe.
5. **Pipe Stubouts for Future Sewer Connections:** Pipe stubouts shall be the same type as approved for use in the lateral, main, or trunk sewer construction. Strength classifications shall be the same class as in adjacent trenches. Where two different classes of pipe exist at a manhole, the higher-strength pipe shall govern strength classification. Connect stubouts to manholes as specified in Section 401.4.01.d.1, "Connection to Existing Manholes." Rubber-gasketed, watertight plugs shall be furnished with each stubout and shall be adequately braced against air test pressures.
6. **Gaskets:** Manhole sections shall be installed with either preformed rubber gaskets or plastic gaskets. Rubber gaskets shall conform to ASTM C-443. Plastic gaskets shall be Kent-seal No. 2 or Ram Neck, or approved equal, and shall meet all requirements of ASTM C-990.
7. **Manhole Steps:** Steps shall be required and shall be constructed as specified and shown in Detail No. S-2080 of these standards, unless otherwise approved by the City's authorized representative. When pipe is 24 inches in diameter or smaller, steps shall be located as indicated in Detail No. S-2065 of these standards. For pipe larger than 24 inches in diameter, steps shall be located over a bench as coordinated with the

City's authorized representative. Maximum drop from rim to first step shall be 27 inches.

c. Workmanship

1. **Foundation Stabilization:** If, in the opinion of the geotechnical engineer or the City's authorized representative, unstable subgrade material exists that will not support the manhole or other structure, the contractor shall excavate below grade and backfill with foundation-stabilization material approved by the City's authorized representative.
2. **Pipe Connections:** All rigid pipes entering or leaving the manhole shall be provided with flexible joints within 1 foot of the manhole structure and shall be placed on firmly compacted bedding. Special care shall be taken to see that the openings through which pipes enter the structure are completely watertight. All flexible pipe shall be connected to manholes according to the manufacturers' recommendations.
3. **Flexible Joints:** Where the last joint of the line laid up to the manhole is more than 1 foot from the manhole base, a 6-inch concrete encasement shall be constructed around the entire pipe, from the manhole base to within 1 foot of the pipe joint, at the discretion of the City's authorized representative. The pipe encasement shall be constructed integrally with the manhole base. Pipes laid out of the manhole shall be shortened to ensure that the first flexible joint is no more than 1 foot from the manhole base.
4. **Manhole Connections:** The contractor shall connect sewer pipe to manholes as specified in Section 401.4.01.d, "Types of Connections."
5. **Concrete Bases (Poured-in-Place):** Poured-in-place bases shall be used over existing pipelines. The contractor shall remove water from the excavated area, provide a minimum 8-inch-thick layer of compacted ¾"-0" crushed aggregate for a base, and construct the concrete base so that the first precast manhole section has a uniform bearing throughout the full circumference. There shall be a minimum of 8 inches of concrete between the compacted gravel and the lowest invert of the manhole. The contractor shall deposit sufficient concrete on the base to assure a watertight seal between base and manhole wall. Twenty-four hours shall be allowed to elapse before the remaining manhole sections are placed on the base, unless otherwise approved by the City's authorized representative.
6. **Drop Manholes**
  - (a) The maximum inside drop in a manhole shall be 18 inches. See Section 401.4.01.d.3, "Shallow Inside Drop Manhole," for construction of this connection.

- (b) When more than 18 inches of drop exists, an outside drop manhole shall be used. Outside drop manholes shall use ductile iron pipe (see Detail No. S-2040 of these standards).
7. **Placing Manhole Section:** The contractor shall clean the end of each sections of foreign material. Manholes shall be installed with either watertight rubber o-rings or preformed plastic gaskets in conformance with the manufacturers' recommendations. If plastic gaskets are used, the inside seams shall be grouted with a high-strength, non-shrink grout meeting ODOT SSC Section 02440.50(b), "Non-Shrink Grout," such as Alcrete Twenty Minute Fast Setting Grout<sup>®</sup>, or approved equal. Unused grout shall be discarded after 20 minutes and shall not be used. Manholes will be visually inspected for water leakage by the City's authorized representative. Any leakage observed shall be repaired at the contractor's expense, and the manhole re-inspected.
8. **Manhole Inverts:** The contractor shall construct manhole inverts in conformance with Detail No. S-2005 or S-2010 of these standards. Inverts shall have smooth transitions to ensure an unobstructed flow through the manhole. The contractor shall remove all sharp edges or rough sections that tend to obstruct flow.
9. **Manhole Stubouts:** The contractor shall install stubouts from manholes for sewer extensions, as shown in these standards or as required by the City's authorized representative. A watertight flexible connection shall be used for pipe sizes 6 inches through 18 inches in all new manholes. The contractor shall construct invert channels in accordance with Detail No. S-2005 or S-2010 of these standards. The minimum length of stubouts in existing manholes shall be 12 inches outside the manhole wall. Pipes shall be grouted in precast walls or the manhole base to create a watertight seal around the pipes. The contractor shall install compacted base rock, as specified in these standards, to undisturbed earth under all stubouts.
10. **Manhole Extensions, Rings, and Covers:** The contractor shall install rings and covers on top of manholes to positively prevent all infiltration of surface water or groundwater into manholes. Rings shall be set in a bed of high-strength, non-shrink grout meeting ODOT SSC Section 02440.50(b), "Non-Shrink Grout," such as Alcrete Twenty Minute Fast Setting Grout<sup>®</sup>, or approved equal, with the grout carried over the flange of the ring, and shall be set so that tops of covers are flush with the surface of the adjoining pavement, or 1 foot above the natural ground, unless otherwise directed by the City's authorized representative. Unused grout shall be discarded after 20 minutes and shall not be used. Total thickness of grade rings shall not exceed 12 inches; rings shall be grouted watertight. Drop from rim to first manhole step shall not exceed 27 inches. In designated floodplain areas, all manholes shall be at an elevation of at least 2 feet greater than the 100-year storm event.

d. Types of Connections

1. **Connection to Existing Manholes:** The contractor shall connect sewers to existing manholes at the locations shown on the plans. Contractor shall submit a plan for diversion control and receive written approval from the City's authorized representative before proceeding with construction. The contractor shall provide all diversion facilities, and shall perform all work necessary to maintain sewage flow in existing sewers while connections are being made to the manholes. Connections to existing manholes shall be core-drilled, and the bases shall be grouted as necessary to allow a smooth flow into and through the existing manholes.
2. **Manholes Over Existing Sewers:** The contractor shall construct manholes over existing operating sewer lines at the locations shown on the plans. The contractor shall construct a poured-in-place base under the existing sewer and the precast sections as specified. The contractor shall not cut into any existing lines until the new manhole(s) are grouted and pressure tested, the new lines are balled, flushed, deflection tested, and pressure tested, and all portions of the sewer have been approved and accepted by the City's authorized representative. After acceptance, the contractor shall sawcut into the existing line; cut edges of concrete pipe shall be covered with grout and troweled smooth; with ductile iron or plastic pipe, grout shall be applied up to cutout and troweled smooth.
3. **Shallow Inside Drop Manhole:** Where the invert of the connecting pipe is above the manhole shelf and less than 18 inches above the outlet, an inside drop shall be constructed utilizing Portland cement concrete as shown in Detail No. S-2040 of these standards. The sewage entering the manhole shall follow a smooth concrete channel transitioning evenly from the invert of the inlet pipe into the main channel. Sewage shall not be allowed to fall freely to the manhole base.

**401.4.02 Gravity Sewer Pipe**

a. General

Sanitary sewer pipe shall have flexible gasket joints. Joints on all fittings shall be the same as the joints used on the pipe. Caps or plugs shall be furnished with each fitting, outlet, or stub, as required, and shall have the same type of gasket or joint as the pipe.

b. Materials

Materials shall be the following types or approved equal:

1. Concrete Pipe (NRCP/RCP)
  - (a) Non-reinforced concrete pipe shall conform to requirements of ASTM C-14. Unless otherwise specified, pipe shall conform to Class 3 design requirements.
  - (b) Reinforced concrete, nonpressure pipe shall conform to the requirements of ASTM C-76 or C-655 and shall be of the class specified. Unless otherwise specified, pipe shall meet the design requirements of Wall B. Reinforced concrete low-head-pressure pipe shall conform to the requirements of ASTM C-361.
  - (c) Gaskets shall conform to the requirements of ASTM C-443.
  - (d) All steam-cured concrete pipe must be at least seven days old before it can be used. If the pipe has not been steam-cured, it must not be used before it has cured for 28 days.
  - (e) Fittings shall be manufactured integrally and be of a class at least equal to that of the adjacent pipe. Field taps shall be machine-drilled.
  - (f) Mortar used shall be standard nonshrink premixed mortar conforming to ASTM C-387 or in a proportion of one part Type II Portland cement to two parts clean, well-graded sand that will pass a 1/8-inch screen. Mortar mixed for longer than 30 minutes shall not be used.
2. Ductile Iron Pipe (D.I.)
  - (a) Ductile iron pipe shall conform to the requirements of AWWA C-151/ ANSI A21.51, cement lined push-on joint. The minimum thickness class shall be Class 50 (up through 12-inch diameter pipe) and Class 51 (for 14-inch diameter and larger pipe).
  - (b) Fittings shall be mechanical or push-on. Mechanical joint ductile iron fittings shall conform to AWWA C-110. Push-on joint fittings shall be gray iron, with body thickness and radii of curvature conforming to ANSI A-21.10. Rubber gasket joints shall conform to AWWA C-111/ ANSI A-21.11.
3. Polyvinyl Chloride Pipe (PVC)
  - (a) PVC pipe shall conform to the applicable portions of the following specifications: ASTM D-3034, ASTM D-2729, ASTM D-1784, ASTM D-1785, ASTM F-679, ASTM F-794, AWWA C-900, and AWWA C-905.
  - (b) PVC fittings shall conform to the applicable portions of the following specifications: ASTM D-3034, ASTM D-2729, ASTM D-1785, ASTM D-2466, and ASTM D-2467. Fitting joints shall be the same as

the pipe joints. Threaded connections shall conform to the requirements of ASTM D-2464 for schedule 80 pipe.

#### 4. Fittings

##### (a) General

- (1) Manufactured tee fittings shall be provided in the sewer main for side sewers. Fittings shall be of sufficient strength to withstand all handling and load stresses encountered.
- (2) Fittings shall be of the same materials as the pipe. Material joining the fittings shall be of the same material as the pipe.
- (3) Material joining the fittings to the pipe shall be free from cracks and shall adhere tightly to each joining surface.
- (4) All fittings shall be capped or plugged, and shall be gasketed with the same gasket material as the pipe joint, fitted with an approved mechanical stopper, or have an integrally cast knockout lug. The plug shall be able to withstand all test pressures without leaking. When later removed, the plug shall permit continuation of piping with jointing similar to joints in the installed line.

- (b) Mechanical Couplings: Mechanical couplings shall be wrought steel. Installation procedures must meet the manufacturers' recommendations.

#### 5. Line Tap Saddle

- (a) PVC Tee Saddle: manufactured in accordance with ASTM D-3034 with minimum cell classification of 12454B-C or 12364-C as defined in ASTM D-1784. Elastomeric seals shall meet ASTM F-477 specifications; locate seals at both the lead and skirt ends of the saddle. Saddles shall be banded to pipe with #316 Stainless Steel bands, 9/16-inch wide. This saddle is allowed on PVC, clay, IPS, concrete, asbestos cement, and PE pipe.
- (b) Romac Style "CB" Saddle shall be made of casting of ductile iron, which meets ASTM A-536, grade 65-45-12. Rubber gaskets shall conform to AWWA C-111/ANSI A21.11. The band shall be stainless steel with Teflon coated nuts and bolts. This saddle is not allowed on plastic pipe except C-900.
- (c) Inserta Tee<sup>®</sup>, or approved equal: hub adaptor shall be manufactured in accordance with ASTM D-3034; elastomeric seals shall meet ASTM F-477 specifications. This connection is allowed only on thick wall pipe material, e.g., concrete, ductile iron, rib type plastic. Connection point shall be core drilled; hole diameter shall be cut to manufacturer's

specifications. Hub adaptor shall be connected to rubber sleeve with #316 Stainless Steel band (9/16-inch wide), screw, and housing. Inserta Tee<sup>®</sup> connection shall have a gasketed bell for use with sanitary sewers.

c. Proof Tests

The intent of this requirement is to prequalify a joint system, components of which meet the joint requirements, as to the watertightness capability of the joint system. The proof test shall be understood to apply to sanitary sewers that are to be tested for watertightness before acceptance. Material and test equipment for proof-testing shall be provided by the manufacturer. When approved, internal hydrostatic pressure may be applied by a suitable joint tester. Each pipe material and joint assembly shall be subject to the following three proof tests, at the discretion of the City's authorized representative:

1. **Pipe in Straight Alignment:** No less than three or more than five pipes selected from stock by the City's authorized representative shall be assembled according to the manufacturers' installation instructions, with the ends suitably plugged and restrained against internal pressure. The pipe shall be subjected to 10-psi hydrostatic pressure for 10 minutes. Free movement of water through the pipe joint wall shall be grounds for rejecting the pipe.
2. **Pipe in Maximum Deflected Position:** A test section is described below for each pipe material. The pipe shall be subjected to 10-psi hydrostatic pressure for 10 minutes. Free movement of water through the pipe joint or pipe wall shall be grounds for rejecting the pipe.
3. **Joints Under Differential Load:** The test section shall be supported on blocks or otherwise, as described below for each pipe material. There shall be no visible leakage when the stressed joint is subjected to 10-psi internal hydrostatic pressure for 10 minutes.
  - (a) **Concrete Pipe:** For a deflected position, a position  $\frac{1}{2}$  inch wider than the fully compressed position shall be created on one side of the outside perimeter. For a differential load, one pipe shall be supported so that it is suspended freely between the adjacent pipe, bearing only on the joints. In addition to the weight of the suspended pipe, a test load shall be added, as shown in **Table 4-3**.

**Table 4.3. TEST LOADS FOR CONCRETE PIPES UNDER DIFFERENTIAL LOAD**

| Pipe Size (inches)       | Load per Foot, Laying Length Up to 4 Feet (pounds) | Total Load, Pipe 4 Feet and Over (pounds) |
|--------------------------|----------------------------------------------------|-------------------------------------------|
| <b>Sanitary Laterals</b> |                                                    |                                           |
| 4                        | 650                                                | 2,600                                     |
| 6                        | 1,000                                              | 4,000                                     |
| <b>Sanitary Mains</b>    |                                                    |                                           |
| 8                        | 1,300                                              | 5,200                                     |
| 10                       | 1,400                                              | 5,600                                     |
| 12                       | 1,500                                              | 6,000                                     |
| 15                       | 1,850                                              | 7,400                                     |
| 18                       | 2,200                                              | 8,000                                     |
| 21                       | 2,500                                              | 10,000                                    |
| 24 and over              | 2,750                                              | 11,000                                    |

(b) **Ductile Iron Pipe:** For the deflected position, a position ½ inch wider than the fully compressed section shall be created on one side of the outside perimeter. For a differential load, one of the pipes shall be supported so that it is suspended freely between the adjacent pipe, and bearing only on the joints. A force shall be applied along a longitudinal distance of 12 inches beside one of the joints, as specified in **Table 4-4**.

**Table 4.4. TEST LOADS FOR DUCTILE IRON PIPES UNDER DIFFERENTIAL LOAD**

| Pipe Size (inches) | Load (pounds) | Pipe Size (inches) | Load (pounds) |
|--------------------|---------------|--------------------|---------------|
| 4                  | 600           | 15                 | 3,700         |
| 6                  | 900           | 18                 | 4,400         |
| 8                  | 1,200         | 21                 | 5,000         |
| 10                 | 1,500         | 24 and over        | 5,500         |
| 12                 | 1,800         | --                 | --            |

(c) **PVC Pipe:** For the deflected position, two 12½-foot lengths shall be joined, then deflected along an arc of 720-foot radius (0.11 feet offset at the end of each length from a tangent at the joint). For a differential load, two lengths shall be joined and uniformly supported for at least 2 feet on both sides of the joint and the adjacent pipe to 95 percent of its vertical diameter.

d. Workmanship

1. **Line and Grade**

- (a) Survey control hubs for both line and grade shall be provided by the design engineer in a manner consistent with accepted practices. The contractor shall establish line and grade for pipe by the use of lasers or by transferring the cut from the offset stakes to the trench at a maximum of 50-foot intervals, to maintain the line and grade.
- (b) Variance from the established line and grade shall not be greater than  $\frac{1}{4}$  inch for grade and  $\frac{1}{2}$  inch for line, provided that such variation does not result in a level or reverse-sloping invert.
- (c) The contractor shall check line and grade as necessary. If the limits prescribed in these standards are not met, the work shall be immediately stopped, the City's authorized representative notified, and the cause remedied before proceeding with the work.
- (d) Variation in the invert elevation between adjoining ends of pipe, due to nonconcentricity of joining surface and pipe interior surfaces, shall not exceed  $\frac{1}{64}$  per inch of pipe diameter, or  $\frac{1}{2}$  inch maximum.
- (e) Tee stations shall be staked as specified in Section 401.1.05, "Surveying," to enable the contractor to install services at the correct property location.

2. **Pipe Handling**

- (a) The contractor shall unload pipe only by approved means. Pipe shall not be unloaded by dropping it to the ground and shall not be dropped or dumped into trenches.
- (b) The contractor shall inspect all pipe and fittings before lowering them into trenches to ensure that no cracked, broken, or otherwise defective materials are used.
- (c) The contractor shall clean the ends of pipe thoroughly, remove foreign matter and dirt from inside the pipe, and keep it clean during laying and joining.
- (d) The contractor shall lower the pipe into the trench in such a manner as to avoid any physical damage to the pipe.
- (e) The contractor shall remove all damaged pipe from the job site.

### 3. **Tying In**

- (a) The contractor shall not break into an existing sewer line until just before the project is finalized and the manhole has been tested and approved by the City's authorized representative.
- (b) When a contractor ties into a "live" line, the contractor shall keep the new line plugged at the downstream end of the construction to prevent groundwater from entering the City's sewage system.

### 4. **Foreign Material**

- (a) The contractor shall take all necessary precautions to prevent excavated or other foreign material from entering the pipe during the laying operation.
- (b) At all times, when laying operations are not in progress, the contractor shall use a mechanical plug at the open end of the last laid section of pipe, to prevent entry of foreign material or creep of the gasketed joints.

### 5. **Pipe Laying**

- (a) Pipe laying shall proceed upgrade, with the spigot ends pointing in the direction of flow.
- (b) After a section of pipe is lowered into the prepared trench, the contractor shall clean the end of the pipe to be joined, the inside of the joint, and the rubber ring (if required) immediately before joining the pipe.
- (c) At the location of each joint, dig bell (joint) holes of ample dimensions in the bottom of the trench and at the sides, where necessary, to permit the joint to be made properly.
- (d) The joint shall be assembled according to the recommendations of the manufacturer. The contractor shall provide all special tools and appliances required for the jointing assembly. After the joint is made, the pipe shall be checked for alignment and grade.
- (e) The trench bottom shall form a continuous and uniform bearing and support for the pipe at every point between joints.
- (f) Do not lay pipe in water or when, in the opinion of the City's authorized representative, trench conditions are unsuitable.

- 6. **Movable Shield:** When pipe is laid in a movable trench shield, the contractor shall take all necessary precautions to prevent the pipe joints from pulling apart when the shield is moved ahead. The bottom of the

shield shall not extend below the springline of the pipe without recompacting the pipe zone.

7. **Cutting Pipe:** When cutting or machining the pipe is necessary, the contractor shall use only the tools and methods recommended by the pipe manufacturer and approved by the City's authorized representative. The contractor shall cut ductile iron pipe using a method approved by the City's authorized representative; all burrs or rough edges shall be removed before joining pipe. The contractor shall not flame-cut the pipe.
8. **Transition Fittings:** When joining different types of pipes, the contractor shall use approved ridged fittings. Flexible fittings such as Fernco, Caulder, or approved equal may be considered upon approval of the City's authorized representative; flexible fittings may require additional support under the coupling. Bell type couplings are considered flexible.
  - (a) Shear ring/ridge transition couplings meeting the ASTM C-564 or equal shall be used.
  - (b) PVC couplers or adapters shall meet the specifications for ASTM D-3034, SDR 35 pipe fittings.
  - (c) Ductile iron transition couplings shall be manufactured from ductile iron conforming to ASTM A-536, grade 65-45-12, for center and end rings. Rubber gaskets, bolts, and nuts shall conform to AWWA C-111/ANSI A21.11.
9. **Concrete Closure Collars**
  - (a) The contractor shall pour closure collars against undisturbed earth, remove all water from the excavation, and construct suitable forms to create shapes that will provide full bearing surfaces against undisturbed earth, as indicated in Detail No. S-2190 of these standards.
  - (b) Closure collars shall be used only when approved by the City's authorized representative, and then only to make connections between dissimilar pipe or where standard rubber-gasketed joints are impractical.
  - (c) Before the closure collars are installed, the contractor shall wash the pipe to remove all loose material and soil from the surface where they will be placed.
10. **Pipe Zone Material:** The contractor shall install pipe zone material uniformly on both sides of the pipe, up to the springline of the pipe. Material shall be placed in lifts not exceeding 6 inches. Material shall be well worked with hand tools to ensure proper support in the haunching area.

## 11. Line Taps

- (a) Line taps shall be core drilled unless approved otherwise by the City's authorized representative. Core drilled holes shall be done using a cylinder-style hole saw for only plastic pipe material or a diamond core bit for concrete and D.I. pipes.
- (b) Line tap connections to existing sanitary lines may be done using either saddle tees as per Section 401.4.02.b.5(a), or by using Inserta Tee<sup>®</sup> as per Section 401.4.02.b.5(c).
- (c) Line taps shall be centered on the spring line of the pipe being tapped.
- (d) The area around the saddle installation site shall be cleaned and free of all rough edges before installing the saddle.
- (e) While installing the saddle, no rock, dirt, or debris shall be allowed to enter the main sewer line from the core hole.
- (f) The contractor shall install ¾"-0" crushed aggregate in the pipe zone around the line tap, from 6 inches below the pipe to 12 inches above the pipe.
- (g) Laterals shall have tracer wire (12-gauge with green THNN insulation) installed beside the pipe and plastic caution tape installed 1-foot above the pipe crown as shown in Detail No. S-2175 of these standards.

### 401.4.03 Pressure Mains

#### a. General Provisions

These specifications, together with all other applicable requirements of federal, state, and local law, shall govern the character and quality of material, equipment, installation, and construction procedures for pressurized sanitary sewer work.

#### b. Materials

1. **Ductile Iron Pipe:** Ductile iron pipe shall be lined with cement mortar and seal-coated and shall conform to applicable portions of the following specifications: ASTM A-536, AWWA C-104/ANSI A21.4, AWWA C-111/ANSI A21.11, and AWWA C-151/ANSI A21.51.
2. **PVC Pipe:** PVC pipe with diameters of 4 inches through 12 inches shall conform to the requirements of AWWA C-900. Joints shall be elastomeric gasketed and shall conform to the requirements of ASTM D-3139.
3. **High Density Polyethylene Pipe (HDPE):** HDPE pipe with diameters of 4 inches through 63 inches shall conform to the requirements of AWWA

C-906. Joints shall be joined by thermal heat fusion and shall conform to the requirements of ASTM D-2683 for socket-type fittings, ASTM D-3261 for butt-type fittings, or ASTM F-1055 for electrofusion-type fittings.

c. Workmanship and Pipe Installation

- (a) All pipe shall be laid to the specified lines and grades. The minimum depth of the pipe cover shall be as specified in Section 401.2.02.j, "Sanitary Pipe Design, Pipe Cover." Pipes shall not be deflected either horizontally or vertically beyond the limits established and recommended by the pipe manufacturer.
- (b) Pipeline shall be laid to a grade that results in the minimum number of high points, based on terrain and economic considerations. Abrupt transitions and sharp peaks shall be avoided.
- (c) All tees, elbows, or other fittings shall be produced by the pipe manufacturer and shall be properly braced, anchored, or blocked.
- (d) Automatic air and vacuum release valves with a bleed-off port shall be installed at all high points or locations in the pipeline where air pockets would be expected to accumulate. Valves shall be installed in a vault, as shown in Detail No. W-3060 of these standards, so as to provide accessibility for service and repair. Sumps shall be required for holding excess liquid discharged from the bleed-off port.

**401.5.00 CONSTRUCTION SPECIFICATIONS**

**401.5.01 General Provisions**

The specifications detailed here, together with the standards established by the Oregon DEQ, the U.S. Environmental Protection Agency, and any other applicable requirements of the City, shall govern the character and quality of material, equipment, installation, and construction procedures for mainline sanitary sewer work of gravity-flow systems.

**401.5.02 Scheduling**

The contractor shall plan their construction work in conformance with Section 101.8.02, "Scheduling."

**401.5.03 Environmental Protection, Erosion Prevention, and Sediment Control**

The contractor shall take all appropriate measures and precautions to minimize the work's impact on the environment and shall control erosion, as outlined in Section 101.9.00, "Environmental Protection, Erosion Prevention, and Sediment Control."

#### **401.5.04 Interferences and Obstructions**

Various obstructions may be encountered during the course of the work. The contractor shall follow the guidelines established in Section 101.8.05, "Interferences and Obstructions."

#### **401.5.05 Contaminated Soil or Hazardous Material**

If during construction contaminated soil or with hazardous materials or chemicals are encountered, the Contractor shall follow the procedures specified in Section 101.9.02, "Contaminated Soils or Hazardous Materials."

#### **401.5.06 Trench Excavation, Preparation, and Backfill**

Trench excavation, preparation, and backfill shall conform to the requirements of Section 6, "Trench Excavation and Backfill."

#### **401.5.07 Preservation, Restoration, and Cleanup**

Cleanup of all construction debris, excess excavation, and excess materials and complete restoration of all fences, mailboxes, ditches, culverts, signposts, and similar items shall be completed according to Section 101.8.16, "Preservation, Restoration, and Cleanup."

#### **401.5.08 Bores**

Bores shall conform to the requirements of Section 301.11.08, "Bores."

#### **401.6.00 TESTING PROCEDURES**

##### **401.6.01 General**

- a. **Testing Order:** Sanitary systems and appurtenances shall pass a deflection test and an air test before acceptance, and shall be free of visible leakage. Information about air testing may be obtained from the City's authorized representative. Individual joints on pipe 54 inches in diameter or larger may be tested by an approved joint-testing device. All details of testing procedure shall be subject to approval of the City's authorized representative. Testing of sanitary systems shall be conducted in the following order.
  1. Deflection testing of pipelines.
  2. Air pressure testing of pipelines.
  3. Video-inspection of pipelines.
  4. Vacuum testing of manholes
- b. If repair work is required on a section of the system, that portion of the system shall be retested in the testing order given above.

- c. Deflection testing, air pressure testing, and video-inspection shall be done only after backfill has passed the required compaction test(s) based on AASHTO T-180 and roadway base rock has been placed, compacted, and approved.
- d. The sanitary system must pass deflection testing, air pressure testing, and video-inspection before paving of overlying roadways will be permitted.
- e. Vacuum testing of manholes shall be performed only after paving is completed and approved.

#### 401.6.02 Gravity System Testing

- a. **Cleaning Before Test:** Before testing and City inspection of the system, the contractor shall ball and flush and clean all parts of the system. The contractor shall remove all accumulated construction debris, rocks, gravel, sand, silt, and other foreign material from the system at or near the closest downstream manhole. If necessary, the contractor shall use mechanical rodding, bucketing or vactor equipment. When the City's authorized representative inspects the system, any foreign matter still present shall be flushed and removed from the system. ***Contractor shall provide screening; no material shall be flushed into the downstream city sewer system.***
- b. **Test Equipment:** The contractor shall furnish all necessary test equipment and perform the tests in a manner satisfactory to the City's authorized representative. Any arrangement of test equipment shall be permitted that will provide observable and accurate measurements of air leakage under the specified conditions. Gauges for air testing shall be calibrated with a standardized test gauge.
- c. **Deflection Test for Flexible Pipe:** Sanitary sewers constructed of flexible pipe shall be deflection-tested by pulling an approved mandrel through the completed pipeline. The diameter of the mandrel shall be 95% of the nominal pipe diameter, unless otherwise specified by the City's authorized representative. The mandrel shall be a rigid, nonadjustable, odd-numbered leg (9 legs minimum) mandrel having an effective length of not less than its nominal diameter. Testing shall be done manhole-to-manhole and after the line has been completely balled and flushed with water, and after compaction tests of backfill have been completed and accepted. The contractor will be required to locate and repair any sections that fail the test and to retest those sections. All repairs shall follow, and be in compliance with, the manufacturer's recommendations.
- d. **Air Pressure Testing**
  - 1. **General:** After the system is complete, including service connections and backfilling, the contractor shall conduct a low-pressure air test. The contractor shall provide all equipment and personnel for the test. The method, equipment, and personnel shall be subject to approval of the

City's authorized representative. The City's authorized representative may, at any time, require a calibration check of the instrument used. The pressure gauge shall have minimum divisions of 0.10 psi and an accuracy of 0.0625 psi (one ounce per square inch). All air shall pass through one control panel.

2. **Safety Precautions:** All plugs used to close the sewer for the air test must be capable of resisting the internal pressures and must be securely braced. All air-testing equipment must be placed above ground. No one shall be permitted to enter a manhole or trench where a plugged line is under pressure. All pressure must be released before the plugs are removed. The testing equipment must include a pressure-relief device designed to relieve pressure in the line under test at 10 psi or less, and must allow continuous monitoring to avoid excessive test pressure. The contractor shall use care to prevent the air inlet from flooding with infiltrated groundwater. The contractor shall inject air at the upper plug if possible. Only qualified personnel shall be permitted to conduct the test.
3. **Method:** Air testing shall be by the time pressure drop method, as follows:
  - (a) Clean the lines to be tested and remove all debris.
  - (b) Wet the lines before testing (optional).
  - (c) Plug all open ends with suitable test plugs; brace each plug securely.
  - (d) Check the average height of groundwater over the line. Add air slowly to the section of the system being tested until the internal air pressure is 3.5 psi higher than the average pressure of groundwater (0.433 psi for each foot of average water depth over the line).
  - (e) After the internal test pressure is reached, allow at least two minutes for the air temperature to stabilize, adding only the amount of air required to maintain pressure.
  - (f) After the temperature stabilization period, disconnect the air supply.
  - (g) Determine and record the time (in seconds) required for the internal air pressure to drop from 3.5 psi to 2.5 psi.
  - (h) Compare the time recorded in step (g) above with the time required, as determined below.
4. **Passing test:** A passing test shall be based on meeting or exceeding the requirements below. The test method depends on the type of pipe material. If a line fails to meet the requirements, the contractor shall repair or replace all defective materials or workmanship.
  - (a) Concrete pipe

Air pressure drop method: The tested section, when tested by the air pressure drop method, will be acceptable if the time required for the pressure to drop from 3.5 psi to 2.5 psi is not less than the time (T) in seconds (**Table 4.5**) computed by the following formula:

$$T = K/C$$

where  $K = 0.011 \times d^2L$ .

$C = 1$  or  $0.0003882 \times dL$ , whichever is greater.

$d$  = inside diameter of pipe (inches).

$L$  = length of pipe (feet).

(b) PVC, HDPE, and ductile iron pipe

The minimum duration for the prescribed low-pressure exfiltration pressure drop between two consecutive manholes shall not be less than that shown in **Tables 4.6** or **4.7**. The tables list test duration values for pressure drops of 1.0 psi and 0.5 psi in excess of groundwater pressure above the top of the sewer pipe. Values accommodate both an allowable average loss per unit of surface area and an allowable maximum total leakage rate.

(c) Record the diameter (inches), length (feet), end manhole number, time, pressure drop, and groundwater level of the test on an inspection form. The form shall become part of the permanent record for the project.

Table 4.5. AIR TESTING OF CONCRETE PIPE

| Pipe Diameter (inches) |            |              |              |              |              |              |              |              |              |              |               |
|------------------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Pipe Length (ft)       | 4.0        | 6.0          | 8.0          | 10.0         | 12.0         | 15.0         | 18.0         | 21.0         | 24.0         | 30.0         | 36.0          |
|                        | Time (sec) | Time (sec)   | Time (sec)   | Time (sec)   | Time (sec)   | Time (sec)   | Time (sec)   | Time (sec)   | Time (sec)   | Time (sec)   | Time (sec)    |
| 10                     | 1.8        | 4.0          | 7.0          | 11.0         | 15.8         | 24.8         | 35.6         | 48.5         | 63.4         | 99.0         | 142.6         |
| 20                     | 3.5        | 7.9          | 14.1         | 22.0         | 31.7         | 49.5         | 71.3         | 97.0         | 126.7        | 198.0        | 285.1         |
| 30                     | 5.3        | 11.9         | 21.1         | 33.0         | 47.5         | 74.3         | 106.9        | 145.5        | 190.1        | 297.0        | 427.7         |
| 40                     | 7.0        | 15.8         | 28.2         | 44.0         | 63.4         | 99.0         | 142.6        | 194.0        | 253.4        | 396.0        | 570.2         |
| 50                     | 8.8        | 19.8         | 35.2         | 55.0         | 79.2         | 123.8        | 178.2        | 242.6        | 316.8        | 495.0        | 712.8         |
| 60                     | 10.6       | 23.8         | 42.2         | 66.0         | 95.0         | 148.5        | 213.8        | 291.1        | 380.2        | 594.0        | 855.4         |
| 70                     | 12.3       | 27.7         | 49.3         | 77.0         | 110.9        | 173.3        | 249.5        | 339.6        | 443.5        | 693.0        | 997.9         |
| 80                     | 14.1       | 31.7         | 56.3         | 88.0         | 126.7        | 198.0        | 285.1        | 388.1        | 506.9        | 792.0        | <b>1020.1</b> |
| 90                     | 15.8       | 35.6         | 63.4         | 99.0         | 142.6        | 222.8        | 320.8        | 436.6        | 570.2        | <b>850.1</b> | same.         |
| 100                    | 17.6       | 39.6         | 70.4         | 110.0        | 158.4        | 247.5        | 356.4        | 485.1        | 633.6        | same.        | after         |
| 110                    | 19.4       | 43.6         | 77.4         | 121.0        | 174.2        | 272.3        | 392.0        | 533.6        | <b>680.1</b> | after        | 72 ft.        |
| 120                    | 21.1       | 47.5         | 84.5         | 132.0        | 190.1        | 297.0        | 427.7        | 582.1        | same.        | 86 ft.       |               |
| 130                    | 22.9       | 51.5         | 91.5         | 143.0        | 205.9        | 321.8        | 463.3        | <b>595.1</b> | after        |              |               |
| 140                    | 24.6       | 55.4         | 98.6         | 154.0        | 221.8        | 346.5        | 499.0        | same.        | 108 ft.      |              |               |
| 150                    | 26.4       | 59.4         | 105.6        | 165.0        | 237.6        | 371.3        | <b>510.0</b> | after        |              |              |               |
| 160                    | 28.2       | 63.4         | 112.6        | 176.0        | 253.4        | 396.0        | same.        | 123 ft.      |              |              |               |
| 170                    | 29.9       | 67.3         | 119.7        | 187.0        | 269.3        | 420.8        | after        |              |              |              |               |
| 180                    | 31.7       | 71.3         | 126.7        | 198.0        | 285.1        | <b>425.0</b> | 144 ft.      |              |              |              |               |
| 190                    | 33.4       | 75.2         | 133.8        | 209.0        | 301.0        | same.        |              |              |              |              |               |
| 200                    | 35.2       | 79.2         | 140.8        | 220.0        | 316.8        | after        |              |              |              |              |               |
| 210                    | 37.0       | 83.2         | 147.8        | 231.0        | 332.6        | 172 ft.      |              |              |              |              |               |
| 220                    | 38.7       | 87.1         | 154.9        | 242.0        | <b>340.0</b> |              |              |              |              |              |               |
| 230                    | 40.5       | 91.1         | 161.9        | 253.0        | same.        |              |              |              |              |              |               |
| 240                    | 42.2       | 95.0         | 169.0        | 264.0        | after        |              |              |              |              |              |               |
| 250                    | 44.0       | 99.0         | 176.0        | 275.0        | 215 ft.      |              |              |              |              |              |               |
| 260                    | 45.8       | 103.0        | 183.0        | <b>283.4</b> |              |              |              |              |              |              |               |
| 270                    | 47.5       | 106.9        | 190.1        | same.        |              |              |              |              |              |              |               |
| 280                    | 49.3       | 110.9        | 197.1        | after        |              |              |              |              |              |              |               |
| 290                    | 51.0       | 114.8        | 204.2        | 258 ft.      |              |              |              |              |              |              |               |
| 300                    | 52.8       | 118.8        | 211.2        |              |              |              |              |              |              |              |               |
| 310                    | 54.6       | 122.8        | 218.2        |              |              |              |              |              |              |              |               |
| 320                    | 56.3       | 126.7        | 225.3        |              |              |              |              |              |              |              |               |
| 330                    | 58.1       | 130.7        | <b>226.7</b> |              |              |              |              |              |              |              |               |
| 340                    | 59.8       | 134.6        | same.        |              |              |              |              |              |              |              |               |
| 350                    | 61.6       | 138.6        | after        |              |              |              |              |              |              |              |               |
| 360                    | 63.4       | 142.6        | 322 ft.      |              |              |              |              |              |              |              |               |
| 370                    | 65.1       | 146.5        |              |              |              |              |              |              |              |              |               |
| 380                    | 66.9       | 150.5        |              |              |              |              |              |              |              |              |               |
| 390                    | 68.6       | 154.4        |              |              |              |              |              |              |              |              |               |
| 400                    | 70.4       | 158.4        |              |              |              |              |              |              |              |              |               |
| 410                    | 72.2       | 162.4        |              |              |              |              |              |              |              |              |               |
| 420                    | 73.9       | 166.3        |              |              |              |              |              |              |              |              |               |
| 430                    | 75.7       | <b>170.0</b> |              |              |              |              |              |              |              |              |               |
| 440                    | 77.4       | same.        |              |              |              |              |              |              |              |              |               |
| 450                    | 79.2       | after        |              |              |              |              |              |              |              |              |               |
| 460                    | 81.0       | 430 ft.      |              |              |              |              |              |              |              |              |               |
| 470                    | 82.7       |              |              |              |              |              |              |              |              |              |               |
| 480                    | 84.5       |              |              |              |              |              |              |              |              |              |               |
| 490                    | 86.2       |              |              |              |              |              |              |              |              |              |               |
| 500                    | 88.0       |              |              |              |              |              |              |              |              |              |               |

**Table 4.6. AIR TESTING OF PVC, HDPE, AND DUCTILE IRON PIPE – 1.0 PSIG PRESSURE DROP<sup>1</sup>.**

**Specification Time Required for a 1.0 psig Pressure Drop for Size and Length of Pipe  
Indicated for Q = 0.0015\***

| Pipe Diameter<br>(inches) | Minimum Time<br>(min:sec) | Length for Minimum Time<br>(feet) | Time for Longer Length<br>(sec) | Specified Minimum for Length (L) Shown (min:sec) |        |        |        |        |        |        |        |        |
|---------------------------|---------------------------|-----------------------------------|---------------------------------|--------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
|                           |                           |                                   |                                 | 100 ft                                           | 150 ft | 200 ft | 250 ft | 300 ft | 350 ft | 400 ft | 450 ft |        |
| 4                         | 3:46                      | 597                               | 0.380L                          | 3:46                                             | 3:46   | 3:46   | 3:46   | 3:46   | 3:46   | 3:46   | 3:46   | 3:46   |
| 6                         | 5:40                      | 398                               | 0.854L                          | 5:40                                             | 5:40   | 5:40   | 5:40   | 5:40   | 5:40   | 5:40   | 5:42   | 6:24   |
| 8                         | 7:34                      | 298                               | 1.520L                          | 7:34                                             | 7:34   | 7:34   | 7:34   | 7:36   | 8:52   | 10:08  | 11:24  | 11:24  |
| 10                        | 9:26                      | 239                               | 2.374L                          | 9:26                                             | 9:26   | 9:26   | 9:53   | 11:52  | 13:51  | 15:49  | 17:48  | 17:48  |
| 12                        | 11:20                     | 199                               | 3.418L                          | 11:20                                            | 11:20  | 11:24  | 14:15  | 17:05  | 19:56  | 22:47  | 25:38  | 25:38  |
| 15                        | 14:10                     | 159                               | 5.342L                          | 14:10                                            | 14:10  | 17:48  | 22:15  | 26:42  | 31:09  | 35:36  | 40:04  | 40:04  |
| 18                        | 17:00                     | 133                               | 7.692L                          | 17:00                                            | 19:13  | 25:38  | 32:03  | 38:27  | 44:52  | 51:16  | 57:41  | 57:41  |
| 21                        | 19:50                     | 114                               | 10.470L                         | 19:50                                            | 26:10  | 34:54  | 43:37  | 52:21  | 61:00  | 69:48  | 78:31  | 78:31  |
| 24                        | 22:40                     | 99                                | 13.647L                         | 22:47                                            | 34:11  | 45:34  | 56:58  | 68:22  | 79:46  | 91:10  | 102:33 | 102:33 |
| 27                        | 25:30                     | 88                                | 17.306L                         | 28:51                                            | 43:16  | 57:41  | 72:07  | 86:32  | 100:57 | 115:22 | 129:48 | 129:48 |
| 30                        | 28:20                     | 80                                | 21.366L                         | 35:37                                            | 53:25  | 71:13  | 89:02  | 106:50 | 124:38 | 142:26 | 160:15 | 160:15 |
| 33                        | 31:10                     | 72                                | 25.852L                         | 43:05                                            | 64:38  | 86:10  | 107:43 | 129:16 | 150:43 | 172:21 | 193:53 | 193:53 |
| 36                        | 34:00                     | 66                                | 30.768L                         | 51:17                                            | 76:55  | 102:34 | 128:12 | 153:50 | 179:29 | 205:07 | 230:46 | 230:46 |
| 42                        | 39:48                     | 57                                | 41.883L                         | 69:48                                            | 104:42 | 139:37 | 174:30 | 209:24 | 244:19 | 279:13 | 314:07 | 314:07 |
| 48                        | 45:34                     | 50                                | 54.705L                         | 91:10                                            | 136:45 | 182:21 | 227:55 | 273:31 | 319:06 | 364:42 | 410:17 | 410:17 |

\*Q is the allowable leakage rate in cubic ft/min/ft<sup>2</sup> of inside surface area of pipe.

1. Data from the UNI-Bell<sup>®</sup> PVC Pipe Association.

**Table 4.7. AIR TESTING OF PVC, HDPE, AND DUCTILE IRON PIPE – 0.5 PSIG PRESSURE DROP<sup>1</sup>.**

**Specification Time Required for a 0.5 psig Pressure Drop for Size and Length of Pipe  
Indicated for Q = 0.0015\***

| Pipe Diameter<br>(inches) | Minimum Time<br>(min:sec) | Length for Minimum Time<br>(feet) | Time for Longer Length<br>(sec) | Specified Minimum for Length (L) Shown (min:sec) |        |        |        |        |        |        |        |      |
|---------------------------|---------------------------|-----------------------------------|---------------------------------|--------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|------|
|                           |                           |                                   |                                 | 100 ft                                           | 150 ft | 200 ft | 250 ft | 300 ft | 350 ft | 400 ft | 450 ft |      |
| 4                         | 1:53                      | 597                               | 0.190L                          | 1:53                                             | 1:53   | 1:53   | 1:53   | 1:53   | 1:53   | 1:53   | 1:53   | 1:53 |
| 6                         | 2:50                      | 398                               | 0.427L                          | 2:50                                             | 2:50   | 2:50   | 2:50   | 2:50   | 2:50   | 2:50   | 2:51   | 3:12 |
| 8                         | 3:47                      | 298                               | 0.760L                          | 3:47                                             | 3:47   | 3:47   | 3:47   | 3:47   | 3:48   | 4:26   | 5:04   | 5:42 |
| 10                        | 4:43                      | 239                               | 1.187L                          | 4:43                                             | 4:43   | 4:43   | 4:57   | 5:56   | 6:55   | 7:54   | 8:54   |      |
| 12                        | 5:40                      | 199                               | 1.709L                          | 5:40                                             | 5:40   | 5:42   | 7:08   | 8:33   | 9:58   | 11:24  | 12:50  |      |
| 15                        | 7:05                      | 159                               | 2.671L                          | 7:05                                             | 7:05   | 8:54   | 11:08  | 13:21  | 15:35  | 17:48  | 20:02  |      |
| 18                        | 8:30                      | 133                               | 3.846L                          | 8:30                                             | 9:37   | 12:49  | 16:01  | 19:14  | 22:26  | 25:38  | 28:51  |      |
| 21                        | 9:55                      | 114                               | 5.235L                          | 9:55                                             | 13:05  | 17:27  | 21:49  | 26:11  | 30:32  | 34:54  | 39:16  |      |
| 24                        | 11:20                     | 99                                | 6.837L                          | 11:24                                            | 17:57  | 22:48  | 28:30  | 34:11  | 39:24  | 45:35  | 51:17  |      |
| 27                        | 12:45                     | 88                                | 8.653L                          | 14:25                                            | 21:38  | 28:51  | 36:04  | 43:16  | 50:30  | 57:42  | 64:54  |      |
| 30                        | 14:10                     | 80                                | 10.683L                         | 17:48                                            | 26:43  | 35:37  | 44:31  | 53:25  | 62:19  | 71:13  | 80:07  |      |
| 33                        | 15:35                     | 72                                | 12.926L                         | 21:33                                            | 32:19  | 43:56  | 53:52  | 64:38  | 75:24  | 86:10  | 96:57  |      |
| 36                        | 17:00                     | 66                                | 15.384L                         | 25:39                                            | 38:28  | 51:17  | 64:06  | 76:55  | 89:44  | 102:34 | 115:23 |      |
| 42                        | 19:54                     | 57                                | 20.942L                         | 34:54                                            | 52:21  | 69:49  | 87:15  | 104:42 | 122:10 | 139:37 | 157:04 |      |
| 48                        | 22:47                     | 50                                | 27.352L                         | 45:35                                            | 68:23  | 91:11  | 113:58 | 136:46 | 159:33 | 182:21 | 205:09 |      |

\*Q is the allowable leakage rate in cubic ft/min/ft<sup>2</sup> of inside surface area of pipe.

1. Data from the UNI-Bell<sup>®</sup> PVC Pipe Association.

- e. **Video Inspection of Gravity Systems:** All sanitary systems shall be video-inspected and approved prior to City acceptance. Video inspection shall take place after trench backfill and compaction has been completed and accepted, and channels have been poured in manholes. All pipes shall be thoroughly flushed immediately prior to the video inspection; only that water remaining from flushing shall be present in the system. The camera shall have the ability to tilt up to 90 degrees and rotate 360 degrees on the axis of travel. An inspection of all lateral connections shall be conducted using the tilt capabilities of the camera. A 1-inch target ball shall be placed in front of the camera. Observed sags must be less than 0.5 inch.

The City's authorized representative shall be notified and shall be present during video-inspection of the system, unless otherwise approved by the City's authorized representative. A copy of the video and a written video inspection report, on a City-approved form, shall be supplied to the City's authorized representative. The video shall be recorded in color and in VHS or CD format. Video shall include a visual footage meter recording. Problems revealed during the inspection shall be noted on the video and in the written report. After repairs have been made, the line shall be re-inspected and re-tested. If excessive foreign material, in the opinion of the City's authorized representative, is encountered during video inspection, the line shall be balled and flushed and re-video inspected.

#### **401.6.03 Manhole Testing**

Sanitary sewer manholes shall be tested for acceptance after the trench is backfilled, compaction requirements are met, the road base rock is installed and the street paved, and chimney seals or concrete manhole closure collars are installed. If the manholes pass the tests but the castings were disturbed by construction and must be reinstalled, the manholes shall be retested.

- a. **Vacuum Testing:** All manholes being constructed or rehabilitated shall be vacuum-tested. The test shall consist of plugging all inlets and outlets. The test head shall be placed at the inside of the top of the cone, and shall include grade rings and casting. The seal shall be inflated in accordance with the manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches. The manhole shall pass if the time for the vacuum reading to drop to 9 inches meets or exceed the values listed in **Table 4-8**. The contractor shall repair all manholes that fail to pass the vacuum test; manholes shall be retested to verify the repair.

**Table 4.8. VACUUM TESTING OF MANHOLES**

| Depth of Manhole (feet) | Diameter of Manhole      |         |         |
|-------------------------|--------------------------|---------|---------|
|                         | 48 Inch                  | 60 Inch | 72 Inch |
|                         | Allowable Time (seconds) |         |         |
| 8                       | 20                       | 26      | 33      |
| 10                      | 25                       | 33      | 41      |
| 12                      | 30                       | 39      | 49      |
| 14                      | 35                       | 46      | 57      |
| 16                      | 40                       | 52      | 65      |
| 18                      | 45                       | 59      | 73      |
| 20                      | 50                       | 65      | 81      |
| 22                      | 55                       | 72      | 89      |
| 24                      | 59                       | 78      | 97      |
| 26                      | 64                       | 85      | 105     |
| 28                      | 69                       | 91      | 113     |
| 30                      | 74                       | 98      | 121     |

- b. **Hydrostatic Testing:** When, in the opinion of the City’s authorized representative, the groundwater table is too low to visually detect leaks, manholes may be hydrostatically tested. The test shall consist of plugging all inlets and outlets, then filling the manhole with water to a height determined by the City’s authorized representative. Leakage in each manhole shall not exceed 0.2 gallons per hour per foot of head above the invert. Leakage will be determined by refilling to the rim using a calibrated or known volume container. A manhole may be filled 24 hours before the test, if desired, to permit normal absorption into the pipe walls to take place. The contractor shall repair all manholes that fail to pass the leakage test; manholes shall be retested to verify the repair.

**401.6.04 Pressure Main Testing**

Field testing of the force main and appurtenances shall be completed by a hydrostatic test that meets the following requirements. Contractor shall be responsible for making all necessary provisions for conveying water to the points of use and for disposal of the test water, including temporary taps and plugs.

- a. Prior to the start of the hydrostatic test, all trenching shall be backfilled, compacted, and accepted per the requirements of Chapter 6, “Trench Excavation and Backfill.”
- b. When concrete thrust blocks are used, the hydrostatic test shall be conducted after at least five days elapse from when the concrete thrust blocking was

installed. If high-early cement is used for the concrete thrust blocking, the time may be cut by two days.

- c. Seal pipe ends and secure pipe with temporary thrust restraint, as required, to maintain line and grade and to prevent damage.
- d. Fill the test section with water and allow it to stand at two-thirds of the test pressure for a minimum of 12 hours. All air shall be purged from the pipeline before it is checked for leaks or pressure or acceptance tests are performed on the system..
- e. Furnish all equipment and materials and perform testing in conformance with Section 501.9.01, "Hydrostatic Testing."
- f. If a large amount of water is required to increase the pressure during testing, entrapped air, leakage at joints, or a broken pipe can be suspected. In such cases, tests shall be discontinued until the source of trouble is identified and corrected.
- g. Visible leaks in the wetwell and vaults shall be eliminated regardless of the leakage amount.

#### **401.7.00 SANITARY SEWER LINE ACCEPTANCE POLICY**

The City of Wilsonville will accept new sanitary installations or systems built to the "Public Works Standards," providing that the following conditions are met.

##### **401.7.01 Legal Recordings**

Dedication of any required easements or rights-of-way have been recorded with the County Recorder and the Engineering Department receives a reproducible copy of the recorded documents.

##### **401.7.02 Project Completion**

After completion of construction of the total project, and after all testing has been satisfactorily completed, project closeout shall proceed as outlined in Section 101.8.17.a, "Project Completion."

##### **401.7.03 Maintenance Period**

- a. The Contractor or Applicant shall be responsible for providing Maintenance Assurance for Public Improvements as outlined in Section 101.8.17.b, "Maintenance Assurance." Public sanitary improvements shall be warranted for a minimum of one year; public landscape improvements shall be warranted for a minimum of two years.

- b. At any time during the warranty period, the City's authorized representative has reason to believe the public sanitary improvements have defects that were the result of faulty workmanship or flaws in construction material, the responsible party shall be required, at that party's own cost, to video-inspect the sewer line and repair any problems or faults revealed during video inspection by replacing those sections. The video inspection shall be done during the winter, if possible, or during the wet weather months, to identify all leaks.
- c. Before the end of the Construction Maintenance period, the City's authorized representative shall inspect the project for any remaining deficiencies. If the deficiencies that remain are determined to be the responsibility of the contractor or the applicant, the contractor or applicant shall then make such repairs.
- d. The Landscape Maintenance assurance shall be released two years after acceptance of construction, providing the landscaping meets the 90% survival level (see Section 301.13.02, "Landscape Inspection for Warranty").

## SECTION 5

### WATER SYSTEM DESIGN AND CONSTRUCTION STANDARDS

#### 501.1.00 ENGINEERING

##### 501.1.01 Introduction

This section outlines design and construction requirements for all public water system improvements. These provisions and technical specifications set forth the requirements of the City of Wilsonville for constructing water system improvements. Interpretations of such provisions and their application in specific circumstances shall be made by the City's authorized representative. Refer to Section 1 of the "Public Works Standards" for general provisions and requirements.

##### 501.1.02 Extension of Public Water Systems

Except as otherwise provided, the extension or upsizing of the public water systems to serve any parcel or tract of land shall be done by, and at the expense of, the property owner or permit applicant.

##### 501.1.03 Water Plans

- a. It is the design engineer's responsibility to ensure that engineering plans are sufficiently clear and concise to construct the project in proper sequence, using specified methods and materials, with sufficient dimensions to fulfill the intent of the design guidelines in these standards.
- b. All elevation on design plans and record drawings shall be based on the applicable NAVD datum specified in Section 101.7.07.a, "Surveying and Land Monuments."
- c. All engineering water plans shall be stamped by a Professional Engineer registered in the State of Oregon. Water plans shall contain the following:
  1. At least one sheet shall show a plan view of the entire project site. If the project site is sufficiently large that detailed water plans on any given sheet do not encompass the entire project site, then a sheet showing the plan view of the entire site must serve as an index to subsequent detailed plan sheets.
  2. A topographic map showing existing conditions for the site, including the following:

- (a) Existing topography for the site.
  - (b) Adjacent streets, including street names.
  - (c) Existing utilities, including franchised utilities above or below ground and drainage facilities that transport surface water onto, across, or from the project site. Existing drainage pipes, culverts, and channels shall include the invert or flowline elevations.
  - (d) Existing environmentally sensitive areas (e.g., ravines, swales, steep slopes, wells, springs, wetlands, creeks, lakes, etc.). For natural drainage features, show direction of flow, drainage hazard areas, and 100-year floodplain boundary (if applicable).
3. Plans for proposed water improvements shall include the following:
- (a) Finished grades, showing the extent of cut and fill by existing and proposed contours, profiles, or other designations.
  - (b) Proposed structures, including roads and road improvements, parking surfaces, building footprints, walkways, landscape areas, etc.
  - (c) Proposed utilities, showing exact line and grade of all proposed utilities at crossings with the proposed water system.
  - (d) Applicable detail drawings.
  - (e) Existing and proposed easements.
  - (f) Setbacks from environmentally sensitive areas or resource areas protected within the SROZ.
  - (g) Plan and profile of water facilities, including pipe sizes, pipe types and materials, lengths, valve types, bends, tees, wyes, reducers, and location of thrust blocks. Notes shall be included for referencing details, cross-sections, profiles, etc.
  - (h) Any proposed phasing of construction.

**501.1.04      Surveying**

- a. The design engineer shall be responsible for establishing the location of the water line by means of reference stakes offset along the centerline of the water line. No construction shall be allowed to begin before construction staking. All staking shall be performed by or under the direction of a Professional Land Surveyor registered in the State of Oregon.

- b. Stakes shall locate all public tees, crosses, bends, fire hydrants, blowoffs, isolation valves, vaults, and booster pump stations. Maximum spacing for reference stakes is 50 feet. Stakes shall reference cuts and fills to the finished grade of the ground, asphalt, or concrete surface at that location to maintain minimum cover requirement. The design engineer shall also be responsible for identifying easements during construction.

## **501.2.00      DESIGN GUIDELINES**

The following is intended only as a guide for the design of water system improvements. All designs shall conform to the latest adopted revision of the Oregon State Health Division Administrative Rules, Chapter 333, "Public Water Systems," except where the City's standards exceed those of the state. An approved water system capable of supplying the required fire flow for fire protection shall be provided to all premises on which buildings are to be constructed. For areas of single-family residential, the required fire flow shall be a minimum of 1,500 gallons per minute (gpm) while maintaining a minimum residual pressure of 20 pounds per square inch (psi); for all other areas the required fire flow shall be a minimum of 3,000 gpm while maintaining a minimum residual pressure of 20 psi. The City's authorized representative may require modifications for a particular project. In general, the following guidelines should be followed:

- a. Water lines are considered public, and are subject to these standards, up to the backflow prevention device or to the backside of the residential water meter. Beyond such point the contractor shall follow National Fire Protection Association (NFPA) standards and Unified Plumbing Code (UPC) guidelines and be under the jurisdiction of City of Wilsonville Building Department.
- b. All pipe shall be ductile iron (D.I.) pipe, or approved equal. All water mains 12" or less shall be minimum class 52 ductile iron. All water mains 18" or greater shall be minimum class 51 ductile iron.
- c. Fittings shall be mechanical joint, unless otherwise specified.
- d. Where water lines are planned in the vicinity of sanitary sewer lines, design engineer and contractor shall follow guidelines established in Section 402.02.1, "Water and Sewer Lines."
- e. Minimum-size mains shall be 8 inches; all water mains shall be sized at 8, 12, 18, or 24 inches or as approved by the City's authorized representative. With prior approval of the City's authorized representative, 4-inch or 6-inch lines may be permitted provided there is no possibility of future extensions; 4-inch lines shall be limited to runs of less than 300 feet and no more than eight services.
- f. No fire hydrant shall be connected to a main of less than 8 inches diameter.

- g. Water mains will normally be placed on the south and east side of the street, outside the wheelpath, and located as indicated in the street detail drawings of these standards.
- h. Dead-end mains will not normally be allowed, but when they are permitted, they shall be for lines to be extended in the future and a blowoff assembly will be required.
- i. Main extensions will be required to continue to the boundaries of new subdivisions.
- j. Valves shall be located at intersections whenever possible. In general, sufficient valves shall be provided to permit shutting down any section of the line, but not to exceed 800 feet.
- k. Valves shall be required on all branches of tees and crosses on mainline intersections. At service line connections, valves shall be required at the service line connection only.
- l. Valves shall be flanged by mechanical joint; valves shall be flanged to all tees and crosses.
- m. Mechanical joint fittings at all valves and bends shall be restrained by a joint restraint system such as Megalug<sup>®</sup> retainers, or approved equal.
- n. Valves 18 inches and larger shall be butterfly valves.
- o. Valves shall be installed a minimum of 3 feet off face of curb.
- p. Automatic air and vacuum release valves with a bleed-off port shall be installed at all high points or locations in the pipeline where air pockets would be expected to accumulate. Valves shall be installed as indicated in Detail No. W-3060 of these standards.
- q. Fire hydrants shall be located in compliance with TVF&R fire prevention ordinance.
- r. Easements: When it is not possible or practical to install the main in a dedicated public street, a minimum 15-foot public pipeline easement shall be provided. Water mains shall be located in the center of the easement, unless an exception is approved by the City's authorized representative. The centerline of the pipe shall be at least 7½ feet from an easement side line.
- s. The engineer for the project should meet with the City Engineering Division before design to discuss the size of mains and any other matters specific to the project.

### **501.3.00 OPERATION OF VALVES IN CITY**

Contractor shall request City operation of valves at least 24 hours in advance. At no time shall the contractor undertake to close off or open valves or take any other action that would affect the operation of the existing water system.

### **501.4.00 MATERIALS AND TECHNICAL SPECIFICATONS - DUCTILE IRON PIPE AND FITTINGS**

#### **501.4.01 Joints**

- a. Pipe joints shall be push-on joints, except where specifically shown or detailed otherwise.
  1. Fitting joints shall be mechanical joint ends, except where specifically shown or detailed otherwise.
  2. All valves joined to tees and crosses shall be flanged by mechanical joint.

#### **501.4.02 Mechanical Joint Fittings**

Mechanical joint D.I. fittings shall conform to the latest revision of AWWA C-110/ANSI A21.10 and shall be of a class at least equal to that of the adjacent pipe. Bolts and nuts shall conform to AWWA C-111/ANSI A21.11. Mortar lining for fittings shall be the same thickness specified for pipe.

#### **501.4.03 Push-On Ductile Iron Pipe**

Push-on joint D.I. pipe shall be cement mortar lined and shall conform to AWWA C-104/ANSI A21.4, AWWA C-111/ANSI A21.11, and AWWA C-151/ANSI A21.51 as manufactured by U.S. Pipe and Foundry Company, Pacific States Cast Iron Company, American Ductile Iron Pipe, or approved equal. All water mains 12" or less shall be minimum class 52 ductile iron. All water mains 18" or greater shall be minimum class 51 ductile iron. Rubber ring gaskets shall conform to Section 501.4.05, "Gaskets," and shall be furnished with the pipe. A nontoxic vegetable soap lubricant (meeting the requirements of AWWA C-111/ANSI A21.11) shall be supplied with the pipe in sufficient quantities for installing the pipe furnished.

#### **501.4.04 Flanged Ductile Iron Fittings**

Flanged fittings shall conform to ANSI/AWWA C-207 Class D or ANSI B16.5 150-lb class for pressure ratings up to 150 psi, and either ANSI/AWWA C-207 Class E or ANSI B 16.5 150-lb class for pressure ratings between 150 psi and 275 psi. Flanges shall have flat faces and attached with bolt holes straddling the vertical axis of the pipe. Bolts and nuts shall conform to AWWA C-111/ANSI A21.11. The fittings shall be cement-mortar lined to same thickness specified for pipe.

#### **501.4.05 Gaskets**

- a. **Locking gaskets:** When available for the specified D.I. pipe size, locking rubber gaskets (such as Romac GripRing™, U.S. Steel Field Lok 350®, American Fast-Grip®, or approved equal) conforming to AWWA C-111/ ANSI A21.11 shall be used (for bell ends).
- b. **Flanged gaskets:** Gaskets shall be suitable for the specified pipe sizes and pressures. Flanged gaskets shall be full-cut, with holes to pass bolts. Gasket material shall be free from corrosive alkali or acid ingredients.

#### **501.4.06 Mechanical Couplings**

Mechanical couplings, clamps, or sleeves, not part of the pipe itself, shall be D.I. or steel with rubber rings or gaskets. Gaskets, bolts, and nuts shall conform to AWWA C-111/ANSI A21.11. Couplings, clamps, or sleeves shall be Dresser®, or approved equal.

### **501.5.00 CONSTRUCTION SPECIFICATIONS**

#### **501.5.01 General Provisions**

All installation and testing of water system improvements shall conform to the latest adopted revision of the Oregon Health Division Administrative Rules, Chapter 333, "Public Water Systems," except where the City's provisions exceed those of the state.

#### **501.5.02 Scheduling**

- a. The contractor shall plan their construction work in conformance with Section 101.8.02, "Scheduling."
- b. Newly installed water lines shall not be placed in service until necessary testing and sterilization are complete and system has been approved by the City's authorized representative.

#### **501.5.03 Environmental Protection, Erosion Prevention, and Sediment Control**

The contractor shall take all appropriate measures and precautions to minimize their impact on the environment and control erosion, as outlined in Section 101.9.00, "Environmental Protection, Erosion Prevention, and Sediment Control."

#### **501.5.04 Interferences and Obstructions**

Various obstructions may be encountered during the course of the work. The contractor shall follow the guidelines established in Section 101.8.05, "Interferences and Obstructions."

#### **501.5.05 Contaminated Soil or Hazardous Material**

If during construction contaminated soil or with hazardous materials or chemicals are encountered, the Contractor shall follow the procedures specified in Section 101.9.02, "Contaminated Soils or Hazardous Materials."

#### **501.5.06 Trench Excavation, Preparation, and Backfill**

Trench excavation, preparation, and backfill shall conform to the requirements of Section 6, "Trench Excavation and Backfill."

#### **501.5.07 Preservation, Restoration, and Cleanup**

Cleanup of all construction debris, excess excavation, and excess materials and complete restoration of all fences, mailboxes, ditches, culverts, signposts, and similar items shall be completed according to Section 101.8.16, "Preservation, Restoration, and Cleanup."

### **501.6.00 DUCTILE IRON PIPE—INSTALLATION**

#### **501.6.01 Suitable Conditions for Laying Pipe**

- a. Provide and maintain ample means and devices at all times to remove and dispose of water seepage and runoff entering the trench excavation during the process of pipe laying.
- b. Do not lay pipe in water or when, in the opinion of the City's authorized representative, trench conditions are unsuitable.

#### **501.6.02 Handling**

- a. **Distributing Pipe:** Distribute material on the job from cars, trucks, or storage yard no faster than it can be used to good advantage. In general, distribute no more than one week's supply of material in advance of the laying.
- b. **Handling Pipe and Fittings:** Provide and use proper implements, tools, and facilities for safe and proper work. Lower all pipe, fittings, and appurtenances into the trench, piece by piece, by means of a crane, sling, or other suitable tool or equipment, to prevent damage to the pipeline materials and protective coatings and linings. Do not drop or dump pipeline materials into the trench.

#### **501.6.03 Cleaning Pipe and Fittings**

- a. Remove all lumps, blisters, and excess coating from the bell and spigot ends of each pipe. Wire-brush the outside of the spigot and the inside of the bell and wipe them clean, dry, and free from oil and grease before the pipe is laid.

- b. Wipe clean all dirt, grease, and foreign matter from the ends of mechanical joint and rubber gasket joint pipe and fittings.

#### **501.6.04 Placing Pipe in Trench**

##### Pipe Bells/Joints

- a. At the location of each joint, dig bell (joint) holes of ample dimensions in the bottom of the trench and at the sides, where necessary, to permit the joint to be made properly and to permit easy visual inspection of the entire joint.
- b. Unless otherwise directed, lay pipe with the bell end facing in the direction of the laying.
- c. For lines on steep slopes, face bells upgrade only.
  1. Do not allow foreign material to enter the pipe while it is being placed in the trench.
  2. Lay and join pipe with push-on type joints in strict accordance with the manufacturer's recommendations. Provide all special tools and devices, such as jacks, chokers, and similar items required for the installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes shall be permitted under any circumstances.
  3. After the first length of push-on joint pipe is installed in the trench, secure the pipe in place with approved backfill material that is tamped under and along the spring line to prevent movement. Keep the ends clear of backfill. After each section is joined, place backfill as specified to prevent movement.
  4. Mechanical joint fittings vary slightly with different manufacturers. Install the furnished fittings in accordance with the manufacturer's recommendations. In general, the procedure shall be as specified here. Clean the ends of the fittings of all dirt, mud, and foreign matter by washing with water and scrubbing with a wire brush. When the ends of the fittings are clean, slip the gland and gasket on the plain end of the pipe. If necessary, lubricate the end of the pipe to ease sliding the gasket in place. Then guide the fitting onto the spigot of the laid pipe.

#### **501.6.05 Cutting Pipe**

- a. Cut pipe for inserting valves, fittings, or closure pieces in a neat and workmanlike manner, without damaging the pipe or lining and leaving a smooth end at right angles to the axis of the pipe.
- b. The contractor shall cut ductile iron pipe using a method approved by the City's authorized representative; all burrs or rough edges shall be removed before joining pipe. The contractor shall not flame-cut the pipe.
- c. Dress cut ends of push-on joint pipe by beveling with a heavy file or grinder, or as recommended by the manufacturer.

**501.6.06 Permissible Deflection of Joints**

Wherever it is necessary to deflect the pipe from a straight line either in a vertical or horizontal plane, to avoid obstructions, or where long-radius curves are permitted, the amount of deflection allowed shall not exceed the values shown in **Table 5.1** or the manufacturer’s recommendations, whichever is less.

**Table 5.1. MAXIMUM PERMITTED DEFLECTION, 18-FOOT-LONG PIPE**

| Diameter<br>(inches) | Mechanical Joint                      |                                     | Push-On Joint                 |                                     |
|----------------------|---------------------------------------|-------------------------------------|-------------------------------|-------------------------------------|
|                      | Max. Defl. Angle<br>(degrees-minutes) | Deflection <sup>1</sup><br>(inches) | Max. Defl. Angle<br>(degrees) | Deflection <sup>1</sup><br>(inches) |
| 4                    | 4° – 09'                              | 15                                  | 3°                            | 10                                  |
| 6                    | 3° – 33'                              | 13                                  | 3°                            | 10                                  |
| 8                    | 2° – 40'                              | 10                                  | 3°                            | 10                                  |
| 12                   | 2° – 40'                              | 10                                  | 3°                            | 10                                  |

**Note:** Maximum deflection shall be whichever is less, the value shown in the table or that recommended by the pipe manufacturer.

<sup>1</sup>Safe deflection shown is for 150 psi of pressure. For higher pressure, reduce tabulated deflection 10% for each 150 psi of added pressure.

**501.6.07 Alignment**

Pipelines intended to be straight shall not deviate from the straight line at any joint in excess of 1 inch horizontally or 1 inch vertically.

**501.6.08 Anchorage and Restraint**

All pipelines 4 inches in diameter or larger shall be secured with a suitable mechanical joint restraint system (such as Megalug<sup>®</sup>, RomaGrip<sup>™</sup>, or approved equals) at all tees, plugs, caps, and bends, and at other locations where unbalanced forces exist. Where required, provide thrust blocking as specified in Section 501.09.10, “Thrust Blocking and Restraint.” Gaskets shall be installed in accordance with Section 501.4.05, “Gaskets.”

**501.6.09 Construction of Blow-offs**

Blow-offs shall be constructed as shown in Detail No. W-3050 or W-3055 of these standards. Straddle blocks shall be constructed of reinforced concrete; the concrete mix shall be commercially produced and have a compressive strength of not less than 3,000 psi at 28 days, unless otherwise approved by the City’s authorized representative. Blow-offs shall not be flushed or pressurized until a minimum of 7 days after concrete is installed. If high-early cement is used for the straddle block, the time may be cut by two days.

### **501.6.10 Locating Wire Specifications**

Install tracer wire (12-gauge with blue THNN insulation) beside the pipe and plastic caution tape 1-foot above the pipe crown. Wire shall surface at all fire hydrants, valve boxes, and blowoffs.

### **501.7.00 VALVES AND VALVE BOXES**

#### **501.7.01 Scope**

This section covers the work necessary for furnishing and installing gate valves, butterfly valves, and valve boxes, complete.

#### **501.7.02 Materials**

##### **a. Gate Valves:**

1. Resilient-seated gate valves, sized 3 inches through 12 inches, shall conform to AWWA Standard C-509 or C-515. The manufacturer's name, the model, and the year of manufacture are to be cast on each valve.
2. Valve ends are to be flanged or mechanical joint by flanged, as shown on the plans, and conform to AWWA C-111 and ANSI Class 125. Buried service valves shall open with a counterclockwise rotation of a 2-inch operating nut.
3. All internal parts shall be accessible without removing the body from the line. The one-piece wedge shall be completely encapsulated by resilient material. The resilient sealing material shall be permanently bonded to the wedge with a rubber tearing bond meeting the requirements of ASTM D-429.
4. Nonrising stems (NRS) shall be cast bronze with integral collars in compliance with AWWA C-509 or C-515. The NRS shall have two O-ring seals above the thrust collar and one below. The two top O-rings are to be field replaceable (in the full open position) without removing the valve from service. Low-friction thrust bearings shall be placed above and below the stem collar. The stem nut shall be bronze and independent of the wedge.
5. Outside screw and yoke valves shall have a bronze stem attached to the disc assembly. An adjustable follower gland shall be incorporated to compress braided packing and seal the stem.
6. The waterway in the seat area shall be smooth, unobstructed, and free of cavities. The cast iron body and bonnet shall be fully coated, both interior and exterior, with a fusion-bonded, heat-cured thermo setting material meeting all the application and performance requirements of AWWA C-550.
7. Gate valves shall meet the testing requirements as presented in AWWA C-509 and C-515.

**b. Butterfly Valves:**

1. Butterfly valves shall be the rubber-seated type, suitable for direct-burial service. They shall withstand 150 psi working pressure and a 150 psi pressure differential across the valve. Except as noted, the butterfly valve shall conform to AWWA C-504 for Class 150B.
2. Valve ends are to be flanged or flanged by mechanical joint, as shown on the plans, and conform to AWWA C-111 and ANSI Class 125.
3. All joint accessories shall be furnished with valves.
4. Valves shall be equipped with an iron body and 304 stainless-steel circular shaft. Shaft and disc seals shall be designed for a bottle-tight seal. The valve disc shall be cast iron with stainless-steel edge with acrylonitrile-butadiene (NBR) seat.
5. The butterfly valve shall be furnished with a totally enclosed, integral valve operator design to withstand a minimum of 300 foot-pound input torque without damage to the valve or operator. Operators shall be fully gasketed and greased-packed and designed to withstand submersion in water to a pressure of 10 psi. Valves shall open with a counterclockwise rotation of a 2-inch operating nut. A minimum of 30 turns of the operating nut shall be required to move the disc from a fully opened position to a fully closed position.
6. Butterfly valves shall meet the testing requirements as presented in AWWA C-504.

**c. Extension Stems for Valve Operators:**

1. Where the depth of the operating nut is more than 3 feet, operating extensions shall be provided to bring the operating nut to a point 18 inches below the surface of the ground or pavement (see Detail No. W-3015 of these Standards).
2. Where the depth of the operating nut is more than 6 feet, install a second rock guard plate equidistant between the first rock guard plate and the 2" operating nut.
3. The extension shall be constructed of solid steel rod and approved by the City's authorized representative. Cut extensions to the proper length so the valve box does not ride on the extension when set at grade.

### 501.7.03 Workmanship

#### a. Valves:

1. Valves shall be installed in accordance with Detail No. W-3020 of these standards. Valves shall be flanged by mechanical joint; valves shall be flanged to all tees and crosses.
2. Before installation, the valves shall be thoroughly cleaned of all foreign material. Valves shall be inspected for proper operation, both opening and closing, and to verify that the valves seat properly.
3. Valves shall be installed so that the stems are vertical, unless otherwise directed.
4. Jointing shall conform to AWWA C-600 or AWWA C-603, whichever applies. Joints shall be tested with the adjacent pipeline. If joints leak under test, valves shall be disconnected and reconnected, and the valve or the pipeline or both shall be retested.

#### b. Valve Boxes:

1. Valve boxes shall be installed in conformance with Detail No. W-3020 of these standards.
2. Center the valve boxes and set plumb over the wrench nuts of the valves. Set valve boxes so they do not transmit shock or stress to the valves. Set the valve box covers flush with the surface of the finished pavement, as shown in Detail No. W-3020 of these standards or to another level as may be required.
3. Where the depth of the operating nut is more than 3 feet, operating extensions shall be provided in accordance to Section 501.7.02.c.
4. Valve boxes shall be the two-piece sliding type, cast iron with 6<sup>5</sup>/<sub>8</sub> inch shaft, and shall be Vancouver-style of appropriate length for the installation, or as approved. The letter W shall be cast into the top of the lid. Extension pieces, if required, shall be the manufacturer's standard type for use with the valve box.
5. Backfill shall be the same as specified for the adjacent pipe. Place backfill around the valve boxes and thoroughly compact it to a density equal to that specified for the adjacent trench and in such a manner that will not damage or displace the valve box from the proper alignment or grade. Misaligned valve boxes shall be excavated, plumbed, and backfilled at the contractor's expense.
6. In non-paved areas, the valve box shall be set in a concrete collar as shown in Detail No. W-3020 of these standards.

## **501.8.00 FIRE HYDRANTS**

### **501.8.01 Scope**

This section covers the work necessary for furnishing and installing the fire hydrants, complete. Fire hydrants shall be installed as shown in Detail No. W-3040 of these standards.

### **501.8.02 Hydrants**

- a. Hydrants shall have a nominal 5¼-inch main valve opening with 6-inch bottom connections. The main valve shall be equipped with O-ring seals and shall open when turned left or counterclockwise.
- b. The operating nut shall be a 1½-inch national standard pentagon nut.
- c. Hydrants shall be equipped with two 2½-inch hose nozzles and one 4½-inch pumper nozzle with a Storz HPHA50-45NH permanent hydrant adapter.
- d. Hydrants shall conform to AWWA C-502 and to the City's standards. The normal depth of bury shall be 4 feet. Nozzle threads shall be American National Standard. The inlet connection shall be mechanical joint, restrained by a mechanical joint restraint system such as Megalug<sup>®</sup>, or approved equal.
- e. Hydrants shall be Mueller Centurion, Waterous Pacer, or approved equal.
- f. Hydrants shall be painted with Miller Paint Acrinamel #7323 Safety Yellow, Rust-Oleum #7645 Industrial Low V.O.C. Equipment Enamel Yellow, or approved equal.

### **501.8.03 Base Block**

The base block shall be solid precast concrete pier block with nominal dimensions of 8-inch thickness and 12-inch-square base.

### **501.8.04 Workmanship**

Construction and installation shall conform to these standards and to the provisions of AWWA C-600, except where otherwise specified.

### **501.8.05 Location and Position**

- a. Fire hydrants shall be located in compliance with TVF&R requirements. Locate as shown, or as directed, to provide complete accessibility and to minimize the possibility of damage from vehicles or injury to pedestrians. The maximum distance from a TVF&R approved driving surface to a fire hydrant is 15 feet. Improperly located hydrants shall be disconnected and relocated at the contractor's expense.

- b. When the hydrant is placed behind the curb or sidewalk, set the hydrant barrel so that no part of the pumper or hose nozzle cap is less than 24 inches from the face of the curb or the backside of the sidewalk.
- c. Set all hydrants plum and nozzles parallel with the curb, or at right angles to it. With the pumper nozzle facing the curb, set hydrants so that the safety flange is at least 3 inches and at most 6 inches above the finished ground or sidewalk level, to clear bolts and nuts.
- d. Install an approved blue bi-directional, reflecterized button in the center of the near travel lane using an approved fast-setting bonding agent.

**501.8.06      Excavation**

Do not carry excavation below the subbase grade. Refill over excavated areas with gravel and compact the fill to create a firm foundation.

**501.8.07      Base Rock**

Place base rock on a firm, level subbase or subgrade to assure uniform support.

**501.8.08      Installation of Hydrants**

Place the hydrant carefully on the base block to prevent the base block from breaking. After the hydrant is in place and is connected to the pipeline, place temporary blocks to maintain the hydrant in a plumb position during subsequent work.

**501.8.09      Gravel for Drainage**

Gravel for drainage shall be washed 1½" – ¾" aggregate or graded river gravel free of organic matter, sand, loam, clay, or other small particles that will restrict water flow through the gravel. Place gravel around the base block and hydrant bottom after the hydrant is blocked in place. Top of gravel shall be not less than 6 inches above the hydrant drain opening. Do not connect the drainage system to the sewer.

**501.8.10      Thrust Blocking and Restraint**

- a. Fire hydrants shall be secured by thrust blocking. Provide reaction or thrust blocking, as shown in Detail No. W-3040 of these standards, or as directed. Place blocking between the undisturbed ground and the fitting to be anchored. Blocking bearing surface shall be as shown in Detail No. W-3000 of these standards.
- b. Place the blocking so that the pipe and fitting joints will be accessible to repairs by wrapping all joints and fittings in new plastic sheeting (minimum 8 mil thickness).

- c. The concrete mix shall be commercially produced and have a compressive strength of not less than 3,000 psi at 28 days, unless otherwise approved by the City's authorized representative.
- d. Fire hydrant laterals shall be secured with a mechanical joint restraint system such as Megalug<sup>®</sup>, RomaGrip<sup>™</sup>, or approved equals.

**501.8.11 Thrust Ties**

Thrust ties may be used with concrete thrust blocking, with prior approval of the City's authorized representative, when the top of the existing ground behind the fire hydrant is less than 2 feet above the top of the hydrant base or where unsuitable ground prevents proper anchorage.

**501.9.00 HYDROSTATIC TESTING AND STERILIZATION OF NEWLY INSTALLED PIPE**

**501.9.01 Hydrostatic Testing**

- a. Contractor shall make pressure and leakage tests on all newly laid pipe; follow the procedures specified in AWWA C-600, Section 5.2, "Hydrostatic Testing." Contractor shall furnish all necessary equipment and material, make all taps in the pipes as required, and conduct the tests. The City's authorized representative will monitor the tests and assure that all taps are installed and service pipe extended.
- b. Furnish the following equipment and materials for the tests:

| Amount | Description                                                           |
|--------|-----------------------------------------------------------------------|
| 2      | Pressure gauges                                                       |
| 1      | Hydraulic force pump approved by the City's authorized representative |
| 1      | Suitable hose and suction, as required                                |

- c. Conduct the tests after the trench is backfilled or partially backfilled with the joints left exposed for inspection, or when completely backfilled, as permitted by the City's authorized representative. Where any section of pipe has concrete thrust blocking, do not take the pressure tests until at least five days elapse after the concrete thrust blocking is installed. If high-early cement is used for the concrete thrust blocking, the time may be cut by two days.
- d. Conduct pressure tests in the following manner, unless otherwise approved by the City's authorized representative. After the trench is backfilled or partially backfilled as specified here, fill the pipe with water, expelling all air during the filling. The minimum test pressure shall be 150 psi. For lines working with

operating pressures in excess of 100 psi, the minimum test pressure shall be 1½ times the operating pressure at the point of testing, however, test pressure shall not exceed pipe or thrust-restraint design pressures. The duration of each pressure test shall be 2 hours, unless otherwise directed by the City's authorized representative.

1. **Procedure:** Fill the pipe with water and apply the specified test pressure by pumping, if necessary. Then valve off the pump and hold the pressure in the line for the test period. Test pressure shall not vary by more than ±5 psi for the duration of the test. At the end of the test period, operate the pump until the test pressure is again attained. The pump suction shall be in a barrel or similar device, or metered so that the amount of water required to restore the test pressure can be measured accurately.
2. **Leakage:** Leakage shall be defined as the quantity of water necessary to restore the specified test pressure at the end of the test period. No pipe installation will be accepted if the leakage is greater than the number of gallons per hour, as determined by the following formula:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

where L = allowable leakage (gallons per hour).  
S = length of pipe to be tested (feet).  
D = nominal diameter of pipe (inches).  
P = average test pressure during the leakage test (psi).

3. **Correction of Excessive Leakage:** Should any test of laid pipe disclose leakage greater than that allowed, locate and repair the defective joints or pipe until leakage in a subsequent test is within the specified allowance.

#### 501.9.02 Sterilization

Pipeline intended to carry potable water shall be sterilized before it is placed in service. Disinfection by chlorination for pipelines shall be accomplished according to AWWA C-651, as modified or expanded below, and City requirements. Disinfection of water-storage facilities, water treatment plants, and wells shall be accomplished according to the appropriate sections of AWWA C-652, AWWA C-653, and AWWA C-654.

- a. **Flushing:** Before sterilizing, flush all foreign matter from the pipeline. Contractor shall provide hoses, temporary pipes, ditches, etc., as required to dispose of flushing water without damaging adjacent properties. Flushing velocities shall be at least 2.5 feet per second (fps). For large-diameter pipe that is impractical or impossible to flush at 2.5 fps, clean the pipeline in place from the inside by brushing and sweeping, then flush the line at a lower velocity.

**b. Sterilizing Mixture:**

1. Sterilizing mixture shall be a chlorine-water solution having a free chlorine residual of 40 to 50 parts per million (ppm). The sterilizing mixture shall be prepared by injecting (a) a liquid chlorine-water mixture or (b) a calcium sodium hypochlorite and water mixture into the pipeline at a measured rate, while fresh water is allowed to flow through the pipeline at a measured rate so that the chlorine-water solution is of the specified strength.
2. The liquid chlorine-water mixture shall be applied by means of an approved solution-feed chlorinating device. Chlorinating devices for feeding solutions of the chlorine itself must provide a means of preventing the backflow of water.
3. If the calcium hypochlorite procedure is used, first mix the dry powder with water to make a thick paste, then thin to approximately a 1% solution (10,000 ppm chlorine). If the sodium hypochlorite procedure is used, dilute the liquid with water to obtain a 1% solution. Add the 1% solution to water to obtain a final sterilizing solution of 40 to 50 ppm. **Table 5.2** shows the correct proportions of hypochlorite to water.

**Table 5.2. RATIO OF HYPOCHLORITE TO WATER**

| Product                                           | Quantity | Water    |
|---------------------------------------------------|----------|----------|
| Calcium hypochlorite <sup>1</sup><br>(65%-70% Cl) | 1 lb     | 7.5 gal  |
| Sodium hypochlorite <sup>2</sup><br>(5.2% Cl)     | 1 gal    | 4.25 gal |

<sup>1</sup>Comparable to commercial products known as HTH<sup>®</sup>, Perchloron<sup>®</sup>, and Pittchlor<sup>®</sup>.

<sup>2</sup>Liquid laundry bleach, such as Clorox<sup>®</sup> or Purex<sup>®</sup>.

**501.9.03 Point of Application**

- a. Inject the chlorine mixture into the pipeline to be treated at the beginning of the line through a corporation stop or a suitable tap in the top of the pipeline. Water from the existing system or other approved source shall be controlled to flow slowly into the newly laid pipeline during the application of chlorine. The proportion of the flow rate of the chlorine mixture to the rate of water entering the pipe shall be such that the combined mixture shall contain 40 to 50 ppm of free available chlorine.
- b. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Use check-valves if necessary.

- c. Operate all valves, hydrants, and other appurtenances during sterilization to assure that the sterilizing mixture is dispersed into all parts of the line, including dead ends, new services, and similar areas that otherwise may not receive the treated water.
- d. Do not place the concentrated quantities of commercial sterilizer in the line before it is filled with water.
- e. After chlorination, flush the water from the line (see Section 501.7.05) until the water through the line is equal chemically and bacteriologically to the permanent source of supply.

**NOTE:** When testing and sterilizing procedures are complete, remove the testing corporation stop and replace it with a threaded brass plug.

**NOTE:** The practice of adding a small amount of chlorine powder or tablets at each joint as the main is being laid is *not* an acceptable method of chlorinating a pipeline. The procedure does not permit preliminary flushing, nor does it distribute chlorine uniformly.

#### **501.9.04      Retention Period**

Treated water shall be retained in the pipeline long enough to destroy all non-spore-forming bacteria. With proper flushing and the specified solution strength, 24 hours is adequate. At the end of the 24-hour period, the sterilizing mixture shall have a strength of at least 10 ppm of chlorine.

#### **501.9.05      Disposal of Flushing and Sterilizing Water**

- a. Dispose of flushing and sterilizing water in an approved manner. If the volume and chlorine concentration is such as to pose a hazard to the City's Wastewater Treatment Plant operation, the sterilizing water shall be metered into the system. Notify the City of Wilsonville Environmental Services Division 24 hours before disposing of sterilizing water into the City sanitary system.
- b. Do not allow sterilizing water to flow into a waterway or storm line without reducing the chlorine to a safe level via adequate dilution or another neutralizing method, as approved by the City's authorized representative.
- c. City Water staff will obtain water samples for microbiological analysis 48 hours after the contractor flushes the water line. Contractor shall request the City Water staff to sample lines at least 24 hours in advance. Applicant shall reimburse the City for the cost of collecting and testing each water sample. Fee for water collection and testing is provided on the Engineering Department's Project Permit.

**501.10.00 WATER SERVICE CONNECTIONS**

**501.10.01 Scope**

The work includes trench excavation and backfill, furnishing and installing service saddles, corporation or valves, meter vaults or boxes, meters, service connection piping, fittings, and appurtenances within the designated limits, testing, flushing, and other incidental work as required for a complete installation.

**501.10.02 Hydrostatic Test and Leakage**

Test service connections and service connection pipe in conjunction with the main, as detailed in Section 501.9.00, "Hydrostatic Testing of Newly Installed Pipe."

**501.10.03 Materials**

- a. **Service lines: ¾- and 1-inch:** Corporation stops for ¾-inch (single service) and 1-inch copper service lines shall have AWWA thread inlet and compression connect outlet and shall be Mueller®.
- b. **Service lines: larger than 1-inch:** All service lines greater than 1 inch in size shall attach to water main using a service saddle and compression couplings.
- c. **Meter Boxes and Covers:** Generally, meter boxes and covers are installed in landscape areas and shall be of the type indicated in **Table 5.3**, Pedestrian Rated, or approved equal. Occasionally, with the approval of the City's Authorized Representative, installation of meter boxes in driveway areas may be allowed. In these cases, meter boxes and covers shall be of the type indicated in **Table 5.3**, Traffic Rated, or approved equal. All boxes shall be ordered with a 3" x 6" mouse hole precut into one end of the box.

**Table 5.3. METER BOXES AND COVERS**

| Service Line       | Pedestrian Rated           |                           | Traffic Rated                |                           |
|--------------------|----------------------------|---------------------------|------------------------------|---------------------------|
|                    | Meter Box                  | Meter Cover               | Meter Box                    | Meter Cover               |
| ¾-inch and 1-inch, | Armorcast No. P6001868x12  | Armorcast No. A6001866 H1 | Armorcast No. A6001946PCx12  | Armorcast No. A6001969 H1 |
| 1½-inch and 2-inch | Armorcast No. P6001534 X18 | Armorcast No. P6001634 H1 | Armorcast No. A6001640 PCX12 | Armorcast No. A6001947T   |

- d. **Corporation Stops:** 1-inch corporation stops shall be Mueller H-15008 (110 Compression) for direct taps or Mueller H-15028 (110 Compression) for saddle taps; Mueller H-15000 (Flare) for direct taps or Mueller H-15025 (Flare) for saddle taps.

- e. **Angle Valves:** Mueller H-14255 angle curb stop. Ford No. KV23-444W for ¾-inch and 1-inch line. Mueller No.14276 or 14277, Ford No. FV 23-777W for 1½-inch and 2-inch line.
- f. **Copper Tube:** Copper tube used for ¾-inch to 1-inch service connections shall be soft temper Type K, conforming to ASTM B-88. Copper pipe used for 1½-inch to 2-inch service connections shall be (hard) drawn temper Type K, conforming to ASTM B-88.

#### 501.10.04 Workmanship

- a. **Trench Excavation, Preparation, and Backfill:** Trench excavation, preparation, and backfill shall conform to the requirements of Section 6, "Trench Excavation and Backfill." Backfill material in the trench to within 6 inches of service connection pipe or line. Cover over pipe shall be as indicated in Detail No. S-2140 of these standards.
- b. **Connection to Main:** Service connections shall be installed as shown in Detail No. W-3030 or W-3035 of these standards. Taps shall be made in the pipe by experienced workmen, using tools in good repair, with proper adapters for the size of pipe being tapped. Line taps shall be 30° above the horizontal for ¾" or 1" service connections, and centered on the spring line of the pipe being tapped for 1½" or 2" service connections. Tap shall be made no closer than 18 inches from the outside edge of the sleeve to the beginning of the bell flare or end of the MJ fitting. The City's authorized representative shall be notified and shall be present during tapping of City water main, unless otherwise approved by the City's authorized representative.
- c. **Copper Tubing:** The copper tubing shall be cut with square ends, reamed, cleaned, and made up tightly. Care shall be taken to prevent the tube from kinking or buckling on short radius bends. Kinked or buckled sections of copper tube shall be cut and the tube spliced with the proper brass fittings, at the contractor's expense.
- d. **Installation of Meters and Meter Boxes:**
  - 1. Meters and meter boxes or vaults shall be installed as shown in Detail No. W-3030 or W-3035 of these standards, or as directed by the City's authorized representative.
  - 2. City of Wilsonville Water Division shall install all meters 2 inches in diameter or less. Meters larger than 2 inches in diameter shall be installed by the contractor under the supervision of City of Wilsonville Water Division.
  - 3. Meters shall not be installed until the entire water system is ready for operation, the system has been tested and approved, and water meter permit(s) have been obtained from the City of Wilsonville Building Division.

4. The remainder of the service connection, excluding the meter, may be installed at any time during or after construction of the main. Before the meter is connected, the angle valve shall be opened and the service line flushed of all foreign materials, and shall be properly tested and chlorinated.
5. The finish grade of the completed meter enclosure shall allow a minimum of 6 inches and a maximum of 12 inches of clearance from the top of the meter to the meter box. Meter boxes or vaults shall be set or constructed plumb, with the top set horizontally. Lightly compacted earth backfill shall be placed inside the meter boxes to the bottom of the meter stop. Grade adjustments of the meter boxes or vaults shall be made by using standard extension sections for the specified box or vault. Backfill around meter vaults shall be as specified for adjoining pipe. Provide adequate space to allow for sidewalk installation. Under no circumstances shall meter boxes be placed in the sidewalk.
6. Depending on the elevation difference between the meter and the main line water system working pressure, the City may require a backflow-prevention valve and/or a pressure reducing valve on the customer side of the meter, at the meter box. Installation shall be approved by the City's authorized representative.

#### **501.11.00 WATER LINE ACCEPTANCE POLICY**

##### **501.11.01 Water Line Activation**

The City of Wilsonville will provide water to the project when the following are complete.

- a. Compliance with these standards.
- b. Installation of the materials and workmanship as described herein.
- c. Successful hydrostatic pressure tests, as witnessed and approved by the City's authorized representative.
- d. Adequate flushing and chlorination of mains.
- e. Approval by an Oregon Health Division certified water quality laboratory of samples taken for bacteriological examination.

##### **501.11.02 Water Line Acceptance**

The City of Wilsonville will accept new water installations or systems built to the "Public Works Standards," provided that the following conditions are met.

- a. Dedication of any required easements or rights-of-way have been recorded with the County Recorder and the Engineering Department receives a reproducible copy of the recorded documents.
- b. After completion of construction of the total project, and after all testing has been satisfactorily completed, project closeout shall proceed as outlined in Section 101.8.17.a, "Project Completion."
- c. The Contractor or Applicant shall be responsible for providing Maintenance Assurance for Public Improvements as outlined in Section 101.8.17.b, "Maintenance Assurance." Public water improvements shall be warranted for a minimum of one year; public landscape improvements shall be warranted for a minimum of two years.
- d. At any time during the warranty period, the City's authorized representative has reason to believe the public water improvements have defects that were the result of faulty workmanship or flaws in construction material, the responsible party shall be required, at that party's own cost, to repair any faults to the public water improvements deemed necessary by the City's authorized representative.
- e. Before the end of the Construction Maintenance period, the City's authorized representative shall inspect the project for any remaining deficiencies. If the deficiencies that remain are determined to be the responsibility of the contractor or the applicant, the contractor or applicant shall then make such repairs.
- f. The Landscape Maintenance assurance shall be released two years after acceptance of construction, providing the landscaping meets the 90% survival level (see Section 301.13.02, "Landscape Inspection for Warranty")

## SECTION 6

### TRENCH EXCAVATION AND BACKFILL

#### 601.1.00 DEFINITIONS

- a. **Trench Excavation:** Trench excavation is the removal of all material encountered in a trench to the depths shown on the plans or as directed by the City's authorized representative. Trench excavation shall be classified as either common or rock excavation.
  1. "Common excavation" is defined as the removal of all material that is not classified as rock excavation. The term "rock excavation" shall be understood to indicate a method of removal and not a geological formation.
  2. "Rock excavation" is defined as the removal of material that cannot, in the City Engineer's judgment, be reasonably excavated with equipment comparable in machine weight and rated horsepower to a hydraulic hoe excavator with a minimum weight of 45,000 pounds and a net horsepower rating of 130 to 140. Rock excavation is also the removal of material by drilling and blasting (see Section 601.3.01.i, "Explosives," for blasting restrictions) or power-operated rock-breaking equipment. Boulders or concrete pieces larger than ½ cubic yard encountered in the trench excavation shall be classified as rock excavation if removing them requires any of the above excavation methods, in the opinion of the City's authorized representative.
- b. **Trench Foundation:** The bottom of the trench on which the pipe bedding will lie. The trench foundation supports the pipe bedding.
- c. **Pipe Bedding:** The furnishing and placing of specified materials on the trench foundation to uniformly support the barrel of the pipe, from the trench foundation to the spring line of the pipe.
- d. **Pipe Zone:** The full width of the trench, from 12 inches above the top outside surface of the barrel of the pipe to the spring line of the pipe.
- e. **Spring Line:** Halfway up the sides of the pipe (horizontal centerline) when the pipe is laid on the pipe bedding.
- f. **Haunch:** That portion of the pipe below the spring line.
- g. **Trench Backfill:** The furnishing, placing, and compacting of material in the trench between the top of the pipe zone material and the bottom of the pavement base rock, ground surface, or surface materials.

- h. **Native Material:** Earth, gravel, rock, or other common material free of humus, organic matter, vegetative matter, frozen material, clods, sticks, and debris, isolated points or areas, or larger stones that would fracture or dent the structure or subject it to undue stress.

**601.2.00 MATERIALS**

**601.2.01 Trench Foundation**

Trench foundation (as defined in Section 601.1.00.b) shall be native material in all areas except where groundwater or other conditions exist and, in the opinion of the City's authorized representative, the native material cannot support the bedding and pipe. Under those conditions, geotextile fabrics approved by the City's authorized representative shall be installed, or the unsuitable material shall be removed, as determined by the City's authorized representative, and the trench backfilled with Class B backfill.

**601.2.02 Pipe Area**

- a. **Pipe Bedding:** Pipe bedding material shall be Class B backfill, uniformly graded from coarse to fine, or as approved by the City's authorized representative.
- b. **Pipe Zone:** The pipe zone material shall consist of Class B backfill.

**601.2.03 Trench Backfill**

Above the pipe zone, trench backfill will be divided into the following classifications (from ODOT SSC):

- a. **Class A Backfill:** Class A backfill shall be native or common material, which in the opinion of the City's authorized representative meets the characteristics required for the specific surface loading. Selected trench fill material shall contain no frozen soil, gravel, or cobbles larger than 6 inches in diameter, and shall be free of organic or other deleterious material.
- b. **Class B Backfill:** Class B backfill shall be ¾"-0" granular grade crushed aggregate material, unless otherwise approved by the City's authorized representative. The aggregate shall conform to the following.
  - 1. The aggregate shall consist of uniform-quality, clean, tough, durable fragments of rock or gravel and shall be free of flat, elongated, soft, or disintegrated pieces, or other objectionable matter occurring either free or as a coating on the stone.
  - 2. The aggregate shall meet the requirements for fractured faces and durability as specified in ODOT SSC Section 02630.10 "Dense-Graded Aggregate."

3. Gradation and plasticity index requirements of the crushed aggregate shall be as shown for ¾"-0" rock in **Table 2.7**, "Gradation Requirements of Granular Backfill."
4. Class B backfill material shall be approved by the City's authorized representative prior to placement.

### **601.3.00 CONSTRUCTION**

#### **601.3.01 Excavation**

- a. **Clearing and Grubbing:** When clearing the right-of-way is necessary, clearing shall be completed before the start of trenching. Clearing and grubbing shall follow the procedures outlined in Section 201.5.02, "Clearing and Grubbing." Under no condition shall excavated materials be permitted to cover brush before the brush is cleared and disposed of. Excavated material shall be stockpiled where and so it does not create a hazard to pedestrian or vehicular traffic; nor shall it interfere with the function of existing drainage facilities.
- b. **Erosion Control:** The contractor shall be responsible for erosion prevention and sediment control on the jobsite and shall use appropriate prevention measures as outlined in Section 101.9.04, "Erosion Prevention and Sediment Control." The contractor shall maintain the erosion-prevention and sediment-control facilities as specified in Section 101.9.05, "Maintenance."
- c. **Interferences and Obstructions:** Various obstructions may be encountered during the course of the work. The contractor shall follow the guidelines established in Section 101.8.05, "Interferences and Obstructions."
- d. **Contaminated Soils:** If during construction contaminated soil or with hazardous materials or chemicals are encountered, the Contractor shall follow the procedures specified in Section 101.9.02, "Contaminated Soils or Hazardous Materials."
- e. **Open Trench Limit**
  1. Construction shall proceed in a systematic manner that will result in minimum inconvenience to the public. Construction staking for the work being performed shall be completed before the start of excavation.
  2. The contractor shall limit their operations to a small work area per crew. The length of the excavated trench shall always be kept to a minimum. At no time shall the trenching equipment be farther than 100 feet ahead of the pipe-laying crews, unless advance written permission is given by the City's authorized representative.

3. The trench shall be backfilled so that no section of trench is left open longer than 24 hours. Before the contractor stops construction for the day, trenches located in the right-of-way shall be completely backfilled, unless the trench is covered with Steel Plates. Use of Steel Plates shall conform to Section 101.8.02.b.5, "Progress of Construction."

**f. Trench Width**

1. The trench width at the surface of the ground shall be kept to the minimum necessary to safely install the pipe. All aspects of excavation, trenching, and shoring shall meet current OSHA standards and regulations. In all cases, trenches must be wide enough to allow for shoring and to permit proper joining of the pipe and backfilling and compaction of material along the sides of the pipe.
2. Trench width in the pipe zone must provide a minimum clear working space outside the maximum outside diameter of the pipe. Minimum clear working space shall be 6 inches for pipe up to 12-inch interior diameter; for pipe greater than 12-inch interior diameter the minimum clear working space shall be  $\frac{1}{2}$  the inside pipe diameter up to a maximum of 24 inches (see Table A in Detail No. S-2140 or Detail No. S-2145 of these standards). Excavation for manholes and other structures shall be wide enough to provide at least 12 inches between the structure's surface and the sides of the excavation or shoring.
3. Maximum width of the trench at the top of the pipe shall be 12 to 24 inches plus the width of the pipe bell. When required by the project design, the maximum trench width shall be shown on the plans.
4. If the contractor exceeds the maximum trench width shown on the plans without written authorization, the contractor shall be required to contact the design engineer or the geotechnical engineer and obtain written approval allowing installation of the pipe as specified, or contractor shall provide, at their cost, pipe of a higher strength designation, a higher class of bedding, or both, as recommended by the design engineer or the geotechnical engineer, and approved by the City's authorized representative.
5. The contractor shall confine the top width of the trench to right-of-ways or easements. If circumstances require extending the width of the trench beyond the right-of-way or easement boundary, the applicant shall obtain written agreements with the affected property owner(s), and provide them to the City's authorized representative before commencing excavation.

**g. Grading**

1. The bottom of the trench shall be graded to the line and grade to which the pipe is to be laid, with proper allowance for pipe thickness and bedding material, or for greater base when specified or indicated. Before laying each section of the pipe, check the aggregate grade and correct any irregularities.
2. The trench bottom shall form a continuous and uniform bearing surface and support the pipe on solid and undisturbed ground at every point between bell holes, except that the grade may be disturbed for removing lifting tackle.

**h. Rock Excavation**

1. Where the bottom of the trench encounters ledge rock, boulders, or large stones that meet the definition of "rock excavation," rock excavation shall be performed to create six inches of clearance on each side and below all pipe and accessories.
2. Excavations below subgrade in rock shall be backfilled to subgrade with Class B backfill material and compacted to not less than 90% of its maximum dry density as determined by AASHTO T-180.

**i. Explosives**

Explosives shall not be used in the City of Wilsonville without prior written approval from the City Engineer.

**601.3.02 Installation** (see trench detail drawing of these standards)

**a. Shoring**

1. The contractor shall provide all materials, labor, and equipment necessary to adequately shore trenches to protect the work, existing property, utilities, pavement, etc., and to provide safe working conditions in the trench.
2. Cribbing or sheeting that extends below the spring line of rigid pipe or below the crown elevation of flexible pipe shall be left in place, unless a satisfactory means can be demonstrated for reconsolidating bedding or side support that would be disturbed by removing the cribbing or sheeting.
3. If a movable box is used instead of cribbing or sheeting and the bottom cannot be kept above the spring line of the crown elevation of the flexible pipe, the bedding or side support shall be carefully reconsolidated behind the movable box before backfill is placed.

4. The use of horizontal strutting below the barrel of pipe, or the use of pipe as support for trench bracing, will not be permitted.

**b. Dewatering**

- a. The contractor shall provide and maintain ample means and devices for promptly removing and disposing of all water entering the trench excavation while the trench is prepared for pipe laying, during the laying of the pipe, and until the backfill is placed and compaction is complete.
- b. Groundwater shall be controlled to keep it from softening the bottom of the excavation. Dewatering systems shall be designed and operated to prevent removal of the natural soils and to keep the groundwater level outside the excavation from being reduced to an extent that would damage or endanger adjacent structures or property.
- c. Dewatering systems shall be discharged to a stormwater detention/retention facility unless otherwise approved by the City's authorized representative.
- c. **Grade:** The contractor shall excavate the trench a minimum of 6 inches plus the pipe wall thickness below the specified pipe grade, or as established by the geotechnical engineer. The subgrade on which the bedding is to be placed shall be firm, undisturbed, and true to grade.

**d. Trench Foundation**

1. When in the judgment of the geotechnical engineer or the City's authorized representative, the existing material in the bottom of the trench is unsuitable to support the pipe, the contractor shall excavate below the pipe, as directed.
2. The contractor shall backfill the trench to the subgrade of the pipe bedding with Class B backfill material over the full width of the trench, and shall compact in layers not exceeding 6 inches deep.
3. Fill material shall be compacted to not less than 90% of its maximum dry density, as determined by AASHTO T-180.

**e. Pipe Bedding**

1. Class B backfill material shall be placed under all pipes.
2. Pipe bedding consists of leveling the bottom of the trench on the top of the foundation material and placing bedding material to the horizontal centerline of the pipe, unless otherwise specified.

3. Granular base shall be placed in the trench to a depth of 6 inches, loose, for the full width of the trench. The contractor shall spread the bedding smoothly to the proper grade so the pipe is uniformly supported along the barrel.
4. The contractor shall excavate bell holes at each joint to permit proper assembly and inspection of the entire joint. Bedding under the pipe shall provide firm, unyielding support along the entire pipe length.
5. Contractor shall be aware of the importance in proper placement and compaction of backfill material placed below the spring line of the pipe (haunch area). Proper backfilling ensures that adequate stability and support is provided to the pipe during final backfilling of the pipe zone. Backfill material shall be worked under the haunches by hand.

**f. Backfill in Pipe Zone**

1. After the pipe is in place and ready for backfilling, place Class B backfill to a minimum depth of 12 inches over the top of the pipe. The material shall be placed at approximately the same rate on each side of the pipe, so that the elevation of the aggregate on each side of the pipe is always equal.
2. Particular attention shall be given to the backfilling and tamping procedure to assure that there are no unfilled or noncompacted areas under the pipe.

**g. Trench Backfill**

1. Backfill shall be placed in the trench in such a way as to **not** permit material to freefall until the top of the pipe is covered by at least 2 feet of material. Under no circumstances shall the contractor allow sharp, heavy objects to drop directly onto the pipe or pipe zone material around the pipe.
2. If the required compaction density cannot be obtained, the contractor shall remove the backfill from the trench and recompact. The process shall be repeated until the contractor establishes a procedure that will provide the required density. The contractor will then be permitted to proceed with backfilling and compacting the rest of the pipeline under the approved compaction procedure.
3. Within the public right-of-way, trench backfill shall consist of granular fill meeting the requirements of Section 201.3.01, "Granular Fill."

**h. Native or Select (Class A) Backfill**

1. Backfill the entire depth of the trench above the pipe zone with excavated trench materials placed in 12-inch layers. Remove all cobbles and stones

2 inches in diameter and larger from material used for backfill in the upper 12 inches of the trench.

2. Compact each layer using mechanical tampers or vibratory compactors to 85% of its maximum dry density, as determined by AASHTO T-180. Bring the fill to the required surface grade, and compact so that no settlement will occur.

i. **Granular Backfill**

1. Granular backfill material shall meet the requirements of Section 201.3.01, "Granular Fill." Granular backfill shall be tested at a minimum of every 200 feet of trench length and at depths specified by the City's authorized representative.
2. The aggregate backfill within 2 feet of base grade shall be compacted to not less than 95% of its maximum dry density, as determined by AASHTO T-180. Backfill placed more than 2 feet from base grade shall be compacted to not less than 90% of its maximum dry density.

## APPENDIX A

### BICYCLE AND PEDESTRIAN FACILITIES

#### A.1.00 INTRODUCTION

The purpose of this appendix is to outline the design and construction requirements for bicycle and pedestrian improvements in the City of Wilsonville. The City regards facilities for bicyclists and pedestrians as important parts of the overall transportation system and not just recreational facilities, and shall continue to improve and expand pedestrian and bicycle facilities, with a focus on improved connectivity between major activity centers while minimizing conflicts with other modes of transportation.

Bicycle and pedestrian facilities are addressed in the City of Wilsonville's TSP, the 1993 Bicycle and Pedestrian Master Plan (BPMP), and the 1994 Parks and Recreation Master Plan (PRMP).

#### A.1.01 Bicycle and Pedestrian Facility System

To encourage bicycling and walking in the City, it is critical to provide safe and convenient systems that connect residential, commercial, and industrial destinations. Therefore, major and minor collector and arterial street design shall include bicycle facilities on or near the streets. Sidewalks shall be provided on (preferred) or near all streets. The multi-use path system shall be expanded to provide off-street pathways and trails for convenience, safety, and recreation. Finally, the citywide bicycle and pedestrian facility system shall connect with existing and potential routes outside of the City limits. To this end, the City shall continue to coordinate with other cities, counties, the state, and Metro to further a regional approach to bicycle and pedestrian issues.

#### A.1.02 Playground Facilities

Playground facilities shall be designed in conformance to the Consumer Product Safety Commission Handbook for Public Playground Safety, or latest edition.

#### A.2.00 DESIGN OF BICYCLE AND PEDESTRIAN FACILITIES

#### A.2.01 General Design, Location, and Easement Requirements

- a. **Design:** The design of all bicycle and pedestrian facilities within the City of Wilsonville shall be in conformance with applicable AASHTO, ODOT, and ADA requirements and standards, as provided in the 1999 AASHTO publication, "Guide for the Development of Bicycle Facilities," the 1995 ODOT publication, "Oregon Bicycle and Pedestrian Plan," and ADAAG guidelines, or latest editions. Any deviation from the AASHTO, ODOT, ADA, or City standards shall require written approval from the City Engineer.

- b. **Location:** Bicycle and pedestrian facilities shall be installed on the basis of the City of Wilsonville's TSP, BPMP, and PRMP. In case of conflict, however, the BPMP takes precedence in matters dealing with off-street facilities.
- c. **Right-of-Way and Easements**
  - 1. All public-owned bicycle facilities shall be constructed within a public right-of-way or easement. When a bicycle facility must be constructed outside the public right-of-way, an appropriate easement shall be granted to the City for construction and maintenance of the facility; the location and width of the easement shall be approved by the City's authorized representative. A temporary construction easement may also be required.
  - 2. All new development or redevelopment within the City shall provide an easement to access adjacent streets, neighborhoods, and properties, especially schools, retail, and commercial areas. The intent of the easements is to reduce the length of travel to desired destinations from residential areas, thereby promoting bicycle/pedestrian travel.

#### **A.2.02 On-Street Design Standards**

- a. **Design Standards:** On-street standards for different situations are described below. It is recommended that bicycle lanes be the preferred facility design. Other facility designs should be used only if the bicycle lane cannot be constructed to the standard because of physical constraints. The alternative standards are listed in order of preference.
  - 1. **Bicycle Lane**
    - (a) Bicycle lanes shall always be one-way facilities and carry bicycle traffic in the same direction as adjacent motor vehicle traffic.
    - (b) The design shall include 12-foot minimum travel lanes for motor vehicles with 5- to 6-foot paved shoulders, or 5-foot paved lanes where on-street parking is allowed that are striped, marked, and signed as bicycle lanes.
    - (c) There shall be a minimum clear riding zone of 4-feet if there is a longitudinal joint between asphalt pavement and concrete gutter. Additional widths are recommended where substantial truck traffic is present, on grades, or where motor vehicle speeds exceed 35 miles per hour.
    - (d) This shall be the basic standard applied to bicycle lanes on all arterial and collector streets in the city. Bicycles lanes shall not exceed 6 feet in width.
  - 2. **Shoulder Bikeway:** This design includes a 12-foot minimum travel lane for motor vehicles with 5- to 6-foot paved shoulders that are striped but not marked as a bicycle lane. This should only be used in rural situations when it is

determined by the City's authorized representative that a marked bicycle lane is inappropriate.

3. **Shared Roadway:** This design features 14- to 16-foot travel lane widths for both motor vehicles and bicycles. This standard should be applied to all arterial and collector streets only when sufficient pavement width is not available for a separate bicycle lane. On arterial and collector streets, bicycle route signage is required to alert motorists to the potential presence of bicyclists.

**b. Drainage Grates**

1. Drainage grate inlets and utility covers are potential problems for bicyclists. When a new roadway is designed, all such grates and covers shall be kept out of bicyclists' expected path.
2. On new construction, curb inlets shall be used wherever possible to completely eliminate the exposure of bicyclists to grate inlets.
3. Grates and utility covers shall be adjusted flush with the surface, including after a roadway is resurfaced.
4. Grates shall be identified with a pavement marking, as indicated by the MUTCD, Part 9, or latest edition. Drainage grate inlets shall be bicycle-safe (as required by ORS 810.150) and hydraulically efficient.

**c. Railroad Crossings**

1. Railroad-highway/multi-use path grade crossings should meet at right angles. The greater the approach angle deviates from 90°, the greater the potential for a bicyclist's wheel to be trapped in the railroad flangeway.
2. Where the crossing angle is less than 45°, consideration shall be given to widening the outside lane, shoulder, or bicycle lane to allow bicyclists adequate room to cross the tracks close to a 90° angle.
3. In the case of multi-use path crossings, centerline stripes shall be provided to encourage a right-angle approach. Where these options are not possible, commercially available compressible flangeway fillers shall be installed.
4. The roadway approach shall be at the same elevation as the rails.
5. Warning signs and pavement markings shall be installed in accordance with the MUTCD, Part 9.

**A.2.03 Off-Street Design Standards**

Standards for off-street facilities are as follows:

- a. **Bicycle/Pedestrian (Multi-use) Path:** Multi-use paths are facilities on exclusive rights-of-way or easements. These facilities are physically separated from the roadway and are designed to exclude motor vehicle traffic, except at crossings. Separation shall be obtained by a barrier or by a minimum of 5 feet of open space. It is the City's policy not to illuminate multi-use paths.
1. **Width of Multi-use Paths:** Paths shall have a minimum width of 10 feet for two-way multi-use traffic and 12 feet where high multi-use traffic is expected. In addition, a minimum 2-foot clear distance on both sides of the path is required, although a 3-foot side clear distance is preferred. The maximum gradient for side clear areas shall be 6H:1V.
  2. **Overhead Vertical Clearance:** Overhead vertical clearance shall be a minimum of 8 feet. However, vertical clearance shall be a minimum of 10 feet where vehicular traffic is expected and in under-crossings or tunnels.
  3. **Horizontal Curves and Sight Distance**
    - (a) Multi-use path horizontal curves shall have a minimum 35-foot centerline curve radius.
    - (b) Corner sight distance shall be a minimum of 25 feet.
    - (c) When substandard radius curves must be used on multi-use paths because of right-of-way, topographical, or other considerations, standard curve warning signs and supplemental pavement markings shall be installed in accordance with the MUTCD, Part 9. The negative effects of substandard curves can be partially offset by widening the pavement through the curve and removing objects that impair sight distance.
  4. **Drainage:** The minimum pavement cross slope shall be 2%. Curves shall be banked with the low side on the inside of the curve. Paths constructed along hillsides shall have an interceptor ditch of suitable dimension on the uphill side.
  5. **Super-elevation Rate:** For most multi-use path applications, the super-elevation rate (i.e., a raised elevation of one side of the path) will vary from a minimum of 2% (the minimum necessary to encourage adequate drainage) to a maximum of 5% percent (beyond which maneuvering difficulties by slow bicyclists and adult tricyclists might be expected). The minimum super-elevation rate of 2% will be adequate for most conditions and will simplify construction.
  6. **Grade**
    - (a) Grades on multi-use paths shall be kept to a minimum, especially long inclines, and are recommended to be no greater than 5%.
    - (b) Where terrain dictates, grades over 5% and less than 500 feet in length are acceptable only when consideration has been given to sight distance and

stopping distances. In areas of generally steep terrain, it may be desirable to meander path alignments to attain reasonable grades for steep slope ascent.

- (c) In no case shall a “down-hill” approach grade of the intersection of a multi-use path to a sidewalk or street exceed 5% for the last 50 feet unless provisions have been made to provide satisfactory sight vision between the two intersecting facilities.
- (d) Grade changes on pathways shall provide for a minimum pedal clearance of 6 inches. If use by pedestrians is expected, ADA requirements must be met.

## 7. Structures

- (a) Multi-use paths constructed along hillsides or next to drainage ditches steeper than 3H:1V shall be protected with an approved handrail system in conformance with Detail No. R-1150 of these standards.
- (b) Bridges designed exclusively for bicycle and pedestrian traffic shall be designed for pedestrian live loadings. Bridge width shall be the total of the path width plus the side clear distances (see Section A.2.02.a.1). Bridge decks shall be designed with bicycle safe expansion joints. Decking boards shall be placed transverse to the direction of normal bike travel and shall be coated with a nonskid surfacing material approved by the City’s Public Works Department.
- (c) Where gravel driveways cross the path, a 5-foot paved apron shall be provided to minimize the transfer of gravel to the pathway.

## 8. Pavement Design

- (a) Subgrades shall be sterilized with a suitable non-environmentally hazardous herbicide that is approved by the City of Wilsonville Public Works Operations Division, in cooperation with the Environmental Services Division, to prevent subsequent intrusion of hardy weeds, vines, or other plant material into or upheaving through path surfaces.
- (b) Additional asphalt, base rock, and subgrade reinforcement shall be provided in path sections projected to bear heavy maintenance vehicle traffic. No less than one additional inch of asphalt shall be provided in these areas.
- (c) The wearing surface of AC pavement shall conform to ODOT SSC Section 00745, “Hot Mixed Asphalt Concrete” for Level 1 HMAC. Pavement design shall be a minimum of 3 inches of AC pavement over a 4-inch thick base consisting of ¾”-0” crushed aggregate backfill, meeting requirements of Section 201.3.01, “Granular Fill.” Base rock shall be compacted to 95% of the maximum dry density as determined by AASHTO T-180. Base rock shall be placed over a firm subgrade stripped as per Section 201.5.02, “Clearing and Grubbing.”

- (d) PCC pavement shall be an acceptable path surface alternative. The surface shall be cross-broomed and crack-control joints shall be saw-cut, not troweled. Minimum design thickness shall be 4 inches of PCC over a 4-inch base consisting of ¾"-0" crushed aggregate backfill, meeting requirements of Section 201.3.01, "Granular Fill." Base rock shall be compacted to 95% of the maximum dry density as determined by AASHTO T-180. Base rock shall be placed over a firm subgrade stripped as per Section 201.5.02, "Clearing and Grubbing."
- (e) Location of expansion and contraction joints in PCC multi-use paths shall be as specified in Detail No. R-1080 of these standards. All expansion joints, paving joints, driveway intersections, and railroad crossings shall be designed to maintain a smooth riding surface.
- (f) Pathways shall be protected from root intrusion as per Section 201.2.22.d, "Root Barriers."

9. **Public Easements and Rights-of-Way:** The City, through the development application process, may require the granting of a public easement for multi-use paths. Where it is deemed to be in the best interests of the City, a dedication of right-of-way may be required in lieu of an easement. Bike path easements and rights-of-way shall be no less than 15 feet wide, or wider as determined by the City in accordance with the following:

- a) Where terrain dictates cut or fill sections to meet path design requirements, additional width shall be required only to the extent necessary for sideslopes.
- b) Where utility needs, drainage requirements or independent bike paths create multi-use opportunities, additional width shall be required only to the extent necessary for the multi-use.

b. **Recreational Trail:** This is an ADA accessible surface with a usable width of 3 to 12 feet conforming to the ADA Standards for Accessible Design requirements. It is the City's policy not to illuminate recreational trails.

c. **Landscaping**

- 1. Landscaping shall be provided along multi-use paths and recreational trails. Selection of trees, shrubs, and ground cover should include low-maintenance varieties that are drought tolerant and require little pruning. Shrubs should be low growing (under 3 feet at mature height). Location and placement of plant materials should not result in growth over or onto the path surface.
- 2. All proposed plant materials shall be approved by the City of Wilsonville. All landscaping, signs, and other potential obstructions shall be set back a minimum of 1 foot from the edge of the pathway surface. No exposed rock shall be permitted within 2 feet of the pathway surface. All exposed earth within 2 feet of

the pathway surface shall be planted with grass, sod, or covered with 2" of barkdust.

3. A number of important design considerations should be reviewed when selecting materials and planning planting schemes. Trees are of primary concern regarding location and variety. Specifically, placement and selection of trees should evaluate the following:
  - (a) Tree rooting characteristics - to avoid potential path surface upheaval.
  - (b) Tree size - trees shall be of satisfactory caliper to permit a minimum vertical clearance of 8 feet to the lowest branch. The clearance shall be a minimum of 10 feet where vehicular traffic is expected.
  - (c) Tree placement - to avoid creating hiding areas or permitting foliage to block path lighting, trees shall be located a minimum of 10 feet from path lighting fixtures.
- d. **Root Control:** Pathways shall be protected from root intrusion as per Section 201.2.22.d, "Root Barriers."

#### **A.2.04 Sidewalks**

- a. The location, design, and construction of sidewalks shall be in conformance with Section 201.2.22, "Sidewalks," and Detail No. R-1080 of these standards.
- b. Special Design Standards: The physical environment shall be enhanced to encourage bicycling and walking by following these standards:
  1. Minimum sidewalk width shall be in conformance with Section 4.178(.01) of the Wilsonville Code.
  2. Issues should be addressed to encourage walking by providing a more pleasant environment. Urban design features to provide pedestrian amenities such as street trees, furniture, kiosks, trash receptacles, directional signage, and bicycle amenities such as bike racks, shall be provided when required by the City.
  3. Pedestrian facilities shall be consistent with the ADA Standards for Accessible Design.

#### **A.2.05 Signing and Marking**

- a. All pathways and bicycle route shall be clearly identified and posted with signs are a common method for identifying bicycle routes. Signing and marking of bikeways are important in providing safety to users and shall be in conformance with the MUTCD, Part 9.
- b. On multi-use paths, adequate signing and marking shall be used to alert users to potential hazards and to convey regulatory messages to bicyclists, pedestrians, and

motorists at highway intersections. In addition, guide signs, such as to dictate directions, destinations, distances, route numbers, and names of crossing streets, shall be used in the same manner as they are used on highways.

- c. On multi-use path areas where limited sight vision or curves exist, or where heavy volumes of bicycles or nighttime riding is expected, a 4-inch wide yellow centerline stripe shall be used. Four-inch wide white edge lines (or fog lines) shall be used where nighttime bicycle traffic is expected. Skid-resistant pavement marking materials shall be used over materials that become slippery when wet.

#### **A.3.00           TRAFFIC CONTROL**

- a. At intersections where bicycle traffic exists or is anticipated, bicycles shall be considered in the timing of the traffic signal cycle, as well as the traffic detection device.
- b. To check the clearance interval, a bicyclist's speed of 10 miles per hour and a perception/reaction/braking time of 2.5 seconds shall be used. Detectors for traffic-actuated signals shall be sensitive to bicycles and shall be located in the bicyclist's expected path, including left-turn lanes. Where programmed visibility signal heads are used, they shall be checked to ensure that they are visible to bicyclists who are properly positioned on the road.
- c. The MUTCD, Part 9, and the Oregon Supplement shall be consulted for guidance on signs and pavement markings. Where bicyclists are expected to use different patterns than motorists, direction signing shall be used to advise bicyclists of this special routing. At intersections, bicyclists proceeding straight through and motorist turning right must cross paths. It is recommended to use striping and signing configurations that encourage these crossings in advance of the intersection, in a merging fashion.

#### **A.4.00           SUPPORT FACILITIES**

In addition to improving public facilities and routes to connect destinations, the City requires basic design considerations for bicyclists and pedestrians when they arrive at their destination. City requirements for the following support facilities can be found in the BPMP and City zoning code:

- On-site Bicycle and Pedestrian Circulation for all New Developments.
- Bicycle and Pedestrian Paths.
- Bicycle Parking Requirements.
- Bicycle Lockers or Other Secure Parking Facilities
- Locational Standards for Bicycle Parking.

## APPENDIX B

### LANDSCAPE REQUIREMENTS: STORM WATER QUALITY AND QUANTITY FACILITIES

#### B.1.00 INTRODUCTION

- a. Successful revegetation is critical to the function of water quality and quantity facilities, and vegetated corridors. Plantings improve water quality and provide habitat and aesthetic benefits.
- b. The purpose of this appendix is to assist design professionals and the development community in successfully planning, designing, and implementing landscape plans for water quality and quantity facilities and vegetated corridors. The information should not be used simply as a boilerplate applied to all sites. Instead, it should be used to guide design decisions to promote successful planting efforts. Each design will be unique and must consider the individual opportunities and constraints offered by each site.

#### B.2.00 LANDSCAPE GUIDELINES

The designer must consider four major components while developing landscape plans for water quality and quantity facilities: hydrology, soils, plant materials, and maintenance.

Understanding the future hydrologic conditions at the treatment facility is critical to designing a successful planting plan. Identifying and correcting poor soil conditions and selecting and placing appropriate plant materials are also substantially important for planting success. Finally, landscape design and planting plans should not interfere with a facility's engineering function or create maintenance problems. These four components are discussed in detail below:

##### B.2.01 Hydrology

- a. Varying hydrologic conditions complicate landscape design. Water levels change seasonally and also with local storm events. Treatment facilities are often inundated during the wet season and early growing season, but then dry out during the summer. These conditions must be understood and accounted for in the planting plan. Selected plants must be adapted to variable moisture regimes.
- b. Construction documents prepared by a Landscape Architect registered in the State of Oregon are required. Construction documents detail the design and provide good control; good control assures the project is installed as designed.

Proper installation provides predictable hydrologic conditions and thus increases the chances for successful planting.

#### **B.2.02            Soil**

- a. Plants require appropriate soil conditions to grow. On completion of earthwork, the landscape contractor is commonly left with soils that are high in clay or minerals and devoid of topsoil and organic material, or soils high in noxious weed content.
- b. Site preparation is necessary to improve the soil and remove undesirable plant materials and seeds. Before planting, clearing and grubbing (see Section 201.5.02, “Clearing and Grubbing”) may be required to remove rhizomes and seed banks where noxious weeds are present. Topsoil should be stripped and stockpiled for reuse whenever possible, but noxious weed conditions may require that topsoil is stripped and removed from the site.
- c. Where topsoil has been removed, is not adequate, or does not exist, scarify the subgrade and import 4 inches of topsoil, unless noted otherwise. Imported topsoil should be tested for the following characteristics to assure it will provide a good growing medium for the selected plants:
  1. Texture—relative proportions of soil separates (sand, silt, and clay).
  2. Fertility—nutrient content and fertility status of the soil.
  3. Microbial—presence of microbial organisms in the soil.
- d. Incorporate 2 inches of garden compost into imported topsoil. Where topsoil is present and is weed free, incorporate 2 inches of garden compost into the top 4 inches of the native soil. Incorporate other amendments, conditioners, and bio-amendments as needed to provide a soil capable of supporting the specified plants. Traditional fertilization techniques (applying N-P-K) are detrimental to the soil and should be avoided when using native plants.

#### **B.2.03            Plant Materials**

- a. Plant selection must consider soil types, hydrologic conditions, and shade requirements. Dense planting with small stock is preferred to sparse planting with large stock. Native plant stock is recommended because many species are adapted to hydrologic conditions common in water treatment facilities and generally require minimal maintenance. Ornamental stock can be useful for blending treatment facilities into surrounding landscapes, but is discouraged in areas that will not receive additional maintenance.
- b. Plantings shall be installed between February 1 and May 1 or between October 1 and November 15. When plantings must be installed outside these

times, additional measures may be needed to assure survival. Additional considerations for preparing planting plans include:

1. Plant Massing: Plantings should be placed in-groups ranging from three to seven of the same species to encourage massing. Groupings may be larger, depending on the size of the facility. Groupings of different species can be placed next to each other, as long as the species are appropriate for the given hydrologic conditions.
2. Plant quantities' shall comply with the following minimum acceptable design standard:
  - (a) Evergreen trees: 3 per 1000 square feet, minimum height 6 feet.
  - (b) Deciduous trees: 2 per 1000 square feet, minimum caliper 1 to 1-1/2 inch at 2 feet above base.
  - (c) Shrubs: 30 per 1000 square feet, minimum container 1 gallon or equivalent.
  - (d) Wetland plants: 1 per 2 square feet of pond emergent plant zone.
3. Planting Restrictions
  - (a) Do not place deep rooting trees and shrubs (e.g., willow) on top of pipe alignments.
  - (b) Falling leaves will fill the pond and clog drainage structures.  
However, it is desirable to place trees, particularly evergreens, next to the south and west perimeter of standing water, to provide shade and thereby reduce water temperatures.
4. Seeding: Seed mixes and application rates for wet, moist, and dry zones are provided in **Tables B.4** and **B.5**. Alternative mixes may be approved by the City.
5. Mulching: Trees, shrubs, and groundcovers shall be adequately mulched with an appropriate material (e.g., compost, bark dust) to retain moisture and discourage weed growth around newly installed plant material.

#### **B.2.04 Maintenance**

Providing a low maintenance planting design should be a goal for every facility. However, all treatment facilities will require some degree of maintenance to help assure that facilities function as designed. Third parties (e.g., volunteer groups, homeowner associations) can provide additional maintenance if a more refined aesthetic is desired. The following maintenance issues should be addressed during project design and through the maintenance period:

- a. Access: Access roads shall be provided as outlined in Section 301.4.04, "Access Road Design."
- b. Irrigation: A method for irrigation shall be installed and used during the plant establishment period, unless a natural water source is available and is an approved substitute by the City. Watering shall be provided to assure survival through the dry season.
- c. Weed Control: The removal of noxious weeds including Himalayan blackberry (*Rubus discolor*), reed canarygrass (*Phalaris arundinacea*), teasel (*Dipsacus fullonum*), Canada thistle (*Cirsium arvense*), and others will be necessary through the maintenance period, or until a healthy stand of desirable vegetation is established.
- d. Plant Replacement: Plants that fail to meet the acceptance criteria must be replaced during the maintenance period (see Section 301.13.02, "Landscaping Inspection for Warranty – Stormwater Quality/Quantity Facilities"). Before replacing a plant, the cause for loss shall be determined. On determining the cause, correct the problem (e.g., amend soil, provide wildlife protection, modify species selection) and then replace the plant(s).
- e. Erosion Control: Where seeding is used for erosion control, refer to Section 101.9.04, "Erosion Prevention and Sediment Control."
- f. Wildlife Protection: Appropriate measures shall be taken to discourage wildlife browsing. Biodegradable plastic mesh tubing, or other substitute approved by the City, shall be placed around individual trees and shrubs to prevent browsing by wildlife, including beaver, nutria, deer, mice, and voles.

**B.3.00 RECOMMENDED PLANT SPECIES**

- a. This section outlines commonly available native plants suited for various hydrologic regimes and illustrates typical planting schemes for water quality and quantity facilities, and vegetated corridors. The schemes provide a foundation from which to begin planting design, but they may require modification in response to individual site characteristics. Consulting a professional landscape architect, ecologist, or horticulturist knowledgeable about native plants and water quality and quantity facility design is highly recommended when preparing planting plans.
- e. Water quality facilities and vegetated corridors generally feature three types of planting zones with respect to hydrology during the growing season:
  - 1. Wet (standing or flowing water/nearly constant saturation; anaerobic soils).
  - 2. Moist (periodically saturated; anaerobic and/or aerobic soils).

3. Dry (infrequent inundation/saturation, if any; aerobic soils).
- f. Open water, typically 3 feet or more deep, is also common in treatment facilities, particularly in forebays and extended wet ponds. These areas are rarely vegetated, except by floating aquatics that generally volunteer on their own.
  - d. Specific plant sizes may be required as part of the development approval process, but shall not be less than three to five gallon container stock for trees; one gallon container stock for shrubs; and conservation plugs for emergents. Live stakes shall be used for willow plantings. Live stakes may be used for other species that take readily from cuttings (e.g., Douglas spirea, red-osier dogwood). Conservation plugs are also known as leach tubes and styro-blocks. They typically have soil intact around deeply developed roots systems. They are the preferred alternative for most emergent stock. Rhizomes, tubers, bare root, and potted stock are also acceptable, but they may require additional planting quantities and higher densities to achieve design intent. Plant size and stock may be tailored to meet availability issues and the individual requirements of each site.
  - e. **Tables B.1, B.2, and B.3** list commonly available plants for wet, moist, and dry zones, respectively. The zones are used later in the planting schemes to depict different planting zones within the different water treatment facilities. Plants other than those listed in the following tables may be used with City approval.

**Table B.1. PLANTS FOR WET AREAS**

| Botanical Name           | Common Name            | Spacing     | Preferred Light                        | Comments                               |
|--------------------------|------------------------|-------------|----------------------------------------|----------------------------------------|
| <b>Trees</b>             |                        |             |                                        |                                        |
| Salix sp.                | Willow species         | 3-5' O.C.   | Sun, part shade                        |                                        |
| <b>Shrubs</b>            |                        |             |                                        |                                        |
| Cornus sericea           | Red-osier dogwood      | 3-4' O.C.   | Sun, part shade                        | Highly adaptable                       |
| Spirea douglasii         | Douglas spirea         | 2-3' O.C.   | Sun                                    | Tolerates prolonged inundation         |
| <b>Herbaceous</b>        |                        |             |                                        |                                        |
| Alisma plantago-aquatica | Water plantain         |             |                                        |                                        |
| Beckmannia syzigachne    | American sloughgrass   |             |                                        |                                        |
| Bidens cernua            | Nodding beggar's tick  | 1-2' O.C.   | Sun                                    |                                        |
| Bromus carinatus         | California brome grass |             |                                        |                                        |
| Carex densa              | Dense sedge            | 12" O.C.    | Sun                                    |                                        |
| Carex comosa             | Beared sedge           | 12" O.C.    | Sun                                    | Tolerates variable water regimes       |
| Carex obnupta            | Slough sedge           | 12" O.C.    | Shade or part shade; will tolerate sun | Tolerates variable water regimes       |
| Carex stipata            | Sawbeak sedge          | 12" O.C.    | Part shade                             |                                        |
| Deschampsia caespitosa   | Tufted hairgrass       |             |                                        |                                        |
| Deschampsia caespitosa   | Tufted hairgrass       |             |                                        |                                        |
| Eleocharis spp.          | Spikerushes            | 12" O.C.    | Sun                                    | Tolerate prolonged inundation          |
| Elymus glaucus           | Blue wildrye           |             |                                        |                                        |
| Festuca rubra v. rubra   | Native red fescue      |             |                                        |                                        |
| Iris tenax               | Oregon iris            |             |                                        |                                        |
| Juncus effuses           | Soft rush              |             |                                        |                                        |
| Juncus ensifolius        | Daggerleaf rush        | 12" O.C.    | Sun                                    |                                        |
| Juncus acuminatus        | Tapertip rush          | 12" O.C.    | Sun                                    |                                        |
| Juncus oxymeris          | Pointed rush           | 12" O.C.    | Sun                                    |                                        |
| Lysichitum americanum    | Skunk cabbage          |             |                                        |                                        |
| Sagittaria laifolia      | Wapato                 | 12" O.C.    | Sun                                    | Favors prolonged inundation (to 6")    |
| Scirpus acutus           | Hardstem bulrush       | 18-24" O.C. | Sun                                    | Favors prolonged inundation            |
| Scirpus microcarpus      | Small-fruited bulrush  | 12" O.C.    | Sun, part shade                        | Tolerates prolonged inundation (to 6") |
| Scirpus tabernaemontanii | Softstem bulrush       | 18-24" O.C. | Sun                                    | Favors prolonged inundation            |
| Sparganium emersum       | Simplestem bur reed    | 12-18" O.C. | Sun, part shade                        |                                        |
| <b>Aquatics</b>          |                        |             |                                        |                                        |
| Nuphar luteum ssp.       | Pond lily              | 3' O.C.     | Sun                                    |                                        |

**Table B.2. PLANTS FOR MOIST AREAS**

| <b>Botanical Name</b>                        | <b>Common Name</b>         | <b>Spacing</b> | <b>Preferred Light</b> | <b>Comments</b>                       |
|----------------------------------------------|----------------------------|----------------|------------------------|---------------------------------------|
| <b>Trees</b>                                 |                            |                |                        |                                       |
| <i>Alnus rubra</i>                           | Red alder                  | 6-10' O.C.     | Sun                    | Highly adaptable;<br>nitrogen fixer   |
| <i>Acer macrophyllum</i>                     | Big leaf maple             | 12-18' O.C.    | Sun                    |                                       |
| <i>Cornus stolonifera</i>                    | Redtwig dogwood            |                |                        |                                       |
| <i>Crataegus douglasii</i>                   | Black hawthorn             | 6-10' O.C.     | Sun                    |                                       |
| <i>Fraxinus latifolia</i>                    | Oregon ash                 | 10-15' O.C.    | Sun, part shade        |                                       |
| <i>Thuja plicata</i>                         | Western red cedar          | 12-18' O.C.    | Park shade, shade      |                                       |
| <b>Shrubs</b>                                |                            |                |                        |                                       |
| <i>Acer circinatum</i>                       | Vine maple                 | 10 O.C.        | Part sun, shade        |                                       |
| <i>Lonicera involucrata</i>                  | Twinberry                  | 5' O.C.        | Part shade             |                                       |
| <i>Oemleria cerasiformis</i>                 | Indian plum                | 5-8' O.C.      | Shade                  | Tolerates fluctuating<br>water table  |
| <i>Physocarpus capitatus</i>                 | Pacific ninebark           | 5-8' O.C.      | Part shade             |                                       |
| <i>Rosa nutkana</i>                          | Nootka rose                | 5' O.C.        | Sun                    |                                       |
| <i>Rosa pisocarpa</i>                        | Swamp rose                 | 5' O.C.        | Part shade             |                                       |
| <i>Rubus spectabilis</i>                     | Salmonberry                | 5' O.C.        | Sun, part shade        | Prefers slightly drier<br>soils       |
| <i>Sambucus racemosa</i>                     | Red elderberry             | 5-8' O.C.      | Part shade             |                                       |
| <i>Symphoricarpos albus</i>                  | Snowberry                  | 5' O.C.        | Sun, shade             | Prefers well drained<br>soils         |
| <b>Herbaceous</b>                            |                            |                |                        |                                       |
| <i>Aster chilensis</i> ssp.<br><i>Hallii</i> | Common California<br>aster | 3' O.C.        | Sun                    |                                       |
| <i>Aster subspicatus</i>                     | Douglas's aster            | 3' O.C.        | Sun                    |                                       |
| <i>Cammasia quamash</i><br>ssp.              | Common camas               | 12" O.C.       | Part shade             | Bulb; prefers drier<br>soil           |
| <i>Carex aperta</i>                          | Columbia sedge             | 12" O.C.       | Sun                    |                                       |
| <i>Carex deweyana</i>                        | Dewey's sedge              | 12" O.C.       | Sun, part shade        |                                       |
| <i>Carex obnupta</i>                         | Slough sedge               | 12" O.C.       | Part shade             |                                       |
| <i>Carex stipata</i>                         | Sawbeak sedge              | 12" O.C.       | Part shade             |                                       |
| <i>Gualtheria shallon</i>                    | Salal                      | 3-4' O.C.      | Part shade, shade      | Prefers moist, well-<br>drained soils |
| <i>Juncus tenuis</i>                         | Slender rush               | 12" O.C.       | Sun                    |                                       |
| <i>Juncus patens</i>                         | Spreading rush             | 1-2' O.C.      | Sun<br>Part shade      |                                       |
| <i>Polystichum munitum</i>                   | Sword fern                 | 3-4' O.C.      | Part sun, shade        | Prefers moist, well<br>drained soils  |
| <i>Scirpus microcarpus</i>                   | Small-fruited<br>bulrush   | 12" O.C.       | Sun, part shade        | Prefers moister soils                 |

**Table B.3. PLANTS FOR DRY AREAS**

| Botanical Name                 | Common Name             | Spacing     | Preferred Light     | Comments                            |
|--------------------------------|-------------------------|-------------|---------------------|-------------------------------------|
| <b>Trees</b>                   |                         |             |                     |                                     |
| <i>Alnus rubra</i>             | Red alder               | 6-10' O.C.  | Sun                 | Highly adaptable;<br>nitrogen fixer |
| <i>Corylus cornuta</i>         | Hazelnut                | 6-10' O.C.  | Sun                 |                                     |
| <i>Prunus emarginata</i>       | Bitter cherry           | 6-10' O.C.  | Sun                 | Shade intolerant                    |
| <i>Quercus garryana</i>        | Oregon white oak        | 10-15' O.C. | Sun                 |                                     |
| <i>Pseudotsuga menziesii</i>   | Douglas fir             | 10-15' O.C. | Sunn, part shade    |                                     |
| <b>Shrubs</b>                  |                         |             |                     |                                     |
| <i>Amelanchier alnifolia</i>   | Western serviceberry    | 5' O.C.     | Sun, part shade     |                                     |
| <i>Holodiscus discolor</i>     | Oceanspray              | 9' O.C.     | Sun, part shade     |                                     |
| <i>Ribes sanguineum</i>        | Red flowering currant   | 6' O.C.     | Sun, part shade     |                                     |
| <i>Rosa gymnocarpa</i>         | Baldip rose             | 6' O.C.     | Sun                 |                                     |
| <i>Rubus parviflorus</i>       | Thimbleberry            | 5' O.C.     | Part shade          |                                     |
| <i>Sambucus racemosa</i>       | Red elderberry          | 5' O.C.     | Part shade          |                                     |
| <i>Symphoricarpos albus</i>    | Snowberry               | 5' O.C.     | Sun/shade           |                                     |
| <b>Herbaceous</b>              |                         |             |                     |                                     |
| <i>Achillea millefolium</i>    | Western yarrow          |             | Sun                 | 1 lb/acre                           |
| <i>Arctostaphylos uva-ursi</i> | Kinnikinnick            | 12-18" O.C. | Sun/shade           |                                     |
| <i>Bromus carinatus</i>        | Native California brome |             | Sun                 | 10 lb/acre                          |
| <i>Elymus glaucus</i>          | Blue wildrye            |             | Sun                 | 9 lb/acre                           |
| <i>Festuca rubra v. rubra</i>  | Native red fescue       |             |                     |                                     |
| <i>Fragaria vesca</i>          | Wood strawberry         | 1' O.C.     | Part shade          |                                     |
| <i>Gualtheria shallon</i>      | Salal                   | 3-4' O.C.   | Part shade<br>Shade | Prefers moist, well-drained soils   |
| <i>Lupinus bicolor</i>         | Two-color lupine        |             | Sun                 | 8 lb/acre                           |
| <i>Lupinus latifolius</i>      | Broadleaf lupine        |             | Sun                 | 8 lb/acre                           |
| <i>Lupinus polyphylus</i>      | Large-leafed lupine     |             | Sun                 | 8 lb/acre                           |
| <i>Mahonia aquifolium</i>      | Tall Oregon grape       | 4-6' O.C.   | Sun, part shade     |                                     |
| <i>Mahonia nervosa</i>         | Cascade Oregon grape    | 3-4' O.C.   |                     |                                     |
| <i>Mahonia repens</i>          | Creeping Oregon grape   | 2-3' O.C.   |                     |                                     |
| <i>Solidago canadensis</i>     | Canada goldenrod        |             | Sun                 | 2 lb/acre                           |

**B.4.00 SEED MIXES**

The seed mixes indicated in **Tables B.4** and **B.5** shall be used to overseed in water quality and quantity treatment facilities, and vegetated corridors. One seed mix is prescribed for use in wet and moist zones, and one for dry zones.

Alternative mixes may be approved by the City. Broadcast application is discouraged to prevent wind drift of the smaller, native seeds. Lower rates may be used in areas where seeding is intended to augment other plantings (e.g. the bottom of water quality swales).

**Table B.4. WET/MOIST AREA SEED MIX**

| Scientific Name               | Common Name          | % Mixture |
|-------------------------------|----------------------|-----------|
| <i>Elymus glaucus</i>         | Blue Wildrye         | 47        |
| <i>Hordeum brachyantherum</i> | Meadow Barley        | 40        |
| <i>Deschampsia caespitosa</i> | Tufted Hairgrass     | 10        |
| <i>Glyceria occidentalis</i>  | Western Mannagrass   | 2         |
| <i>Beckmannia syzigachne</i>  | American Sloughgrass | 1         |

\*Pro Time 840 Native Wetland Mix. Application rate: 20 – 40 lbs/acre

**Table B.5. DRY AREA SEED MIX**

| Scientific Name               | Common Name             | % Mixture |
|-------------------------------|-------------------------|-----------|
| <i>Elymus glaucus</i>         | Blue Wildrye            | 60        |
| <i>Hordeum brachyantherum</i> | Meadow Barley           | 30        |
| <i>Bromus carinatus</i>       | Native California Brome | 10        |

\*Pro Time 400 Native Grass Mix. Application rate: 15 – 30 lbs/acre

### **B.5.00 PLANTING SCHEMES**

The following schemes provide general recommendations for plant placement in water quality facilities and buffers. These are guidelines only; planting plans must be individually tailored to unique conditions at each site. The City’s Storm Water Master Plan (2001) also provides guidance for species selection and spacing.

#### **B.5.01 Water Quality Swale**

Water quality swales should generally be vegetated with emergents in the swale bottom, with emergents, groundcovers, and shrubs on the sideslopes, and with groundcovers, shrubs, and trees on the adjacent dry areas. Typically, the swale bottom is wet, the lower 8 to 12 inches of the sideslopes are moist, and areas 12 inches above the bottom of the swale are dry.

#### **B.5.02 Extended Dry Pond/Extended Wet Pond**

Extended dry ponds and extended wet ponds should be vegetated similarly to water quality swales. Emergents should be placed in the pond bottom, emergents,

groundcovers, and shrubs on the sideslopes, and groundcovers, shrubs, and trees on the adjacent dry areas. The hydrologic planting zones will vary in the facilities, but typically, wet areas occur at or below the permanent pool elevation, moist areas occur between the permanent pool elevation and maximum pool elevation, and dry areas occur above the maximum pool elevation.

### **B.5.03            Constructed Wetland**

Constructed wetlands should feature dense emergent plantings in the wet zones, which are typically composed of deep and shallow emergent areas. Floating aquatics and emergents capable of surviving extended or permanent inundation may also be placed in the permanent pool areas. The moist zones should be planted with emergents, groundcovers, shrubs, and trees, and the dry zones with groundcovers, shrubs, and trees.

### **B.5.04            Vegetated Corridors**

Three types of vegetated corridors are described below: headwater forests, riparian forests, and forested wetlands. Upland and wetland habitats are present in all three types; local topography and drainage patterns dictate where the habitats occur.

- a. **Headwater Forest:** Headwater forests are densely wooded and wet throughout most of the year. Steep valley slopes prone to landslides drain the top of the watershed to the stream below. Perennial to intermittent flows may occur, depending on local conditions. Channels range from shallow to deeply entrenched, with rock and large woody debris common throughout. A mixture of wetland and upland species may occur in this community, depending on local drainage and topography. The headwater forest should be planted with 200 trees per acre (three species min.), 300 shrubs per acre (four species min.), and 1,000 emergents per acre (two species min.).
- b. **Riparian Forest:** Riparian forests are moderately to densely wooded floodplains beside a stream. Landscape character ranges from flat with open floodplain to moderately steep with U-shaped valleys and upland terraces. They are frequently inundated during the rainy season and moist to dry during the summer. Hydrologic conditions vary. Channels with large woody debris are typically moderately to deeply incised with flat floodplains. Wetland species are the norm, but upland species do occur where microtopography allows. The riparian forest should be planted with 170 trees per acre (two species min.), 300 shrubs per acre (four species min.), and 2,000 emergents per acre (three species min.).
- c. **Forested Wetland:** Forested wetlands are densely wooded, wet in the winter, and frequently dry out in the summer. The landscape is flat to gently rolling and may be perched above the stream in some areas. Frequently flooded with low-velocity overbank flows or rainwater results in shallow groundwater

interaction or surface water influence into June in normal rainfall years. Stream channels range from shallow to deeply entrenched, depending on local conditions. A natural levee is common along the stream. The forested wetland should be planted with 200 trees per acre (two species min.), 300 shrubs per acre (three species min.), and 4,000 emergents per acre (three species min.).

## APPENDIX C

### INFILTRATION REQUIREMENTS, SITE CHARACTERIZATION, AND SITE SUITABILITY CRITERIA

#### C.1.00 INTRODUCTION

- a. This appendix specifies the site characterization and site suitability criteria that must be considered for siting infiltration treatment facilities.
- b. For infiltration treatment facilities site selection and design decisions, a geotechnical and hydrogeologic report shall be prepared by a qualified engineer with geotechnical and hydrogeologic experience. A comparable professional, acceptable to the City, may also conduct the work if it is under the seal of a Professional Engineer registered in the State of Oregon. The design engineer shall utilize a team of certified or registered professionals in soil science, hydrogeology, geology, and other related fields. A member of this design team shall be considered/designated the site professional (as referenced in this Appendix C).

#### C.2.00 SITE CHARACTERIZATION

Applicant shall conduct a site characterization study prior to siting and designing infiltration treatment facilities. Information gathered during initial geotechnical investigations shall be used for the site characterization. Key data and issues to be characterized include, but are not limited to, the following.

##### C.2.01 Surface Features Characterization

- a. Topography within 500 feet of the proposed facility. The plan shall show existing ground contours (shaded) and proposed ground contours at a minimum 2-foot contour interval. Slopes steeper than 6H:1V shall be identified.
- b. Anticipated site use (residential, commercial, or industrial).
- c. Location of water supply wells within 500 feet of proposed facility.
- d. Location of ground water protection areas and/or 1-, 5-, and 10-year time of travel zones for municipal well protection areas.
- e. A description of local site geology, including soil or rock units likely to be encountered, the groundwater regime, and geologic history of the site.
- f. Site location relative to identified flood plain or floodway.

- g. Site location relative to surface water features, such as waterways, wetlands, etc.

#### **C.2.02 Subsurface Characterization**

- a. Subsurface explorations (test holes or test pits) shall be performed to a depth of at least five times the maximum design depth of ponded water proposed for the infiltration treatment facility.
- b. Continuous sampling (representative samples from each soil type and/or unit) to a depth below the base of the infiltration facility of 2.5 times the maximum design ponded water depth, but not less than 6 feet.
  - 1. For basins, at least one test pit or test hole per 5,000 square feet of basin infiltrating surface (in no case less than two per basin).
  - 2. For trenches, at least one test pit or test hole per 50 feet of trench length (in no case less than two per trench).
- c. Prepare detailed logs for each test pit or test hole and a map showing the location of the test pits or test holes. Logs must include at a minimum, depth of pit or hole, soil descriptions, depth to water, presence of stratification.

#### **C.2.03 Soil Testing**

Soil characterization for each soil unit (soils of the same texture, color, density, compaction, consolidation and permeability) encountered should include:

- a. Grain-size distribution (ASTM D-422 or AASHTO T-311).
- b. Textural class (USDA).
- c. Percent clay content (include type of clay, if known) as determined by hydrometer testing (ASTM D-422 or AASHTO T-88).
- d. Cation exchange capacity (CEC) and organic matter content for each soil type and strata. Where distinct changes in soil properties occur, to a depth below the base of the infiltration treatment facility of at least 2.5 times the maximum design water depth, but not less than 6 feet. Consider if soils are already contaminated, thus diminishing pollutant sorptive capacity.
- e. For soils with low CEC and organic content, deeper characterization of soils may be required by the City (refer to Section D.3.00, "Site Suitability Criteria").
- f. Color/mottling.
- g. Variations and nature of stratification.

**C.2.04          Infiltration Rate Determination**

1. Determine the representative infiltration rate of the unsaturated vadose zone based on field infiltration tests and grain size/texture determinations. Field infiltration rates shall be determined using infiltration test methods as presented in the King County Surface Water Design Manual or comparable reference; infiltration testing shall be done in the soil stratum at the design elevation of the bottom of the infiltration facility.
2. Site testing shall be performed to verify infiltration rate estimates based on soil size distribution and/or texture. As a minimum, one soil grain-size distribution analysis (ASTM D-422 or AASHTO T-311) per soil stratum in each test hole shall be performed within 2.5 times of the maximum design water depth, but not less than 6 feet.
3. The infiltration rate is needed for routing and sizing purposes and for classifying the soil for treatment adequacy.

**C.2.05          Infiltration Receptor**

Infiltration receptor (unsaturated and saturated soil receiving the stormwater) characterization shall include:

- a. Installation of ground water monitoring wells, unless the highest ground water level is known to be at least 50 feet below the proposed infiltration facility. Use at least three wells per infiltration treatment facility, or three hydraulically connected surface and ground water features. This will establish a three dimensional relationship for the ground water table. The monitoring wells will:
  1. Monitor the seasonal ground water levels at site through a minimum of one wet-season.
  2. Consider the potential for both unconfined and confined aquifers, or confining units, at the site that may influence the proposed infiltration facility as well as the ground water gradient. Other approaches to determine ground water levels at the proposed site could be considered if pre-approved by the City Engineer or the City's authorized representative.
  3. Determine the ambient ground water quality, if there is a concern identified by the City.
- b. Estimate the volumetric water holding capacity of the infiltration receptor soil. This is the soil layer below the infiltration treatment facility and above the seasonal high-water mark, bedrock, hardpan, or other low permeability layer. This analysis should be conducted at a conservatively high infiltration rate based on vadose zone porosity, and the water quality runoff volume to be infiltrated. Along with an analysis of ground water movement, this will be

used in determining volumetric limitations that would adversely affect drawdown.

- c. Depth to ground water table and to bedrock/impermeable layers.
- d. Seasonal variation of ground water table based on recorded well water levels and observed mottling.
- e. Existing ground water flow direction and gradient.
- f. Lateral extent of infiltration receptor.
- g. Horizontal hydraulic conductivity of the saturated zone to assess the aquifer's ability to laterally transport the infiltrated water.
- h. Impact of the infiltration rate and volume at the project site on ground water mounding, flow direction, and water table; and the discharge point or area of the infiltrating water. A ground water mounding analysis shall be conducted at all sites where the depth to seasonal ground water table or low permeability stratum is less than 15 feet and the runoff to the infiltration treatment facility is from more than one acre. The site professional can consider conducting an aquifer test or slug test and the type of ground water mounding analysis necessary at the site.

### **C.3.00 SITE SUITABILITY CRITERIA**

This section specifies the site suitability criteria that must be considered for siting infiltration treatment facilities. When a site investigation reveals that any of the nine applicable criteria cannot be met, appropriate mitigation measures must be implemented so that the infiltration treatment facility will not pose a threat to safety, health, and the environment.

#### **C.3.01 Setbacks**

Setback requirements shall be in compliance with City regulations, uniform building code requirements, and/or state regulations. Also evaluate on-site and off-site structural stability due to extended subgrade saturation and/or head loading of the permeable layer, including the potential impacts to downgradient properties, especially on hills with known side-hill seeps.

The following setbacks are provided as guidance.

- a. From drinking water wells, septic tanks or drainfields, and springs used for public drinking water supplies. Infiltration treatment facilities upgradient of drinking water supplies and within 1, 5 and 10-year time of travel zones must comply with Oregon Health Division requirements.

- b. From building foundations (a minimum of 20 feet downslope and 100 feet upslope).
- c. From the top of slopes steeper than 10% (setback a minimum of 50 feet from crest of slope)

**C.3.02 Ground Water Drinking Water Protection Areas**

A site shall be deemed not suitable if the infiltrated stormwater will be in violation of OAR 340-044-0014.

**C.3.03 High Vehicle Traffic Areas**

Infiltration treatment facilities may be considered for runoff from areas of industrial activity and the high vehicle traffic areas described below, if appropriate pretreatment (including oil removal) is provided to ensure that ground water quality standards will not be violated and that the infiltration treatment facility will not be adversely affected.

High Vehicle Traffic Areas are defined as:

- a. Commercial or industrial sites subject to an expected ADT  $\geq 100$  vehicles/1,000 square feet gross building (trip generation); and
- b. Road intersections with an ADT of  $\geq 25,000$  on the main roadway, or  $\geq 15,000$  on any intersecting roadway.

**C.3.04 Soil Infiltration Rate/Drawdown Time**

- a. Infiltration rates short-term and long-term:
  - 1. For treatment purposes the short-term soil infiltration rate should be 2.4 in./hour, or less, to a depth of 2.5 times the maximum design pond water depth, or a minimum of 6 feet below the base of the infiltration treatment facility. This infiltration rate is also typical for soil textures that possess sufficient physical and chemical properties for adequate treatment, particularly for soluble pollutant removal (see criteria # 6, soil and physical and chemical suitability for treatment). It is comparable to the textures represented by Hydrologic Groups B and C. Long-term infiltration rates up to 2.0 inches/hour can also be considered, if the infiltration receptor is not a sole-source aquifer, and in the judgment of the site professional, the treatment soil has characteristics comparable to those specified in criteria #6 to adequately control the target pollutants.
  - 2. The long-term infiltration rate should also be used for maximum drawdown time and routing calculations.

b. Drawdown time:

It is necessary to empty the maximum ponded depth (water quality volume) from the infiltration basin within 24 hours from the completion of inflow to the storage pond in order to meet the following objectives:

1. Restore hydraulic capacity to receive runoff from a new storm.
2. Maintain infiltration rates.
3. Aerate vegetation and soil to keep the vegetation healthy.
4. Enhance the biodegradation of pollutants and organics in the soil.

**C.3.05 Depth to Bedrock, Water Table, or Impermeable Layer**

The base of all infiltration basins or trench systems shall be  $\geq 5$  feet above the seasonal high-water mark, bedrock (or hardpan) or other low permeability layer. A minimum separation of 3 feet may be considered if the ground water mounding analysis, volumetric receptor capacity, and the design of the overflow and/or bypass structures are judged by the site professional to be adequate to prevent overtopping and to meet the site suitability criteria specified in this section.

**C.3.06 Soil Physical and Chemical Suitability for Treatment**

The soil texture and design infiltration rates should be considered along with the physical and chemical characteristics specified below to determine if the soil is adequate for removing the target pollutants. The following soil properties must be carefully considered in making such a determination:

- a. CEC of the treatment soil must be  $\geq 5$  millequivalents (meq) CEC/100 g dry soil (USEPA Method 9081). Consider empirical testing of soil sorption capacity, if practicable. Ensure that soil CEC is sufficient for expected pollutant loadings, particularly heavy metals. Lower CEC content may be considered if it is based on a soil loading capacity determination for the target pollutants that is accepted by the City Engineer or the City's authorized representative.
- b. Depth of soil used for infiltration treatment must be a minimum of 18 inches.
- c. Organic content of the treatment soil as determined by ASTM D-2974: Organic matter can increase the sorptive capacity of the soil for some pollutants. The site professional should evaluate whether the organic matter content is sufficient for control of the target pollutant(s).
- d. Waste fill materials should not be used as infiltration media nor should such media be placed over uncontrolled or non-engineered fill soils.

- e. Engineered soils may be used to meet the design criteria in this section. Field performance evaluation(s), using acceptable protocols, would be needed to determine feasibility, and acceptability by the City Engineer or the City's authorized representative.

**C.3.07            Seepage Analysis and Control**

Determine whether there would be any adverse effects caused by seepage zones on nearby building foundations, basements, roads, parking lots or sloping sites.

**C.3.08            Impact of Roadway Deicers**

Potential impact of roadway deicers on potable water wells must be considered in the siting determination. Mitigation measures must be implemented if infiltration of roadway deicers can cause a violation of ground water quality standards.

**C.3.09            Verification Testing of the Completed Facility**

Verification testing of the completed full-scale infiltration treatment facility is recommended to confirm that the design infiltration parameters are adequate to manage the design volume and meet the pollutant capture objectives of the infiltrating soil. The site professional should determine the duration and frequency of the verification testing program for the potentially impacted ground water. The ground water monitoring wells installed during site characterization may be used for this purpose. Long-term in-situ drawdown and water quality monitoring for a two-year period, would be preferable.

## APPENDIX D

### STORMWATER QUALITY FACILITIES DESIGN

#### D.1.00 INTRODUCTION

The purpose of this appendix is to outline the design and construction guidelines for water quality facilities in the City of Wilsonville. These guidelines may be used to comply with the water quality facility design standards in Section 301.5.00, "Water Quality Facility Design." It is the responsibility of the design engineer to determine the appropriate design criteria that ensures compliance with the City of Wilsonville design standards, in combination with other federal, state, and local laws and ordinances.

Safety of stormwater quantity facilities shall be in conformance with Section 301.3.09.c, "Safety."

#### D.2.00 FILTRATION

##### D.2.01 Biofiltration Swale

###### a. Hydraulic design criteria

1. Design storm = water quality storm
2. Minimum hydraulic residence time = 9 minutes.
3. Maximum water design depth = 0.5 feet.
4. Minimum freeboard = 1.0 foot (for facilities not protected from high flows).
5. Manning  $n$  value = 0.24.
6. Maximum velocity = 2.0 feet per second based on 25-year flow.

###### b. Design criteria

1. Provide an energy dissipater at the entrance to the swale as per Section 301.3.08, "Outfall Protection," or a swale inflow spreader as shown in Detail No. S-2225 of these standards. It shall be designed to reduce velocities and spread the flow across the treatment cross-section.
2. Intermediate flow spreaders may be required.
3. Minimum length = 100 feet.

4. Minimum slope = 0.5%.
5. Minimum bottom width = 2 feet.
6. Maximum treatment depth (measured from top of gravel) = 0.5 feet.
7. Maximum sideslope:
  - (1) In treatment area = 4H:1V
  - (2) Above treatment area = 3H:1V
8. Use 2"-¾" gap-graded river aggregate placed 2½ to 3 inches deep on jute matting placed over 6 inches of topsoil, or use another base-stabilization method approved by the City's authorized representative. Extend river aggregate, jute, and topsoil to top of treatment area.
9. If the swale slope is less than 1.5%, an underdrain shall be installed using a perforated pipe, or equivalent. Amend the soil if necessary to allow effective percolation of water to the underdrain. Underdrains can be made of 6 inch diameter Schedule 40 PVC perforated pipe with 6 inches of drain gravel over the pipe. The gravel and pipe must be enclosed by geotextile fabric. Slopes greater than 2.5% need check dams (riprap) at vertical drops of 12-15 inches.
10. Retaining walls are not allowed in the treatment area.
11. Provide an approved outlet structure for all flows.
12. All exposed areas shall be protected with jute matting or an alternative approved by the City's authorized representative
13. Plant vegetation consistent with the requirements of Appendix B, "Landscape Requirements, Water Quality and Quantity Facilities."

**D.2.02 Sand Filter**

a. Design Criteria

1. The design of sand filters is based on Darcy's Law<sup>1</sup>:

$$A = Q \div (k \times i)$$

where A = area of sand filter.

Q = peak flow rate (from hydrograph).

k = sand permeability (3.5 feet/day).

---

<sup>1</sup> A safety factor of 2 is applied to the equation.

$i$  = hydraulic gradient (see below).

$$i = (h + L) \div L$$

where  $h$  = height of water column over sand filter.

$L$  = thickness of sand filter.

2. No drainage shall be allowed directly to the filter; it must first go through a catch basin, inlet, sedimentation manhole, or similar large debris collection device.
3. The sand filter shall infiltrate the entire water quality volume without overflow.
4. The drawdown period for sand filters shall not exceed 24 hours.
5. The sand filter shall consist of an inlet structure, a sand bed, underdrain piping, and a basin liner. Criteria for these components are given below.

b. Inlet Structure

The inlet structure shall spread the flow of incoming water uniformly across the surface of the filter medium during all anticipated flow conditions. At a minimum, the inflow spreader shall meet the requirements as provided in Section 301.3.08, "Outfall Protection," or the swale inflow spreader as shown in Detail No. S-2225 of these standards. It shall be designed to reduce velocities and spread the flow across the treatment cross-section. Flow shall be spread in a manner that prevents roiling or otherwise disturbing the filter medium.

c. Sand Bed—Filter Medium

1. The length-to-width ratio shall be 2:1 or greater.
2. The sand bed configuration may be either of the two configurations as shown in Detail No. S-2270 of these standards. All depths shown are final compacted depths. The effects of consolidation and compaction must be taken into account when placing medium materials. The surface of the filter medium shall be level.
3. The filter bed medium shall consist of clean, medium to fine sand, with no organics, frozen pieces, or other deleterious materials. Sand used as a filter medium shall be certified by a certified testing laboratory as meeting or exceeding the gradation requirements in **Table D.1**. Sieve analysis shall be determined according to AASHTO T-27.

**Table D.1. GRADATION REQUIREMENTS FOR  
FILTER BED MEDIUM**

| Sieve Size | Percent Passing |
|------------|-----------------|
| 3/8-inch   | 100             |
| No. 4      | 95-100          |
| No. 8      | 80-100          |
| No. 16     | 45-85           |
| No. 30     | 15-60           |
| No. 50     | 3-15            |
| No. 100    | < 4             |

- d. Sand Bed With Gravel Filter (see Detail No. S-2270 of these standards)
- The top layer shall be a minimum of 18 inches of sand meeting gradation requirements of **Table D.1**.
  - The sand shall be placed over a non-woven geofabric material, meeting the specifications provided in **Table D.2**, covering a layer of ½- to 2-inch washed drain rock. The finished depth of this drain rock shall be sufficient to provide a minimum of 2 inches of cover over the underdrain piping system.
  - No gravel is required below the underdrain piping system.

**Table D.2. GEOFABRIC MATERIAL SPECIFICATIONS**

| Property                | Test Method           | Specification           |
|-------------------------|-----------------------|-------------------------|
| Unit Weight             | --                    | 8 oz/sy (minimum)       |
| Filtration Rate         | --                    | 0.08 inch/sec (minimum) |
| Puncture Strength       | ASTM D-751 (modified) | 125 lb (minimum)        |
| Mullen Burst Strength   | ASTM D-751            | 400 psi (minimum)       |
| Tensile Strength        | ASTM D-1682           | 200 lb (minimum)        |
| Equivalent Opening Size | US Standard Sieve     | 80-120                  |

- e. Sand Bed Using Trench Design (see Detail No. S-2270 of these standards)
- The top layer shall be a minimum of 12 inches of sand meeting gradation requirements of **Table D.1**.

2. The sand shall be placed over a non-woven geofabric material, meeting the specifications provided in **Table D.2**, covering a layer of ½- to 2-inch washed drain rock. The finished depth of this drain rock shall be sufficient to provide a minimum of 2 inches of cover over the underdrain piping system.
3. The piping and gravel shall be underlain with drainage matting meeting the specifications provided in **Table D.3**.

**Table D.3. DRAINAGE MATTING MATERIAL SPECIFICATIONS**

| Property                   | Test Method                  | Specification                                    |
|----------------------------|------------------------------|--------------------------------------------------|
| Unit Weight                |                              | 20 oz/SY                                         |
| Flow Rate (fabric)         |                              | 180 gpm/SF (minimum)                             |
| Permeability               | ASTM D-2434                  | 0.124 cm/sec                                     |
| Grab Strength (fabric)     | ASTM D-1682                  | Dry Lg 90<br>Dry Wd 70<br>Wet Lg 95<br>Wet Wd 70 |
| Puncture Strength (fabric) | COE CW-02215                 | 42 (minimum)                                     |
| Mullen Burst Strength      | ASTM D-117                   | 140 psi (minimum)                                |
| Equivalent Opening Size    | US Standard Sieve            | 80 – 120                                         |
| Flow Rate (drainage core)  | Drexel Universal Test Method | 14 gpm/ft. width                                 |

f. Underdrain Piping

1. The underdrain piping system shall consist of appropriately sized perforated pipes (minimum 4-inch diameter). The pipe used in this system shall be schedule 40 polyvinyl chloride (PVC) material, or an approved equal. Flexible perforated pipe will not be approved. Lateral spacing shall not exceed 10 feet.
2. The underdrain laterals shall be placed with positive gravity drainage to the collector pipe
3. The collector pipe shall have a minimum 1% grade toward the discharge point.
4. All laterals and collector pipe shall have cleanouts installed, accessible from the surface without removing or disturbing filter media.

g. Basin Liner

1. An impermeable liner is required for all sand filter systems. The liner shall comply with the requirements provided in Appendix E, "Water Quality Facility Liners."
2. Geomembrane liners shall meet the requirements provided in Section E.4.03, "Geomembrane Liners." They shall be placed on a smooth, compacted bed of sand, minimum 6 inches thick, graded as necessary to facilitate the hydraulic performance designed into the facility.

**D.3.00 PONDS**

**D.3.01 Wet Ponds**

a. Hydraulic design criteria

1. Permanent pool volume =  $0.55 \times \text{WQV}$  (Water Quality Volume).
2. Minimum water quality detention/retention volume =  $1.0 \times \text{WQV}$ .
3. Water quality drawdown time = 48 hours.
4. To calculate orifice size, use the following equation:

$$D = 24 \times [(Q / (\pi C_d [2gH]^{0.5}))]^{0.5}$$

where D = orifice diameter (inches).

$$Q \text{ (cfs)} = \text{WQV}(\text{cf}) / (48 \text{ hr} \times 60 \text{ min/hr} \times 60 \text{ sec/min}).$$

$C_d$  = orifice coefficient (0.62 for square-edged entrance).

g = gravitational constant (32.2 ft/sec<sup>2</sup>).

H =  $\frac{2}{3}$  temporary detention height (feet) to orifice centerline.

5. Maximum depth of permanent pool = 6 feet.
6. Maximum depth of water quality pool (not including permanent pool) = 2.5 feet.
7. Provide an emergency spillway sized to pass the 100-year storm event or an approved hydraulic equivalent. The emergency spillway shall be located in existing soils when feasible and shall be armored with riprap embedded in concrete, or other approved erosion protection extending to the toe of the embankment (see Detail No. S-2275 of these standards).

8. Provide for a basin dewatering system with a 24-hour maximum drawdown time.

b. Design Criteria

1. The pond configuration, as well as the inlet and outlet locations, shall maximize water travel time through the facility.
2. The pond shall be designed using the following surface-area-to-depth relationship (for the volume required by a permanent pool):

70% of the surface area @ 2- to 6-foot depth

30% of the surface area @ 0- to 2-foot depth

The maximum depth of the permanent pool shall be 6 feet. The 0-to-2-foot depth shall be distributed evenly around the perimeter of the pond.

3. The facility shall be divided into at least two cells. The first cell (forebay) shall contain approximately 10% of the design surface area.
4. The construction of wets ponds and maintenance accessibility shall be in conformance with Section 301.2.03, "Design Criteria," Section 301.3.09, "Detention/Retention Facility Protection," and Section 301.4.04, "Access Road Design."
5. The slopes in the treatment and surrounding areas of the pond shall be 3H:1V or flatter, unless approved by the City's authorized representative. **Note:** If steeper slopes are desired, the site shall be fenced as described in Section 301.5.02.b.4, "Fencing." The applicant shall provide calculations and geotechnical data indicating adequate slope stability. Calculations and data shall be provided from a Professional Engineer registered in the State of Oregon whose area of expertise is geotechnical engineering.
6. The average length-to-width ratio shall be at least 3:1. This ratio is critical to prevent "short-circuiting," where water passes directly through the facility without being detained for any time.
7. If a riser pipe outlet is used, it shall be protected by a trash rack and antivortex plate. If an orifice plate is used, it shall be protected with a trash rack with at least 10 square feet of open surface area. In either case, the rack must be hinged or easily removable to allow for cleaning. The rack shall be adequately secured to prevent it from being removed or opened when maintenance is not in progress.

c. Dead Storage

1. The dead (permanent) storage volume,  $V_{\text{pond}}$ , is equivalent to the post-development runoff.
2. Calculating runoff volume using the SBUH method can be approximated by the following equation:

$$V = 25.9 \times A \times \% I + 27.7 \times A$$

where  $V$  = runoff volume (cubic feet).

$A$  = total contributing land area (acres).

$\% I$  = percent of land area that is impervious (i.e., if the land is 20% impervious, enter 20 in the equation)

**D.3.02 Extended Wet Pond**

a. Hydraulic design criteria

1. Permanent pool volume =  $0.55 \times \text{WQV}$ .
2. Minimum water quality detention/retention volume =  $1.0 \times \text{WQV}$ .
3. Water quality drawdown time = 48 hours.
4. To calculate orifice size, use the following equation:

$$D = 24 \times [(Q / (\pi C_d [2gH]^{0.5}))]^{0.5}$$

where  $D$  = orifice diameter (inches).

$Q$  (cfs) =  $\text{WQV}(\text{cf}) / (48 \text{ hr} \times 60 \text{ min/hr} \times 60 \text{ sec/min})$ .

$C_d$  = orifice coefficient (0.62 for square-edged entrance).

$g$  = gravitational constant ( $32.2 \text{ ft/sec}^2$ ).

$H$  =  $\frac{2}{3}$  temporary detention height (feet) to orifice centerline.

5. Maximum depth of permanent pool = 2 feet.
6. Maximum depth of water quality pool (not including permanent pool) = 2.5 feet.
7. Provide an emergency spillway sized to pass the 100-year storm event or an approved hydraulic equivalent. The emergency spillway shall be located in existing soils when feasible and shall be armored with riprap

embedded in concrete, or other approved erosion protection extending to the toe of the embankment (see Detail No. S-2275 of these standards).

8. Provide for a basin dewatering system with a 24-hour maximum drawdown time.

b. Design criteria

1. Minimum of two cells, with the first cell (forebay) at least 10% of the design surface area. The forebay shall also constitute 20% of the treatment volume. Where space limits multicell design, use one cell with a forebay at the inlet to settle sediments and distribute flow across the wet pond.
2. Maximum sideslopes in basin treatment area = 3H:IV
3. Overexcavate by a minimum of 20% to allow for sediment deposition.
4. Minimum freeboard = 1 foot from 25-year design water surface elevation.
5. Retaining walls are not allowed in the treatment area.
6. Provide an approved outlet structure for all flows.
7. The construction of wet ponds and maintenance accessibility shall be in conformance with Section 301.2.03, "Design Criteria," Section 301.3.09, "Detention/Retention Facility Protection," and Section 301.4.04, "Access Road Design."

**D.3.03 Extended Dry Pond**

a. Hydraulic design criteria

1. Permanent pool depth = 0.4 feet.
2. Permanent pool is to cover the entire bottom of the basin.
3. Minimum water quality detention/retention volume =  $1.0 \times \text{WQV}$ .
4. Water quality drawdown time = 48 hours.
5. To calculate orifice size, use the following equation:

$$D = 24 \times \left[ \frac{Q}{\pi C_d [2gH]^{0.5}} \right]^{0.5}$$

where D = orifice diameter (inches).

$$Q \text{ (cfs)} = \text{WQV}(\text{cf}) / (48 \text{ hr} \times 60 \text{ min/hr} \times 60 \text{ sec/min}).$$

$C_d$  = orifice coefficient (0.62 for square-edged entrance).

$g$  = gravitational constant (32.2 ft/sec<sup>2</sup>).

$H$  =  $\frac{2}{3}$  temporary detention height (feet) to orifice centerline.

6. Maximum depth of water quality pool (not including permanent pool) = 4 feet.
  7. Provide an emergency spillway sized to pass the 100-year storm event or an approved hydraulic equivalent. The emergency spillway shall be located in existing soils when feasible and armored with riprap embedded in concrete, or other approved erosion protection extending to the toe of the embankment (see Detail No. S-2275 of these standards).
- b. Design criteria
1. Minimum of two cells, with the first cell (forebay) at least 10% of the design surface area. The forebay shall also constitute 20% of the treatment volume. Where space limits multicell design, use one cell with a forebay at the inlet to settle sediments and distribute flow across the wet pond.
  2. Minimum bottom width = 4 feet
  3. Maximum sideslope in basin treatment area = 4H:IV.
  4. Minimum freeboard = 1 foot from 25-year design water surface elevation.
  5. Retaining walls are not allowed in the treatment area.
  6. An approved outlet structure shall be provided for all flows.
  7. The construction of dry ponds and maintenance accessibility shall be in conformance with Section 301.2.03, "Design Criteria," Section 301.3.09, "Detention/Retention Facility Protection," and Section 301.4.04, "Access Road Design."

#### **D.4.00 WETLANDS – CONSTRUCTED TREATMENT WETLANDS**

- a. Hydraulic design criteria
1. Permanent pool volume =  $0.55 \times WQV$ .
  2. Water quality detention/retention volume =  $1.0 \times WQV$ .
  3. Water quality drawdown time = 48 hours.

4. To calculate orifice size, use the following equation:

$$D = 24 \times [(Q / (\pi C_d [2gH]^{0.5}) ) ]^{0.5}$$

where D = orifice diameter (inches).

Q (cfs) = WQV(cf)/(48 hr × 60 min/hr × 60 sec/min).

C<sub>d</sub> = orifice coefficient (0.62 for square-edged entrance).

g = gravitational constant (32.2 ft/sec<sup>2</sup>).

H = 2/3 temporary detention height (feet) to orifice centerline.

5. Maximum depth of permanent pool = 2.5 feet.
6. Maximum velocity through the wetland should average less than 0.01 feet per second for the water quality flow. Design should distribute flow uniformly across the wetland.
7. Provide an emergency spillway sized to pass the 100-year storm event or an approved hydraulic equivalent. The emergency spillway shall be located in existing soils when feasible and shall be armored with riprap embedded in concrete, or other approved erosion protection extending to the toe of the embankment (see Detail No. S-2275 of these standards).
8. Provide for a basin dewatering system with a 24-hour maximum drawdown time.

b. Design Criteria

1. Minimum of two cells, with the first cell (forebay) at least 10% of the surface area. The forebay shall also constitute 20% of the treatment volume. Where space limits multicell design, use one cell with a forebay at the inlet to settle sediments and distribute flow across the wet pond.
2. Permanent pool depth to be spatially varied throughout wetland.
3. Provide a perimeter zone 10 to 20 feet wide that is inundated during storms.
4. Maximum sideslopes for wetland planting = 5H:IV.
5. Maximum sideslopes for nonwetland planting = 3H:IV.
6. Overexcavate by a minimum of 20% to allow for sediment deposition.
7. Minimum freeboard = 1 foot from 25-year design water surface elevation.
8. Retaining walls are not allowed in the treatment area.

8. The construction of wetlands and maintenance accessibility shall be in conformance with Section 301.3.09, "Detention/Retention Facility Protection," and Section 301.4.04, "Access Road Design."
9. Provide an approved outlet structure for all flows.

## **D.5.00 INFILTRATION**

### **D.5.01 Infiltration Trench**

Design criteria

- a. The design of infiltration trenches is based on Darcy's Law<sup>2</sup>:

$$A = 2.0 \times Q \div (f \times i)$$

Where A = area of trench bottom (square feet).

Q = design flow rate (cfs).

f = infiltration rate of soil or infiltration media (ft/se ).

i = hydraulic gradient (see below).

$$i = (h + L) \div L$$

where h = height of water column over infiltration media.

L = distance from surface to bottom of trench

- b. The infiltration trench shall infiltrate the entire water quality storm without overflow.
- c. Infiltration facilities shall not be accepted in soils with a tested infiltration rate of less than 0.50 inches per hour.
- d. There shall be no less than 3 feet of undisturbed depth of infiltration medium between the bottom of the facility and any impervious layer (hardpan, solid rock, high groundwater levels, etc.).
- e. Drawdown time (time for the trench to empty water from the water quality storm) shall not exceed 24 hours.
- f. Infiltration trenches shall meet the following setback requirements for downstream slopes: minimum of 100 feet from slopes of 16%; add 5 feet of setback for each additional percent of slope up to 30%; 200-foot setback for slopes of 30%; infiltration trenches shall not be used where slopes exceed 30%.

---

<sup>2</sup> A safety factor of 2 is applied to the equation.

- g. All infiltration trenches shall have an overflow installed that is capable of transporting the design capacity of the water delivery system through the facility to an approved stormwater receiving system if the facility infiltration capacity is exceeded. An approved stormwater receiving system is a stream, lake, or pond, or a storm sewer or drainage ditch. Overflows shall be designed with appropriate erosion-control devices.
- h. Each trench shall have one slotted observation pipe (4-inch) that extends to the bottom of the trench, at a point approximately halfway along the trench. The observation pipe shall have a threaded or hinged cap or plug.
- i. Drain medium shall have filter fabric between the medium and native soils or backfill meeting specifications established in Table D.2.
- j. Infiltration areas shall be clearly marked before site work begins to avoid soil disturbance during construction. No vehicular construction traffic, except that specifically used to construct the facility, shall be allowed within 10 feet of infiltration trench areas.
- k. An certified soils scientist (ARCPACS certification), or suitably trained person working under the supervision of a Professional Engineer registered in the State of Oregon, shall inspect the soil after the system is excavated and before trenches are filled with drain medium, to confirm that soils remain in suitable condition to perform at anticipated infiltration rates.

**D.5.02          Infiltration Basin**

Design criteria

- a. The design of infiltration trenches is based on Darcy's Law<sup>3</sup>:

$$A = 2.0 \times Q \div (f \times i)$$

Where A = area of trench bottom (square feet).

Q = design flow rate (cfs).

f = infiltration rate of soil or infiltration media (ft/sec).

i = hydraulic gradient (see below).

$$i = (h + L) \div L$$

where h = height of water column over infiltration media.

L = distance from surface to bottom of trench

- b. The infiltration basin shall infiltrate the entire water quality storm without overflow.

---

<sup>3</sup> A safety factor of 2 is applied to the equation.

- c. Infiltration basins shall meet the following setback requirements for downstream slopes: minimum of 100 feet from slopes of 10%; add 5 feet of setback for each additional percent of slope up to 30%; 200-foot setback for slopes of 30%; infiltration trenches shall not be used where slopes exceed 30%.
- d. All infiltration basins shall have an overflow installed that is capable of transporting the design capacity of the water delivery system through the facility to an approved stormwater receiving system if the facility infiltration capacity is exceeded. An approved stormwater receiving system is a stream, lake, or pond, or a storm sewer or drainage ditch. Overflows shall be designed with appropriate erosion-control devices.
- e. Any imported drain medium shall have filter fabric between the medium and native soils or backfill.
- f. Two staff gauges shall be installed, at opposite ends of the bottom of the basin, to enable maintenance staff to measure the depth of accumulated silts.
- g. Infiltration areas shall be clearly marked before site work begins to avoid soil disturbance during construction. No vehicular traffic, except that specifically used to construct the facility, shall be allowed within 10 feet of infiltration basin areas.
- h. A certified soils scientist (ARCPACS certification), or suitably trained person working under the supervision of a Professional Engineer registered in the State of Oregon, shall inspect the soil after the system is excavated and before the basin is filled with drain medium, to confirm that soils remain in suitable condition to accept anticipated infiltration.
- i. Infiltration facilities shall not be accepted in soils with a tested infiltration rate of less than 0.50 inches per hour.
- j. There shall be no less than 3 feet of undisturbed depth of infiltration medium between the bottom of the facility and any impervious layer (hardpan, solid rock, high groundwater levels, etc.).
- k. Drawdown time (time for the basin to empty water from the water quality design storm) shall not exceed 24 hours.

## APPENDIX E WATER QUALITY FACILITY LINERS

### E.1.00 INTRODUCTION

The purpose of this appendix is to provide guidelines for the design and construction of water quality facilities in the City of Wilsonville.

### E.2.00 WATER QUALITY FACILITY LINERS

Liners are intended to reduce the likelihood that pollutants in stormwater will reach groundwater when water quality facilities are constructed. In addition to groundwater protection considerations, some facility types require permanent water for proper functioning. An example is the first cell of a wet pond.

Treatment liners amend the soil with materials that treat stormwater before it reaches more freely draining soils. The liners have slow rates of infiltration, generally less than 2.4 inches per hour ( $1.7 \times 10^{-3}$  centimeters per second [cm/s]), but not as slow as low-permeability liners. Treatment liners may use in-place native soils or imported soils. Low-permeability liners reduce infiltration to a very slow rate, generally less than 0.02 inches per hour ( $1.4 \times 10^{-5}$  cm/s).

These types of liners should be used for industrial or commercial sites that have a potential for high pollutant loading in stormwater runoff. Low-permeability liners may be fashioned from compacted till, clay, geomembrane, or concrete. Till liners are preferred because of their general resilience and ease of maintenance.

#### E.2.01 General Design Criteria

- a. **Table E.1** shows recommendations for the type of liner generally best suited for use with various water quality facilities.
- b. Liners shall be evenly placed over the bottom or sides of the treatment area of the facility, as shown in **Table E.1**. Areas above the treatment volume that are required to pass flows greater than the water quality flow (or volume) need not be lined. However, the lining must extend to the top of the interior sideslope and be anchored, if it cannot be permanently secured by other means.

**Table E.1. RECOMMENDED LINERS FOR  
STORMWATER FACILITIES**

| <b>Type of Facility</b>                    | <b>Area to Be Lined</b>                                             | <b>Recommended Liner</b>                                                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Presettling basin                          | Bottom and sides                                                    | Low-permeability liner or treatment liner. (If basin will intercept seasonal high groundwater table, treatment liner is recommended.)    |
| Wet pond                                   | First cell: bottom and sides to water quality design water surface  | Low-permeability liner or treatment liner. (If wet pond will intercept seasonal high groundwater table, treatment liner is recommended.) |
|                                            | Second cell: bottom and sides to water quality design water surface | Treatment liner                                                                                                                          |
| Combined detention/ water quality facility | First cell: bottom and sides to water quality design water surface  | Low-permeability liner or treatment liner. (If facility will intercept seasonal high groundwater table, treatment liner is recommended.) |
|                                            | Second cell: bottom and sides to water quality design water surface | Treatment liner                                                                                                                          |
| Constructed treatment wetland              | Bottom and sides, both cells                                        | Low-permeability liner. (If facility will intercept seasonal high groundwater table, treatment liner is recommended.)                    |
| Sand filtration basin                      | Basin sides only                                                    | Treatment liner                                                                                                                          |
| Sand filter vault                          | Not applicable                                                      | No liner needed                                                                                                                          |
| Media filter (in vault)                    | Not applicable                                                      | No liner needed                                                                                                                          |
| Wet vault                                  | Not applicable                                                      | No liner needed                                                                                                                          |

c. For low-permeability liners, the following criteria apply:

1. Where the seasonal high groundwater elevation is likely to contact a low-permeability liner, liner buoyancy may be a concern. A low-permeability liner shall not be used unless evaluated and recommended by a Professional Engineer registered in the State of Oregon whose area of expertise is geotechnical engineering.

2. Where the design calls for grass to be planted over a low-permeability liner, a minimum of 6 inches of good topsoil or compost-amended native soil (2 inches compost tilled into 6 inches native till soil) must be placed over the liner in the area to be planted; 12 inches of cover is preferred.

#### **E.2.02 Interference With Seasonal Groundwater**

If a treatment liner will be below the seasonal high-water level, the liner's pollutant-removal performance must be evaluated by a qualified professional, and the liner's placement must be found as protective as if the liner were above the level of the groundwater. A qualified professional shall be either a Professional Engineer registered in the State of Oregon whose area of expertise is geotechnical engineering, a Certified Engineering Geologist registered in the State of Oregon, or a Professional Hydrogeologist registered in the State of Oregon.

See Sections E.3.00, below, and E.4.00 for more specific design criteria for treatment liners and low-permeability liners.

#### **E.3.00 WATER QUALITY TREATMENT LINERS**

##### Design Criteria

- a. A 2-foot-thick layer of soil with a minimum organic content of 5% and a minimum CEC of 5 milliequivalents/100 grams can be used as a treatment layer beneath a water quality or quantity facility.
- b. To demonstrate that in-place soils meet the above criteria, one sample per 1,000 square feet of facility area shall be tested. Each sample shall be a composite of subsamples taken throughout the depth of the treatment layer (usually 2 to 6 feet below the expected facility invert).
- c. Typically, sidewall seepage is not a concern if the seepage flows through the same stratum as the bottom of the stormwater facility. However, if the treatment soil is an engineered soil or has very low permeability, the potential to bypass the treatment soil through the sidewalls may be significant. In those cases, the stormwater facility sidewalls should be lined with at least 18 inches of treatment soil, as described above, to prevent untreated seepage. This lesser soil thickness is based on unsaturated flow as a result of alternating wet and dry periods.
- d. Organic content shall be measured on a dry-weight basis using ASTM D-2974.
- e. CEC shall be tested using EPA laboratory method 9081.
- f. Certification that imported soil meets the organic content and CEC criteria above shall be provided to the local approval authority by a soils-testing laboratory.

- g. Animal manures used in treatment soil layers must be sterilized because of the potential for bacterial contamination of groundwater.

**E.4.00 LOW-PERMEABILITY LINER OPTIONS**

This section specifies the design criteria for four low-permeability liner options: compacted till liners, clay liners, geomembrane liners, and concrete liners.

**E.4.01 Compacted Till Liners**

- a. Liner thickness shall be 18 inches after compaction.
- b. Soil shall be compacted to 95% of the maximum dry density, as determined by AASHTO T-180.
- c. A different depth and density sufficient to retard the infiltration rate to  $2.4 \times 10^{-5}$  inches per minute ( $1 \times 10^{-6}$  cm/s) may also be used instead of Criteria 1 and 2.
- d. Soil should be placed in 6-inch lifts.
- e. Gradation requirements of the soil shall be as indicated in **Table E.2**. Sieve analysis shall be determined according to AASHTO T-27.

**Table E.2. SOIL GRADATION REQUIREMENTS, COMPACTED TILL LINERS**

| Sieve Size | Percent Passing |
|------------|-----------------|
| 6-inch     | 100             |
| 4-inch     | 90              |
| No. 4      | 70-100          |
| No. 200    | 20              |

**E.4.02 Clay Liners**

- a. Liner thickness shall be 12 inches.
- b. Clay shall be compacted to 95% of the maximum dry density, as determined by AASHTO T-180.
- c. A different depth and density sufficient to retard the infiltration rate to  $2.4 \times 10^{-5}$  inches per minute ( $1 \times 10^{-6}$  cm/s) may also be used instead of the above criteria.
- d. The slope of clay liners must be restricted to 3H: IV for all areas requiring soil cover. Otherwise, the soil layer must be stabilized by another method so that

soil does not slip into the facility. Any alternative soil-stabilization method must take maintenance access into consideration.

- e. Where clay liners form the sides of ponds, the interior should not be steeper than 4H:1V, irrespective of fencing. This restriction is to ensure that anyone falling into the pond can climb out.
- f. Specification requirements of the clay soil shall be as indicated in **Table E.3**.

**Table E.3. SPECIFICATIONS FOR SOIL IN CLAY LINERS**

| Property                 | Test Method        | Unit    | Specification                        |
|--------------------------|--------------------|---------|--------------------------------------|
| Permeability             | ASTM D-2434        | cm/sec  | $1 \times 10^{-6}$                   |
| Plasticity Index of Clay | ASTM D-423 & D-424 | percent | Not less than 15                     |
| Liquid Limit of Clay     | ASTM D-2216        | percent | Not less than 30                     |
| Clay Particles Passing   | ASTM D-422         | percent | Not less than 30                     |
| Clay Compaction          | ASTM D-2216        | percent | 95% of Max. Dry Density, AASHTO T-99 |

**E.4.03 Geomembrane Liners**

- a. Geomembrane liners shall be ultraviolet (UV) light resistant and have a minimum thickness of 30 mils. A thickness of 40 mils shall be used in areas of maintenance access or where heavy machinery must operate over the membrane.
- b. Geomembranes shall be bedded according to the manufacturer's recommendations.
- c. Liners shall be installed so that they can be covered with 12 inches of top dressing forming the bottom and sides of the water quality facility, except for liner sand filters. Top dressing shall consist of 6 inches of crushed aggregate covered with 6 inches of native soil. The aggregate layer is to mark the location of the liner for future maintenance. As an alternative to crushed aggregate, 12 inches of native soil may be used if orange plastic safety fencing or another highly-visible, continuous marker is embedded 6 inches above the membrane.

- d. If possible, liners should be of a contrasting color so that maintenance workers are aware of any areas where a liner may become exposed when maintaining the facility.
- e. Geomembrane liners shall not be used on slopes steeper than 5H:1V to prevent the top dressing material from slipping. Textured liners may be used on slopes up to 3H:1V, provided that a Professional Engineer registered in the State of Oregon, whose area of expertise is geotechnical engineering, recommends that the top dressing will be stable for all site conditions, including maintenance.

**E.4.04 Concrete Liners**

- a. Portland cement liners are allowed irrespective of facility size, and shotcrete may be used on slopes. However, specifications must be developed by a Professional Engineer registered in the State of Oregon who certifies the liner against cracking or losing water retention ability under expected conditions of operation, including facility maintenance operations. Maintenance equipment can weigh up to 80,000 pounds when fully loaded.
- b. AC may not be used for liners because of its permeability to organic pollutants.
- c. If grass is to be grown over a concrete liner, slopes must be no steeper than 5H: 1V to prevent the top dressing from slipping.

**APPENDIX F**

**City of Wilsonville FORMS**

## **MINIMUM EROSION PREVENTION AND SEDIMENT CONTROL MONITORING REQUIREMENTS**

### **All Sites**

1. A person with knowledge and experience in construction storm water controls and management practices shall conduct the inspections. The Grading and Erosion Control Plan shall identify the person(s) and/or title of the personnel that will conduct the inspections and provide a contact phone number for such person(s).

### **Active Sites**

2. Frequency of inspections shall be daily during storm water runoff or snowmelt runoff and at least once every seven (7) calendar days and within 24 hours after any storm event of greater than 0.5 inches of rain per 24-hour period.

### **Inactive Sites**

3. During inactive periods of greater than seven (7) consecutive calendar days, inspections shall only be required once every two (2) weeks.
4. Prior to discontinuing activities at the site, any exposed area shall be stabilized to prevent erosion. Stabilization may occur by applying appropriate cover (mulch, erosion control blanket, soil tackifier, etc.) or establishing adequate vegetative cover.
5. When a site is inaccessible due to adverse weather conditions, inspections shall not be required. Adverse weather condition shall be recorded on the inspection sheet.
6. Prior to leaving an inactive site or in anticipation of site inaccessibility, existing erosion and sediment control measures shall be inspected to ensure that they are in working order. Any necessary maintenance or repair shall be made prior to leaving the site.

### **Written Records**

7. All visual inspections must document the following information:
  - a. Inspection date, inspector's name, weather conditions, and rainfall amount for past 24 hours (inches). (Rainfall information can be obtained from the nearest weather recording station.)
  - b. List observations of all BMPs: erosion and sediment controls, chemical and waste controls, locations where vehicles enter and exit the site, status of areas that employ temporary or final stabilization control, soil stockpile area, and non-stormwater controls.
  - c. At representative discharge location(s) from the construction site conduct observation and document the quality of the discharge for any turbidity, color,

sheen, or floating materials. If possible, in the receiving stream, observe and record color and turbidity or clarity upstream and downstream within 30 feet of the discharge from the site. For example, a sheen or floating material could be noted as present/absent, if observation is yes, it could indicate concern about a possible spill and/or leakage from vehicles or materials storage. For turbidity and color an observation would describe any apparent color and the clarity of the discharge, and any apparent difference in comparison with the receiving stream.

- d. If significant amounts of sediment are leaving the property, briefly explain the corrective measures taken to reduce the discharge and/or clean it up and describe efforts to prevent future releases. The EPSC Plan shall be amended accordingly.
  - e. If a site is inaccessible due to inclement weather the inspection shall include observations at a relevant discharge point or downstream location, if practical.
8. All inspection records for an active site shall be kept on-site or be maintained with the permittee, and shall made available to the City's authorized representative upon request.
  9. A written record of inspections for an inactive site shall be maintained with the permittee and made available to the City's authorized representative upon request.
  10. Retention of all inspection records shall be for a period of one year from project completion.

## CERTIFICATE OF INSURANCE

This Certificate of Insurance is issued to the terms, conditions and coverage of  
 Policy No. \_\_\_\_\_ issued to \_\_\_\_\_

at \_\_\_\_\_

by \_\_\_\_\_ . Date of Expiration \_\_\_\_\_

This Certificate of Insurance is not intended to affirmatively or negatively alter, extend or rescind  
 any of the existing terms, conditions or coverage of the above-mentioned policy.

| TYPE OF INSURANCE                                                                       | LIMITS OF LIABILITY                            |                    |           |
|-----------------------------------------------------------------------------------------|------------------------------------------------|--------------------|-----------|
|                                                                                         |                                                | EACH<br>OCCURRENCE | AGGREGATE |
| GENERAL LIABILITY<br>Comprehensive Form                                                 | Bodily Injury                                  |                    |           |
| Manufacturer's & Contractor's<br>Liability Broadform Property Damage                    | Property Damage                                |                    |           |
| Owner & Contractor's<br>Protective Blanket Contractual<br>Products/Completed Operations | Bodily Injury &<br>Property Damage<br>Combined |                    |           |
| Automotive                                                                              | Personal Injury                                |                    |           |
| Automotive<br>Comprehensive Form                                                        | Bodily Injury &<br>Property Damage<br>Combined |                    |           |
| Excess Liability<br>Umbrella Form                                                       | Bodily Injury &<br>Property Damage<br>Combined |                    |           |
| WORKER'S COMPENSATION                                                                   | Statutory                                      |                    |           |

DATE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

Note: A standard certificate of insurance form such as the Accord form may be substituted  
 for this form.

-End-

CITY OF WILSONVILLE  
30000 SW TOWN CENTER LOOP E  
WILSONVILLE, OR 97070

**ENGINEERING PROJECT PERMIT SHEET**  
**ENGINEERING DEPARTMENT**

PERMIT NUMBER: \_\_\_\_\_

PARCEL NUMBER: \_\_\_\_\_

**APPLICANT'S SECTION (APPLICANT IS TO COMPLETE ITEMS 1-7)**

1. NAME OF PROJECT: \_\_\_\_\_

2. OWNER/DEVELOPER: \_\_\_\_\_

3. OWNER'S ENGINEER: \_\_\_\_\_

4. CONTRACTOR: \_\_\_\_\_  
NAME PHONE OCCB BUSINESS LICENSE

5. PROJECT'S CONTACT PERSON: \_\_\_\_\_

6. ESTIMATED CONSTRUCTION COST: \_\_\_\_\_

PLAN CHECK FEE: (Paid) \_\_\_\_\_

REVISED ESTIMATED PROJECT COST: \_\_\_\_\_

REVISED PLAN CHECK FEE: \_\_\_\_\_

PENALTY PLAN CHECK FEE: \_\_\_\_\_

7. I, \_\_\_\_\_ (owner) do hereby agree by my signature below to the preliminary fee as stated above for the plan review fee knowing said fee is based upon the preliminary cost estimate as stated and is subject to change and hereby agree that a response on the above mentioned project may not be verbally or in writing by the Engineering Department until 10 days from the signature date by the owner or his authorized agent. I further agree to comply with the above description plans and specifications as herewith approved by the Engineering Department and also with all rules, regulations, ordinances and resolutions pertaining to construction within Public R.O.W. or dedicated easements.

\_\_\_\_\_  
OWNER/DATE

8. **PLANS REVIEW EXPIRATION NOTICE**

Ninety (90) days has elapsed since the construction plans you submitted on the above date were approved resulting in the expiration of your plan review approval. Enclosed you will find a copy of your construction plans. Prior to beginning construction on this project the construction plans shall be reviewed for finalization. A revised plan review application shall be completed and the fee paid prior to the review.

\_\_\_\_\_  
ENGINEERING DEPARTMENT/DATE

**9. FEE SUMMARY:**

|                             |       |
|-----------------------------|-------|
| TOTAL PLAN CHECK FEE        | _____ |
| BALANCE PLAN CHECK DUE      | _____ |
| PUBLIC WORKS PERMIT FEE     | _____ |
| TITLE FEE                   | _____ |
| MANHOLE INSERT FEE          | _____ |
| STREET SIGN FEE             | _____ |
| <b>TOTAL FEES DUE</b>       | _____ |
| <b>ADDITIONAL FEES PAID</b> | _____ |

| <u>PROJECT COSTS:</u>  | <u>COST</u> | <u>DESCRIPTION</u> |
|------------------------|-------------|--------------------|
| A). WATER SYSTEM:      | _____       | _____              |
| B). WASTEWATER SYSTEM: | _____       | _____              |
| C). STORMWATER SYSTEM: | _____       | _____              |
| D). ROADWAY AREA:      | _____       | _____              |
| E). STREET LIGHTS:     | _____       | _____              |
| F). OTHER:             | _____       | _____              |

10.

**PERMIT ISSUED**

I \_\_\_\_\_ do hereby agree by my signature below to assure that myself and all subcontractors under my direction and working on the above project shall have a valid City business license and hereby agree to forfeit all fines and penalties for failure of same. Such forfeiture will be with-held from my payment or retainage or added to the total cost of the permit. I have read and understand the City's "Public Work Standards".

\_\_\_\_\_  
ENGINEERING DEPARTMENT/DATE

\_\_\_\_\_  
CONTRACTOR/DATE

**11. CONSTRUCTION WORK HOURS**

Pacific Standard Times  
Monday - Friday: 7:00 am to 8:00 pm  
Saturday: 9:00 am to 6:00 pm

Daylight Savings Time  
Monday - Friday: 7:00 am to 9:00 pm  
Saturday: 9:00 am to 7:00 pm

**No noise originating on construction, demolition, and/or grading are allowed before or after the times listed, or at any time on Sunday, without the written consent of the Building Official or City Engineer, and may be subject to citation.**

## TRACKING FOR EASEMENTS AND ROW DEDICATIONS

(note: this may not be the same as owner/developer)  
 Name of Grantor \_\_\_\_\_  
 \_\_\_\_\_  
 Mailing Address \_\_\_\_\_  
 \_\_\_\_\_  
 City, State, Zip \_\_\_\_\_  
(from item 5, page 1)  
 Contact Person and Telephone # \_\_\_\_\_

(from item 1, page 1)  
 Project Name \_\_\_\_\_  
(from item 1, page 1)  
 County \_\_\_\_\_  
(from item 1, page 1)  
 Tax Lot, Section, Township, Range \_\_\_\_\_  
 \_\_\_\_\_  
 CITY Contact Person \_\_\_\_\_

**Type of Easement:** *(drop down)*

(Drainage, Pipeline, PUE, Sidewalk, Sidewalk and PUE, Slope, Street Dedication, Deed of Deduction, Conservation, Stormwater Maintenance Covenant, Temporary Construction)

**Type of Ownership:** *(drop down)*

(Partnership, Limited Partnership, Corporation, Individual, Limited Liability Company)

| DATE  | ACTION/COMMENTS                                          | BY    |
|-------|----------------------------------------------------------|-------|
| _____ | Completed document and Preliminary Title Report received | _____ |
| _____ | _____                                                    | _____ |
| _____ | _____                                                    | _____ |
| _____ | Legal description verified                               | _____ |
| _____ | _____                                                    | _____ |
| _____ | Location and map verified                                | _____ |
| _____ | _____                                                    | _____ |
| _____ | Other Action taken _____                                 | _____ |
| _____ | _____                                                    | _____ |
| _____ | _____                                                    | _____ |
| _____ | _____                                                    | _____ |
| _____ | Document sent to Legal Dept. for review                  | _____ |
| _____ | _____                                                    | _____ |
| _____ | Legal Dept. signs "Approved as to Form"                  | _____ |
| _____ | Legal Dept. "Approved as to Legal Description"           | _____ |
| _____ | _____                                                    | _____ |
| _____ | _____                                                    | _____ |
| _____ | Mayor/City Manager signs off: _____                      | _____ |
| _____ | _____                                                    | _____ |
| _____ | City Recorder signs off: _____                           | _____ |
| _____ | Original document sent for recording                     | _____ |
| _____ | _____                                                    | _____ |
| _____ | _____                                                    | _____ |
| _____ | Recording Number _____ and Date _____                    | _____ |
| _____ | Copy of recorded document sent to: Engineering           | _____ |
| _____ | _____                                                    | _____ |
| _____ | _____                                                    | _____ |
| _____ | Economic Development Director                            | _____ |
| _____ | Original document placed in Vault, File _____ Date _____ | _____ |

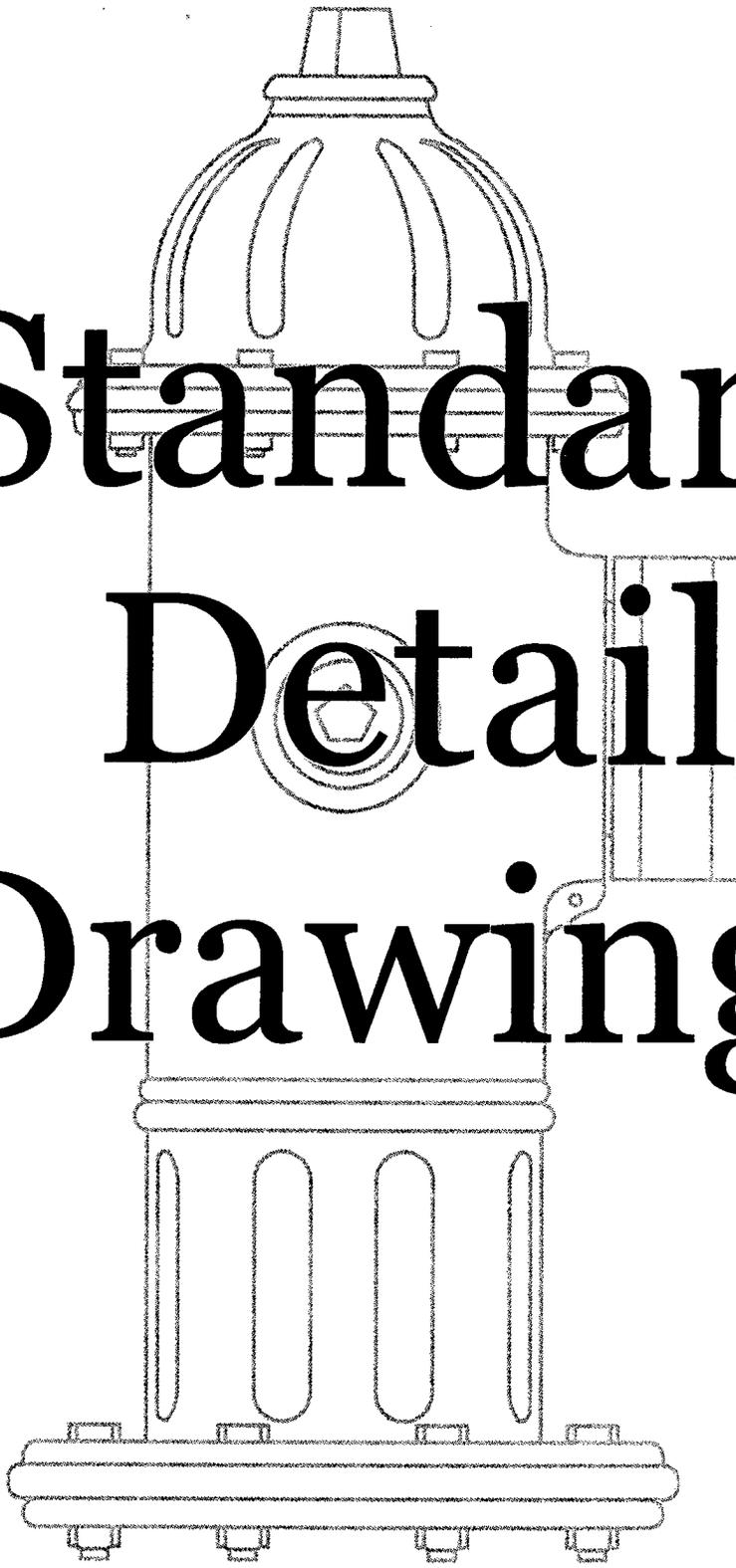
► *(route to Legal)*

► *(route to mayor/city manager)*

► *(route to city Recorder)*

► *(Notify or send copy of transmittal letter to Engineering)*

**APPENDIX G**  
**City of Wilsonville**  
**STANDARD DETAIL DRAWINGS**



# Standard Detail Drawings

ADOPTED: APRIL 3, 2006

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

# Detail Drawings Index

3/31/2006

| <b>Streets</b>                                        |              |                |
|-------------------------------------------------------|--------------|----------------|
| <b>Name</b>                                           | <b>Dwg #</b> | <b>Revised</b> |
| Rural Road - Street                                   | R-1000       | 11/1/2003      |
| Residential Street Cul-de-sac                         | R-1005       | 11/1/2003      |
| Residential Street                                    | R-1010       | 11/1/2003      |
| Residential Transit                                   | R-1015       | 11/1/2003      |
| Minor Collector                                       | R-1020       | 11/1/2003      |
| Minor Collector with On-street Parking                | R-1025       | 11/1/2003      |
| Major Collector                                       | R-1030       | 3/20/2006      |
| Major Collector with On-street Parking                | R-1035       | 11/1/2003      |
| Minor Arterial                                        | R-1040       | 3/20/2006      |
| Major Arterial                                        | R-1045       | 3/22/2006      |
| Major Arterial with Dual Left Turns                   | R-1050       | 3/20/2006      |
| Public Road End Alternatives                          | R-1055       | 11/1/2003      |
| Asphalt Street Curb and Gutter                        | R-1060       | 3/20/2006      |
| Concrete Street Curb and Gutter                       | R-1065       | 3/20/2006      |
| Curb Non-Mountable                                    | R-1070       | 3/20/2006      |
| Sidewalk Ramp                                         | R-1075       | 3/20/2006      |
| Concrete Sidewalk                                     | R-1080       | 3/20/2006      |
| Widened Sidewalk at Mailbox Locations                 | R-1085       | 3/20/2006      |
| PCC to AC Paving Connection                           | R-1090       | 11/1/2003      |
| Concrete Pavement Saw Cutting and Doweling            | R-1095       | 3/20/2006      |
| Centerline Survey Monument                            | R-1100       | 3/20/2006      |
| Driveway to Private Roadway                           | R-1105       | 9/15/2005      |
| Driveway for Non-Curbed Street                        | R-1110       | 3/30/2006      |
| Residential Driveway                                  | R-1115       | 11/1/2003      |
| Commercial Driveway                                   | R-1120       | 11/1/2003      |
| Non-Removable Bollard                                 | R-1125       | 11/1/2003      |
| Removable Vehicle Barrier Post                        | R-1130       | 11/1/2003      |
| Fire/Utility Access Gate                              | R-1135       | 11/1/2003      |
| Fire/Utility Access Gate Latch, Lock, and Locking Pin | R-1140       | 11/1/2003      |
| Street Barricade (Type III)                           | R-1145       | 11/1/2003      |
| Railing Detail                                        | R-1150       | 2/2/2006       |
| Tree Protection Fencing                               | R-1155       | 11/1/2003      |
| Tree Well and Tree Grate Detail                       | R-1156       | 3/20/2006      |
| Street Tree Location and Clearances                   | R-1157       | 3/21/2006      |
| Street Sign Locations                                 | R-1160       | 1/26/2006      |
| Street Sign Assembly                                  | R-1165       | 11/1/2003      |
| Street Name Sign                                      | R-1170       | 3/29/2006      |
| Pavement Markings Page 1                              | R-1175       | 3/21/2006      |
| Pavement Markings Page 2                              | R-1180       | 11/1/2003      |
| Pavement Markings Page 3                              | R-1185       | 3/20/2006      |
| Pavement Markings Page 4                              | R-1186       | 3/22/2006      |

# Detail Drawings Index

3/31/2006

|                                               |              |                |
|-----------------------------------------------|--------------|----------------|
| Transit Bus Turnout                           | R-1195       | 11/1/2003      |
| <b>Storm and Sanitary</b>                     |              |                |
| <b>Name</b>                                   | <b>Dwg #</b> | <b>Revised</b> |
| Standard Symbols                              | S-2000       | 11/1/2003      |
| Standard Manhole                              | S-2005       | 3/29/2006      |
| Cast-in-place Concrete Manhole Base           | S-2010       | 3/29/2006      |
| Precast Rubber Gasket Manhole                 | S-2015       | 3/29/2006      |
| 48" X 18" Rubber Gasket Cone                  | S-2020       | 11/1/2003      |
| Shallow Manhole (less than 5 ft.)             | S-2025       | 11/1/2003      |
| Flat Top Manhole                              | S-2030       | 11/1/2003      |
| Large Diameter Pipe Manhole                   | S-2035       | 11/1/2003      |
| Standard Manhole Outside Drop Connections     | S-2040       | 3/21/2006      |
| Large Cast-in-place Concrete Manhole Base     | S-2045       | 11/1/2003      |
| Stormwater Pretreatment Manhole               | S-2050       | 3/30/2006      |
| Suburban and Standard Manhole Frame and Cover | S-2055       | 3/29/2006      |
| Tamperproof Manhole Frame and Cover           | S-2060       | 11/1/2003      |
| Access Location (less than 5 ft.)             | S-2065       | 1/30/2006      |
| Concrete Street Manhole Repair Detail         | S-2075       | 3/21/2006      |
| Manhole Step                                  | S-2080       | 3/21/2006      |
| Curb Inlet (CG-30)                            | S-2085       | 3/21/2006      |
| Curb Inlet (CG-48)                            | S-2090       | 3/21/2006      |
| Catch Basin                                   | S-2095       | 3/21/2006      |
| Catch Basin - Rebar Reinforcement             | S-2096       | 3/21/2006      |
| Catch Basin Grate and Frame                   | S-2100       | 11/1/2003      |
| Area Drain and Grate (Type 1)                 | S-2105       | 3/29/2006      |
| Area Drain (Type 2)                           | S-2110       | 3/21/2006      |
| Area Drain (Type 2) Grate, Cover, and Frame   | S-2115       | 11/1/2003      |
| Ditch Inlet                                   | S-2120       | 11/1/2003      |
| Ditch Inlet Frame and Cover                   | S-2125       | 3/29/2006      |
| Water Quality Pond Outflow Device             | S-2130       | 3/21/2006      |
| Gutter Inlet Pollution Control Device         | S-2135       | 11/1/2003      |
| Standard Backfill Detail                      | S-2140       | 3/21/2006      |
| Moratorium Street Repair                      | S-2145       | 3/21/2006      |
| Sanitary Sewer Crossing                       | S-2150       | 11/1/2003      |
| PVC Saddle Gasket                             | S-2155       | 11/1/2003      |
| Inserta-Tee                                   | S-2160       | 11/1/2003      |
| Bore Detail                                   | S-2165       | 11/1/2003      |
| Creek Crossing Restoration                    | S-2170       | 3/22/2006      |
| Service Lateral                               | S-2175       | 11/1/2003      |
| Standard Cleanout                             | S-2180       | 1/28/2006      |
| Cleanout Frame & Cover                        | S-2185       | 11/1/2003      |
| Concrete Encasement/Closure Collar            | S-2190       | 1/30/2006      |

# Detail Drawings Index

3/31/2006

|                                                                   |        |           |
|-------------------------------------------------------------------|--------|-----------|
| Anchor Wall                                                       | S-2195 | 3/21/2006 |
| Concrete Cap                                                      | S-2200 | 3/21/2006 |
| HeadWater Depth For Corrugated Pipe W/Inlet Control               | S-2205 | 11/1/2003 |
| HeadWater Depth For Smooth Interior Pipe Culverts W/Inlet Control | S-2210 | 11/1/2003 |
| Average Velocities For Estimating Travel Time For Overland Flows  | S-2215 | 11/1/2003 |
| Head For Culverts (n=0.012) Flowing Full With Outlet Control      | S-2220 | 11/1/2003 |
| Swale Inflow Spreader                                             | S-2225 | 3/21/2006 |
| Wetland Pond                                                      | S-2230 | 11/1/2003 |
| Wheel Wash                                                        | S-2235 | 1/30/2006 |
| Planter Median Manholes                                           | S-2238 | 1/30/2006 |
| Gravel Construction Entrance                                      | S-2240 | 11/1/2003 |
| Sediment Fence                                                    | S-2245 | 11/1/2003 |
| Biofilter Bag Overland Flow                                       | S-2250 | 11/1/2003 |
| Biofilter Bag Ditches And Swales                                  | S-2255 | 11/1/2003 |
| Sediment Marker                                                   | S-2260 | 3/29/2006 |
| Water Quality Sand Bed                                            | S-2270 | 11/1/2003 |
| Emergency Overflow                                                | S-2275 | 11/1/2003 |

## Water

| Name                                                        | Dwg #   | Revised   |
|-------------------------------------------------------------|---------|-----------|
| Horizontal Thrust Block                                     | W-3000  | 3/21/2006 |
| Vertical Thrust Block                                       | W-3005  | 11/1/2003 |
| Standard Straddle Block                                     | W-3010  | 1/30/2006 |
| Valve Operator Extension                                    | W-3015  | 11/1/2003 |
| Standard Valve Box                                          | W-3020  | 1/30/2006 |
| Standard Wet Tap                                            | W-3025  | 11/1/2003 |
| 3/4" & 1" Single Service                                    | W-3030  | 3/21/2006 |
| 1 1/2" & 2" Single Service                                  | W-3035  | 1/30/2006 |
| Fire Hydrant Assembly                                       | W-3040  | 3/29/2006 |
| Water Sampling Station                                      | W-3045  | 11/1/2003 |
| 2" Standard Blow-Off                                        | W-3050  | 1/30/2006 |
| 6" Standard Blow-Off                                        | W-3055  | 3/21/2006 |
| Standard Air Release Valve                                  | W-3060  | 3/22/2006 |
| Stainless Steel Saddle Support                              | W-3065  | 11/1/2003 |
| Dual Remote Reader                                          | W-3070  | 3/21/2006 |
| 3" Compound Meter pg 1                                      | W-3075  | 3/29/2006 |
| Standard Compound Meter Installations - 4X2, 6X3, 8X6, pg 2 | W-3075A | 1/26/2006 |
| Sump Drain Assembly                                         | W-3080  | 3/22/2006 |

## Building

| Name                                              | Dwg #  | Revised   |
|---------------------------------------------------|--------|-----------|
| Standard Double Check Valve Assembly 2" & Smaller | B-4000 | 3/21/2006 |
| Double Detector Check Vault                       | B-4005 | 3/29/2006 |

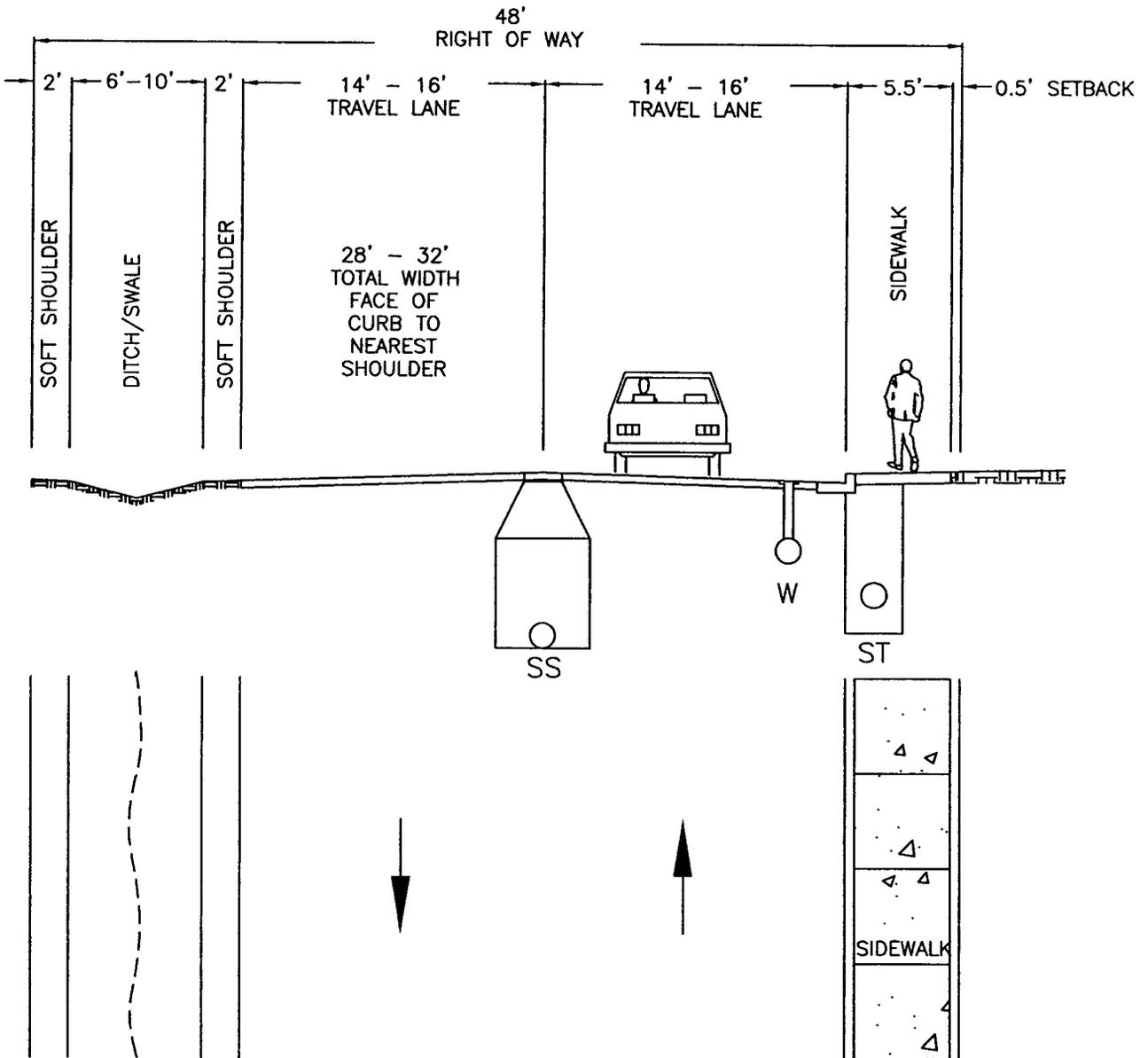
# Detail Drawings Index

3/31/2006

|                                  |        |           |
|----------------------------------|--------|-----------|
| Double Detector Check Vault Pg 2 | B-4010 | 7/1/2002  |
|                                  |        |           |
| <b>Planning</b>                  |        |           |
| <b>Name</b>                      |        |           |
| Tree Planting Detail             | P-5000 | 3/22/2006 |
| Tree Staking Detail              | P-5005 | 3/22/2006 |
| Tree Staking Detail - Large      | P-5010 | 3/22/2006 |
|                                  |        |           |
|                                  |        |           |
|                                  |        |           |

# **Street Improvement Details**

# RURAL ROAD VIEW LOOKING NORTH OR EAST



**NOTES:**

1. CURB WIDTH (1/2') IS INCLUDED IN SIDEWALK WIDTH.
2. 2' SOFT SHOULDER IS PROVIDED FROM EDGE OF PAVEMENT.
3. 1/2' SETBACK IS PROVIDED FROM THE EDGE OF THE CONCRETE SIDEWALK.
4. STRIPING AND SIGNAGE AS REQUIRED.
5. ON STREET PARKING ON SIDEWALK SIDE IS OPTIONAL CONSISTENT WITH EMERGENCY REQUIREMENTS.
6. THE RURAL ROAD CROSS-SECTION IS A SPECIAL APPLICATION ONLY. IT MAY ONLY BE USED WITH PRIOR APPROVAL FROM THE CITY PLANNING DEPARTMENT AND CITY ENGINEER.
7. 1.5:1 MAXIMUM SIDE SLOPE ON 6' DITCH/SWALE. 2.5:1 MAXIMUM SIDE SLOPE ON 10' DITCH/SWALE.

RURAL ROAD

DRAWING NUMBER: R-1000

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: R-1000.dwg

APPROVED BY: MAS

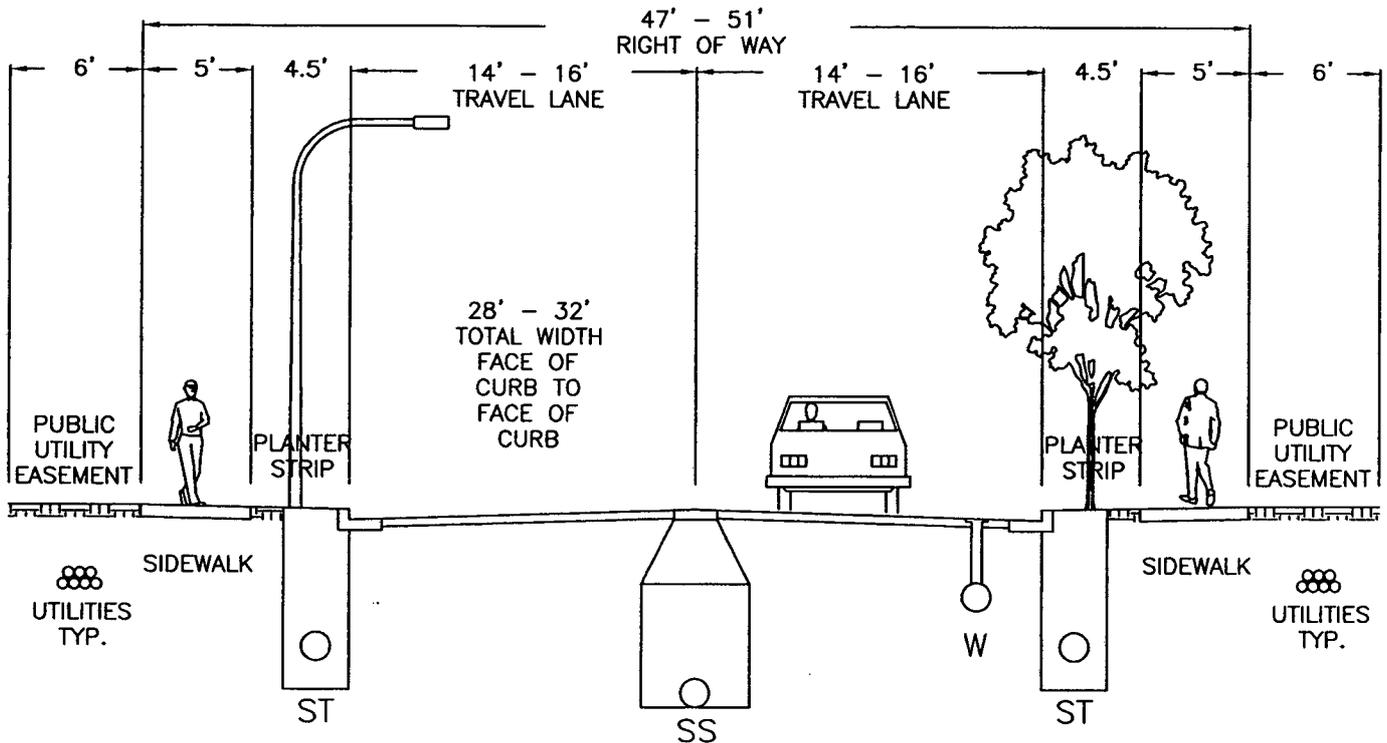
DATE: 11/01/03

CITY OF  
WILSONVILLE



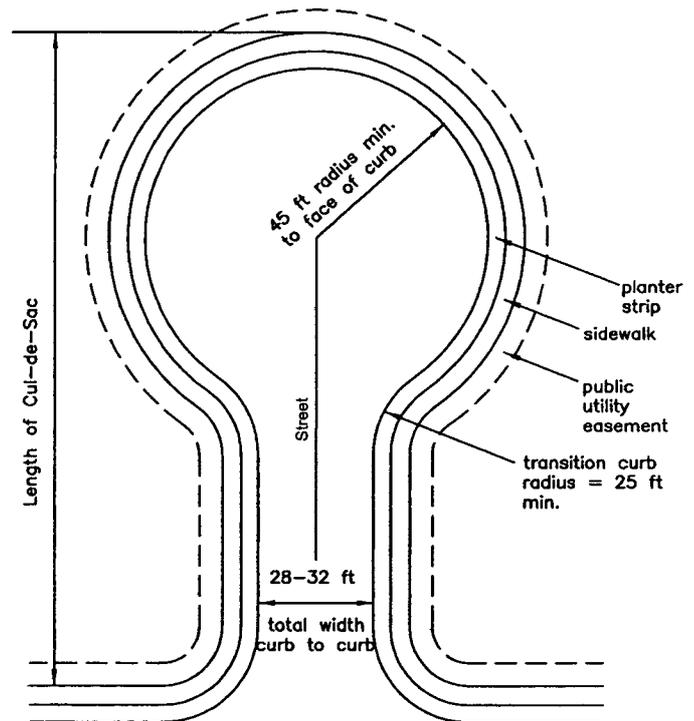
PUBLIC WORKS STANDARDS

# RESIDENTIAL STREET CUL-DE-SAC VIEW LOOKING NORTH OR EAST



**NOTES:**

1. A 4-1/2' PLANTER STRIP IS REQUIRED ON ALL CUL-DE-SACS.
2. CURB WIDTH (1/2') IS INCLUDED IN PLANTER STRIP WIDTH.
3. STREET LIGHTS AND STREET TREES SHALL BE LOCATED WITHIN PLANTER STRIP AS REQUIRED.
4. NO STRIPING ON STREET. SIGNAGE AS REQUIRED.
5. ON-STREET PARKING IS OPTIONAL CONSISTENT WITH EMERGENCY REQUIREMENTS:
  - PARKING ON ONE SIDE ONLY WITH 28' WIDTH.
  - PARKING ON BOTH SIDES WITH 32' WIDTH.
6. THE LENGTH OF THE CUL-DE-SAC SHALL BE NO LONGER THAN 200' UNLESS APPROVED BY THE PLANNING DEPARTMENT AND THE CITY ENGINEER. THE DISTANCE SHALL BE MEASURED FROM THE OUTSIDE RIGHT-OF-WAY OF BULB TO NEAR SIDE RIGHT-OF-WAY OF INTERSECTING STREET ALONG THE STREET CENTERLINE.
7. DEAD END ACCESS ROADS IN EXCESS OF 150' IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TVF&R TURNAROUND. SEE TURN AROUND DETAIL DRAWING.
8. MINIMUM 25' INNER AND 45' OUTER TURNING RADII REQUIRED. CONSULT WITH TVF&R FOR WAIVER. WAIVER TO BE SUPPLIED TO THE CITY PRIOR TO DESIGN APPROVAL.



Residential Street Cul-de-sac

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

DRAWING NUMBER: R-1005

DRAWN BY: GCF

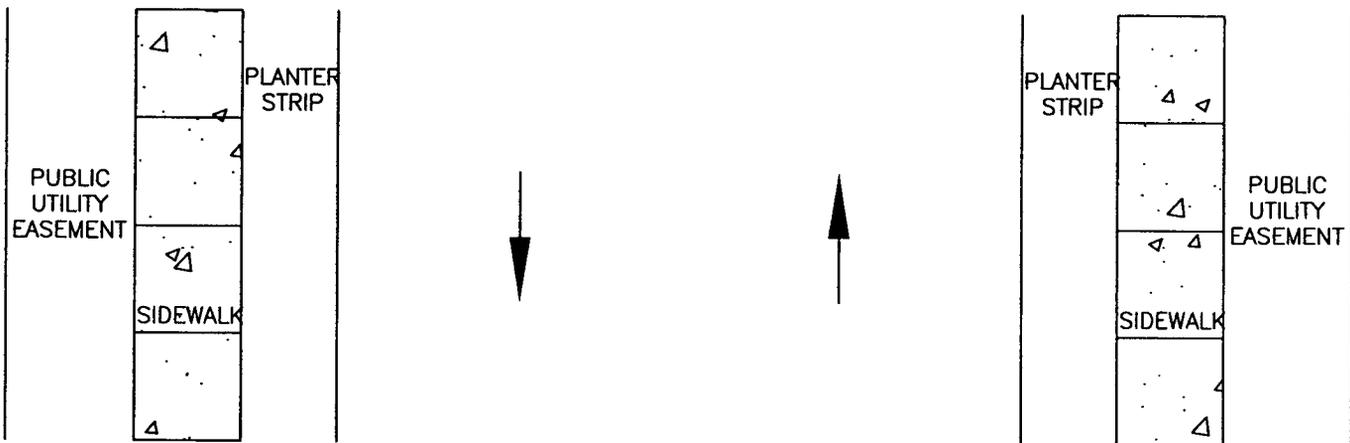
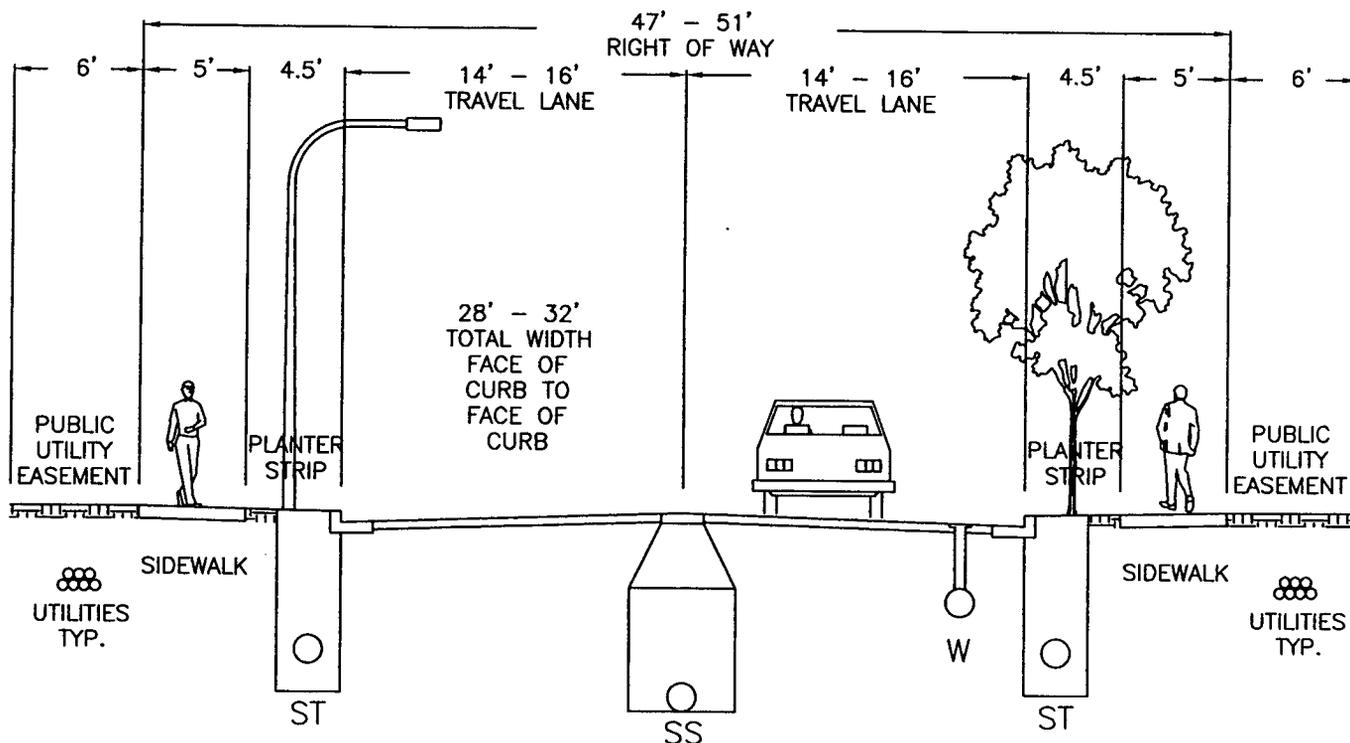
SCALE: N.T.S.

FILE NAME: R-1005.dwg

APPROVED BY: MAS

DATE: 11/01/03

# RESIDENTIAL STREET VIEW LOOKING NORTH OR EAST



**NOTES:**

1. A 4 1/2' PLANTER STRIP IS REQUIRED ON ALL RESIDENTIAL STREETS.
2. WIDTH OF CURB IS INCLUDED IN SIDEWALK OR PLANTER STRIP WIDTH.
3. STREET LIGHTS AND STREET TREES SHALL BE LOCATED WITHIN PLANTERSTRIP AS REQUIRED.
4. NO STRIPING ON STREET. SIGNAGE AS REQUIRED.
5. ON STREET PARKING IS OPTIONAL, CONSISTENT WITH EMERGENCY REQUIREMENTS:
  - PARKING ON ONE SIDE ONLY WITH 28' WIDTH.
  - PARKING ON BOTH SIDES WITH 32' WIDTH.

Residential Street

CITY OF  
WILSONVILLE



DRAWING NUMBER: R-1010

DRAWN BY: GCF

SCALE: N.T.S.

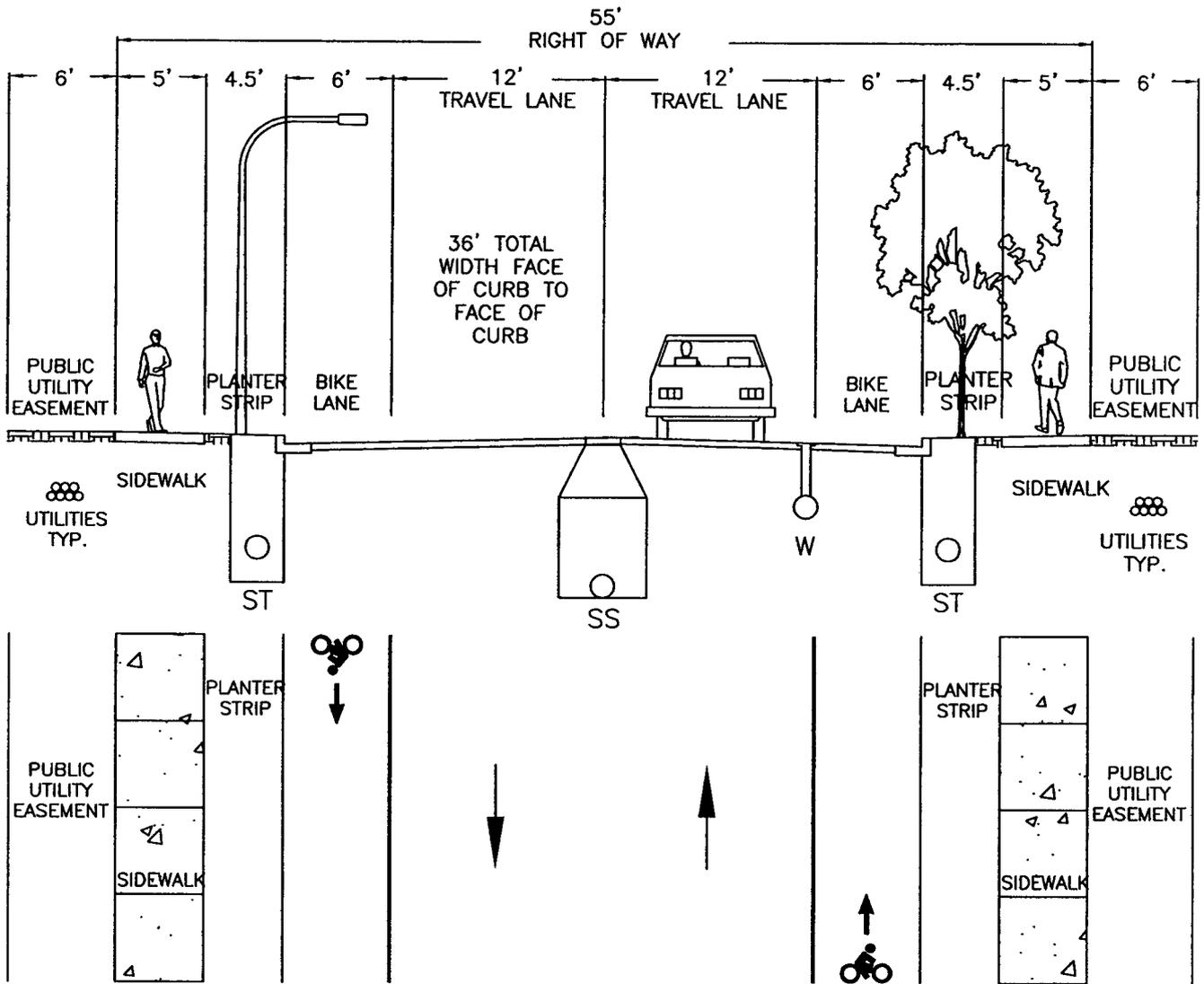
FILE NAME: R-1010.dwg

APPROVED BY: MAS

DATE: 11/01/03

PUBLIC WORKS STANDARDS

# RESIDENTIAL TRANSIT VIEW LOOKING NORTH OR EAST



**NOTES:**

1. A 4 1/2' PLANTER STRIP IS REQUIRED ON ALL RESIDENTIAL COLLECTOR STREETS.
2. WIDTH OF CURB IS INCLUDED IN SIDEWALK OR PLANTER STRIP WIDTH.
3. STREET LIGHTS AND STREET TREES SHALL BE LOCATED WITHIN PLANTER STRIP AS REQUIRED.
4. NO STRIPING ON STREET. SIGNAGE AS REQUIRED. PARKING AREAS TO BE DESIGNATED.
5. ON STREET PARKING IS ALLOWED CONSISTENT WITH EMERGENCY REQUIREMENTS. TRANSIT STOP LOCATIONS TO BE DETERMINED BY TRANSIT DIRECTOR AND LOCATED WITHIN PARKING AREA.
6. THIS SECTION TO BE USED ONLY FOR DESIGNATED TRANSIT CORRIDORS WITH PRIOR APPROVAL FROM DEVELOPMENT REVIEW BOARD, TRANSIT DIRECTOR, AND CITY ENGINEER.

Residential Transit

CITY OF  
WILSONVILLE



DRAWING NUMBER: R-1015

DRAWN BY: GCF

SCALE: N.T.S.

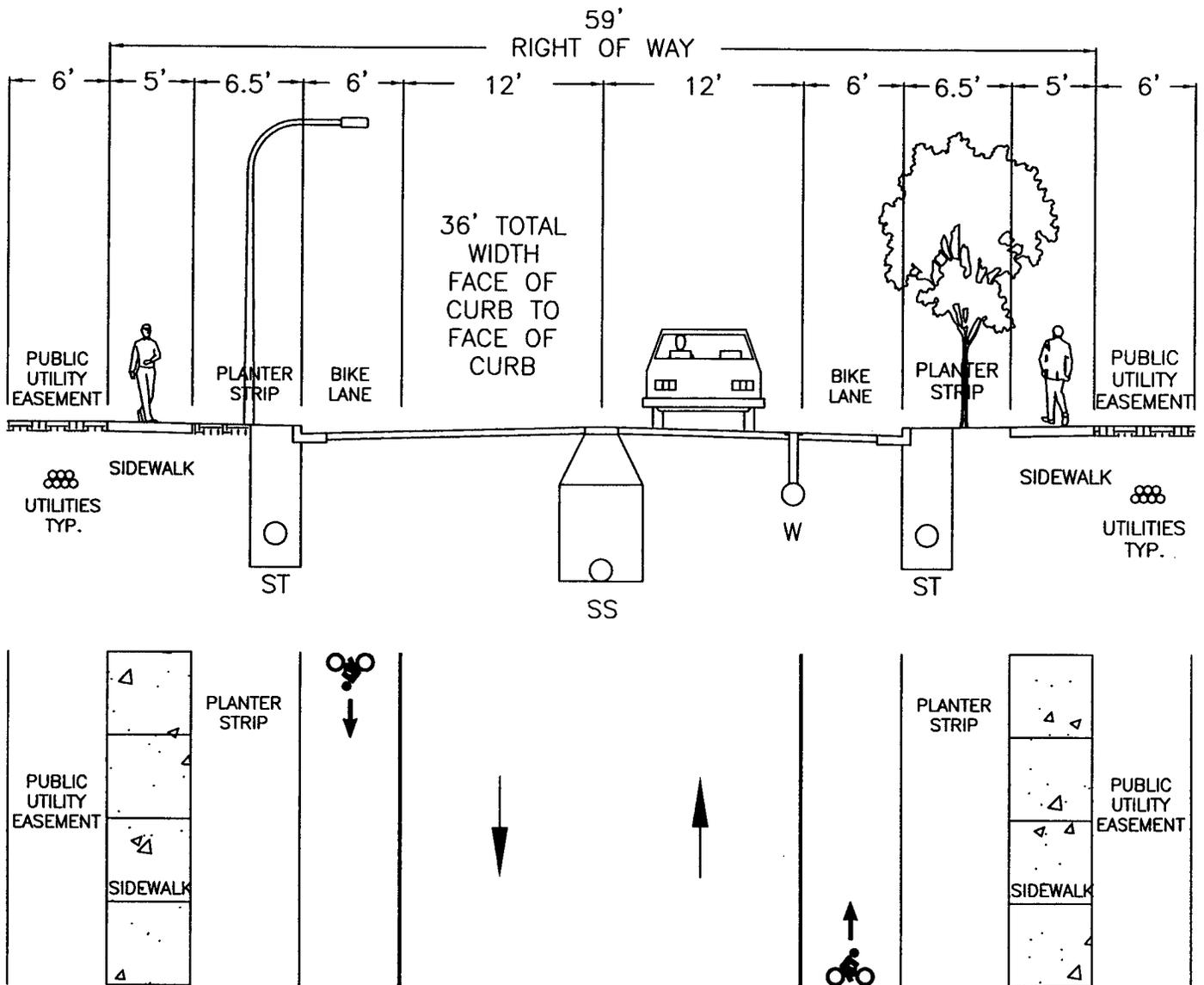
FILE NAME: R-1015.dwg

APPROVED BY: MAS

DATE: 11/01/03

PUBLIC WORKS STANDARDS

MINOR COLLECTOR  
VIEW LOOKING NORTH OR EAST



NOTES:

1. A 6 1/2' PLANTER STRIP IS REQUIRED ON ALL MINOR COLLECTOR STREETS.
2. WIDTH OF CURB IS INCLUDED IN SIDEWALK OR PLANTER STRIP WIDTH.
3. COMBINATION SIDEWALK AND PUBLIC UTILITY EASEMENT IS REQUIRED IN COMMERCIAL/RETAIL ZONES WHERE BUILDINGS DIRECTLY ADJOIN SIDEWALKS.
4. STREET LIGHTS AND STREET TREES SHALL BE LOCATED WITHIN PLANTER STRIP AS REQUIRED.
5. STRIPING AND SIGNAGE AS REQUIRED.
6. NO ON-STREET PARKING IS ALLOWED. TRANSIT STOP LOCATIONS TO BE DETERMINED BY TRANSIT DIRECTOR.

Minor Collector

DRAWING NUMBER: R-1020

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: R-1020.dwg

APPROVED BY: MAS

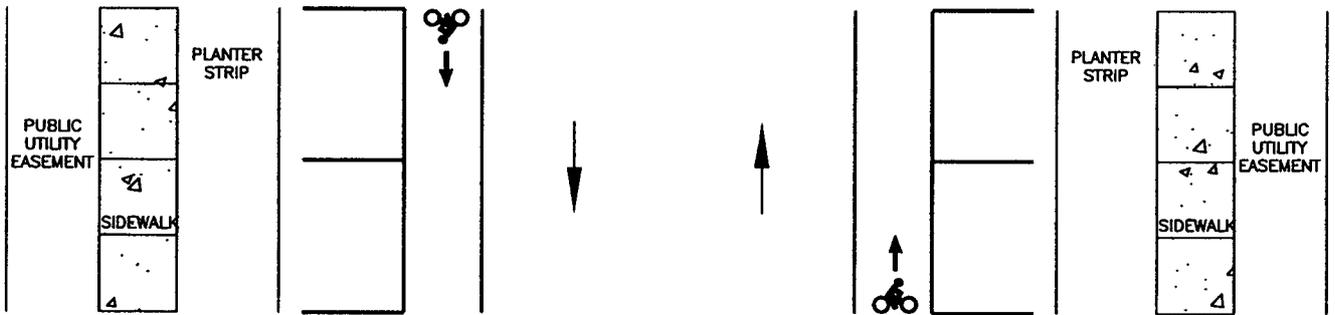
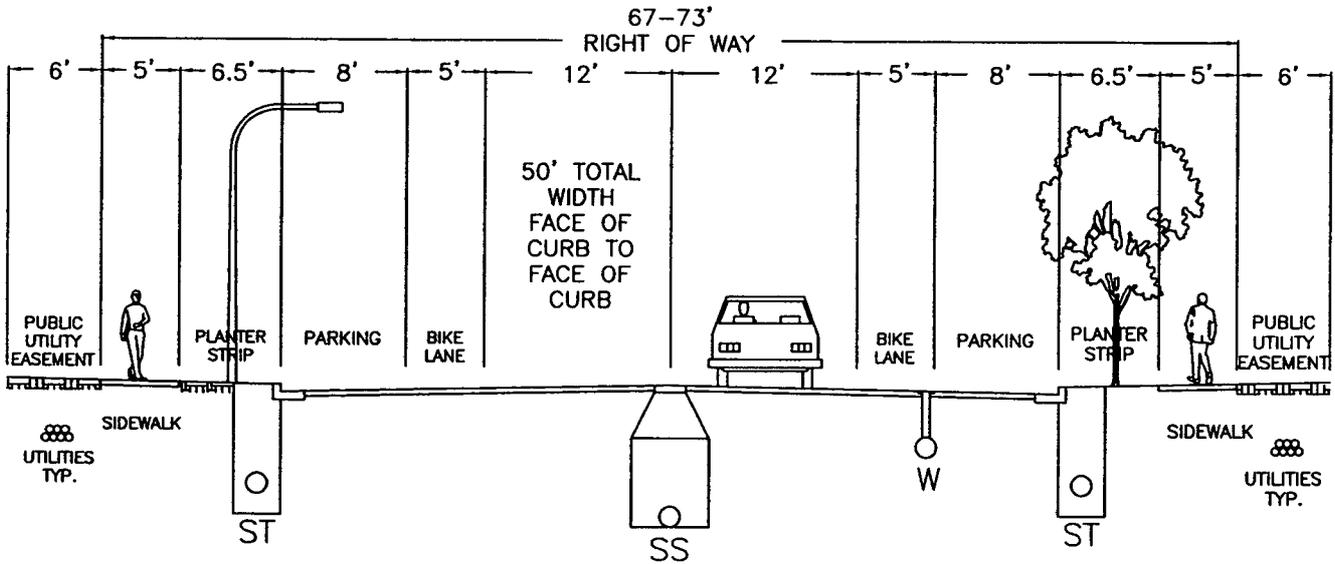
DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

MINOR COLLECTOR WITH ON-STREET PARKING  
VIEW LOOKING NORTH OR EAST



NOTES:

1. A 6 1/2' PLANTER STRIP IS REQUIRED ON ALL MINOR COLLECTOR WITH ON STREET PARKING STREETS IN ALL NON-COMMERCIAL/RETAIL AREAS. WIDTH OF SIDEWALK AND PLANTING STRIP MAY BE COMBINED IN COMMERCIAL/RETAIL AREAS FOR A TOTAL WIDTH OF 8 1/2': STREET TREES SHALL BE IN 4' TREE WELLS ONLY AND ADJACENT TO CURB, SIDEWALK SHALL BE 8 1/2' WIDE AND ADJACENT TO CURB, LEAVING A MINIMUM OF 5' CLEAR SIDEWALK.
2. WIDTH OF CURB IS INCLUDED IN SIDEWALK OR PLANTER STRIP WIDTH.
3. STREET LIGHTS SHALL BE LOCATED WITHIN PLANTER STRIP OR, IF COMMERCIAL/RETAIL AREA, SIDEWALK AS REQUIRED.
4. STRIPING AND SIGNAGE AS REQUIRED. BICYCLE LANES SHALL NOT BE STRIPED UNTIL VOLUME REACHES 1,500 VEH./DAY OR AS DETERMINED BY THE CITY ENGINEER.
5. ON STREET PARKING ON BOTH SIDIS ALLOWED. TRANSIT STOP LOCATIONS TO BE DETERMINED BY TRANSIT DIRECTOR AND LOCATED WITHIN PARKING OR AT BULB-OUT AREA.

Minor Collector with On-street Parking

CITY OF  
WILSONVILLE



DRAWING NUMBER: R-1025

DRAWN BY: GCF

SCALE: N.T.S.

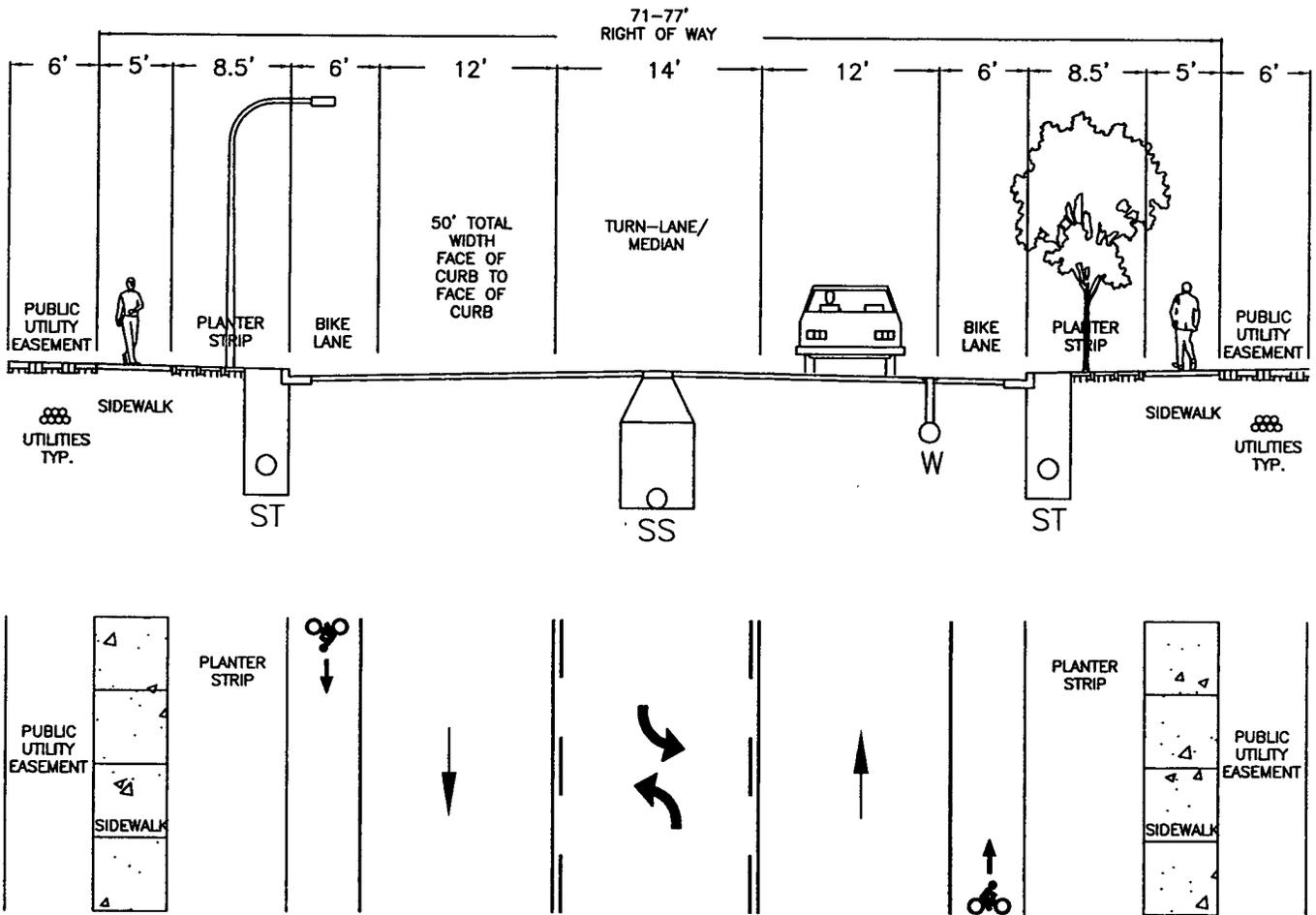
FILE NAME: R-1025.dwg

APPROVED BY: MAS

DATE: 11/01/03

PUBLIC WORKS STANDARDS

MAJOR COLLECTOR  
VIEW LOOKING NORTH OR EAST



NOTES:

1. A 8 1/2' PLANTER STRIP IS REQUIRED ON ALL MAJOR COLLECTOR STREETS IN ALL NON COMMERCIAL/RETAIL AREAS. WIDTH OF SIDEWALK AND PLANTING STRIP MAY BE COMBINED IN COMMERCIAL/RETAIL AREAS FOR A TOTAL WIDTH OF 10 1/2'. STREET TREES SHALL BE IN 4' TREE WELLS ONLY AND ADJACENT TO CURB, SIDEWALK SHALL BE 10 1/2' WIDE AND ADJACENT TO CURB, LEAVING A MINIMUM OF 6' CLEAR SIDEWALK.
2. WIDTH OF CURB IS INCLUDED IN SIDEWALK OR PLANTER STRIP WIDTH.
3. STREET LIGHTS SHALL BE LOCATED WITHIN PLANTER STRIP OR, IF COMMERCIAL/RETAIL AREA, SIDEWALK AS REQUIRED.
4. STRIPING AND SIGNAGE AS REQUIRED.
5. ON STREET PARKING IS NOT ALLOWED. TRANSIT STOP LOCATIONS TO BE DETERMINED BY TRANSIT DIRECTOR.
6. MEDIAN SHALL BE LANDSCAPED WHEN NOT NEEDED AS A LEFT-TURN LANE.
7. MAXIMUM DISTANCE BETWEEN STORM MANHOLES SHALL BE 1600 FEET WITH THREE FLOW THRU INLETS EVENLY SPACED BETWEEN EACH MANHOLE.

Major Collector

CITY OF  
WILSONVILLE



DRAWING NUMBER: R-1030

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1030.dwg

APPROVED BY: SA

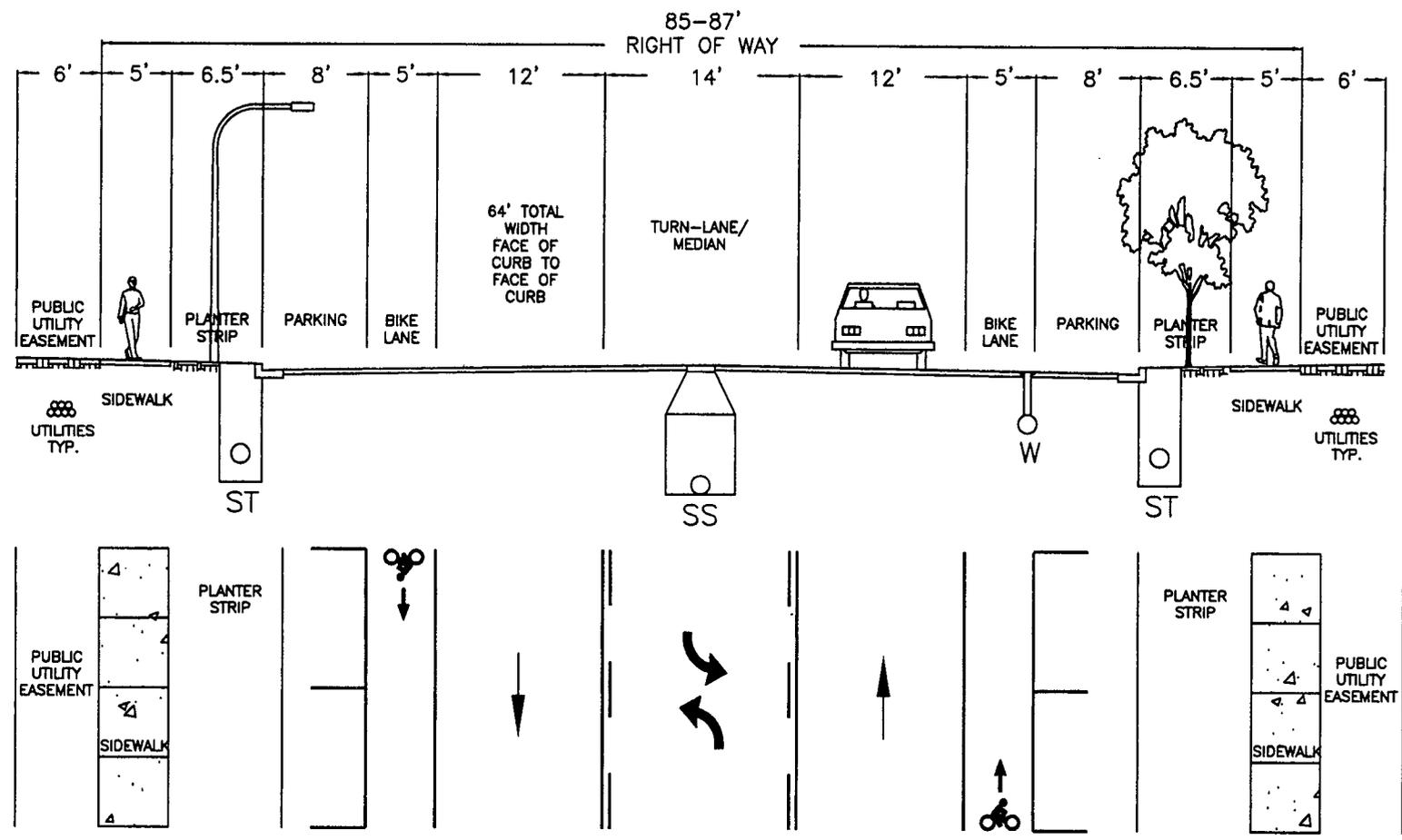
DATE: 03/20/06

PUBLIC WORKS STANDARDS

FILE NAME: R-1035.dwg  
 DRAWING NUMBER: R-1035  
 DRAWN BY: GCF  
 APPROVED BY: MAS  
 DATE: 11/01/03  
 SCALE: N.T.S.  
 CITY OF WILSONVILLE  
 PUBLIC WORKS STANDARDS

Major Collector with On-street Parking

MAJOR COLLECTOR WITH ON-STREET PARKING  
VIEW LOOKING NORTH OR EAST



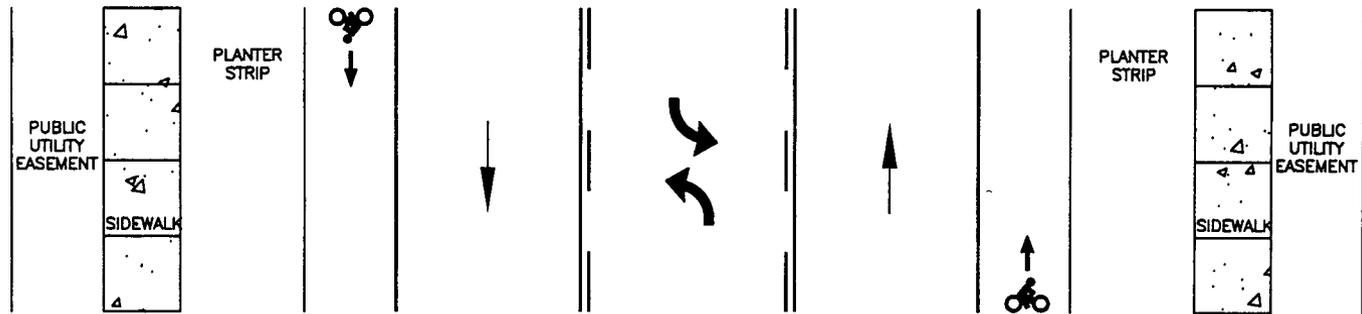
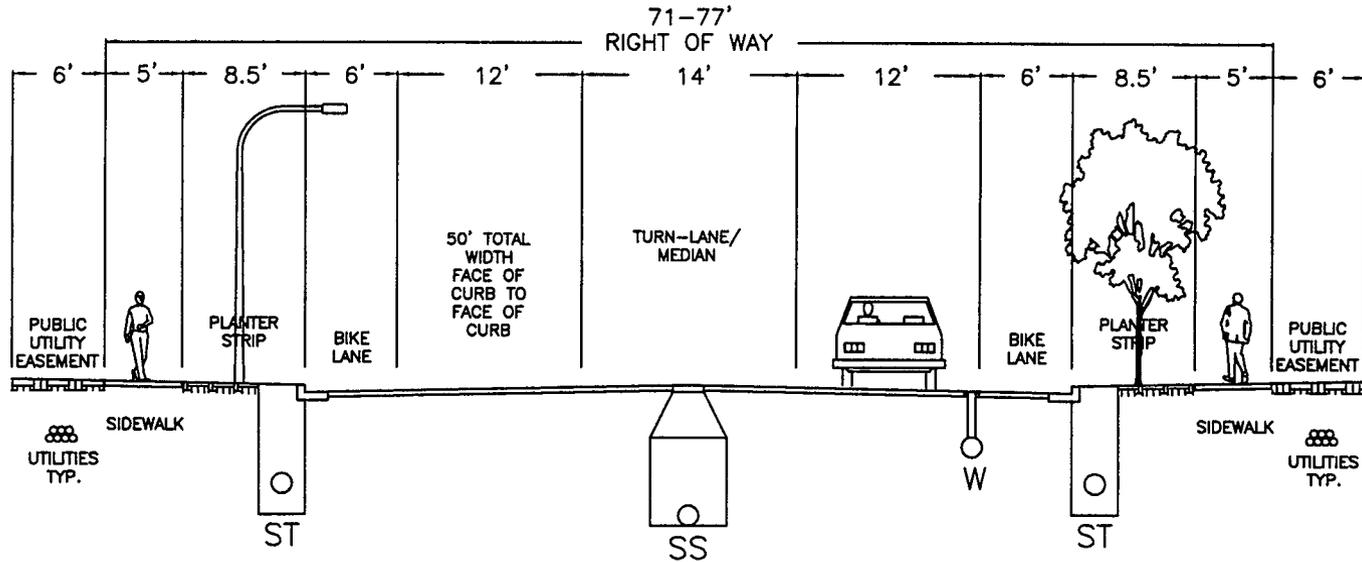
NOTES:

1. A 6 1/2' PLANTER STRIP IS REQUIRED ON ALL MAJOR COLLECTOR STREETS WITH ON-STREET PARKING IN ALL NON-COMMERCIAL/RETAIL AREAS. WIDTH OF SIDEWALK AND PLANTING STRIP MAY BE COMBINED IN COMMERCIAL/RETAIL AREAS FOR A TOTAL WIDTH OF 10 1/2'. STREET TREES SHALL BE IN 4' TREE WELLS ONLY AND ADJACENT TO CURB, SIDEWALK SHALL BE 10 1/2' WIDE AND ADJACENT TO CURB, LEAVING A MINIMUM OF 6' CLEAR SIDEWALK.
2. WIDTH OF CURB IS INCLUDED IN SIDEWALK OR PLANTER STRIP WIDTH.
3. STREET LIGHTS SHALL BE LOCATED IN SIDEWALK AS REQUIRED.
4. STRIPING AND SIGNAGE AS REQUIRED. BICYCLE LANES SHALL NOT BE STRIPED UNTIL 1,500 VEH./DAY OR AS DETERMINED BY THE CITY ENGINEER.
5. ON STREET PARKING ON BOTH SIDIS ALLOWED. TRANSIT STOP LOCATIONS TO BE DETERMINED BY TRANSIT DIRECTOR AND LOCATED WITHIN PARKING OR AT BULB-OUT AREA.
6. MEDIAN SHALL BE LANDSCAPED WHEN NOT NEEDED AS A LEFT-TURN LANE.
7. SEE TRANSPORTATION SYSTEM PLAN FIGURE "MINOR COLLECTOR WITH ON-STREET PARKING" FOR CROSSWALK WITH BULB-OUTS.
8. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 1600 FEET WITH THREE FLOW THRU INLETS BETWEEN EACH MANHOLE.

FILE NAME: R-1040.dwg  
 DRAWING NUMBER: R-1040  
 DRAWN BY: SJ  
 APPROVED BY: SA  
 DATE: 03/20/06  
 SCALE: N.T.S.

Minor Arterial

MINOR ARTERIAL  
 VIEW LOOKING NORTH OR EAST



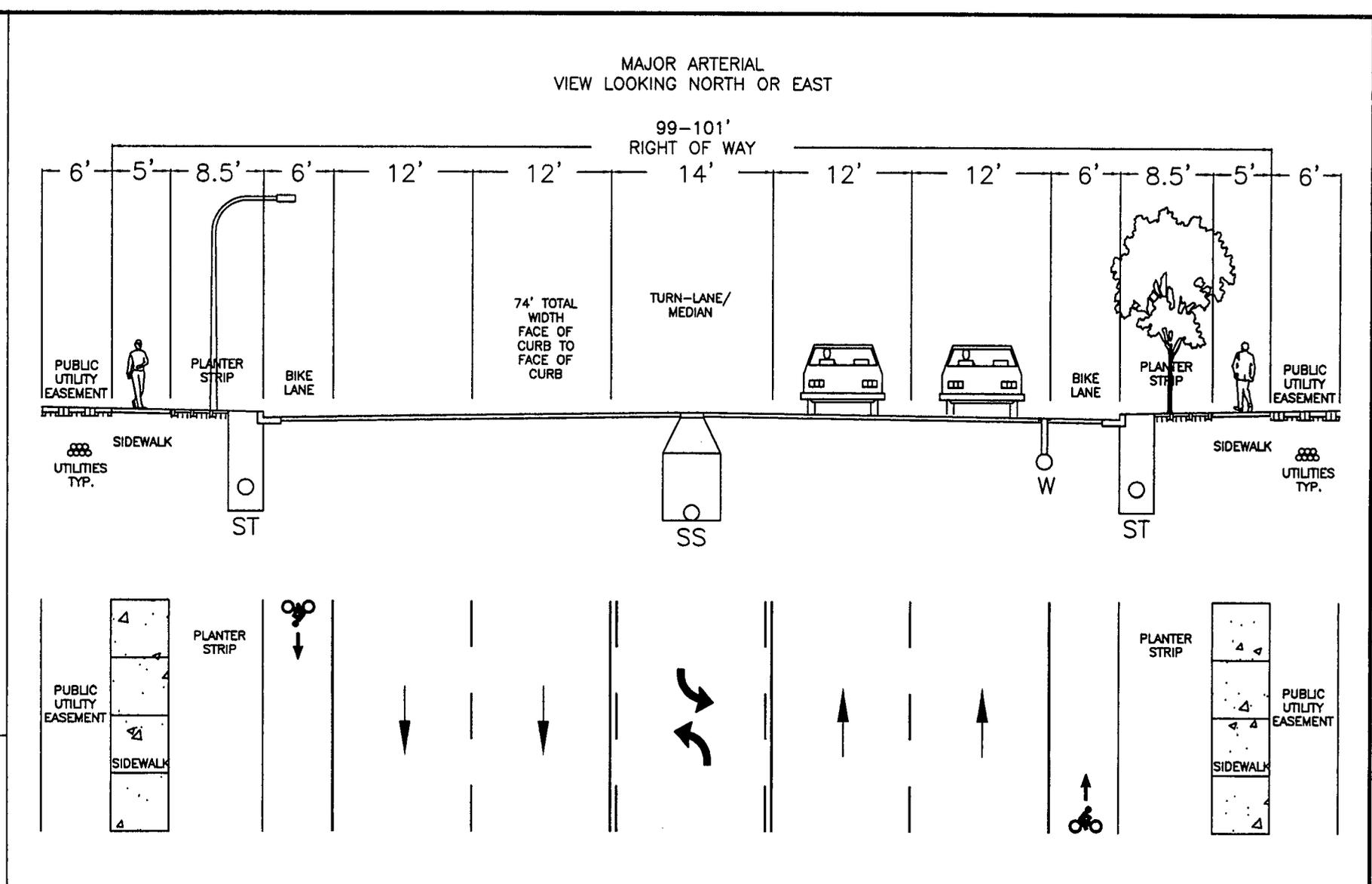
NOTES:

1. A 8 1/2' PLANTER STRIP IS REQUIRED ON ALL MINOR ARTERIAL STREETS IN ALL NON-COMMERCIAL/RETAIL AREAS. WIDTH OF SIDEWALK AND PLANTING STRIP MAY BE COMBINED IN COMMERCIAL/RETAIL AREAS FOR A TOTAL WIDTH OF 10 1/2'; STREET TREES SHALL BE IN 4' TREE WELLS ONLY AND ADJACENT TO CURB, SIDEWALK SHALL BE 10 1/2' WIDE AND ADJACENT TO CURB, LEAVING A MINIMUM OF 6' CLEAR SIDEWALK.
2. WIDTH OF CURB IS INCLUDED IN SIDEWALK OR PLANTER STRIP WIDTH.
3. STREET LIGHTS SHALL BE LOCATED WITHIN PLANTER STRIP OR, IF COMMERCIAL/RETAIL AREA, SIDEWALK AS REQUIRED.
4. STRIPING AND SIGNAGE AS REQUIRED.
5. ON-STREET PARKING IS NOT ALLOWED. TRANSIT STOP LOCATIONS TO BE DETERMINED BY TRANSIT DIRECTOR.
6. MEDIAN SHALL BE LANDSCAPED WHEN NOT NEEDED AS A LEFT-TURN LANE.
7. SEE SPECIAL SETBACK REQUIREMENTS FOR MINOR ARTERIAL STREET SECTIONS.
8. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 1600 FEET WITH THREE FLOW THRU INLETS EVENLY SPACED BETWEEN EACH MANHOLE.

CITY OF  
 WILSONVILLE  
 PUBLIC WORKS STANDARDS



DRAWING NUMBER: R-1045  
 FILE NAME: R-1045.dwg  
 DRAWN BY: SJ  
 APPROVED BY: SA  
 SCALE: N.T.S.  
 DATE: 03/22/06  
 CITY OF WILSONVILLE  
 PUBLIC WORKS STANDARDS



- NOTES:
1. A 8 1/2' PLANTER STRIP IS REQUIRED ON ALL MAJOR ARTERIAL STREETS IN ALL NON-COMMERCIAL/RETAIL AREAS. WIDTH OF SIDEWALK AND PLANTING STRIP MAY BE COMBINED IN COMMERCIAL/RETAIL AREAS FOR A TOTAL WIDTH OF 12 1/2'; STREET TREES SHALL BE IN 4' TREE WELLS ONLY AND ADJACENT TO CURB, SIDEWALK SHALL BE 12 1/2' WIDE AND ADJACENT TO CURB, LEAVING A MINIMUM OF 8' CLEAR SIDEWALK.
  2. WIDTH OF CURB IS INCLUDED IN SIDEWALK OR PLANTER STRIP WIDTH.
  3. STREET LIGHTS SHALL BE LOCATED WITHIN PLANTER STRIP OR, IF COMMERCIAL/RETAIL AREA, SIDEWALK AS REQUIRED.
  4. STRIPING AND SIGNAGE AS REQUIRED.
  5. ON-STREET PARKING IS NOT ALLOWED. TRANSIT STOP LOCATIONS TO BE DETERMINED BY TRANSIT DIRECTOR.
  6. MEDIAN SHALL BE LANDSCAPED WHEN NOT NEEDED AS A LEFT-TURN LANE.
  7. SEE SPECIAL SETBACK REQUIREMENTS FOR MAJOR ARTERIAL STREET SECTIONS.
  8. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 1600 FEET WITH THREE FLOW THRU INLETS EVENLY SPACED BETWEEN EACH MANHOLE.

FILE NAME: R-1050.dwg

DRAWING NUMBER: R-1050

APPROVED BY: SA

DRAWN BY: SJ

DATE: 03/20/06

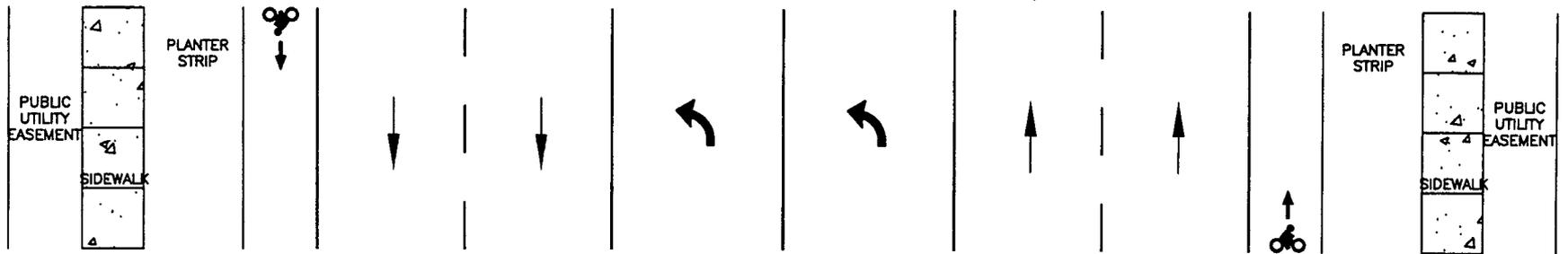
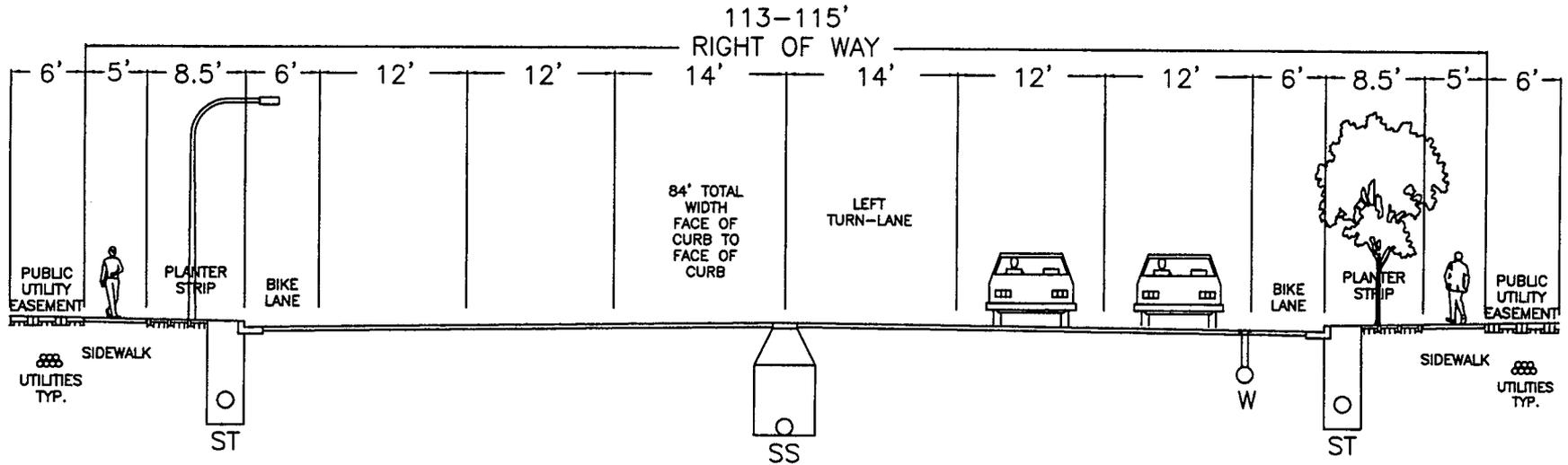
SCALE: N.T.S.

CITY OF WILSONVILLE  
PUBLIC WORKS STANDARDS



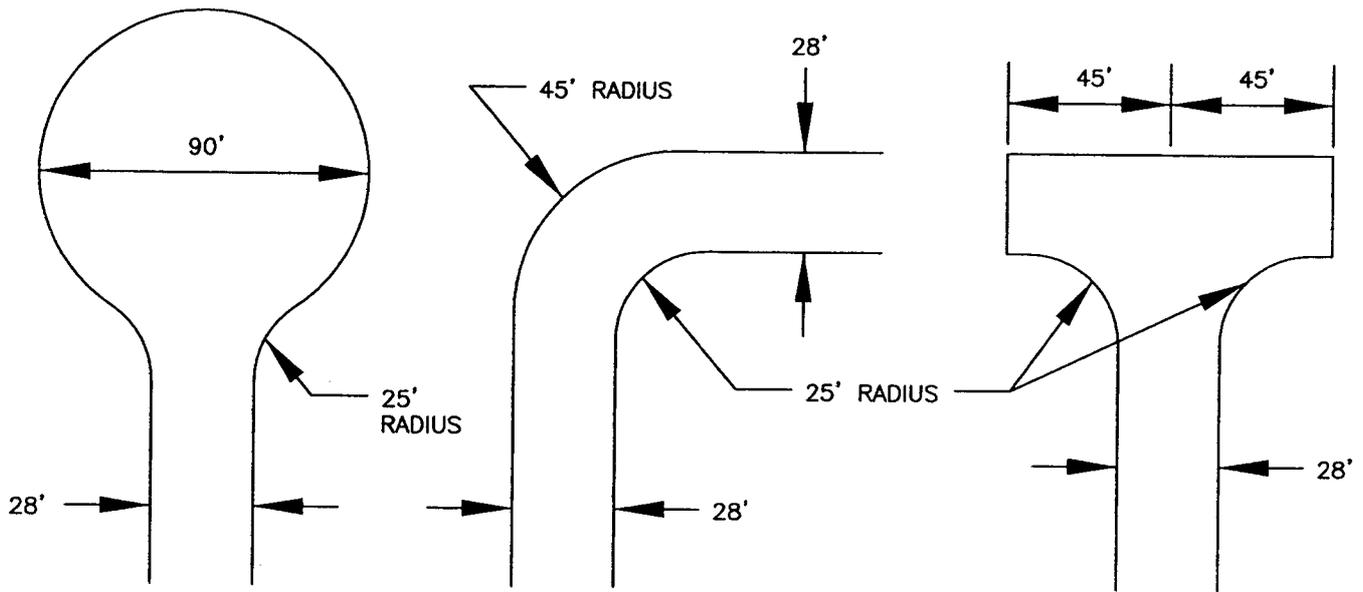
Major Arterial with Dual Left Turns

MAJOR ARTERIAL WITH DUAL LEFT-TURNS  
VIEW LOOKING NORTH OR EAST



NOTES:

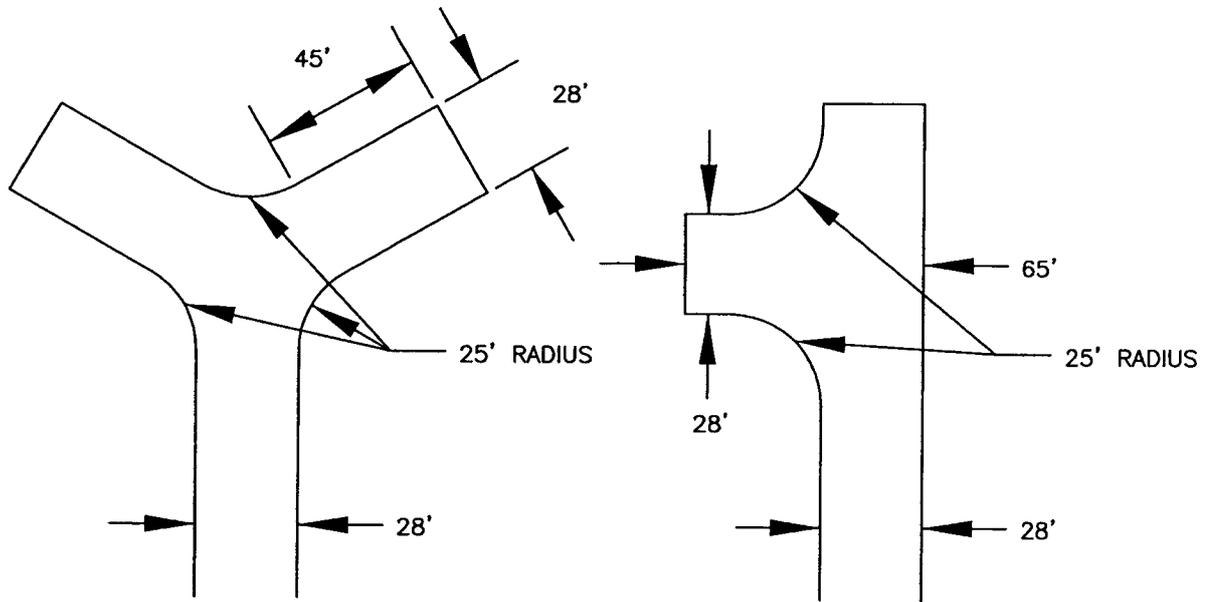
1. A 8 1/2' PLANTER STRIP IS REQUIRED ON ALL MAJOR ARTERIAL WITH DUAL LEFT-TURN STREETS IN ALL NON-COMMERCIAL/RETAIL AREAS. WIDTH OF SIDEWALK AND PLANTING STRIP MAY BE COMBINED IN COMMERCIAL/RETAIL AREAS FOR A TOTAL WIDTH OF 12 1/2'. STREET TREES SHALL BE IN 4' TREE WELLS ONLY AND ADJACENT TO CURB, SIDEWALK SHALL BE 12 1/2' WIDE AND ADJACENT TO CURB, LEAVING A MINIMUM OF 8' CLEAR SIDEWALK.
2. WIDTH OF CURB IS INCLUDED IN SIDEWALK OR PLANTER STRIP WIDTH.
3. STREET LIGHTS SHALL BE LOCATED WITHIN PLANTER STRIP, OR IF COMMERCIAL/RETAIL AREA, SIDEWALK AS REQUIRED.
4. STRIPING AND SIGNAGE AS REQUIRED.
5. ON-STREET PARKING IS NOT ALLOWED. TRANSIT STOP LOCATIONS TO BE DETERMINED BY TRANSIT DIRECTOR.
6. MEDIAN SHALL BE LANDSCAPED WHEN NOT NEEDED AS A LEFT-TURN LANE.
7. SEE SPECIAL SETBACK REQUIREMENTS FOR MAJOR ARTERIAL WITH DUAL LEFT-TURN STREET SECTIONS.
8. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 1600 FEET WITH THREE FLOW THRU INLETS EVENLY SPACED BETWEEN EACH MANHOLE.



CUL-DE-SAC

INSIDE & OUTSIDE  
TURNING RADIUS

HAMMERHEAD



HAMMERHEAD  
ALTERNATIVE 1

HAMMERHEAD  
ALTERNATIVE 2

NOTE:

1. APPROVAL FOR ALTERNATIVE TO CUL-DE-SAC SHALL BE APPROVED BY THE CITY ENGINEER AND THE FIRE MARSHALL.
2. ALL DISTANCES ARE MEASURED TO THE FACE OF CURB.
3. ALL STREET WIDTHS SHALL MEET MINIMUM WIDTH REQUIREMENTS AS SPECIFIED IN THE TRANSPORTATION SYSTEMS PLAN OR AS APPROVED BY THE CITY ENGINEER.

Public Road End Alternatives

DRAWING NUMBER: R-1055

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: R-1055.dwg

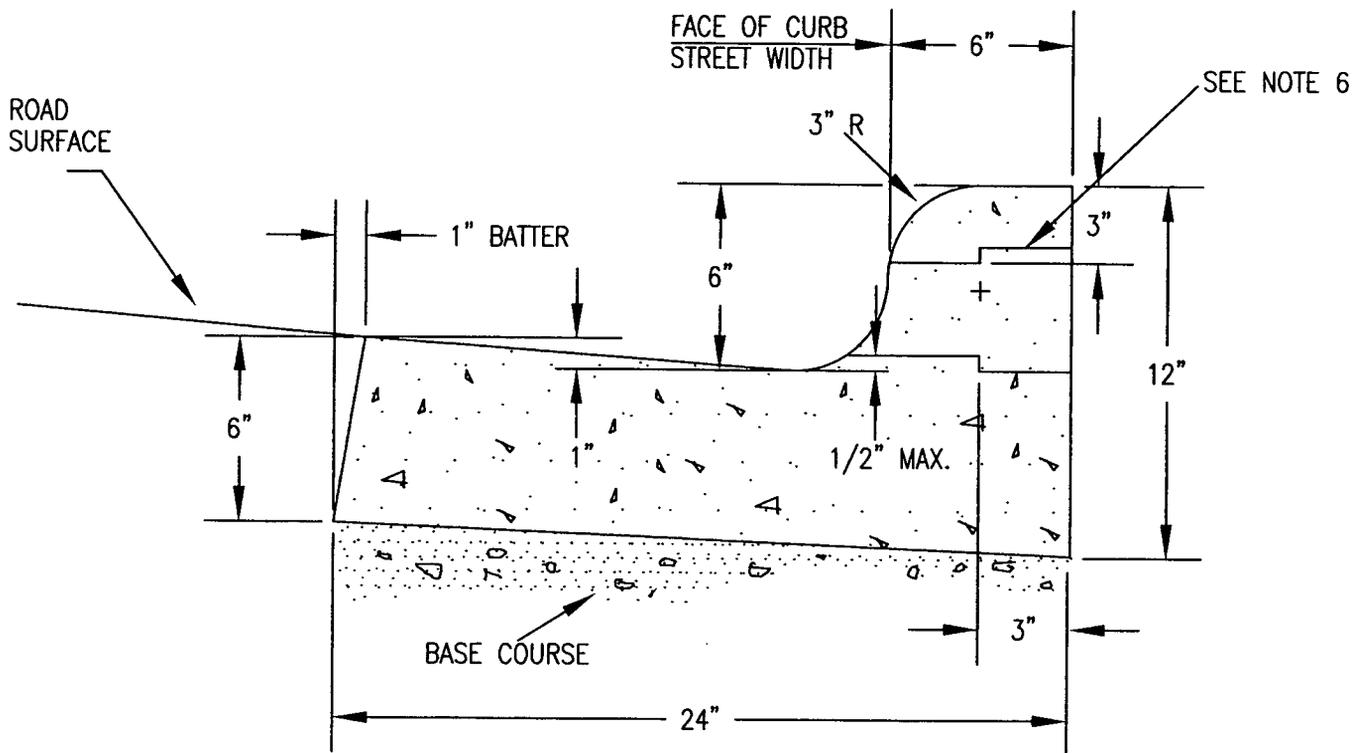
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



1. FOR USE ALONG MEDIANS, GUTTERS MAY BE REDUCED WITH PRIOR APPROVAL FROM THE CITY ENGINEER.
2. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
3. EXPANSION JOINTS.
  - A. TO BE PROVIDED:
    - 1) AT EACH COLD JOINT.
    - 2) AT EACH SIDE OF DRIVEWAYS.
    - 3) AT EACH POINT OF TANGENCY OF THE CURB.
  - B. MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING, WITH A THICKNESS OF 1/2 INCH.
4. CONSTRUCTION JOINTS.
  - A. SPACING TO BE NOT MORE THAN 15 FEET.
  - B. JOINTS SHALL BE HAND SAWCUT, WHEN WET, THROUGH ENTIRE WIDTH OF CURB AND GUTTER
5. BASE ROCK TO BE 3/4"-0 COMPACTED TO 95% OF AASHTO T-180 AND SHALL BE TO SUB GRADE, STREET STRUCTURE, OR 4" IN DEPTH, WHICHEVER IS GREATER.
6. DRAINAGE BLOCK OUT
  - A. 3" I.D. PLASTIC PIPE WITH COUPLING.
  - B. DRAINAGE ACCESS THRU EXISTING CURB SHALL BE CORE DRILLED.

Asphalt Street Curb and Gutter

DRAWING NUMBER: R-1060

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1060.dwg

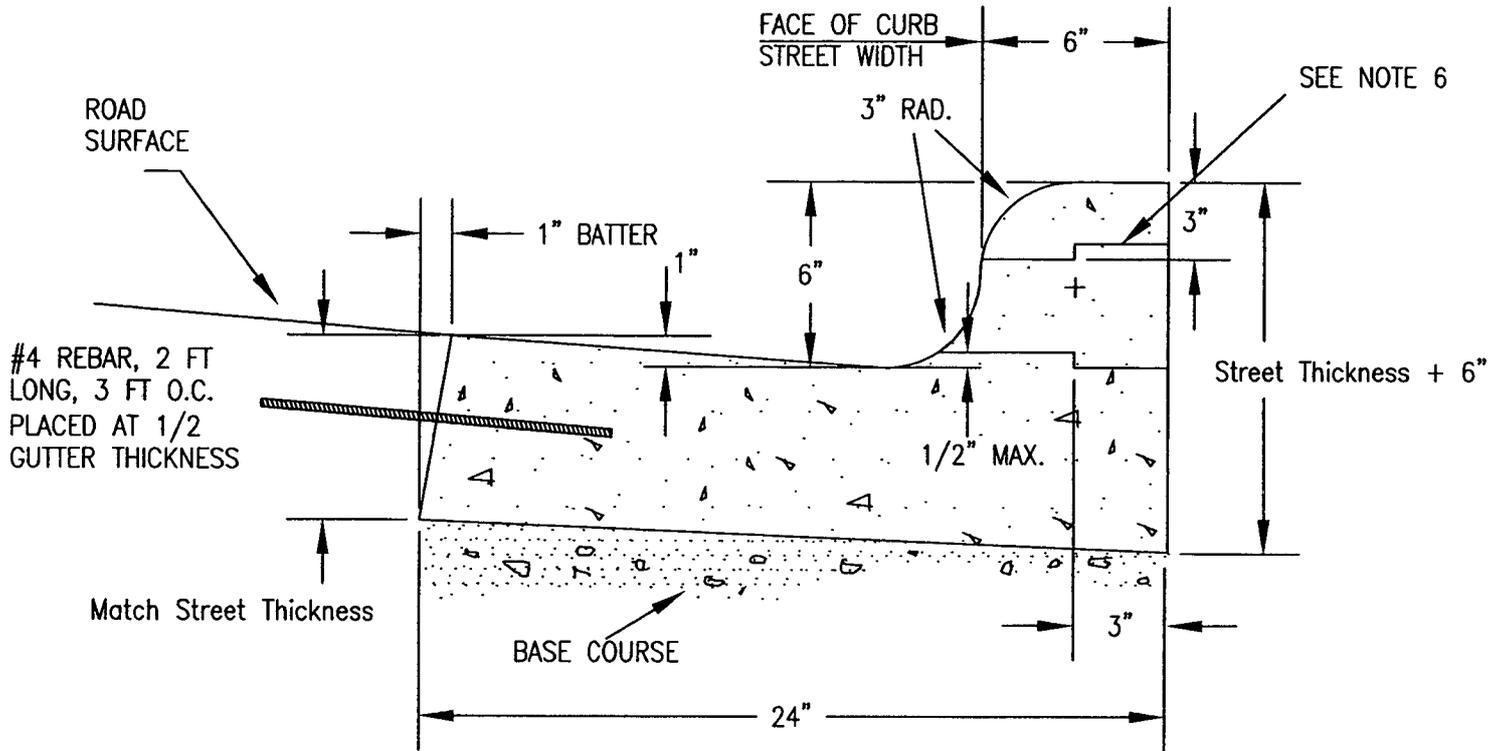
APPROVED BY: SA

DATE: 03/20/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



SEE NOTE 6

1. FOR USE ALONG MEDIANS, GUTTERS MAY BE REDUCED WITH PRIOR APPROVAL FROM THE CITY ENGINEER.
2. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
3. EXPANSION JOINTS.
  - A. TO BE PROVIDED:
    - 1) AT EACH COLD JOINT.
    - 2) AT EACH SIDE OF DRIVEWAYS.
    - 3) AT EACH POINT OF TANGENCY OF THE CURB.
  - B. MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING, WITH A THICKNESS OF 1/2 INCH.
4. CONSTRUCTION JOINTS.
  - A. SPACING TO BE NOT MORE THAN 12 FEET.
  - B. JOINTS SHALL BE HAND SAWCUT, WHEN WET, THROUGH ENTIRE WIDTH OF CURB AND GUTTER.
5. BASE ROCK TO BE 3/4"-0 COMPACTED TO 95% OF AASHTO T-180 AND SHALL BE TO SUB GRADE, STREET STRUCTURE, OR 4" IN DEPTH, WHICHEVER IS GREATER.
6. DRAINAGE BLOCK OUT
  - A. 3" I.D. PLASTIC PIPE WITH COUPLING.
  - B. DRAINAGE ACCESS THRU EXISTING CURB SHALL BE CORE DRILLED.
7. FOR RECONSTRUCTED CURB, DRILL CONCRETE STREET AND SET DOWELS WITH EPOXY PRIOR TO CURB INSTALLATION.

Concrete Street Curb and Gutter

CITY OF WILSONVILLE



DRAWING NUMBER: R-1065

DRAWN BY: SJ

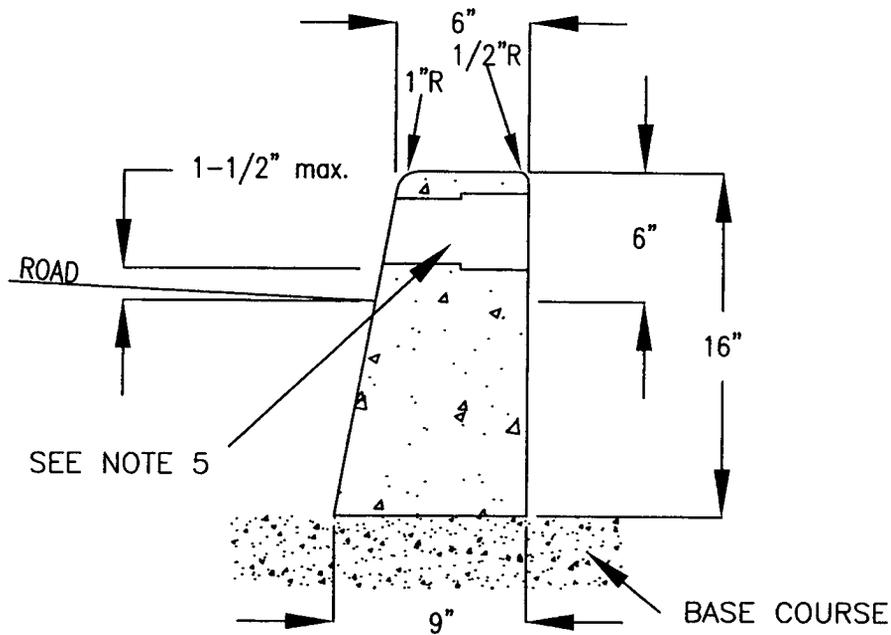
SCALE: N.T.S.

FILE NAME: R-1065.dwg

APPROVED BY: SA

DATE: 03/20/06

PUBLIC WORKS STANDARDS



1. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
2. EXPANSION JOINTS.
  - A. TO BE PROVIDED:
    - 1) AT EACH POINT OF TANGENCY OF THE CURB.
    - 2) AT EACH COLD JOINT.
    - 3) AT EACH SIDE OF DRIVEWAYS.
  - B. MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED, NON-EXTRUDING, WITH A THICKNESS OF 1/2 INCH.
3. CONSTRUCTION JOINTS.
  - A. SPACING TO BE NOT MORE THAN 15 FEET.
  - B. JOINTS SHALL BE HAND SAWCUT, WHEN WET, THROUGH ENTIRE WIDTH OF CURB.
4. BASE ROCK: 3/4"-0", COMPACTED TO 95% OF AASHTO T-180. BASE ROCK SHALL BE TO SUBGRADE OF STREET STRUCTURE OR 4" IN DEPTH, WHICHEVER IS GREATER.
5. DRAINAGE BLOCKOUT - 3" DIA. PLASTIC PIPE.
  - A. I.D. PLASTIC PIPE WITH COUPLING.
  - B. DRAINAGE ACCESS THROUGH EXISTING CURBS SHALL BE CORE DRILLED.

Curb Non-Mountable

DRAWING NUMBER: R-1070

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1070.dwg

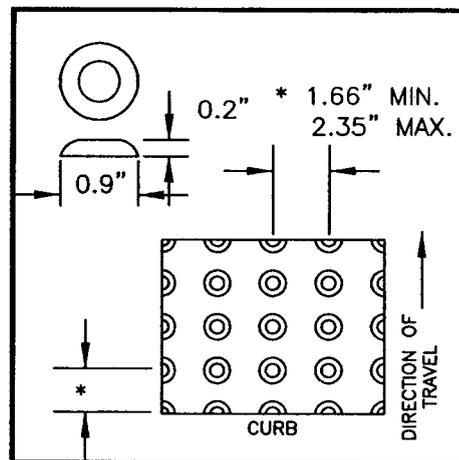
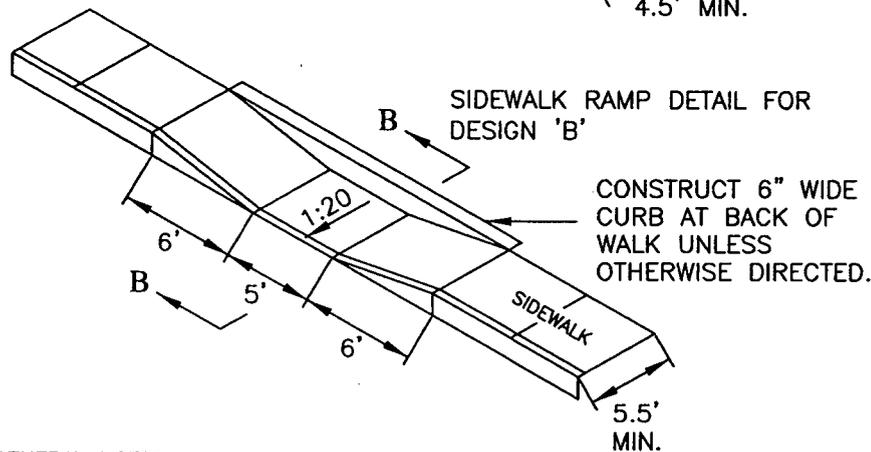
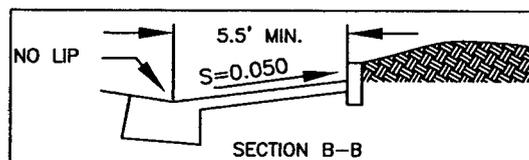
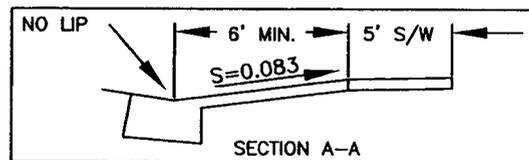
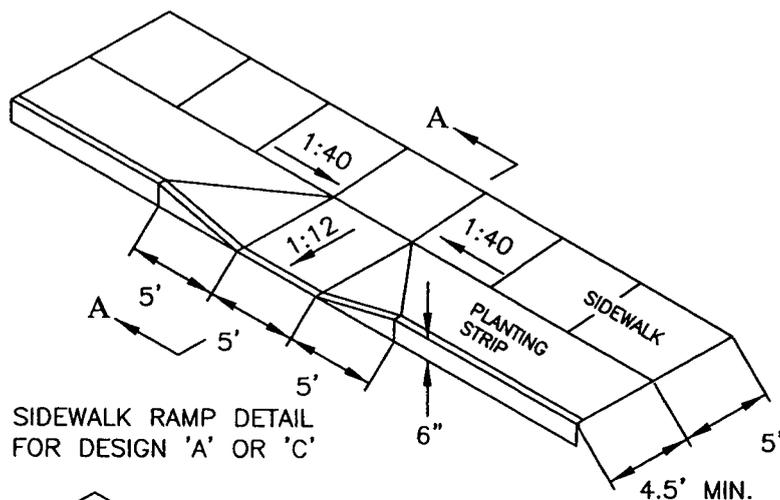
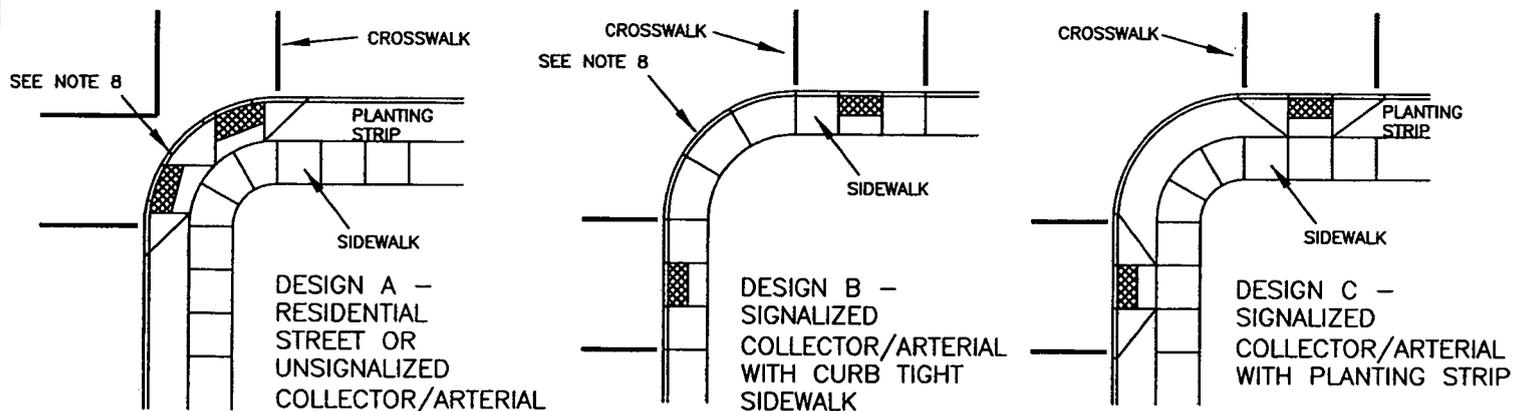
APPROVED BY: SA

DATE: 03/20/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



RAMP TEXTURE PATTERN DETAIL

**GENERAL NOTES:**

1. CONCRETE SHALL BE COMMERCIAL MIXED, MIN. COMPRESSIVE STRENGTH OF 3000 PSI. AT 28 DAYS.
2. RAMP TEXTURE SHALL BE 2' X 2.5' (BLACK) MASCO CAST-IN-TACT WARNING PANELS OR APPROVED EQUAL. TWO PANELS SHALL BE USED TO COMPLETE A 5' WIDE AND 2' DEEP SECTION AT THE BOTTOM OF RAMP.
3. SIDEWALK RAMP SLOPES MAY BE REDUCED TO 1:8, IN ACCORDANCE WITH ORS 447.310, WHEN MODIFYING EXISTING FACILITIES.
4. SIDEWALK RAMP DETAILS ARE BASED ON ORS 447.310.
5. WHERE THE PLANTING STRIP IS LESS THAN 6 FT WIDE, THE SIDEWALK SHALL BE LOWERED AS REQUIRED TO MAINTAIN A MAXIMUM SLOPE OF 1:12.
6. CURB SHALL BE INSTALLED AT BACK OF RAMP FOR DESIGN "A" AND "B" IF DIRECTED BY CITY'S AUTHORIZED REPRESENTATIVE.
7. WHERE PASS THROUGH SIDEWALKS ARE USED IN LIEU OF DESIGN "B", THE WIDTH OF THE PASS THROUGH SIDEWALKS SHALL BE AS FOLLOWS:
  - 3 FEET FOR RECONSTRUCTION OF EXISTING RAMPS.
  - 4 FEET FOR NEW CONSTRUCTION.
8. DESIGN "A" AND "B" CONCRETE THICKNESS SHALL BE 6" MINIMUM PLACED OVER 6" OF COMPACTED 3/4"-0 BASE ROCK ALONG CURB RADIUS.

Sidewalk Ramp

DRAWING NUMBER: R-1075

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1075.dwg

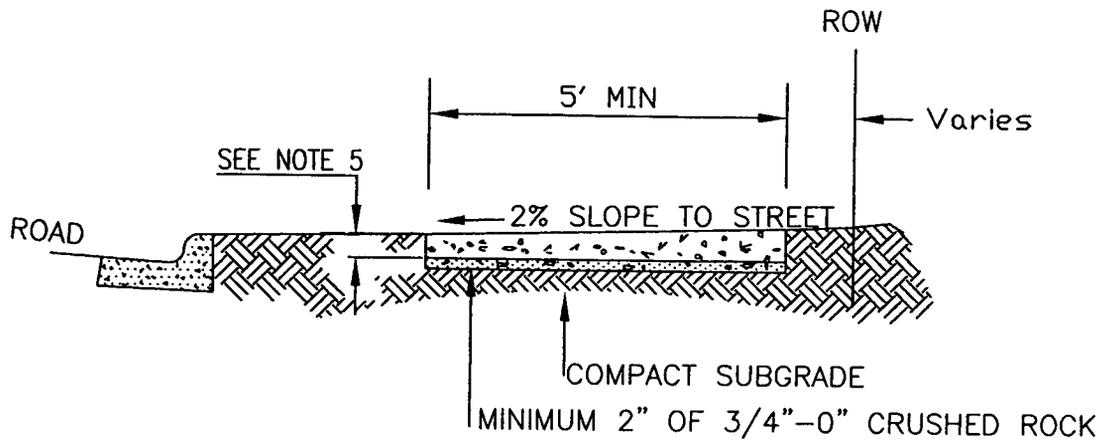
APPROVED BY: SA

DATE: 03/20/06

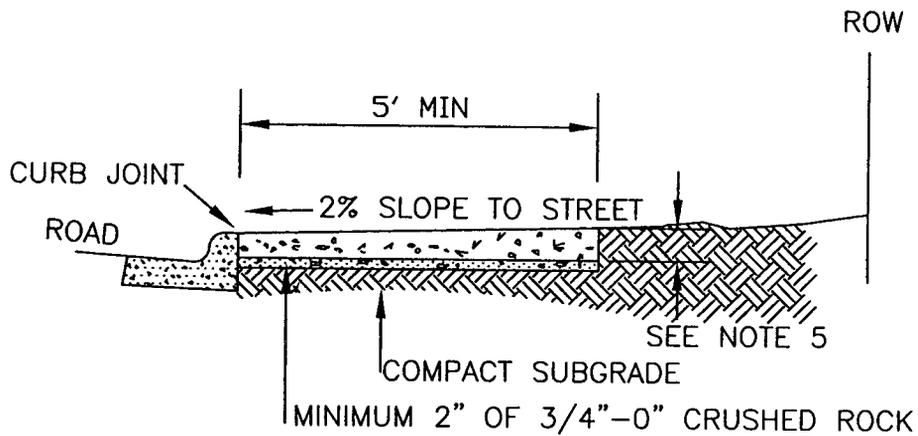
CITY OF WILSONVILLE



PUBLIC WORKS STANDARDS



OFFSET SIDEWALK



CURB TIGHT SIDEWALK

NOTES

1. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI. AT 28 DAYS.
2. PANELS TO BE 5 FEET LONG.
3. EXPANSION JOINTS TO BE PLACED AT SIDES OF DRIVEWAY APPROACHES AND UTILITY VAULTS.
4. FOR SIDEWALKS ADJACENT TO THE CURB AND POURED AT SAME TIME AS THE CURB, THE JOINT BETWEEN THEM SHALL BE A TROWELED JOINT WITH A MINIMUM 1/2" RADIUS.
5. SIDEWALK SHALL HAVE A MINIMUM THICKNESS OF 6 INCHES AT:
  - CURBTIGHT SIDEWALK AT INTERSECTION RADIUS.
  - A MINIMUM OF ONE PANEL BEYOND EDGES OF DRIVEWAYS.
6. DRAIN BLOCKOUTS IN CURBS SHALL BE EXTENDED TO BACK OF SIDEWALK WITH 3" DIA. PLASTIC PIPE AT 2% SLOPE. CONSTRUCTION JOINT TO BE PLACED OVER PIPE.
7. BASE ROCK SHALL BE COMPACTED TO PROVIDE A FIRM BASE FOR CONCRETE.

Concrete Sidewalk

DRAWING NUMBER: R-1080

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1080.dwg

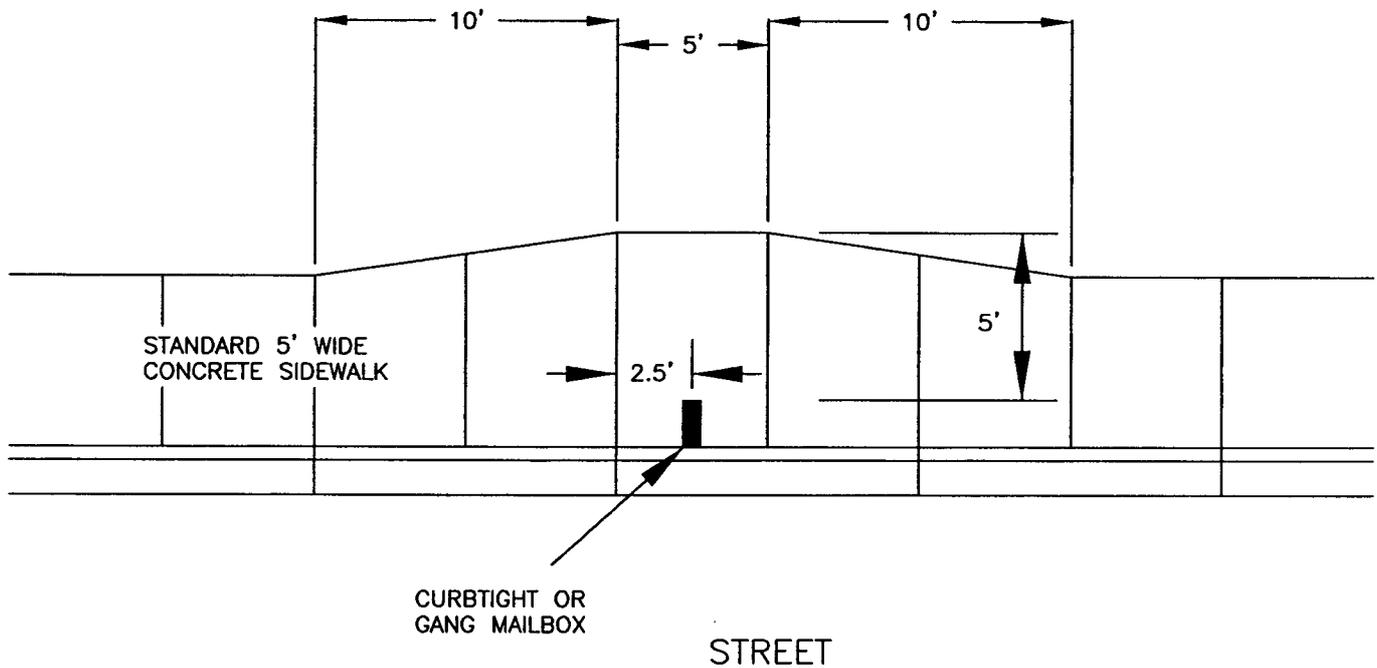
APPROVED BY: SA

DATE: 03/20/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



NOTE:

1. CONSTRUCT WIDENED SIDEWALK AT ALL MAILBOX LOCATIONS.
2. MAILBOX PLACEMENT SPECIFICATIONS:
  - FRONT FACE OF MAILBOX TO BE SET BACK 6" FROM FACE OF CURB.
  - BASE OF MAILBOX TO BE 40" ABOVE PAVEMENT GRADE AT GUTTER.
  - MAINTAIN 5' CLEARANCE BETWEEN BACK OF MAILBOX AND BACK OF WALK.
3. WIDENED SIDEWALK OUTSIDE OF PUBLIC RIGHT OF WAY SHALL HAVE A SIDEWALK EASEMENT DEDICATED TO THE CITY OF WILSONVILLE.

Widened Sidewalk at Mailbox Locations

DRAWING NUMBER: R-1085

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1085.dwg

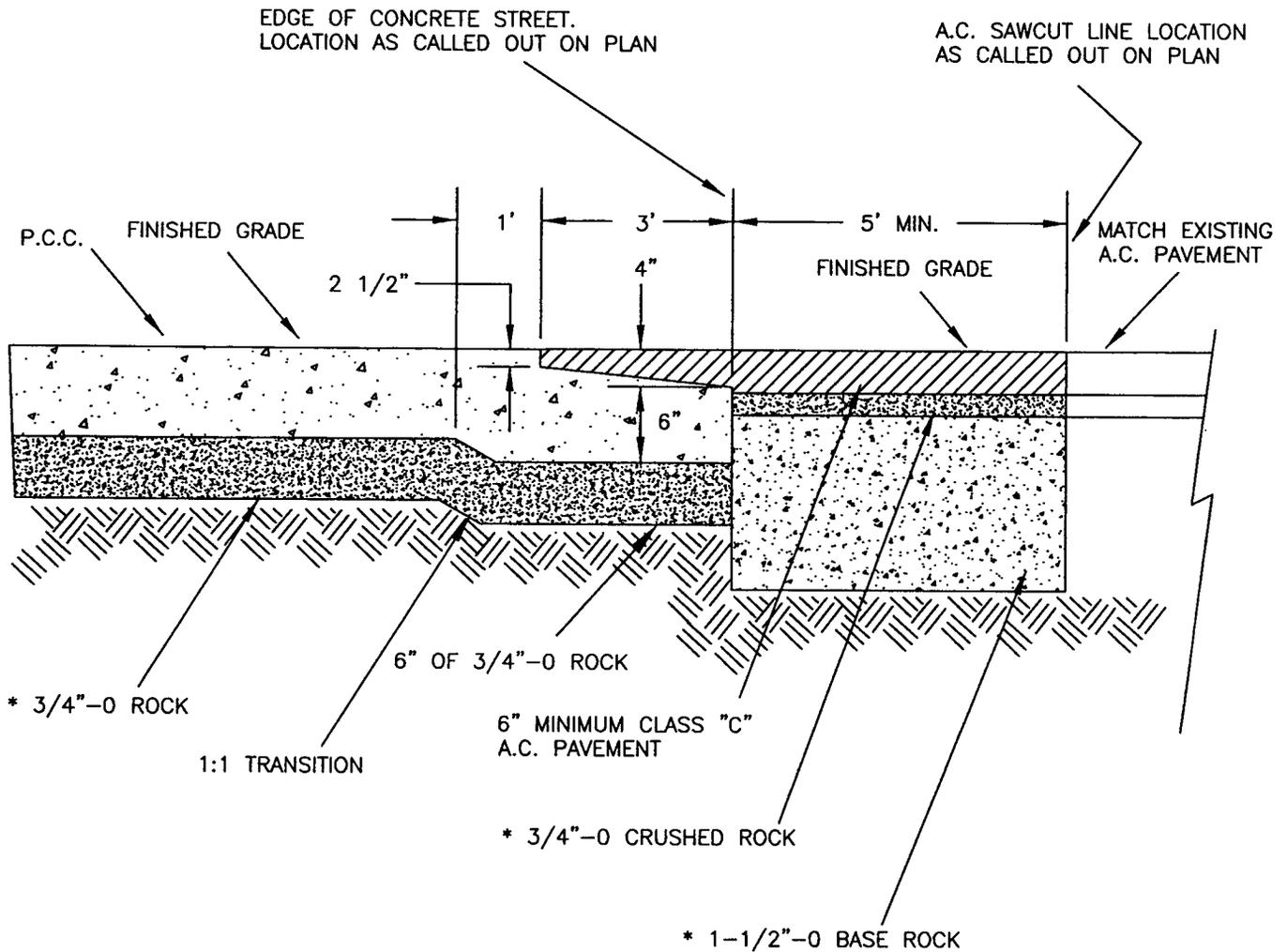
APPROVED BY: SA

DATE: 03/20/06

CITY OF  
WILSONVILLE

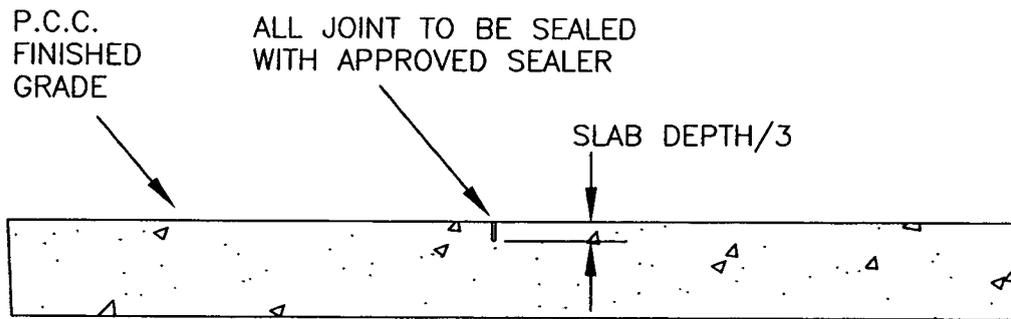


PUBLIC WORKS STANDARDS

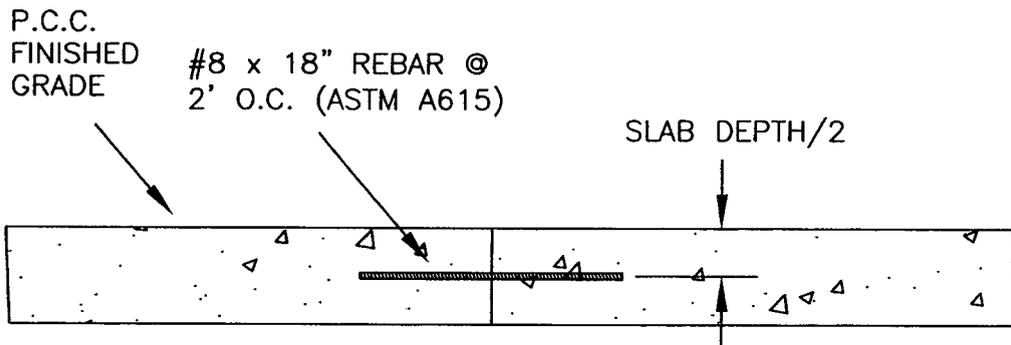


\* NOTE:  
 ROCK SECTIONS VARY DEPENDING ON STRUCTURAL DESIGN OF STREET SECTIONS

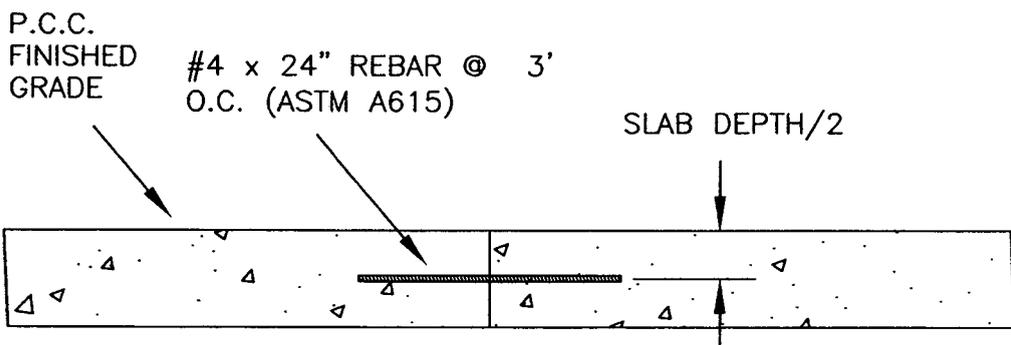
|                                  |                  |                |                                                                                                                                           |
|----------------------------------|------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| P.C.C. to A.C. Paving Connection |                  |                | CITY OF<br>WILSONVILLE<br><br>PUBLIC WORKS STANDARDS |
| DRAWING NUMBER: R-1090           | DRAWN BY: GCF    | SCALE: N.T.S.  |                                                                                                                                           |
| FILE NAME: R-1090.dwg            | APPROVED BY: MAS | DATE: 11/01/03 |                                                                                                                                           |



SAW CUT DETAIL



TRANSVERSE CONSTRUCTION JOINT DETAIL



LONGITUDINAL CONSTRUCTION JOINT DETAIL

NOTES:

1. ALL REBAR SHALL COMPLY WITH ASTM A615.
2. ALL REBAR SHALL BE FIRMLY SET INTO EXISTING CONCRETE USING EPOXY.
3. EPOXY SHALL BE CURED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS PRIOR TO PLACEMENT OF NEW CONCRETE.

Concrete Pavement Saw Cutting and Doweling

CITY OF  
WILSONVILLE



DRAWING NUMBER: R-1095

DRAWN BY: SJ

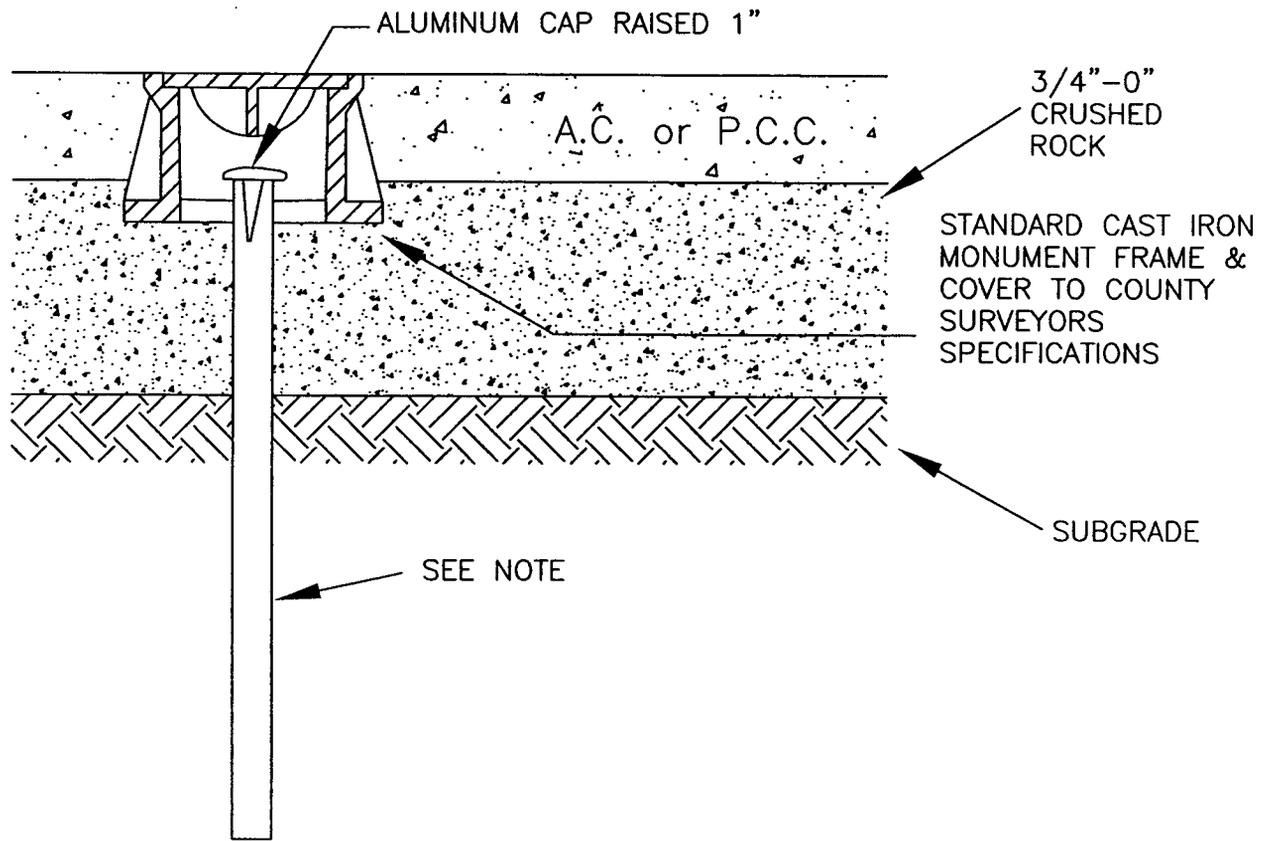
SCALE: N.T.S.

FILE NAME: R-1095.dwg

APPROVED BY: SA

DATE: 03/20/06

PUBLIC WORKS STANDARDS

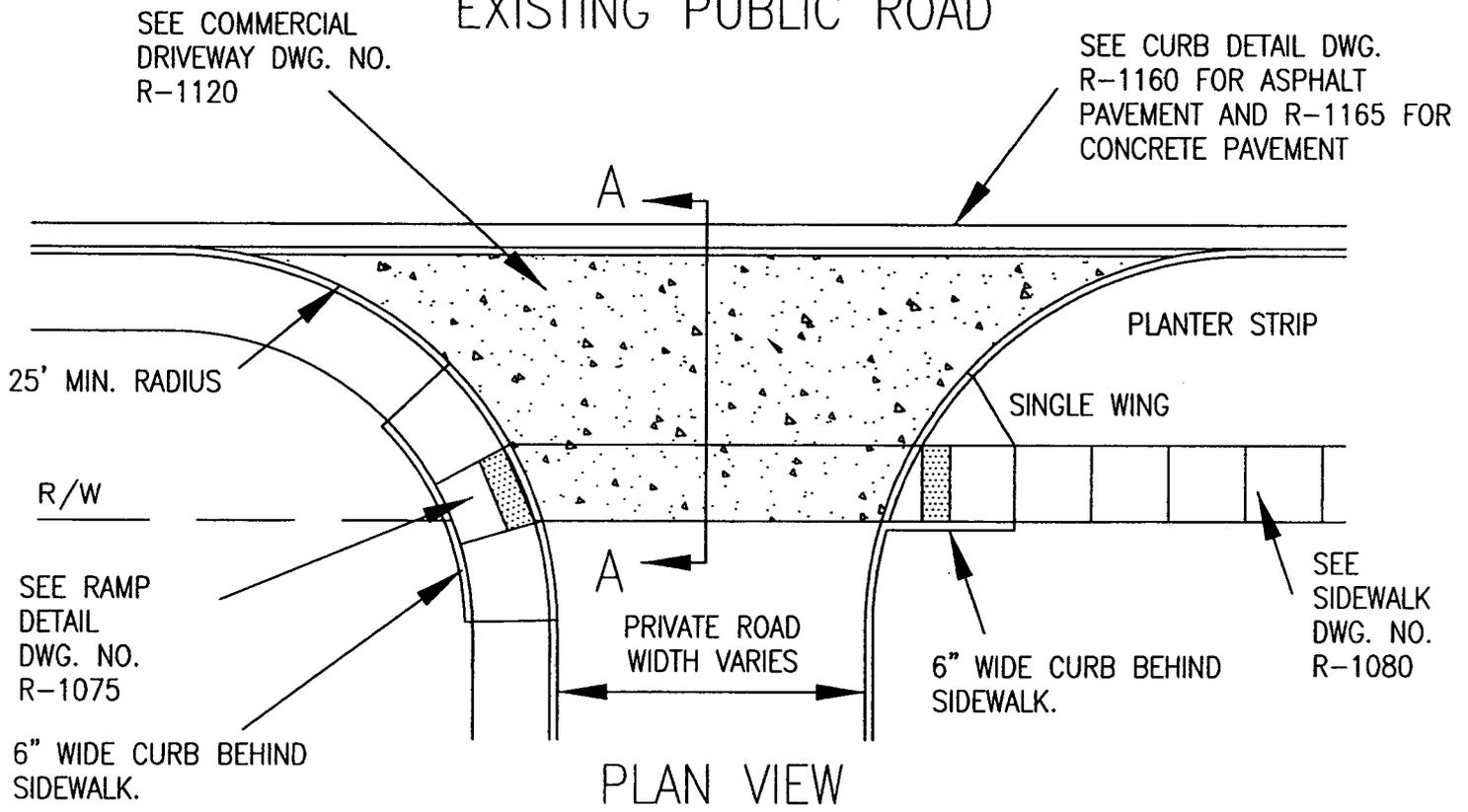


NOTE:

1. ALL MONUMENTS SHALL USE 5/8" DIA. X 30" LONG IRON ROD WITH ALUMINUM CAP.
2. ALL MONUMENT BOXES SHALL CONFORM TO REQUIREMENTS SET BY CLACKAMAS/WASHINGTON COUNTY SURVEYOR'S OFFICE. 12" BOXES SHALL BE USED FOR DESIGN SPEEDS OF 35 MPH OR GREATER. 8" BOXES SHALL BE USED FOR DESIGN SPEEDS LESS THAN 35 MPH.
3. ALL MONUMENT BOXES SHALL BE SET TO FINISH GRADE BEFORE FINAL LIFT OF PAVEMENT IS APPLIED.

|                            |                 |                |                        |                                                                                       |
|----------------------------|-----------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Centerline Survey Monument |                 |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: R-1100     | DRAWN BY: SJ    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: R-1100.dwg      | APPROVED BY: SA | DATE: 03/20/06 | PUBLIC WORKS STANDARDS |                                                                                       |

# EXISTING PUBLIC ROAD

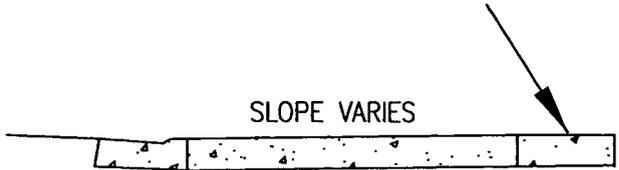


PLAN VIEW

FOR USE AT DRIVEWAYS WHERE SIDEWALK CONTINUES ONTO PRIVATE PROPERTY.

FOR USE AT DRIVEWAYS WHERE SIDEWALK DOES NOT CONTINUE ONTO PRIVATE PROPERTY.

2% SLOPE AT SIDEWALK

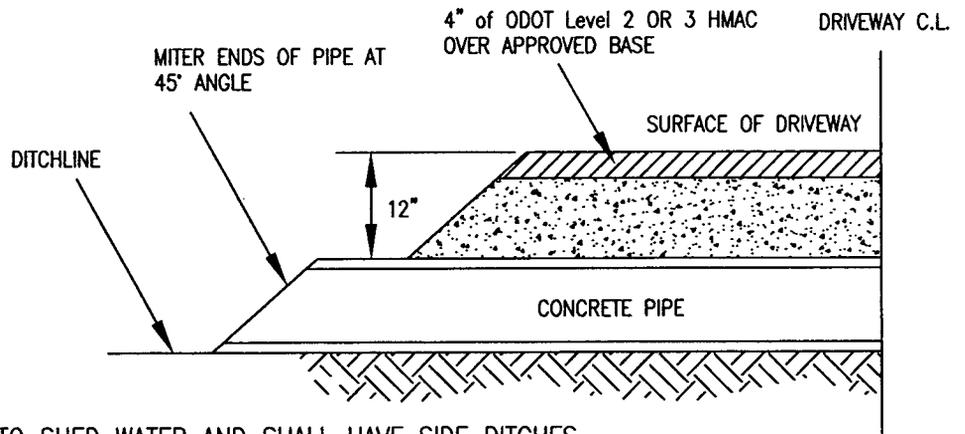
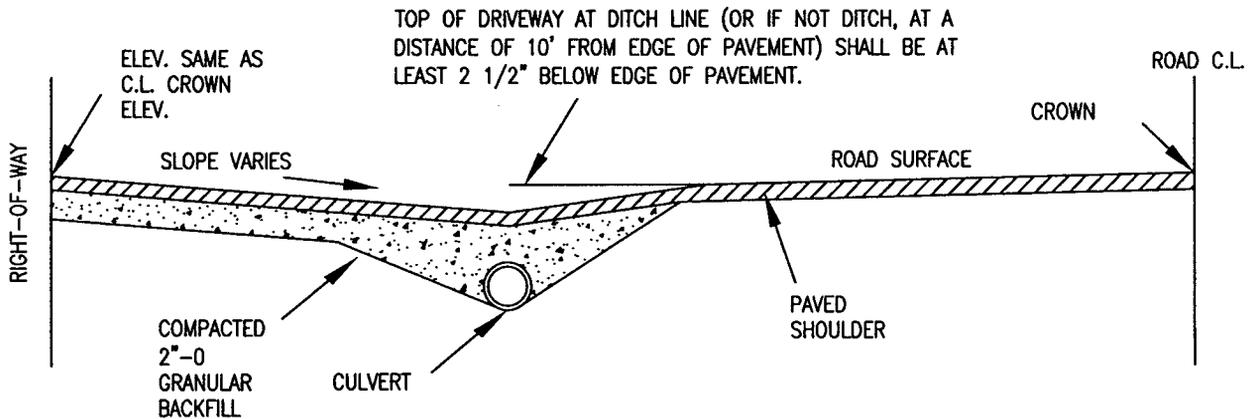
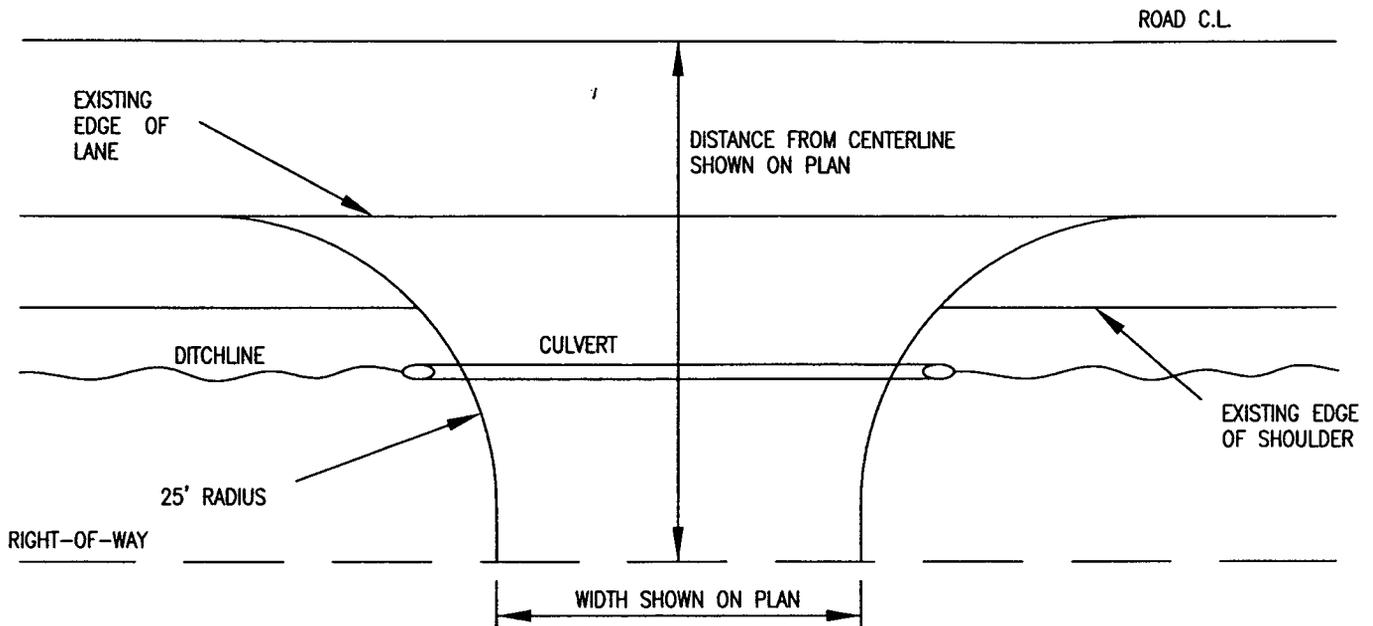


SECTION A-A

**NOTES:**

1. DRIVEWAY APRON SHALL BE CONSTRUCTED TO COMMERCIAL DRIVEWAY STANDARDS.
2. CURB AND GUTTER AND CURB THRU RADIUS SHALL BE CONSTRUCTED PRIOR TO INSTALLATION OF DRIVEWAY APRON.

|                             |                  |                |                        |                                                                                       |
|-----------------------------|------------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Driveway to Private Roadway |                  |                | CITY OF WILSONVILLE    |  |
| DRAWING NUMBER: R-1105      | DRAWN BY: GCF    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: R-1105.dwg       | APPROVED BY: SEZ | DATE: 09/15/05 | PUBLIC WORKS STANDARDS |                                                                                       |



NOTES:

1. DRIVEWAYS SHALL BE CROWNED TO SHED WATER AND SHALL HAVE SIDE DITCHES.
2. AC DRIVEWAYS SHALL CONSIST 4" OF ODOT Level 2 OR 3 HMAC ON APPROVED BASE.
3. PIPE TO BE LAID AT EXISTING GRADE OF DITCH.
4. CULVERT PIPE SIZE TO BE DETERMINED (12" MINIMUM).
5. PIPE OTHER THAN CONCRETE AS APPROVED.

Driveway For Non-Curbed Street

DRAWING NUMBER: R-1110

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1110.dwg

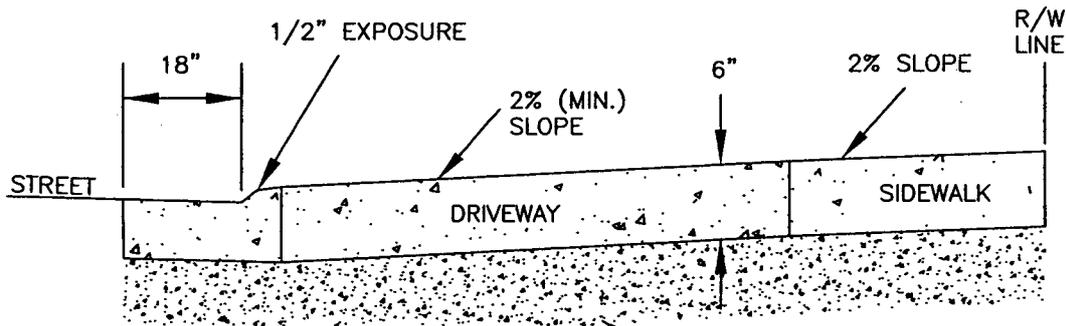
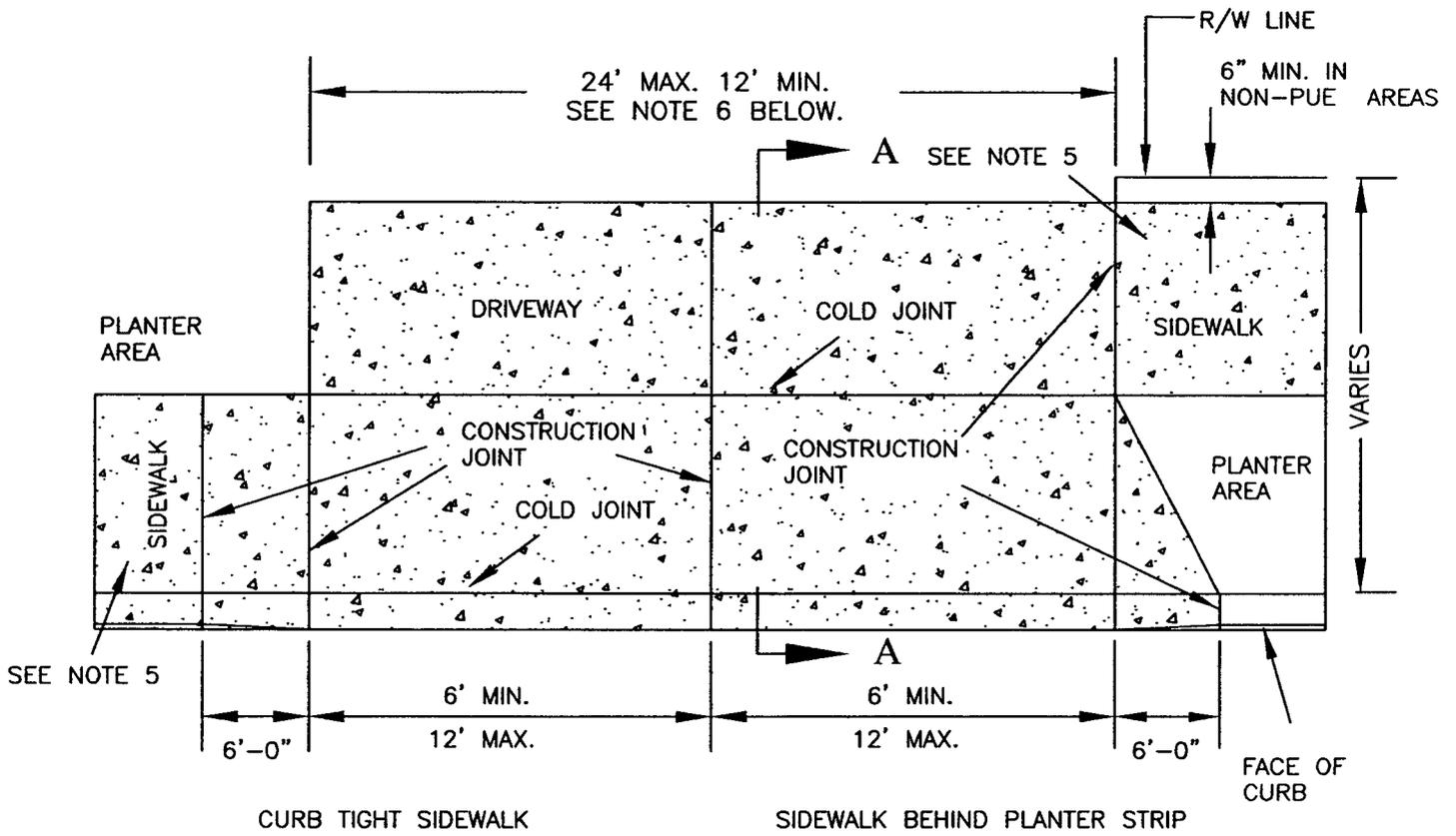
APPROVED BY: SA

DATE: 03/30/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



Section A-A

MINIMUM 6" OF 3/4"-0  
CRUSHED ROCK COMPACTED  
TO 95% OF AASHTO T-180

NOTES

1. CONCRETE SHALL HAVE A MINIMUM BREAKING STRENGTH OF 3000 PSI. AFTER 28 DAYS, 6 SACK MIX.
2. CURB JOINT SHALL BE A TROWELED JOINT WITH A MIN. 1/2" RADIUS ALONG THE BACK OF CURB.
3. CONTRACTION JOINT SPACING SHALL NOT EXCEED 10 FEET.
4. USE EXISTING CURB EXPANSION JOINT OR SAW CUT AND PLACE COLD JOINT.
5. SIDEWALK THICKNESS SHALL BE 6 INCHES MINIMUM AND EXTEND TO AT LEAST ONE PANEL BEYOND DRIVEWAY APRON.
6. 30 FOOT MAXIMUM DRIVEWAY WIDTHS FOR 3-CAR GARAGES SHALL BE APPROVED ON A CASE-BY-CASE BASIS BY CITY'S AUTHORIZED REPRESENTATIVE.

Residential Driveway

DRAWING NUMBER: R-1115

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: R-1115.dwg

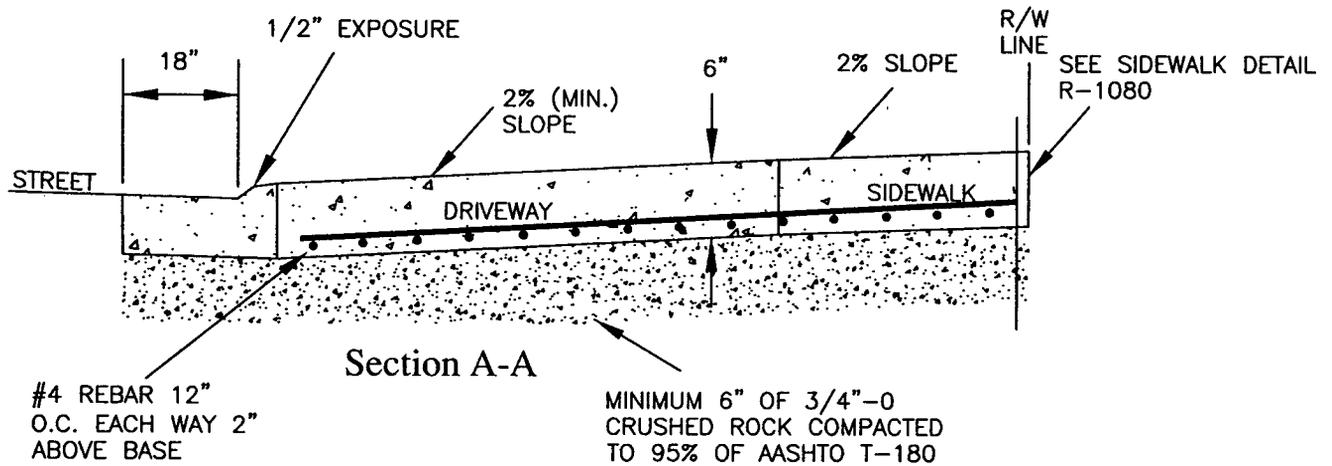
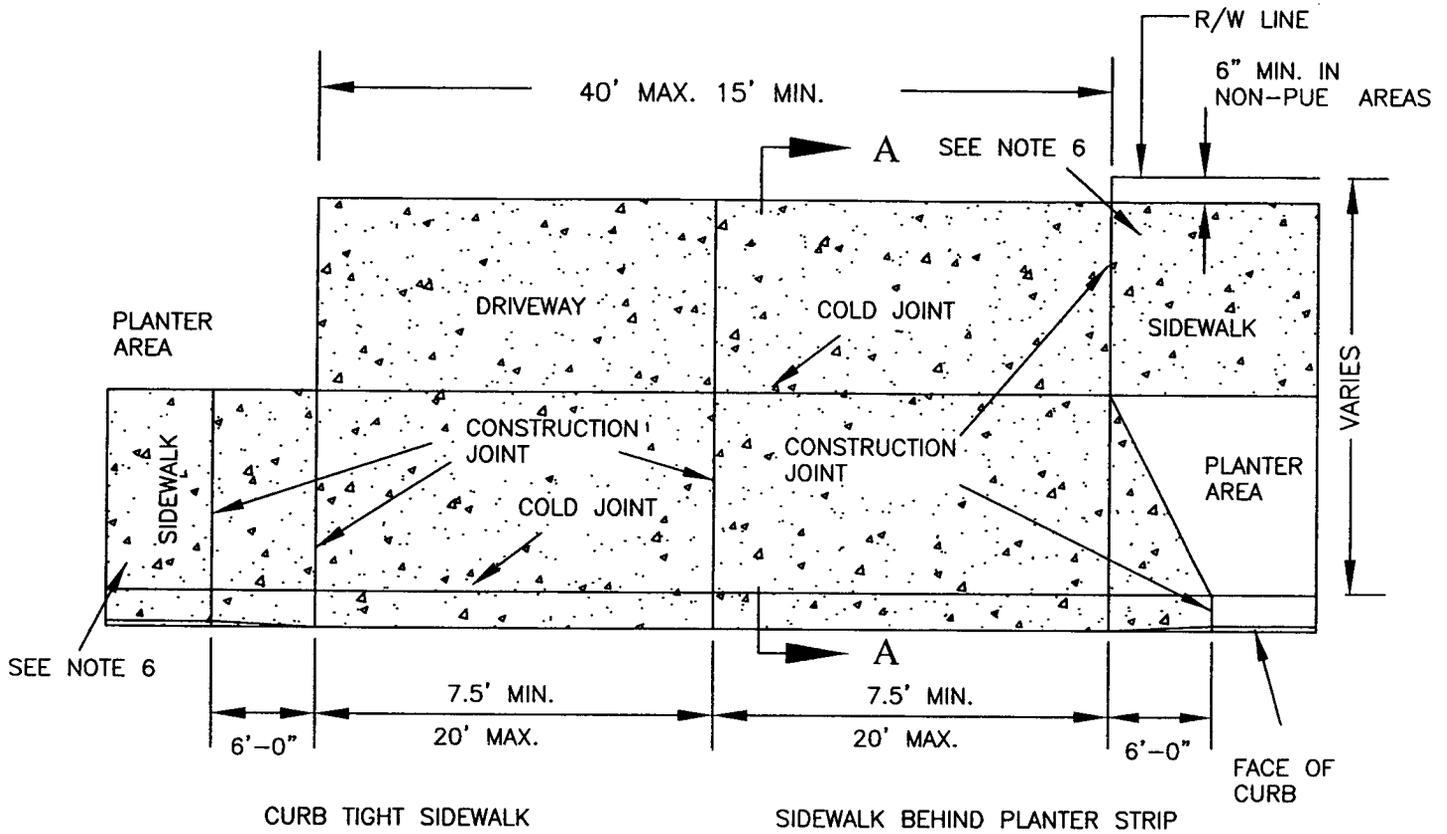
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



NOTES

1. CONCRETE SHALL HAVE A MINIMUM BREAKING STRENGTH OF 3000 PSI. AFTER 28 DAYS, 6 SACK MIX.
2. CURB JOINT SHALL BE A TROWELED JOINT WITH A MIN. 1/2" RADIUS ALONG THE BACK OF CURB.
3. CONTRACTION JOINT SPACING SHALL NOT EXCEED 10 FEET.
4. USE EXISTING CURB EXPANSION JOINT OR SAW CUT AND PLACE COLD JOINT.
5. SPACING OF 2" CONCRETE SUPPORT BLOCKS SHALL BE NO GREATER THAN 3' AND BLOCKS SHALL BE TIED TO #4 REBAR WITH WIRE.
6. SIDEWALK THICKNESS SHALL BE 6 INCHES MINIMUM, REINFORCED, AND EXTEND TO AT LEAST ONE PANEL BEYOND DRIVEWAY APRON.

Commercial Driveway

DRAWING NUMBER: R-1120

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: R-1120.dwg

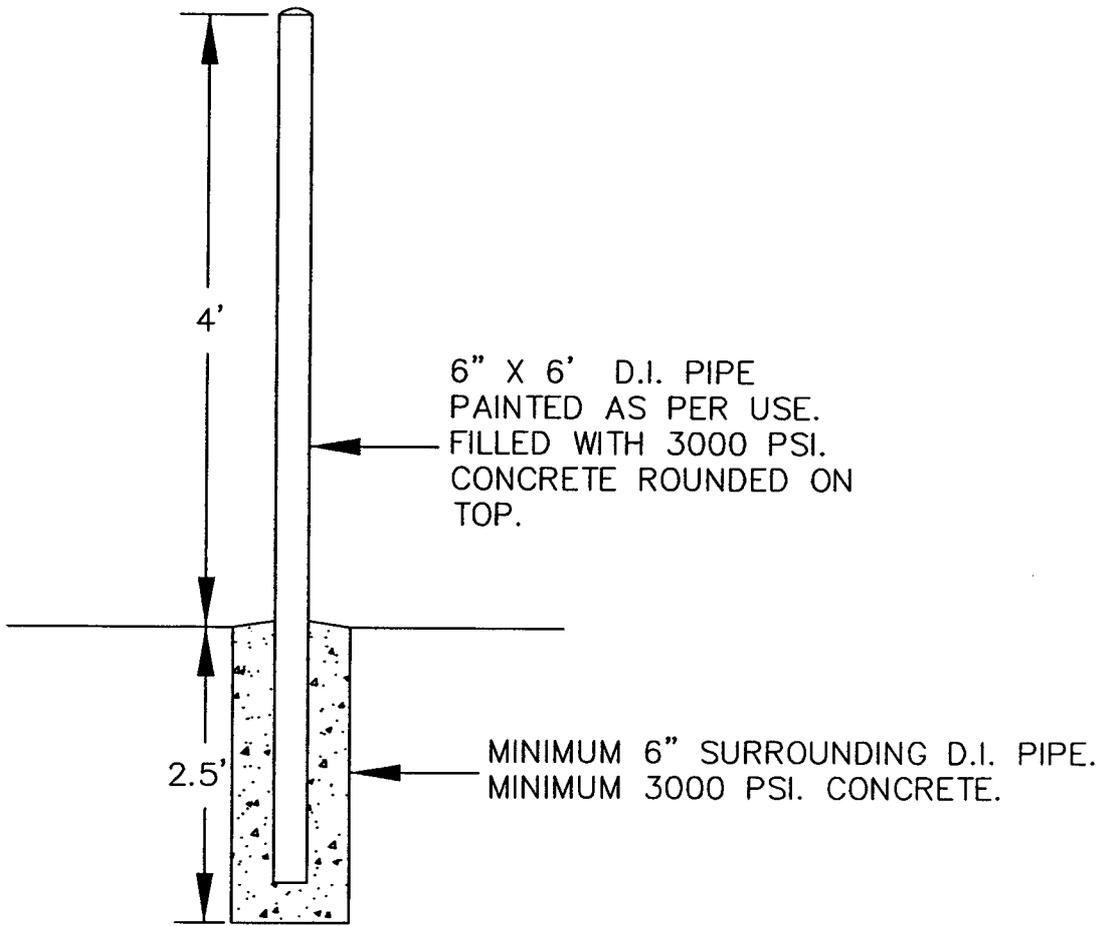
APPROVED BY: MAS

DATE: 11/01/03

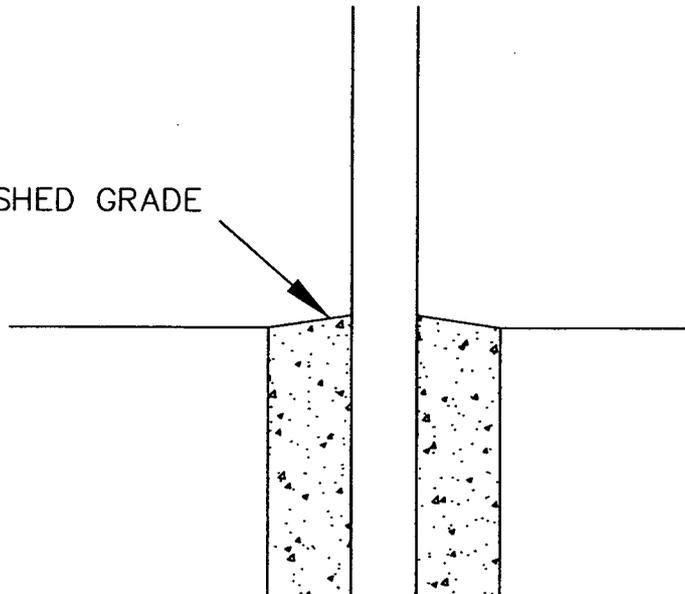
CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



2" RISE FROM FINISHED GRADE



Non-Removable Bollard

DRAWING NUMBER: R-1125

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: R-1125.dwg

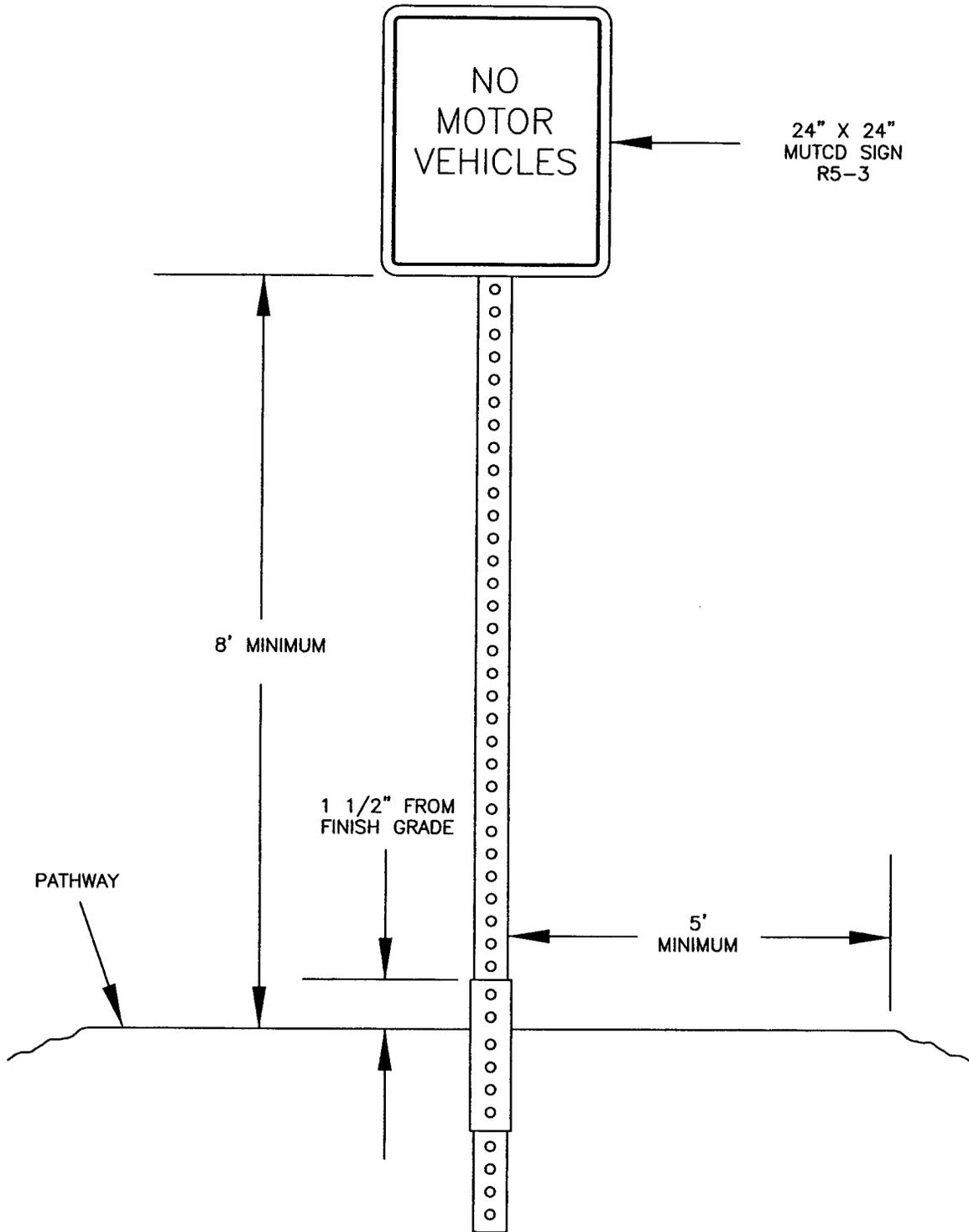
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



NOTES

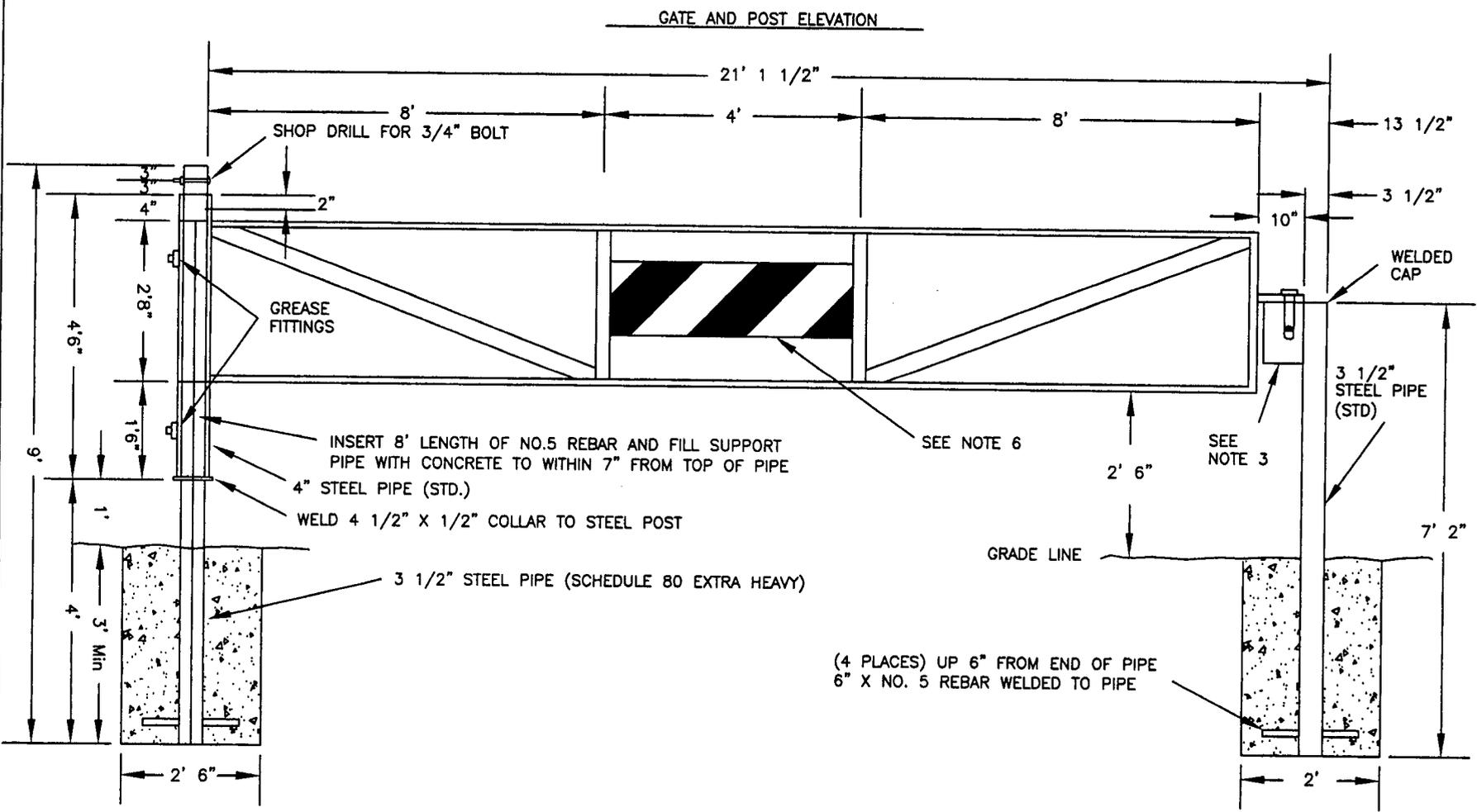
1. ONLY TO BE USED WHEN SPECIFICALLY APPROVED BY THE CITY ENGINEER.
2. NOT TO BE USED ON FIRE ACCESSES.
3. PLACE AT ENTRANCE OF BIKE PATH OR ACCESS AT CENTERLINE.
4. SEE DETAIL DRAWING R-1165 FOR MATERIAL DESCRIPTIONS.

|                                |                  |                |                        |                                                                                       |
|--------------------------------|------------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Removable Vehicle Barrier Post |                  |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: R-1130         | DRAWN BY: GCF    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: R-1130.dwg          | APPROVED BY: MAS | DATE: 11/01/03 | PUBLIC WORKS STANDARDS |                                                                                       |

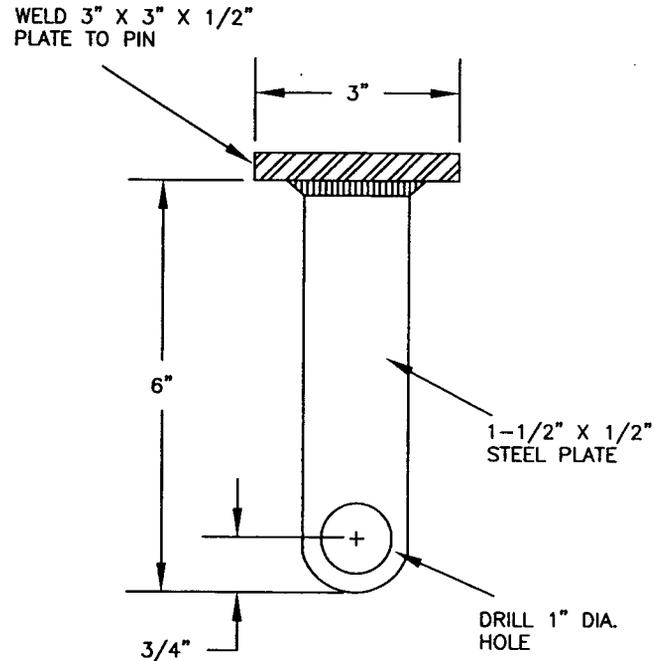
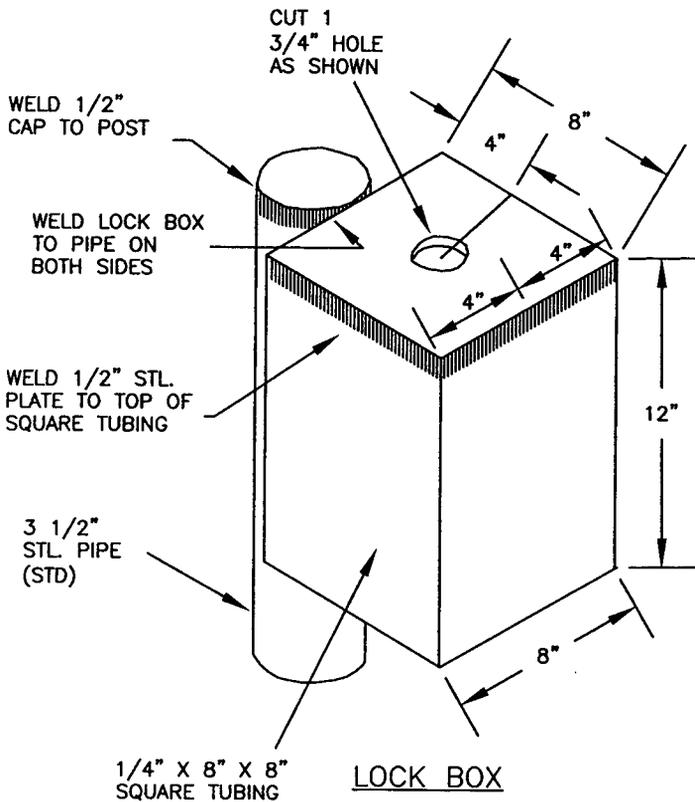
FILE NAME: R-1135.dwg  
 DRAWING NUMBER: R-1135  
 APPROVED BY: MAS  
 DATE: 11/01/03

Fire/Utility Access Gate

CITY OF WILSONVILLE  
 PUBLIC WORKS STANDARDS

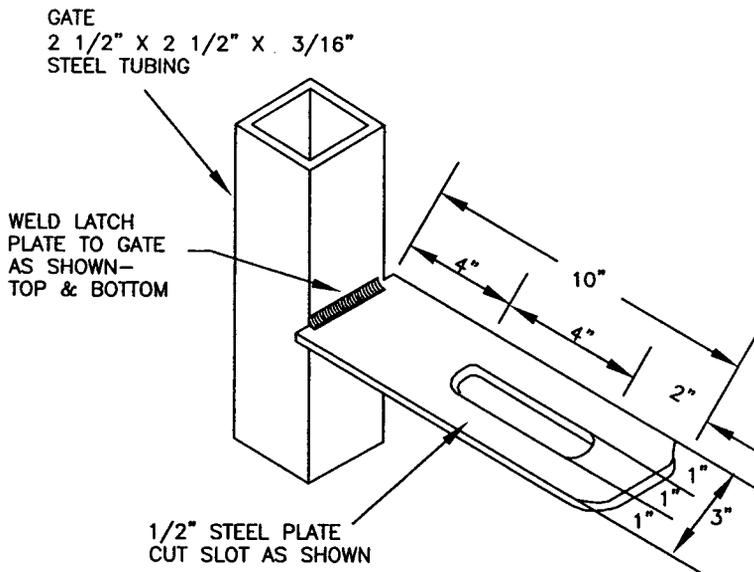


- NOTES:
1. ALL GATE MATERIALS TO BE A-36 STEEL AND STEEL TUBING 2 1/2" X 2 1/2" X 3/16", WELD ALL JOINERY.
  2. METAL SHALL BE PAINTED WITH ONE COAT OF METAL PRIMER AND ONE COAT OF WHITE RUST INHIBITIVE PAINT.
  3. FOR LATCH PLATE, LOCK BOX, AND LOCKING PIN DETAILS, SEE DETAIL DRAWING R-1140.
  4. DIMENSIONS MAY VARY DEPENDING ON INDIVIDUAL APPLICATIONS.
  5. ALL CONCRETE SHALL HAVE A MINIMUM BREAKING STRENGTH OF 3000 PSI. AFTER 28 DAYS, 6 SACK MIX.
  6. 6" WIDE ALTERNATING RED AND WHITE ENCAPSULATED LENS SHEETING AT A 45° ANGLE.



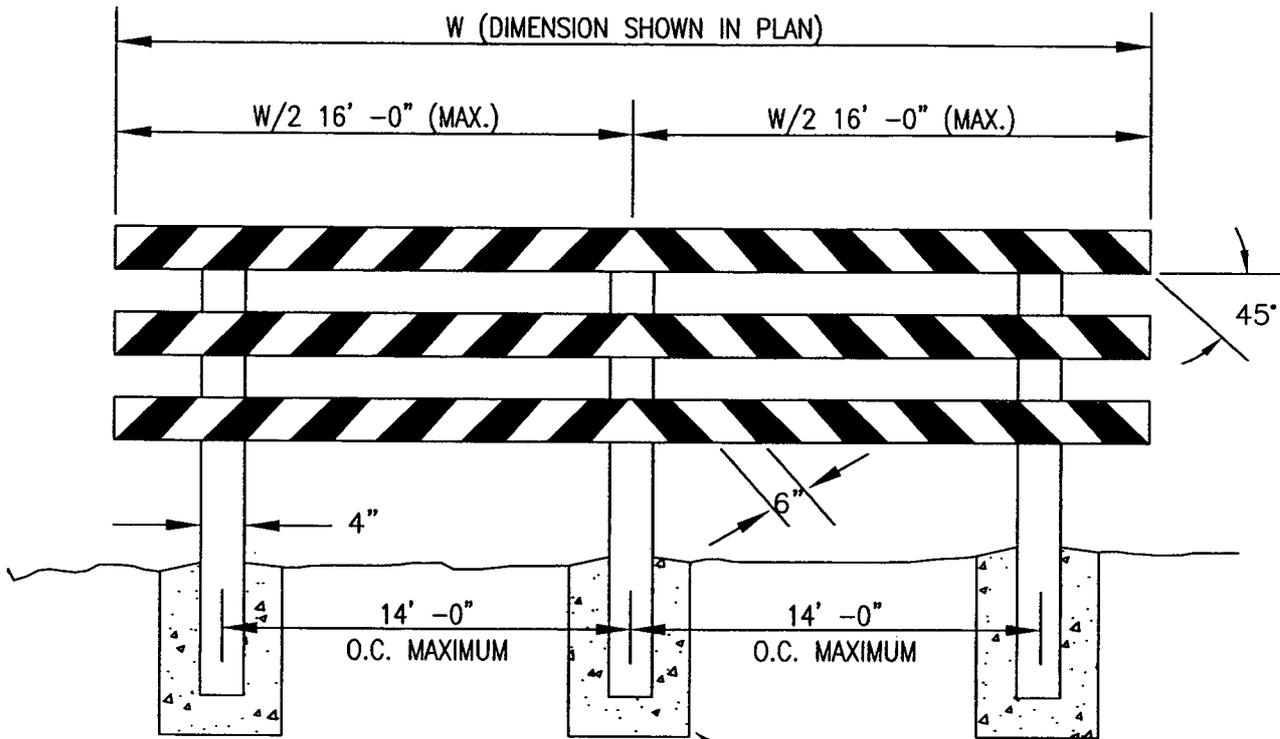
LOCKING PIN DETAIL

NOTE:  
1. ALL STEEL SHALL BE A-36.



LATCH PLATE DETAIL

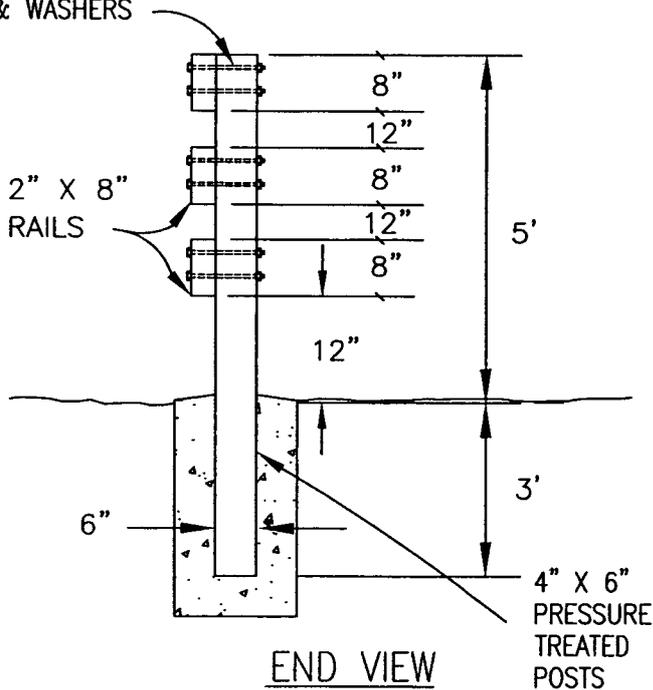
|                                                       |                  |                |                        |                                                                                       |
|-------------------------------------------------------|------------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Fire/Utility Access Gate Latch, Lock, and Locking Pin |                  |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: R-1140                                | DRAWN BY: GCF    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: R-1140.dwg                                 | APPROVED BY: MAS | DATE: 11/01/03 | PUBLIC WORKS STANDARDS |                                                                                       |



ELEVATION

5/8" GALV. SQ. HD.  
MACHINE BOLTS W/GALV.  
NUTS & WASHERS

3000 PSI. CONCRETE 6  
INCHES THICK ON ALL  
SIDES.



END VIEW

NOTES:

1. RAILS TO HAVE ALTERNATING RED AND WHITE STRIPES. ALL STRIPES SHALL HAVE RED AND WHITE ENCAPSULATED LENS SHEETING.
2. SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND THE OREGON SUPPLEMENT.
3. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT OREGON DEPT. OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HWY. CONSTRUCTION.

Street Barricade (Type III)

CITY OF  
WILSONVILLE



DRAWING NUMBER: R-1145

DRAWN BY: GCF

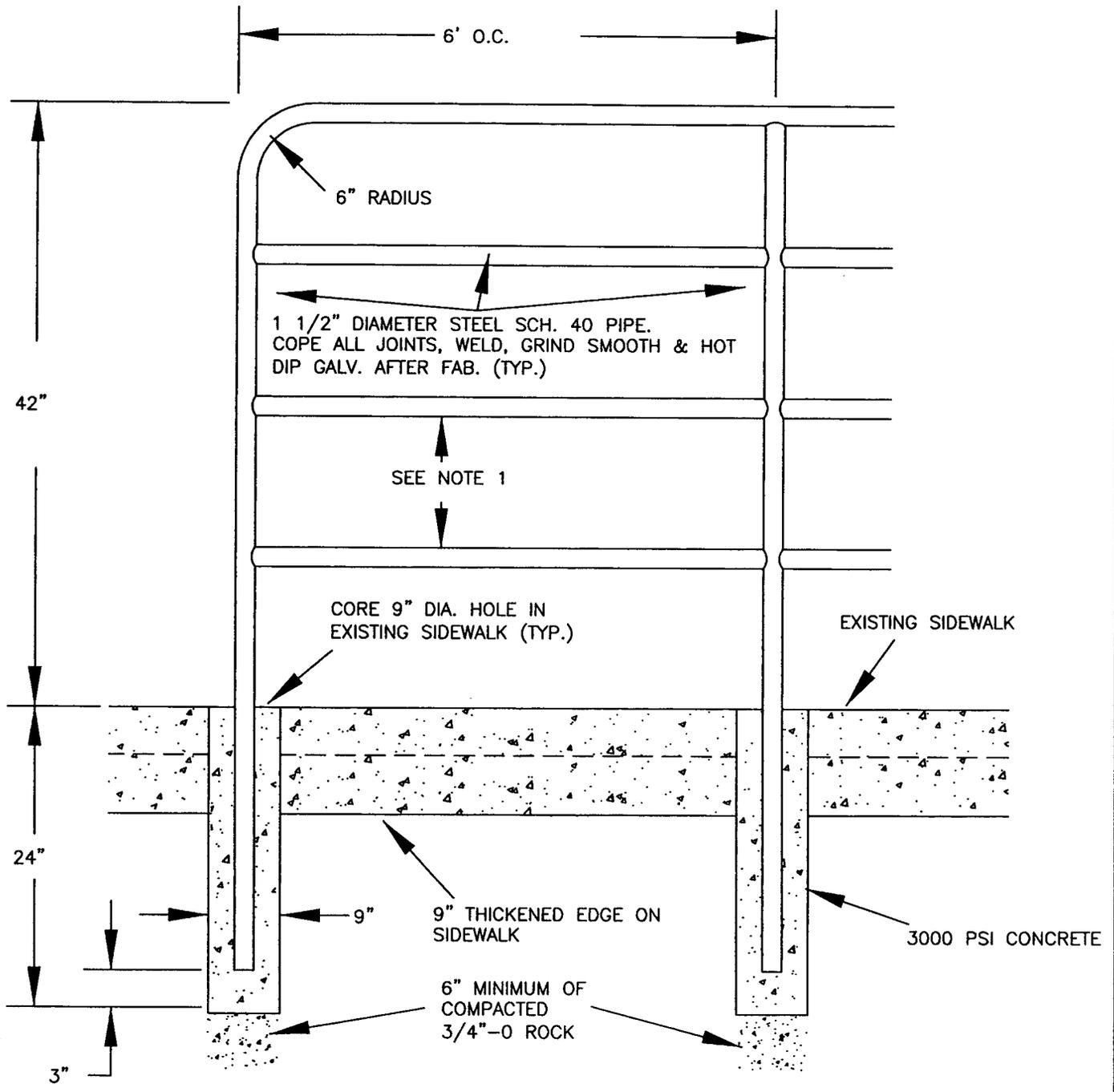
SCALE: N.T.S.

FILE NAME: R-1145.dwg

APPROVED BY: MAS

DATE: 11/01/03

PUBLIC WORKS STANDARDS



NOTE:

1. RAIL SPACING SHALL MEET THE FOLLOWING REQUIREMENTS:
  - 4" MAXIMUM SEPARATION IN RESIDENTIAL AREAS
  - 12" MAXIMUM SEPARATION IN COMMERCIAL/INDUSTRIAL AREAS
  - AREA TYPE SHALL BE DETERMINED BY THE CITY ENGINEER AND BUILDING OFFICIAL.
2. HANDRAIL SYSTEMS FOR MULTI-USE PATHS SHALL BE CONSTRUCTED ALONG HILLSIDES OR NEXT TO DRAINAGE DITCHES STEEPER THAN 3H:1V.
3. RAILS SHALL HAVE A SMOOTH RUB FINISH.

Railing Detail

DRAWING NUMBER: R-1150

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1150.dwg

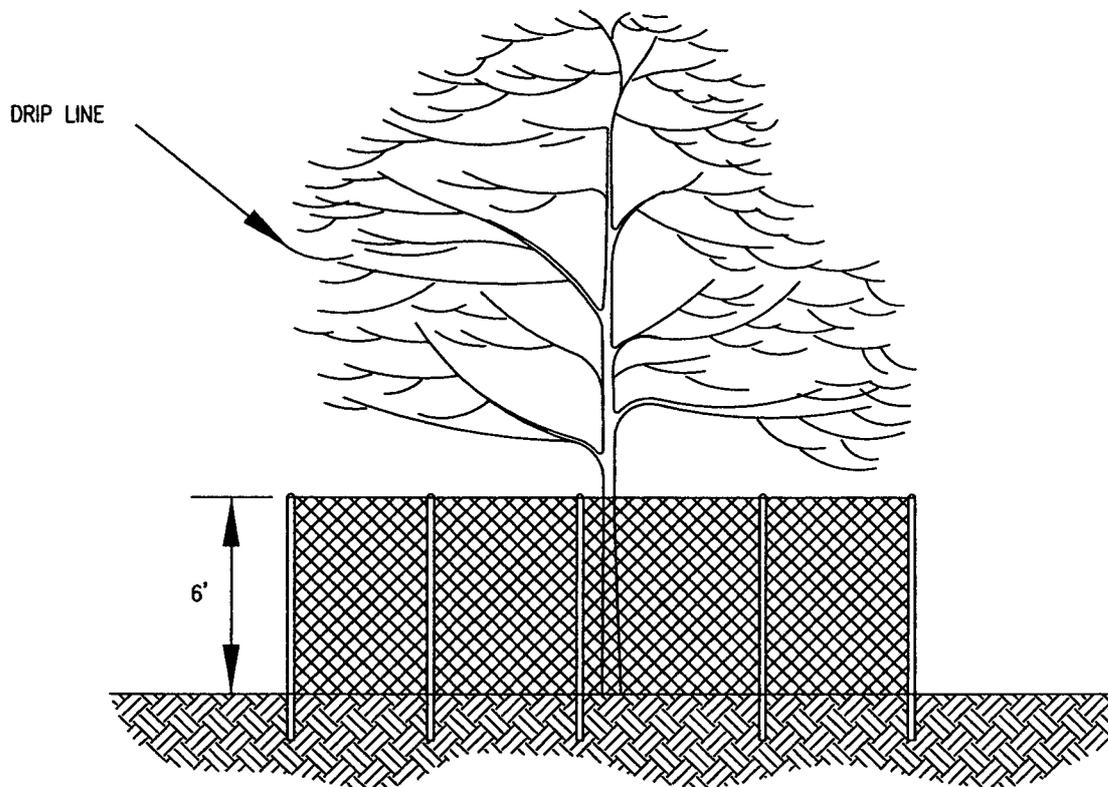
APPROVED BY: SA

DATE: 02/02/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



NOTES:

1. FENCE SHALL BE 6' IN HEIGHT AND SET AT TREE DRIP LINE.
2. FENCE MATERIALS SHALL CONSIST OF 2" MESH CHAIN LINKS SECURED TO A MINIMUM 1 1/2" DIA. STEEL OR ALUMINUM LINE POSTS.
3. POSTS SHALL BE SET TO A DEPTH OF NO LESS THAN 2 FEET IN NATIVE SOIL.
4. FENCE SHALL REMAIN IN PLACE UNTIL THE COMPLETION OF CONSTRUCTION ACTIVITIES. MOVEMENT OR REMOVAL OF FENCE REQUIRES APPROVAL BY CITY'S AUTHORIZED REPRESENTATIVE.

Tree Protection Fencing

CITY OF  
WILSONVILLE



DRAWING NUMBER: R-1155

DRAWN BY: GCF

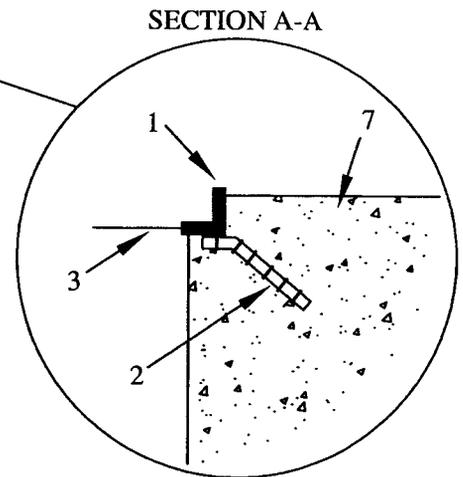
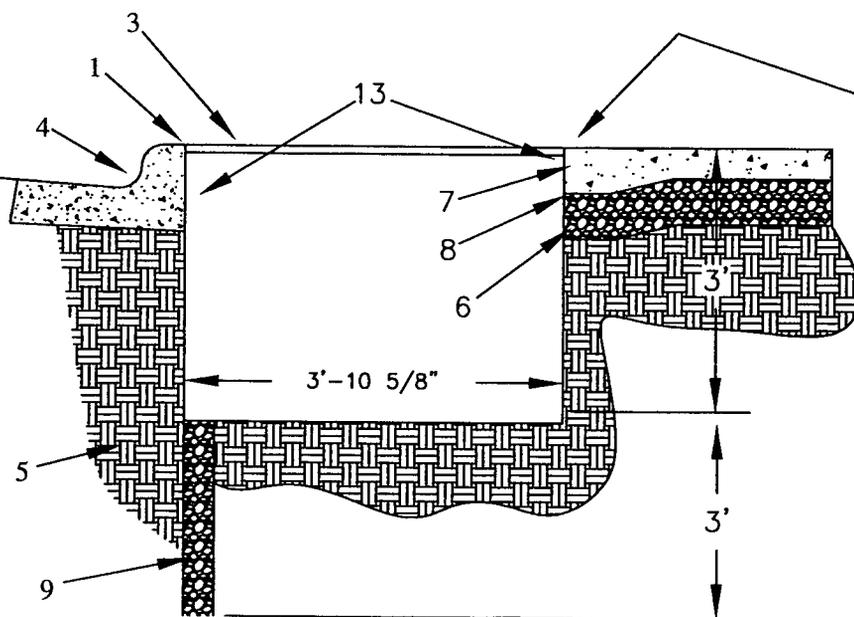
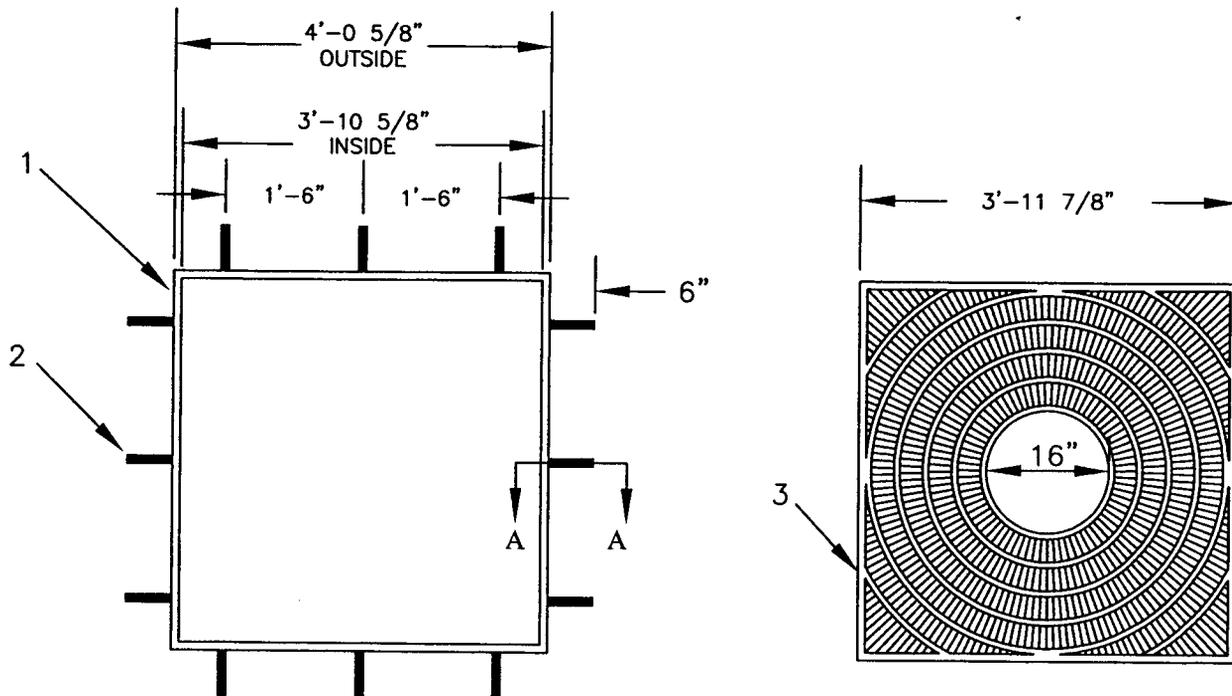
SCALE: N.T.S.

FILE NAME: R-1155.dwg

APPROVED BY: MAS

DATE: 11/01/03

PUBLIC WORKS STANDARDS



Notes:

1. 1" X 1" X 1/4" L STEEL FRAME.
2. #3 REBAR, WELD TO FRAME
3. 3/4" THICK TREE GRATE CAST IN 2 PIECES, NO OPENINGS GREATER THAN 3/8", 16" DIA CENTER OPENING
4. CURB AND GUTTER, REFER TO DETAIL NO. R-1060 FOR ASPHALT STREET, R-1065 FOR CONCRETE STREET.
5. COMPACTED SUBGRADE.
6. MINIMUM 2" LAYER OF 3/4" MINUS GRAVEL COMPACTED
7. 4" CONCRETE SIDEWALK, REFER TO DETAIL R-1080.
8. THICKENED EDGE (6" X 6")
9. 4" DIAMETER X 3' DEEP AUGERED HOLE WITH 4" RIGID PVC PERFORATED PIPE. FILL PIPE WITH DRAIN ROCK AND COVER WITH FILTER SOCK.
10. TREE GRATE SHALL BE SQUARE 4' FAN (W/ FLAT BLACK POWDER COAT), MANUFACTURED BY URBAN ACCESSORIES, 465 E. 15TH STREET, TACOMA WA. 98421, 877-487-0488, WWW.URBANACCESSORIES.COM, OR APPROVED EQUAL.
11. TREE GRATE SHALL BE CAST IRON PER ASTM A-48 CLASS 3b OR BETTER.
12. TREE GRATE FRAME SHALL BE TYPE "S" FRAME, MANUFACTURED BY URBAN ACCESSORIES, OR APPROVED EQUAL.
13. CITY APPROVED ROOT BARRIER SHALL BE PLACED ON ALL SIDES AS PER DETAIL R-1157.

TREE WELL AND GRATE

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

DRAWING NUMBER: R-1156

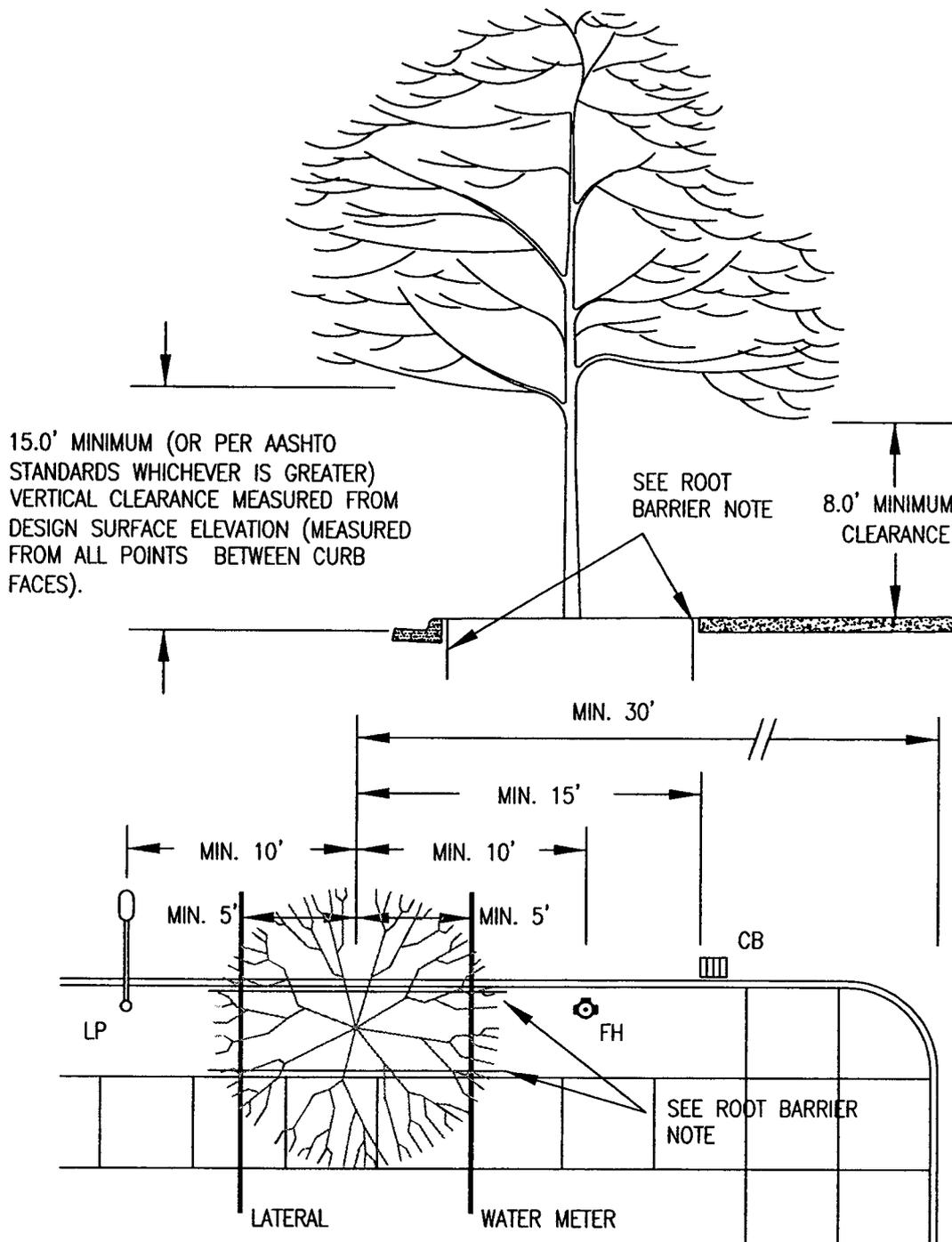
DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1156.dwg

APPROVED BY: SA

DATE: 03/20/06



NOTES:

1. 5' MINIMUM CLEARANCE FROM UNDERGROUND UTILITIES AND LATERALS. LANDSCAPE DESIGN OF TREES AND ENGINEERING DESIGN OF UNDERGROUND SERVICES SHALL BE COORDINATED.
2. TREES SHALL BE CENTERED BETWEEN CURB AND SIDEWALK.
3. CITY APPROVED ROOT BARRIER METHOD TO BE USED FOR ALL STREET TREES LOCATED WITHIN 8 FEET OF ALL CURBS AND SIDEWALKS. ROOT BARRIER SHALL EXTEND TO A DISTANCE OF 20' CENTERED WITH THE TREE BASE. BARRIER SHALL BE 2"-4" FROM CURB OR SIDEWALK AND EXTEND A MINIMUM OF 24" IN DEPTH.
4. WHEN TREES ARE WITHIN TREE WELLS, ROOT BARRIER SHALL BE PLACED ON ALL SIDES.
5. PARALLEL PARKING: LOCATE TREE BETWEEN ON-STREET PARKING SPACES. THIS LOCATION PRECLUDES DOORS OPENING ONTO TREES AND PASSENGERS EXITING IN CONFLICT WITH TREE PLACEMENT.
6. DIAGONAL PARKING: LOCATE TREE MINIMUM 3' AWAY FROM LEFT STALL LINE TOWARD THE CENTER OF THE PARKING SPACE. THIS LOCATION ATTEMPTS TO AVOID THE FRONT END OF THE PARKED CAR OVERHANGING THE CURB.

Street Tree Location and Clearances

CITY OF  
WILSONVILLE



DRAWING NUMBER: R-1157

DRAWN BY: SJ

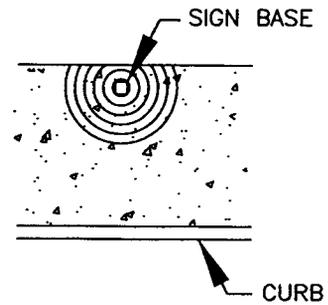
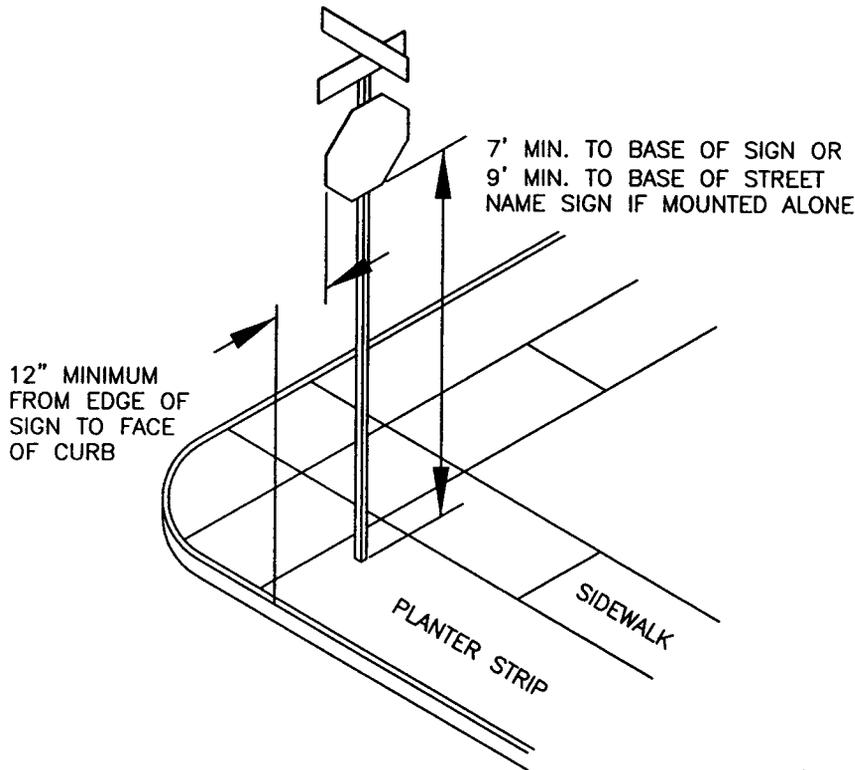
SCALE: N.T.S.

FILE NAME: R-1157.dwg

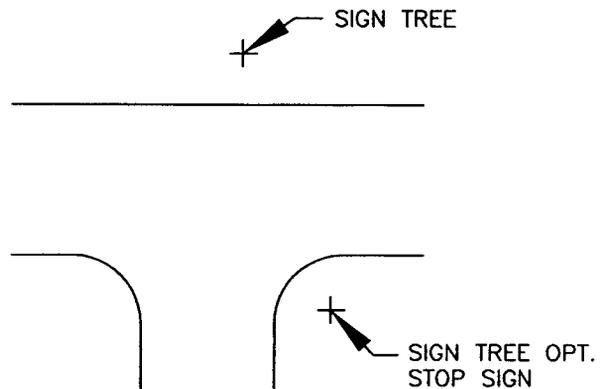
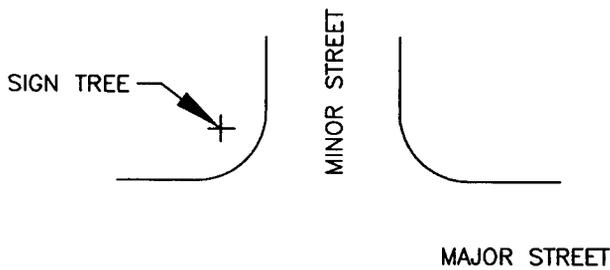
APPROVED BY: SA

DATE: 03/21/06

PUBLIC WORKS STANDARDS



TACTILE STRIP LOCATION  
SEE NOTE 3



CROSS INTERSECTION

TEE INTERSECTION

**NOTE:**

1. SIGN LOCATIONS SHALL BE ACCORDING TO MUTCD AND AS MODIFIED HEREIN.
2. SIGNS WHERE THE SIDEWALK IS CURB TIGHT SHALL BE LOCATED 6" OUTSIDE THE SIDEWALK TO MAXIMUM DISTANCE OF 7' FROM THE FACE OF CURB.
3. IF THE SIDEWALK IS WIDER THAN 6', A TACTILE STRIP 2' WIDE FROM A RADIUS POINT FROM THE BASE OF THE SIGN SHALL BE PLACED IN THE WET CONCRETE. THE TACTILE STRIP SHALL BE MADE BY USING A 1/4" TINE METAL BROOM TO A DEPTH OF 1/4".

Street Sign Locations

DRAWING NUMBER: R-1160

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: R-1160.dwg

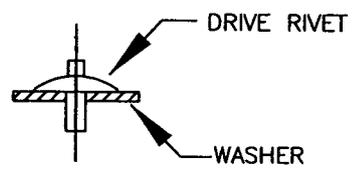
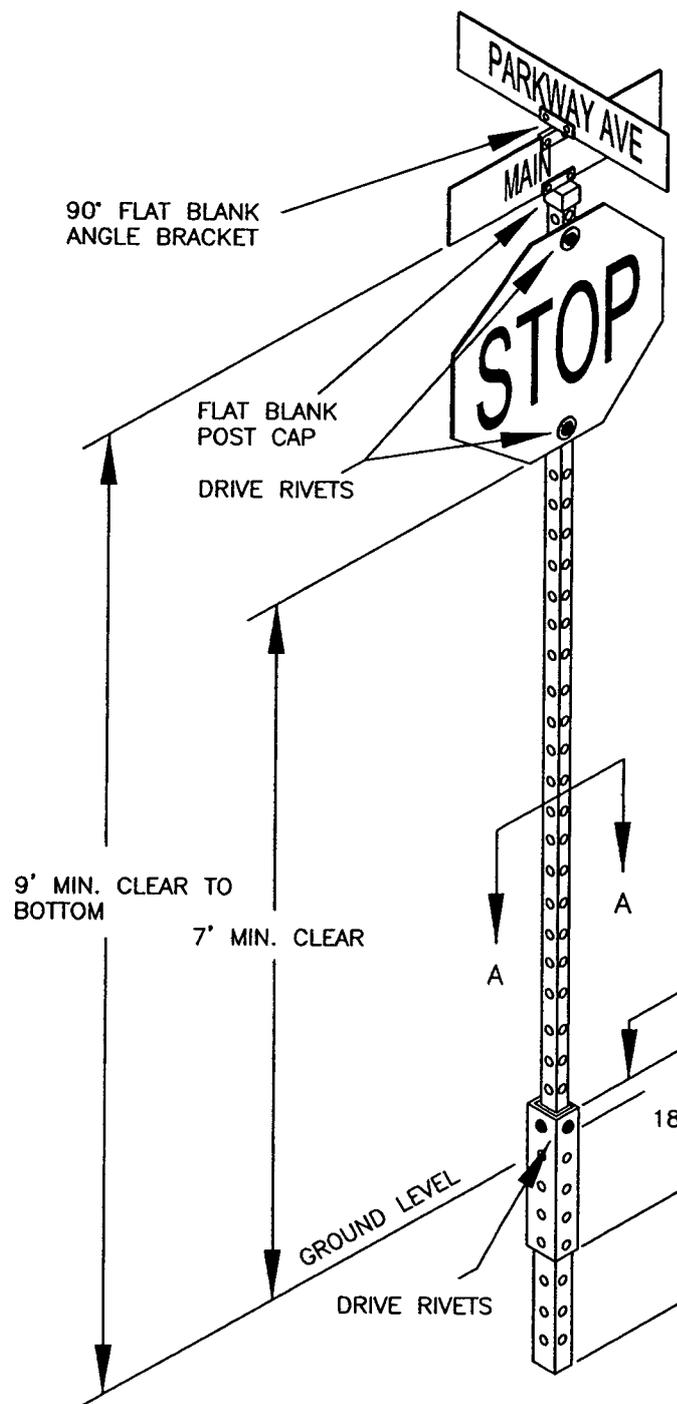
APPROVED BY: SA

DATE: 01/26/06

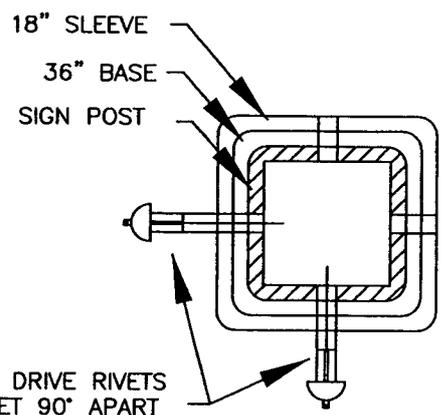
CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



SIGN DRIVE RIVET DETAIL FOR MOUNTING SIGN



VIEW @ SEC A-A

**NOTES:**  
 1. SIGN POST SHALL BE EMBEDDED 12" INTO BASE.

Street Sign Assembly

DRAWING NUMBER: R-1165

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: R-1165.dwg

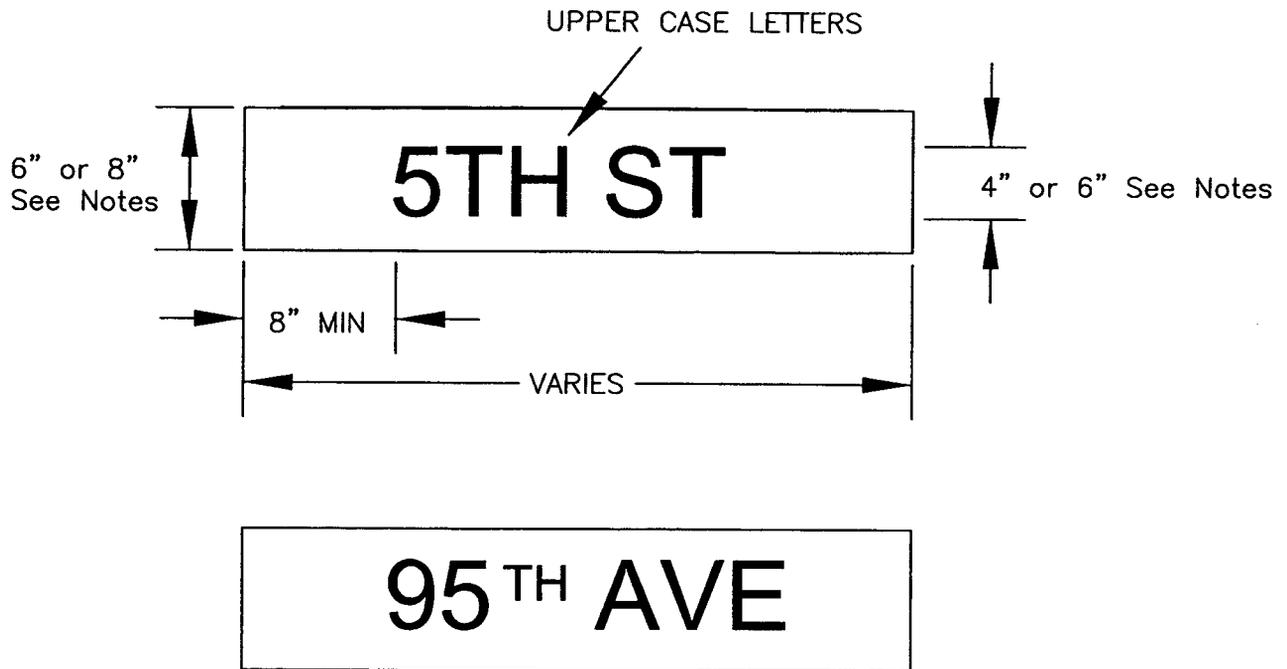
APPROVED BY: MAS

DATE: 11/01/03

CITY OF WILSONVILLE



PUBLIC WORKS STANDARDS



**MATERIALS:**

STREET NAME SIGN FOR STREETS WITH SPEEDS LESS THAN 35 MPH SHALL BE 6" HEIGHT, 0.100" GAUGE FLAT ALODINE FINISH ALUMINUM. THE MINIMUM LENGTH SHALL BE 24" AND MAXIMUM LENGTH SHALL BE 36". BOTH SIDES OF STREET NAME SIGNS SHALL BE GREEN 3M SCOTCHLITE BRAND HIGH INTENSITY REFLECTIVE SHEETING.

STREET NAME SIGN FOR STREETS WITH SPEEDS GREATER THAN 35 MPH SHALL BE 8" HEIGHT WITH 6" HIGH LETTERING.

**LETTERING:**

ALL LETTERS AND NUMBERS USED TO FABRICATE A STREET NAME SIGN SHALL BE HIGH INTENSITY SILVER USING 3M SCOTCHLITE BRAND. THE ACTUAL NAME OF THE STREET IS A 4" SERIES 'B'.

**INSTALLATION:**

MOUNTING HARDWARE SHALL BE STYLE #850F LONG (5") ALUMINUM CAPS/TEES. SEE DRAWING NO. R-1165.

Street Name Sign

CITY OF  
WILSONVILLE



DRAWING NUMBER: R-1170

DRAWN BY: SJ

SCALE: N.T.S.

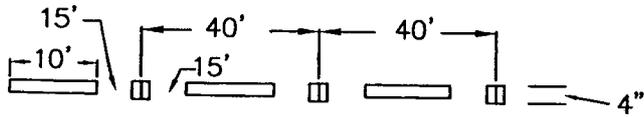
FILE NAME: R-1170.dwg

APPROVED BY: SA

DATE: 03/29/06

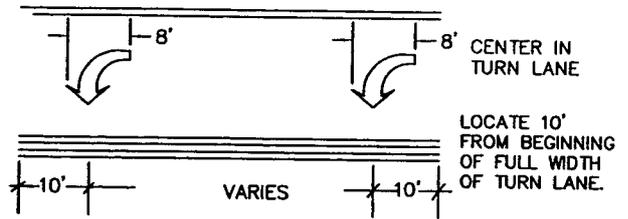
PUBLIC WORKS STANDARDS

# A



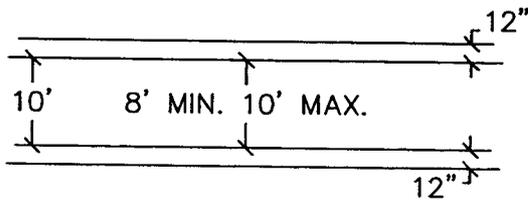
SKIP CENTERLINE:  
4" YELLOW LINE WITH TYPE I BI- DIRECTIONAL YELLOW RAISED PAVEMENT MARKERS AT 40' O.C.

# B



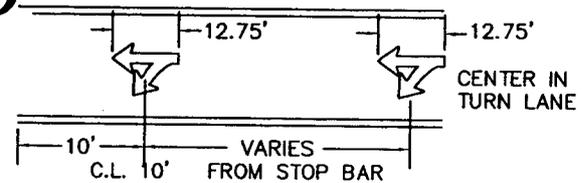
TURN LANE MARKINGS:  
SEE MUTCD AND ODOT STANDARD DRAWING TM530 FOR DETAILS. ARROWS SHALL BE PREFORMED THERMOPLASTIC PAVEMENT MARKING MATERIAL.

# C



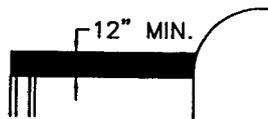
CROSSWALK:  
SPACE TWO 12" WHITE LINES AS SHOWN ON PLANS. CROSSWALK SHALL BE THERMOPLASTIC PAVEMENT MARKING MATERIAL

# D



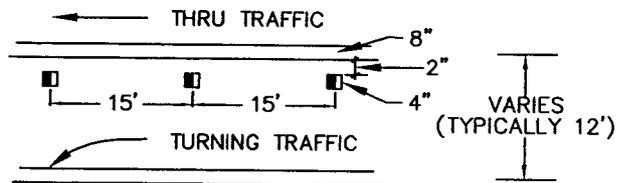
THRU AND TURN LANE MARKINGS  
SEE MUTCD FOR DETAILS. TURN AND THRU ARROWS SHALL BE PREFORMED THERMOPLASTIC PAVEMENT MARKING MATERIAL

# E



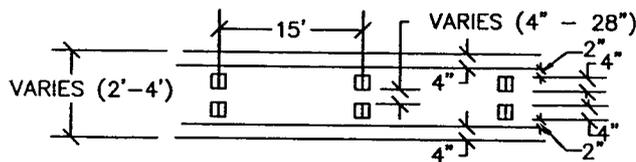
STOP BAR:  
SHALL BE THERMOPLASTIC PAVEMENT MARKING MATERIAL. NOT REQUIRED AT INTERSECTIONS IF MARKED CROSSWALKS ARE INSTALLED.

# F



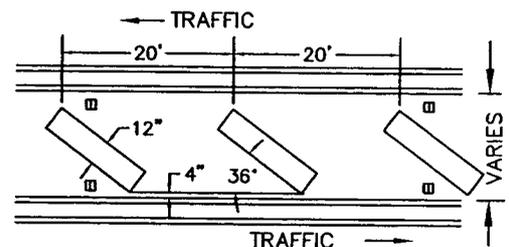
TURN LANE:  
8" WHITE LINE WITH MONO-DIRECTIONAL CRYSTAL TYPE I MARKERS (WHITE) AT 15' O.C.

# G



MEDIAN NOSE:  
TWO 4" YELLOW LINES WITH BI- DIRECTIONAL YELLOW TYPE I MARKERS AT 15' O.C. FOR USE AT INTERSECTIONS WHERE MEDIAN NOSE IS LESS THAN 4' WIDE.

# H



DIAGONAL LINES:  
12" YELLOW OR WHITE LINES INSTALLED AS SHOWN.

Pavement Markings Page 1

DRAWING NUMBER: R-1175

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: R-1175.dwg

APPROVED BY: SA

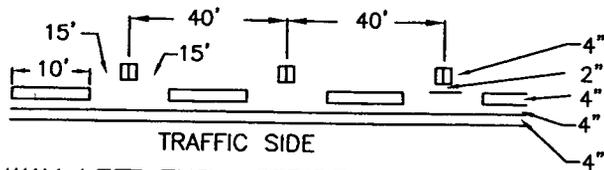
DATE: 03/21/06

CITY OF  
WILSONVILLE



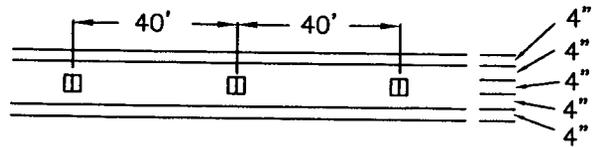
PUBLIC WORKS STANDARDS

I



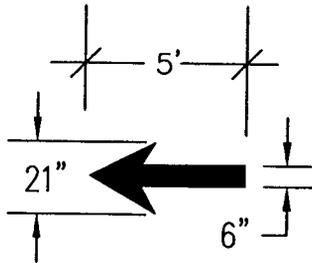
TWO WAY LEFT TURN STRIPE:  
 4" YELLOW LINES WITH TYPE I  
 BI-DIRECTIONAL YELLOW RAISED PAVEMENT  
 MARKERS AT 40' O.C. OUTSIDE LINE IS SOLID  
 INSIDE AT 10'/30' PATTERN.

J



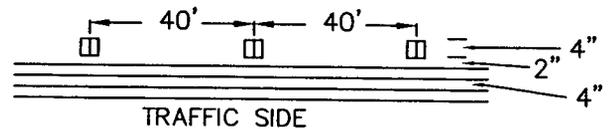
CENTERLINES:  
 TWO 4" YELLOW LINES WITH BI-DIRECTIONAL  
 YELLOW TYPE I MARKERS AT 40' O.C.

K



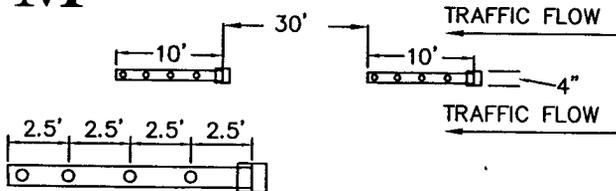
BICYCLE LANE ARROW:  
 SEE ODOT BIKE LANE STANDARDS. USE  
 PREFORMED THERMOPLASTIC PAVEMENT  
 MARKING MATERIAL.

L



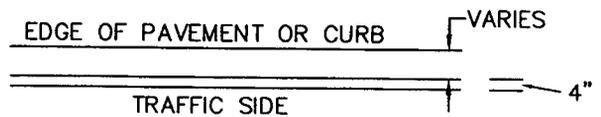
MEDIAN STRIPE:  
 TWO 4" YELLOW LINES WITH TYPE I  
 BI-DIRECTIONAL YELLOW RAISED PAVEMENT  
 MARKERS AT 40' O.C.

M



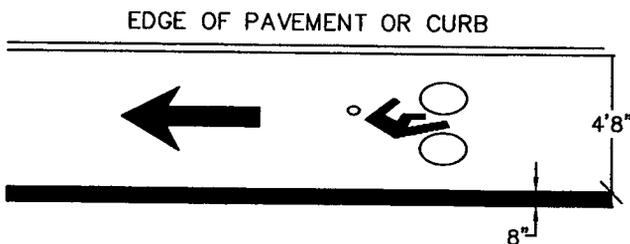
LANE LINE:  
 4" WHITE WITH CRYSTAL. TYPE I WHITE  
 MONO-DIRECTIONAL MARKERS AT 40' O.C.

N



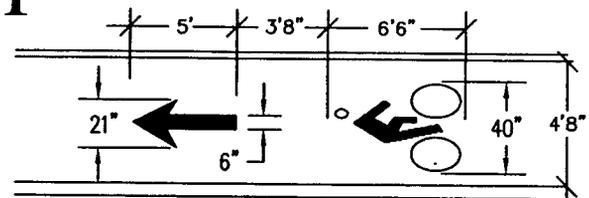
FOG LINE:  
 4" WHITE LINE AS SHOWN ON PLANS

O



BIKE LANE LINE - 8" WIDE WHITE LINE

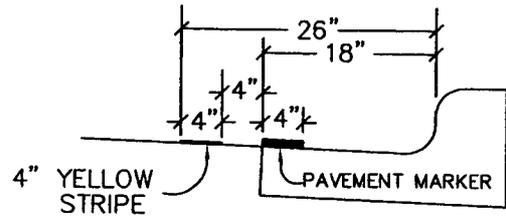
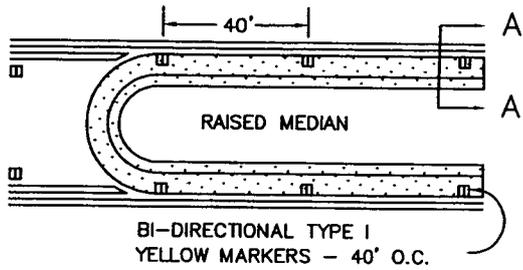
P



BICYCLE LANE MARKING:  
 SEE ODOT BIKE LANE STANDARDS. USE  
 PREFORMED THERMOPLASTIC PAVEMENT  
 MARKING MATERIAL.



Q

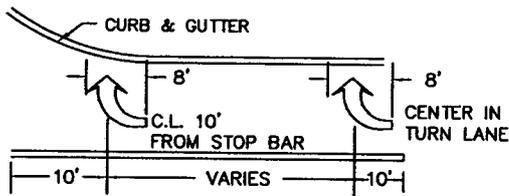


SECTION A - A

RAISED MEDIAN STRIPE:

4" YELLOW LINE WITH TYPE I BI-DIRECTIONAL YELLOW RAISED PAVEMENT MARKERS AT 40' O.C.

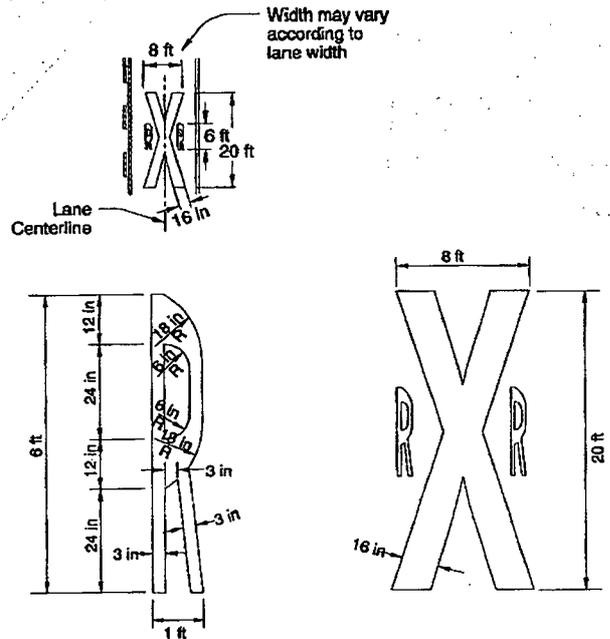
R



RIGHT TURN LANE MARKINGS:

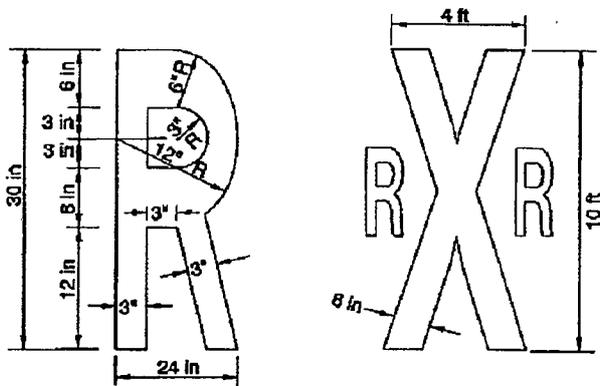
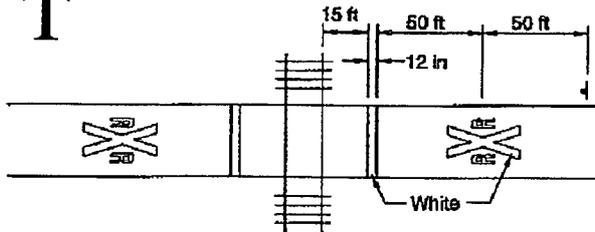
SEE MUTCD AND ODOT STANDARD DRAWING TM530 FOR DETAILS. ARROWS SHALL BE THERMOPLASTIC PAVEMENT MARKING MATERIAL.

S



PAVEMENT MARKINGS FOR R/R CROSSING

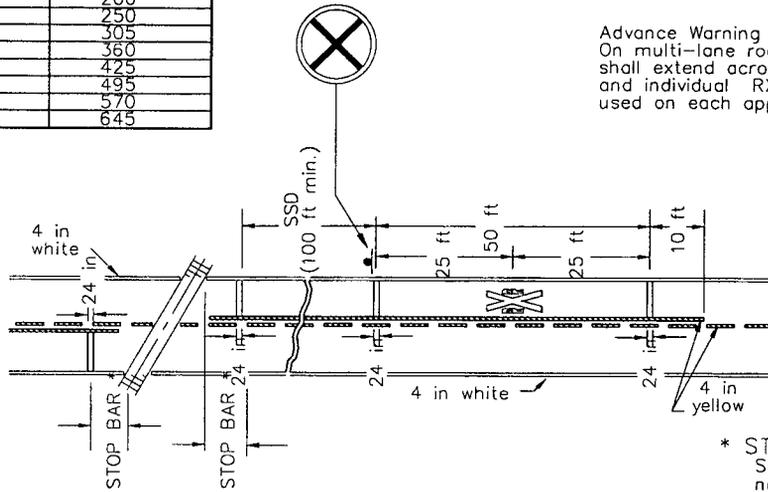
T



PAVEMENT WORD AND SYMBOL MARKINGS FOR BIKE ROUTE AT R/R GRADE X-ING



| Posted Speed (mph) | Safe Stopping Distance SSD (ft) |
|--------------------|---------------------------------|
| 10                 | 50 (use 100)                    |
| 15                 | 80 (use 100)                    |
| 20                 | 115                             |
| 25                 | 155                             |
| 30                 | 200                             |
| 35                 | 250                             |
| 40                 | 305                             |
| 45                 | 360                             |
| 50                 | 425                             |
| 55                 | 495                             |
| 60                 | 570                             |
| 65                 | 645                             |



Advance Warning Pavement Markers (AWPM):  
On multi-lane roads the transverse lines shall extend across all approach lanes and individual RXR symbols should be used on each approach lane.

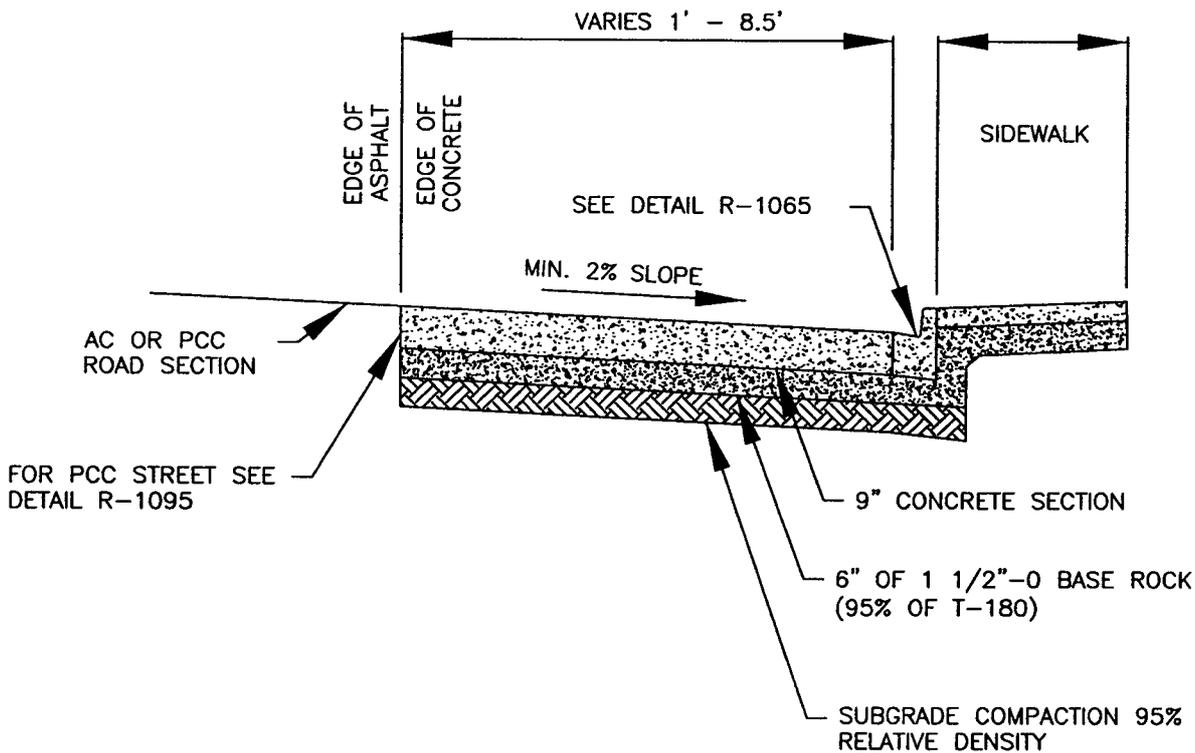
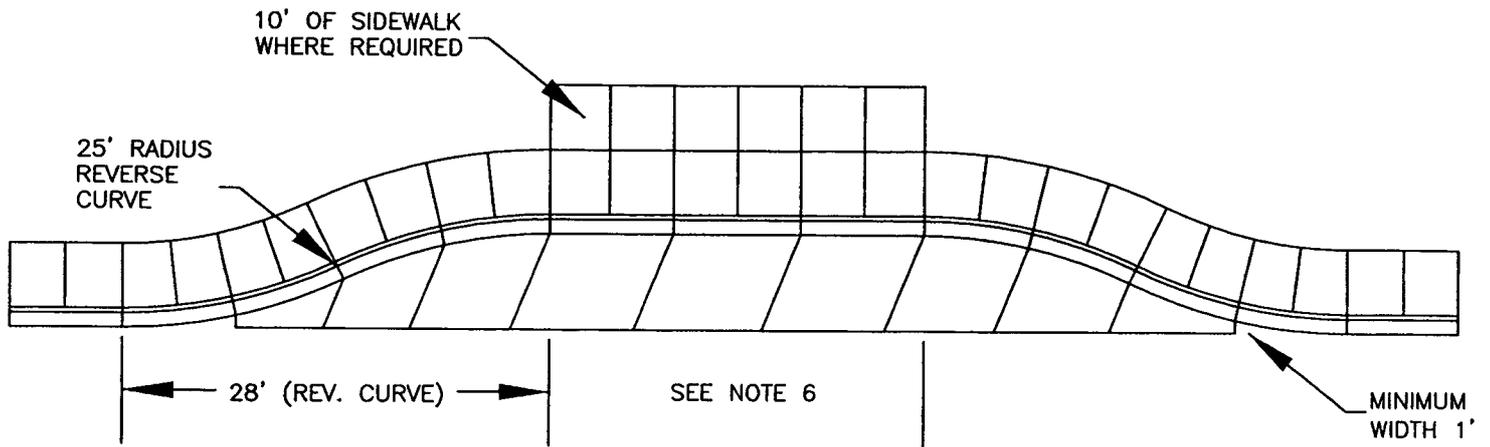
TYPICAL RAILROAD GRADE CROSSING MARKINGS  
(see OAR Chapter 741-110 for details)

\* STOP BAR:  
Stop bar 12 ft minimum from nearest rail or 12 inches in advance of location where gate arm crosses the roadway. Stop bar should be either perpendicular to roadway or parallel to gate, if present.

NOTES

1. ALL STRIPING AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
2. ALL STRIPING AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE CITY OF WILSONVILLE AND ODOT TRAFFIC ENGINEERING DESIGN SPECIFICATIONS.
3. LOCATE STOP BARS 10' BACK OF THE EXTENDED FOG LINE, EDGE OF PAVEMENT, OR CURB FACE. VERIFY SIGHT DISTANCE.
4. LOCATE CROSSWALKS AS PER SIDEWALK RAMP LOCATIONS OR 5' BACK OF EXTENDED FOG LINE, EDGE OF PAVEMENT OR CURB FACE.
5. ANY REMOVAL OF EXISTING STRIPING TO BE DETERMINED IN THE FIELD AND IS CONSIDERED INCIDENTAL WORK. STRIPING SHALL BE BEAD BLASTED FOR PAINT AND GROUND FOR THERMOPLASTIC OR AS DIRECTED BY THE CITY'S AUTHORIZED REPRESENTATIVE.
6. ALL THERMOPLASTIC PAVEMENT MARKING MATERIALS SHALL BE INSTALLED AS PER SECTION 00850 OF THE ODOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
7. ALL PAVEMENT MARKING SHALL CONFORM TO THE MOST CURRENT ODOT SPECIFICATIONS FOR BEAD BINDER PAINT. COPIES OF THE MATERIALS SPECIFICATIONS ARE AVAILABLE FROM:  
ENGINEER OF MATERIALS AND RESEARCH  
HWY. MATERIALS LABORATORY  
600 AIRPORT ROAD S.E.  
SALEM OR. 97310
8. LANE WIDTHS SHALL BE MEASURED FROM CENTERLINE OF STRIPE TO CENTERLINE OF STRIPE OR CURB FACE.





NOTES:

1. CONCRETE SHALL BE 4,000 PSI IN 28 DAYS.
2. TRANSVERSE CONTRACTION JOINTS SHALL BE SAWCUT AND FILLED WITH APPROVED JOINT SEALANT.
3. JOINT SPACING SHALL MATCH CURB JOINT SPACING BUT BE NO MORE THAN 12' O.C.
4. JOINT SKEW SHALL BE 6:1 AND MATCH SKEW IN CONCRETE STREETS.
5. CONSTRUCTION JOINTS WITH PCC STREET AND CURB SHALL BE DOWELED WITH #4 REBAR 3' O.C.
6. 75' MINIMUM LENGTH UNLESS OTHERWISE APPROVED BY THE TRANSIT DIRECTOR AND CITY ENGINEER.

Transit Bus Turnout

DRAWING NUMBER: R-1195

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: R-1195.dwg

APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

# **Storm and Sanitary Sewer Details**

# LEGEND

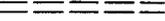
## EXISTING

-  FIRE HYDRANT
-  GATE VALVE
-  BUTTERFLY VALVE W/OPER.
-  WATER METER
-  6" D.I. WATER MAIN
-  THRUST BLOCK
-  MJ PLUG ON TEE

## PROPOSED

-  FIRE HYDRANT
-  GATE VALVE
-  BUTTERFLY VALVE W/OPER.
-  WATER METER
-  WATER MAIN
-  THRUST BLOCK
-  STRADDLE BLOCK
-  BLOW-OFF

## JOINTS and FITTINGS

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li> UNDERGROUND TV CABLE</li> <li> UNDERGROUND POWER</li> <li> UNDERGROUND TELEPHONE</li> <li> 2" G GAS MAIN W/VALVE</li> <li> POWER POLE W/GUY</li> <li> CULVERT</li> <li> MANHOLE</li> <li> 8" SA SANITARY SEWER</li> <li> 18" ST STORM DRAIN</li> <li> SURVEY MONUMENT</li> <li> DITCH OR STREAM</li> </ul> | <ul style="list-style-type: none"> <li> FLANGE JOINT (FLG)</li> <li> MECHANICAL JOINT</li> <li> BELL END OF PIPE</li> <li> FLANGED TEE</li> <li> 45 DEGREE BEND, MJ</li> <li> ADAPTER, FLG x MJ</li> <li> REDUCER, FLG</li> <li> MJ PLUG ON TEE</li> <li> MJ CAP</li> <li> BLIND FLANGE ON TEE</li> <li> SLEEVE OR COUPLING</li> </ul> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Standard Symbols

DRAWING NUMBER: S-2000

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2000.dwg

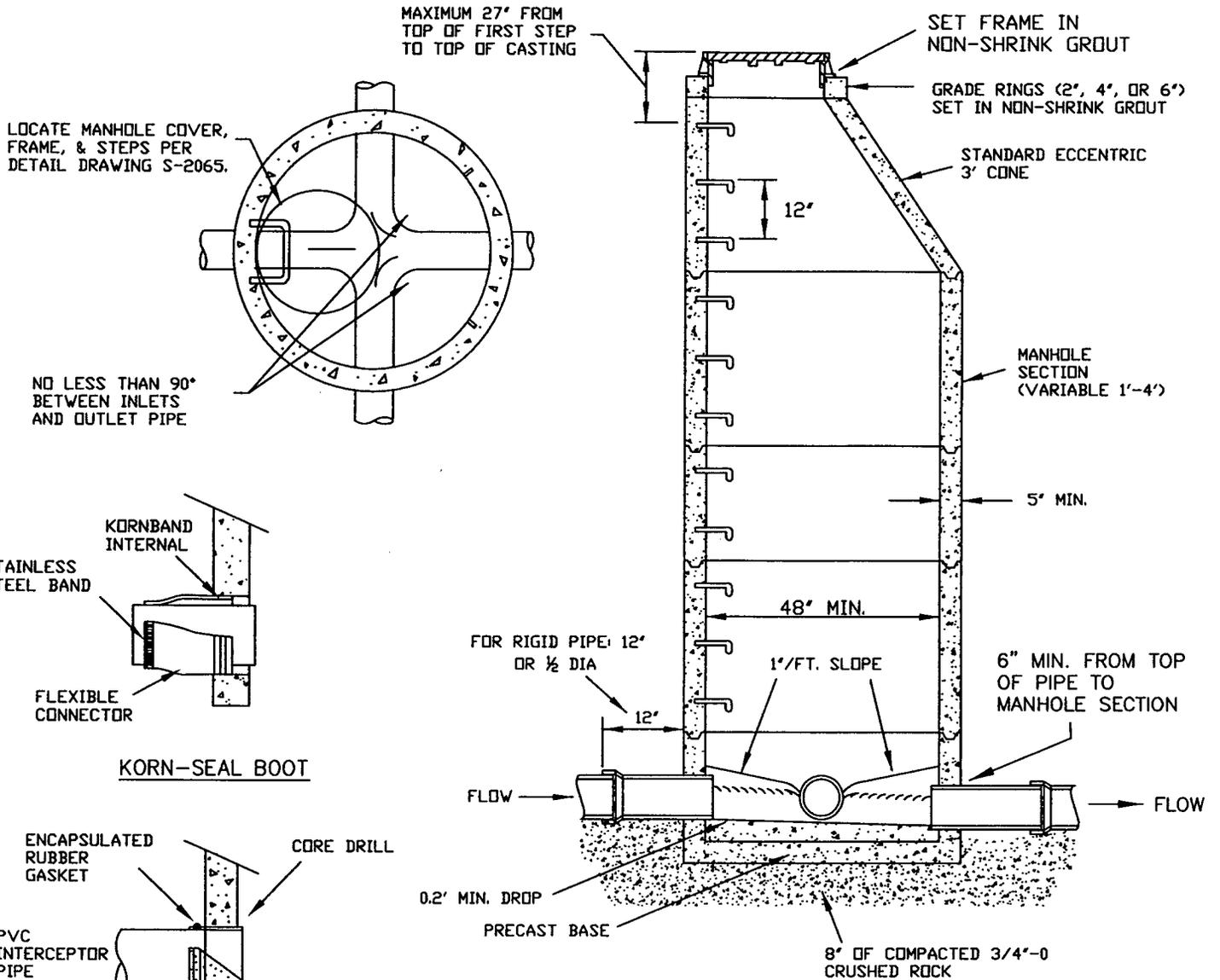
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



**NOTES:**

1. MANHOLE TO CONFORM WITH ASTM C-478, ASTM C-94, AND ASTM C-14.
2. MANHOLE FRAME AND COVER AS PER DETAIL DRAWING S-2055.
3. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT.
4. CHANNELS SHALL BE 3/4 VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
5. RAM-NECK OR KENT-SEAL SHALL BE USED ON ALL MANHOLE SECTIONS.
6. 18" MAXIMUM DROP BETWEEN INVERTS.
7. MIN. 0.20' FALL BETWEEN INLETS AND OUTLET.
8. 8" MINIMUM BETWEEN PIPE ACCESS HOLES INTO MANHOLE. DISTANCE MEASURED AT OUTSIDE OF MANHOLE OR PER MANUFACTURERS RECOMMENDATIONS.
9. MINIMUM HEIGHT OF STANDARD MANHOLE TO BE 5'.
10. SEE MANHOLE STEP DETAIL DRAWING S-2080.
11. PIPE ACCESSES INTO MANHOLES SHALL BE PRE-FORMED OR CORE DRILLED.
12. STANDARD MANHOLE TO BE USED OVER EXISTING MAINS AND FOR PIPE 24" OR LESS IN DIAMETER.
13. MANHOLE FRAME AND COVER AS PER DETAIL DRAWING S-2055.

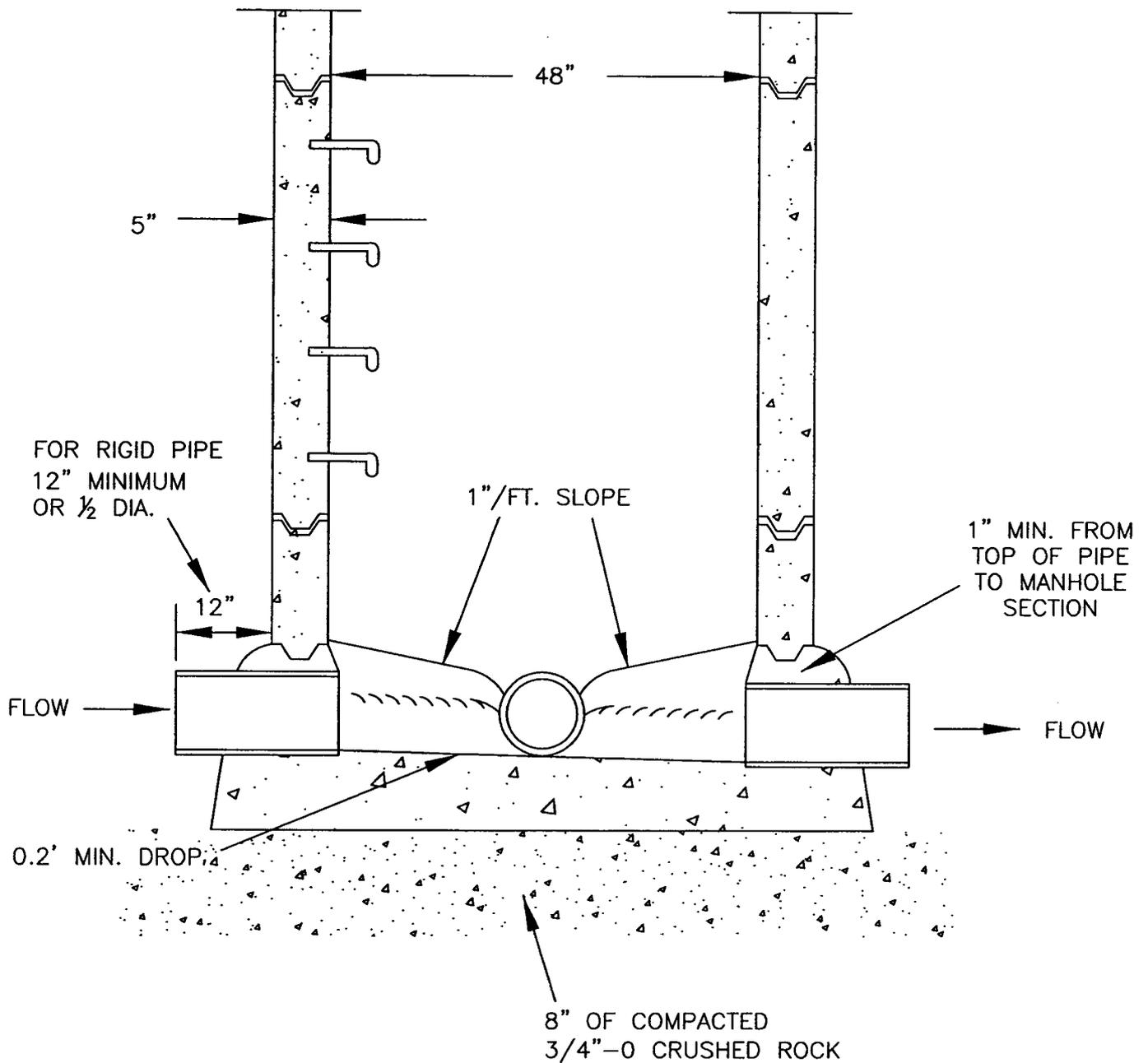
**Standard Manhole**

|                        |                 |                |
|------------------------|-----------------|----------------|
| DRAWING NUMBER: S-2005 | DRAWN BY: SJ    | SCALE: N.T.S.  |
| FILE NAME: S-2005.dwg  | APPROVED BY: SA | DATE: 03/29/06 |

CITY OF WILSONVILLE



PUBLIC WORKS STANDARDS



NOTES:

1. MANHOLE TO CONFORM WITH ASTM C-478, ASTM C-94, AND ASTM C-14.
2. MANHOLE FRAME AND COVER AS PER DETAIL DRAWING S-2055.
3. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT.
4. CHANNELS SHALL BE 3/4 VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
5. RAM-NECK, KENT-SEAL, OR PREFORMED O-RING SHALL BE USED ON ALL MANHOLE SECTIONS. 6. 18" MAXIMUM DROP BETWEEN INVERTS.
7. MIN. 0.20' FALL BETWEEN INLETS AND OUTLET.
8. 8" MINIMUM BETWEEN PIPE ACCESS HOLES INTO MANHOLE. DISTANCE MEASURED AT OUTSIDE OF MANHOLE OR PER MANUFACTURER'S RECOMMENDATION.
9. MINIMUM HEIGHT OF STANDARD MANHOLE TO BE 5'.
10. SEE MANHOLE STEP DETAIL DRAWING S-2080.
11. PIPE ACCESSES INTO MANHOLES SHALL BE PRE-FORMED OR CORE DRILLED.
12. PRECAST MANHOLE CONCRETE BASE TO BE USED FOR PIPE SIZES 24" OR LESS IN DIAMETER.

Cast-in-place Concrete Manhole Base

DRAWING NUMBER: S-2010

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2010.dwg

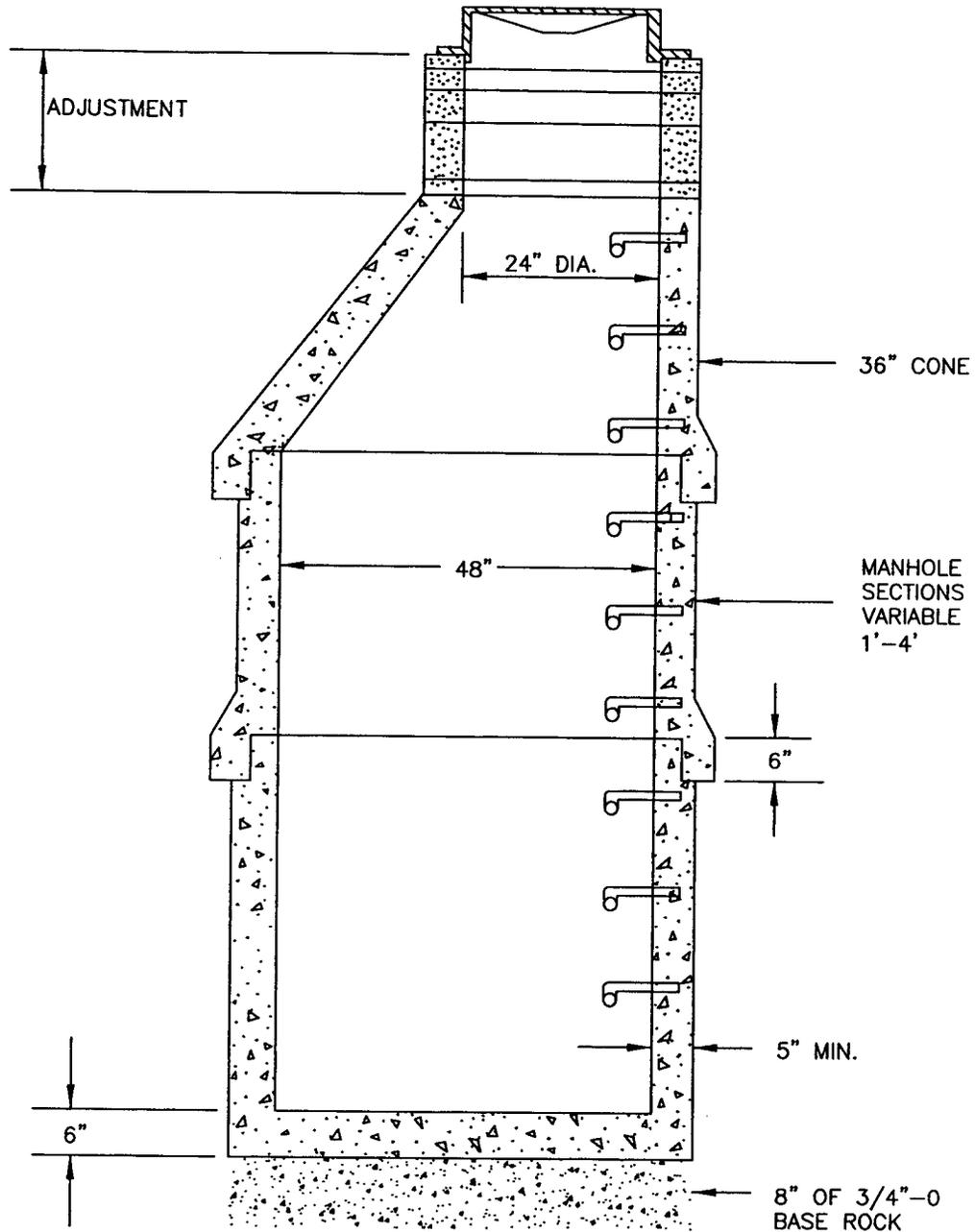
APPROVED BY: SA

DATE: 03/29/06

CITY OF  
WILSONVILLE



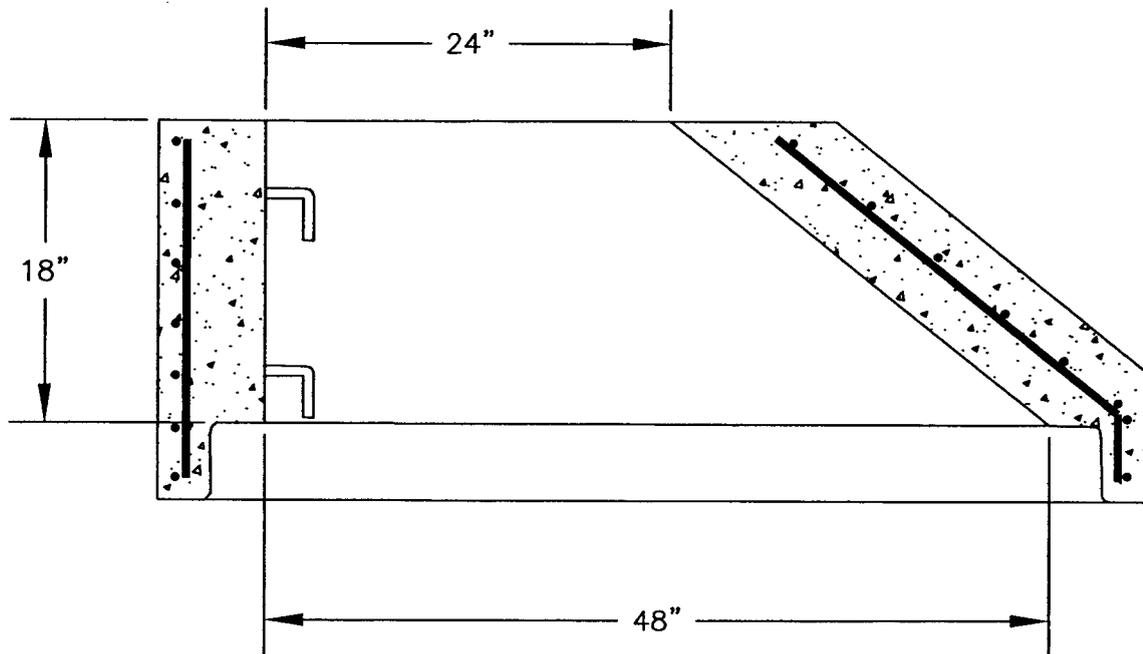
PUBLIC WORKS STANDARDS



NOTES:

1. MANHOLE TO CONFORM WITH ASTM C-478, ASTM C-94, AND ASTM C-14.
2. MANHOLE FRAME AND COVER AS PER DETAIL DRAWING S-2055.
3. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT.
4. CHANNELS SHALL BE 3/4 VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
5. RUBBER GASKET JOINT SHALL CONFORM WITH ASTM C-433.
6. 18" MAXIMUM DROP BETWEEN INVERTS.
7. MIN. 0.20' FALL BETWEEN INLET AND OUTLET.
8. 8" MINIMUM BETWEEN PIPE ACCESS HOLES INTO MANHOLE. DISTANCE MEASURED AT OUTSIDE OF MANHOLE OR PER MANUFACTURER'S RECOMMENDATION.
9. MINIMUM HEIGHT OF STANDARD MANHOLE TO BE 5'.
10. SEE MANHOLE STEP DETAIL DRAWING S-2080.
11. PIPE ACCESSES INTO MANHOLES SHALL BE PRE-FORMED OR CORE DRILLED. HOLE SIZE TO EQUAL PIPE O.D. PLUS MANHOLE WALL THICKNESS. MAXIMUM HOLE SIZE 32".
12. 48" PRECAST MANHOLE TO BE USED FOR PIPE 24" OR LESS IN DIAMETER.
13. MANHOLE FRAME AND COVER AS PER DETAIL S-2055.

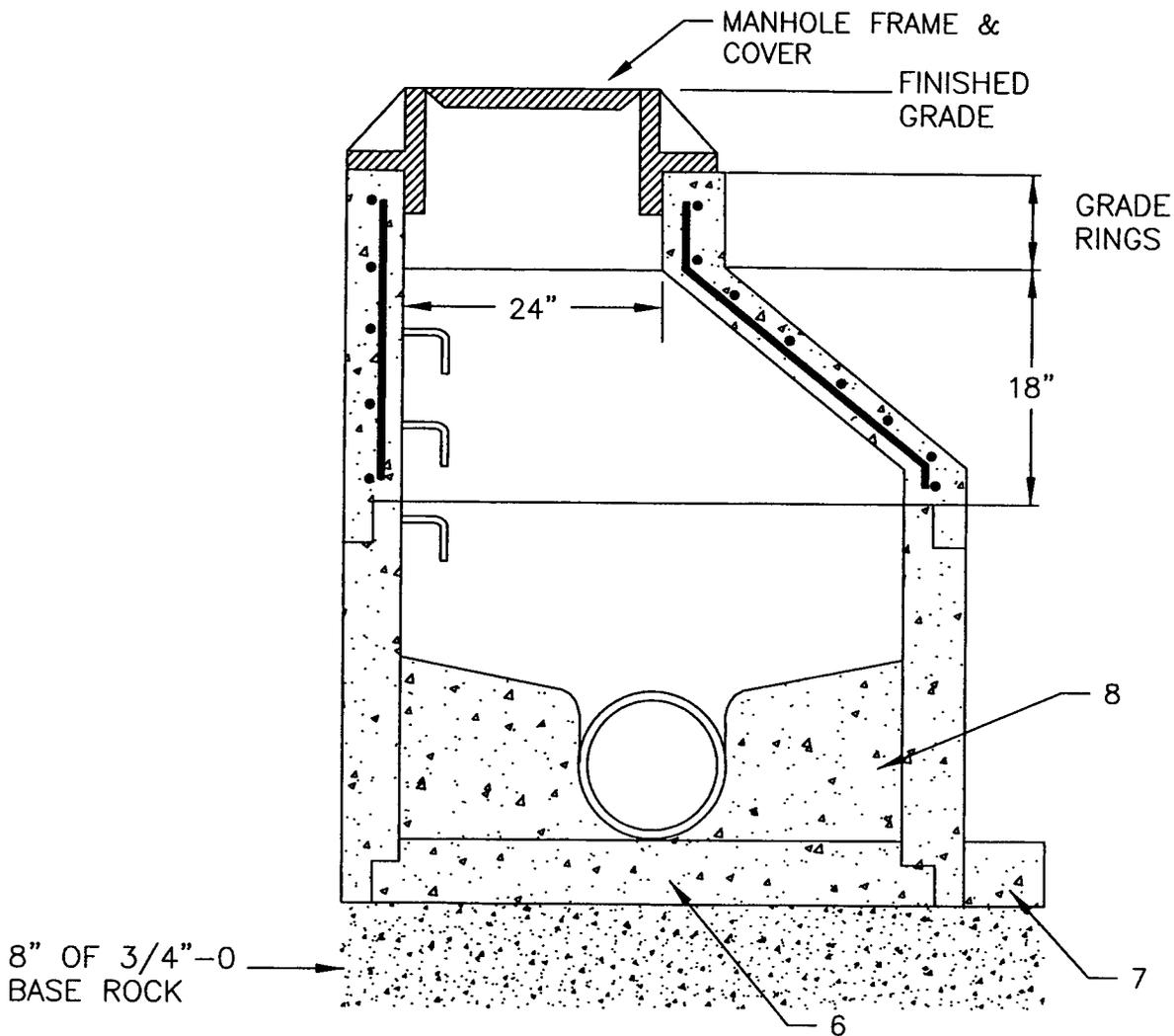
|                               |                 |                |                        |                                                                                       |
|-------------------------------|-----------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Precast Rubber Gasket Manhole |                 |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: S-2015        | DRAWN BY: SJ    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: S-2015.dwg         | APPROVED BY: SA | DATE: 03/29/06 | PUBLIC WORKS STANDARDS |                                                                                       |



NOTES:

1. MANHOLE CONE IS MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
2. CONCRETE HAS A 28 DAY ULTIMATE STRENGTH OF 4,000 PSI.
3. REINFORCING STEEL IS GRADE 60. STEEL AREA IS 0.12 SQ. IN. PER FOOT (D3 ON 3" SPACING). 2 INCHES CLEAR OF SURFACE.
4. WALL THICKNESS IS 5" MINIMUM.
5. AS MANUFACTURED BY CASCADE CONCRETE PRODUCTS, INC., OR APPROVED EQUAL.
6. SEE MANHOLE STEPS DETAIL DRAWING S-2080.

|                              |                  |                |                                                                                                                                           |
|------------------------------|------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 48" X 18" Rubber Gasket Cone |                  |                | CITY OF<br>WILSONVILLE<br><br>PUBLIC WORKS STANDARDS |
| DRAWING NUMBER: S-2020       | DRAWN BY: GCF    | SCALE: N.T.S.  |                                                                                                                                           |
| FILE NAME: S-2020.dwg        | APPROVED BY: MAS | DATE: 11/01/03 |                                                                                                                                           |



NOTES:

1. MANHOLE TO CONFORM WITH ASTM C-478, ASTM C-94, AND ASTM C-14.
2. ALL REINFORCEMENT SHALL BE GRADE 60.
3. ALL CONCRETE WILL HAVE A 28 DAY ULTIMATE STRENGTH OF 4000 PSI.
4. 48" DIAMETER MANHOLE SECTIONS ARE AVAILABLE IN 1', 2', 3', & 4' SECTIONS.
5. SEE MANHOLE STEP DETAIL DRAWING S-2080.
6. STANDARD PRECAST BASE SLAB.
7. EXTENDED BASES WHERE REQUIRED BY THE GEOTECHNICAL ENGINEER.
8. CHANNELS SHALL BE 3/4 VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
9. MANHOLE FRAME AND COVER AS PER DETAIL DRAWING-2055.
10. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT.
11. RUBBER GASKET JOINT SHALL CONFORM WITH ASTM C-433.
12. MAXIMUM FALL BETWEEN INVERTS IS 1.5'. MINIMUM FALL BETWEEN INVERTS IS 0.2'.
13. 8" MINIMUM BETWEEN PIPE ACCESS HOLES INTO MANHOLE. DISTANCE MEASURED AT OUTSIDE OF MANHOLE OR PER MANUFACTURERS RECOMMENDATION.
14. PIPE ACCESSES INTO MANHOLES SHALL BE PRE-FORMED OR CORE DRILLED. HOLE SIZE TO EQUAL PIPE O.D. PLUS MANHOLE WALL THICKNESS.
15. 48" PRECAST MANHOLE TO BE USED FOR PIPE 24" OR LESS IN DIAMETER.

Shallow Manhole (less than 5 ft.)

DRAWING NUMBER: S-2025

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2025.dwg

APPROVED BY: MAS

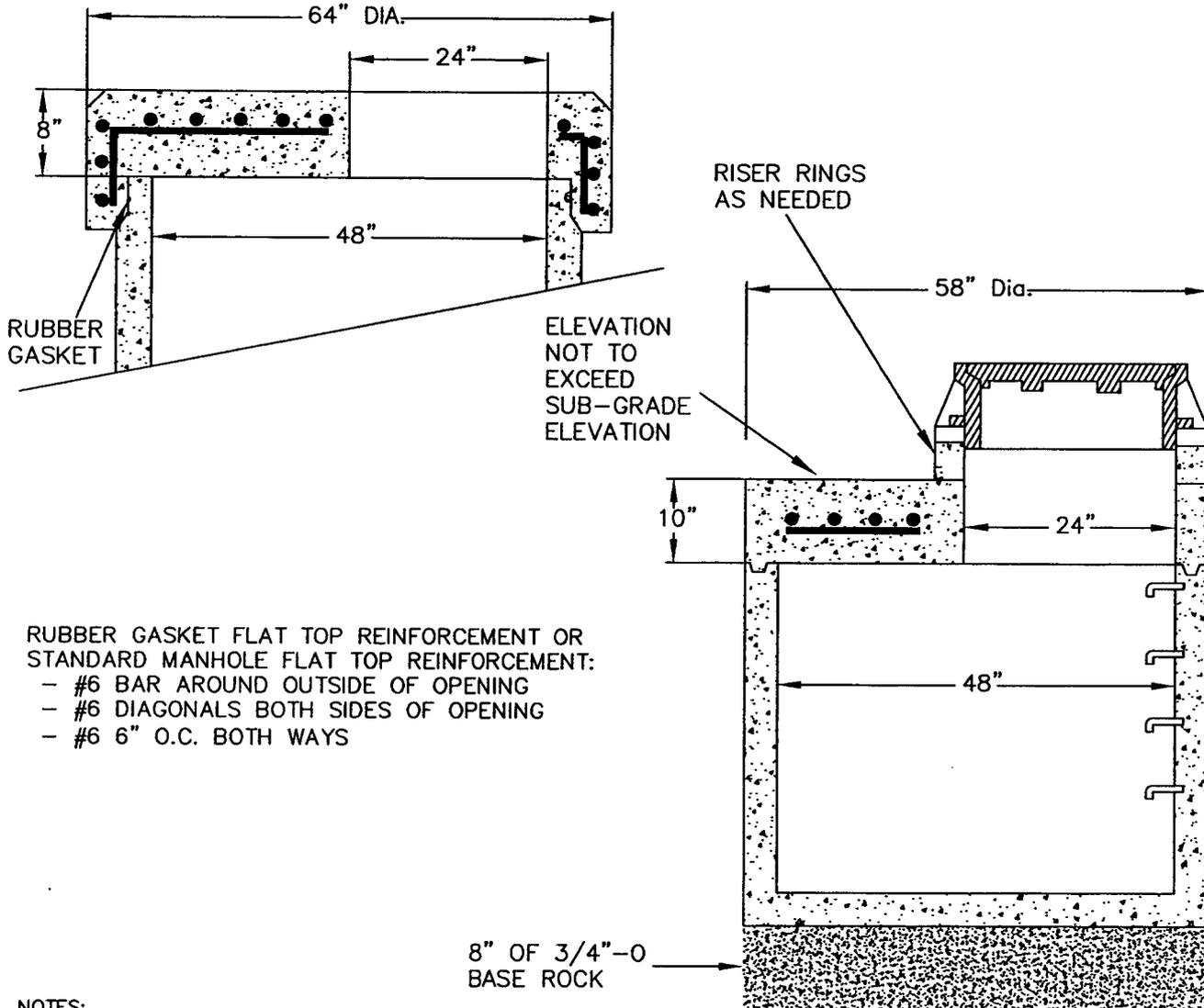
DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

# RUBBER GASKET FLAT TOP (OPTIONAL)



## RUBBER GASKET FLAT TOP REINFORCEMENT OR STANDARD MANHOLE FLAT TOP REINFORCEMENT:

- #6 BAR AROUND OUTSIDE OF OPENING
- #6 DIAGONALS BOTH SIDES OF OPENING
- #6 6" O.C. BOTH WAYS

## NOTES:

1. MANHOLE TO CONFORM WITH ASTM C-478, ASTM C-94, AND ASTM C-14.
2. ALL REINFORCEMENT SHALL BE GRADE 60.
3. ALL CONCRETE WILL HAVE A 28 DAY ULTIMATE STRENGTH OF 4000 PSI.
4. 48" DIAMETER MANHOLE SECTIONS ARE AVAILABLE IN 1', 2', 3', & 4' SECTIONS.
5. STEPS REQUIRED ON FLAT TOP MANHOLES OVER 4' DEEP. SEE MANHOLE STEP DETAIL DRAWING S-2080.
6. STANDARD PRECAST BASE SLAB.
7. EXTENDED BASES WHERE REQUIRED.
8. CHANNELS SHALL BE 3/4 VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
9. MANHOLE FRAME AND COVER AS PER DETAIL DRAWING S-2055.
10. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT.
11. RUBBER GASKET JOINT SHALL CONFORM WITH ASTM C-433.
12. MAXIMUM FALL BETWEEN INVERTS IS 1.5'. MINIMUM FALL BETWEEN INVERTS IS 0.2'.
13. 8" MINIMUM BETWEEN PIPE ACCESS HOLES INTO MANHOLE. DISTANCE MEASURED AT OUTSIDE OF MANHOLE OR PER MANUFACTURER'S RECOMMENDATION.
14. PIPE ACCESSES INTO MANHOLES SHALL BE PRE-FORMED OR CORE DRILLED. HOLE SIZE TO EQUAL PIPE O.D. PLUS MANHOLE WALL THICKNESS.
15. 48" PRECAST MANHOLE TO BE USED FOR PIPE 24" OR LESS IN DIAMETER.

## Flat Top Manhole

DRAWING NUMBER: S-2030

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2030.dwg

APPROVED BY: MAS

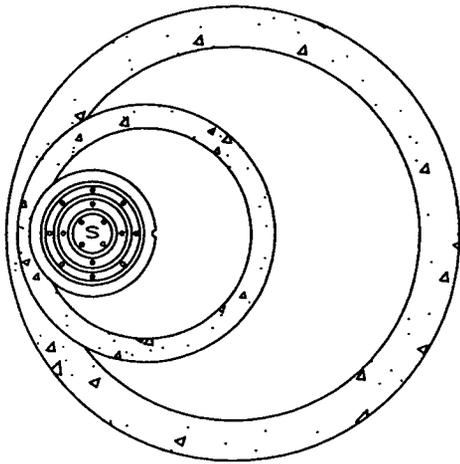
DATE: 11/01/03

CITY OF  
WILSONVILLE

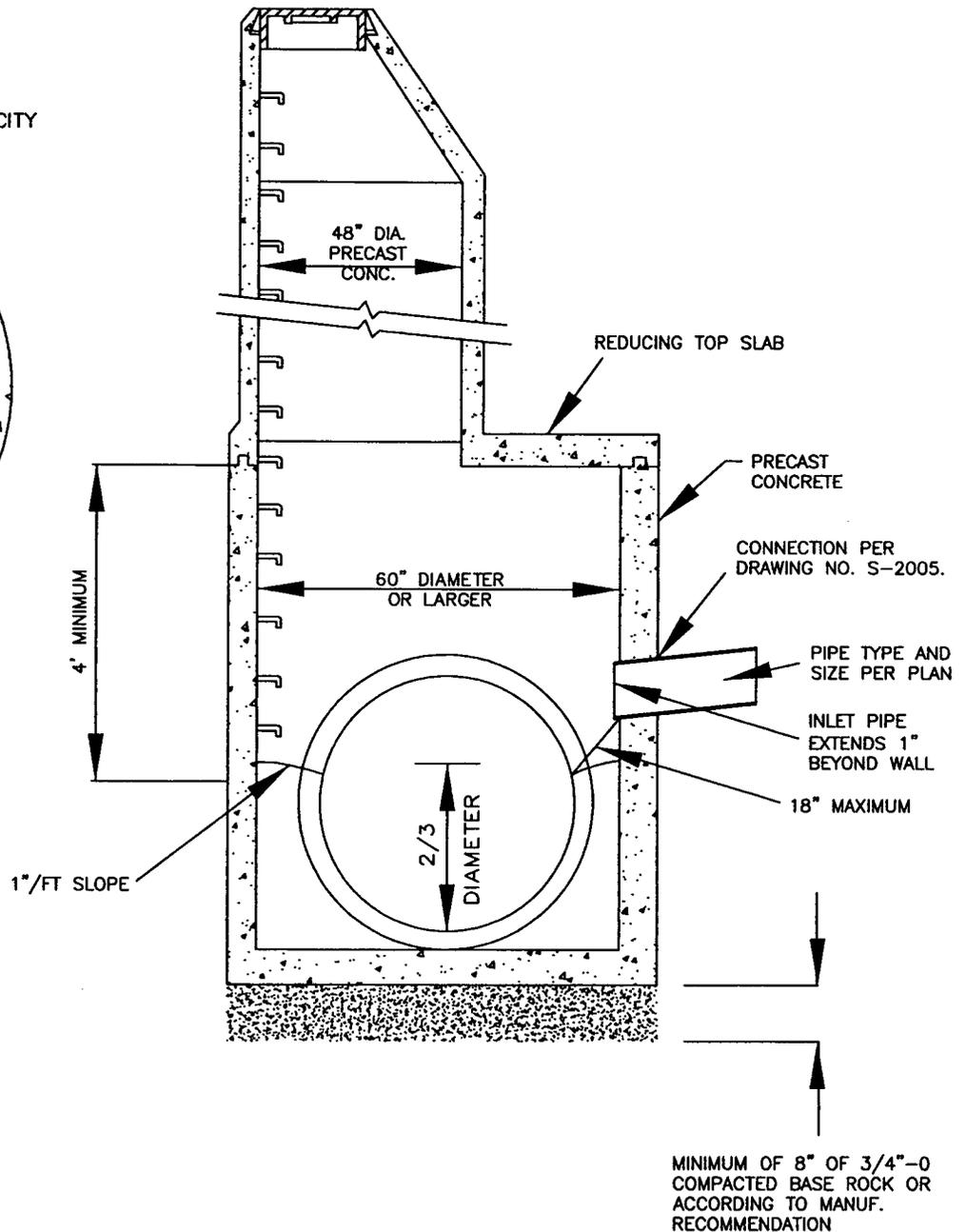


PUBLIC WORKS STANDARDS

DIMENSIONS AND REINFORCING DETAILS  
 ACCORDING TO MANUFACTURER'S  
 SPECIFICATIONS TO BE APPROVED BY CITY



REDUCING TOP SLAB



NOTES:

1. MANHOLE TO CONFORM WITH ASTM C-478, ASTM C-94, AND ASTM C-14.
2. MANHOLE FRAME AND COVER AS PER DETAIL DRAWING S-2055.
3. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT AND BE LOK TYPE OR EQUAL PER ASTM C-923 OF NON SHRINKING GROUT.
4. CHANNELS SHALL BE 2/3 VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
5. 8" MINIMUM DISTANCE BETWEEN PIPE ACCESS HOLES INTO MANHOLE. DISTANCE MEASURED AT OUTSIDE OF MANHOLE OR PER MANUFACTURER RECOMMENDATIONS WHICHEVER IS GREATER.
6. SEE MANHOLE STEP DETAIL DRAWING S-2080.
7. USE A 60" DIA. MANHOLE FOR 27" - 36" DIA. PIPE.
8. USE A 72" MANHOLE FOR 42" OR LARGER DIA. PIPE.
9. SHEAR JOINT SHALL BE 1/2 PIPE DIAMETER BUT NO GREATER THAN 3 FEET FROM OUTSIDE OF MANHOLE.

Large Diameter Pipe Manhole

DRAWING NUMBER: S-2035

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2035.dwg

APPROVED BY: MAS

DATE: 11/01/03

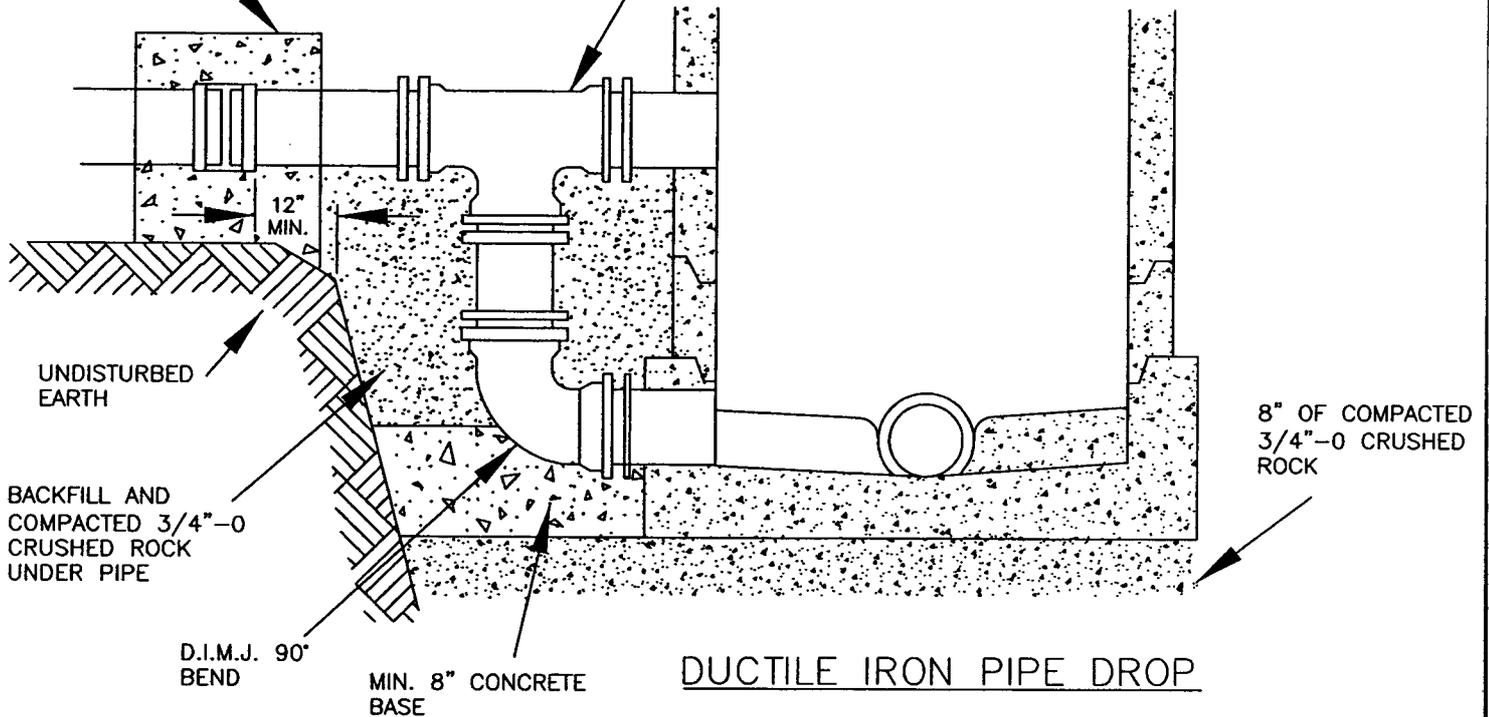
CITY OF  
 WILSONVILLE



PUBLIC WORKS STANDARDS

PIPE CLOSURE  
COLLAR OR APPROVED  
COUPLING

D.I.M.J. TEE  
OUTLET



DUCTILE IRON PIPE DROP

NOTES:

1. MANHOLE TO CONFORM WITH ASTM C-478, ASTM C-94, AND ASTM C-14.
2. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT.
3. CHANNELS SHALL BE 3/4 VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
4. RUBBER GASKET JOINT SHALL CONFORM WITH ASTM C-433.
5. 18" MAXIMUM DROP BETWEEN INVERTS.
6. MIN. 0.20' FALL BETWEEN INLET AND OUTLET.
7. 8" MINIMUM BETWEEN PIPE ACCESS HOLES INTO MANHOLE. DISTANCE MEASURED AT OUTSIDE OF MANHOLE OR PER MANUFACTURER'S RECOMMENDATION.
8. PIPE ACCESSES INTO MANHOLES SHALL BE PRE-FORMED OR CORE DRILLED. HOLE SIZE TO EQUAL PIPE O.D. PLUS MANHOLE WALL THICKNESS. MAXIMUM HOLE SIZE 32".

Standard Manhole Outside Drop Connections

DRAWING NUMBER: S-2040

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2040.dwg

APPROVED BY: SA

DATE: 03/21/06

CITY OF  
WILSONVILLE

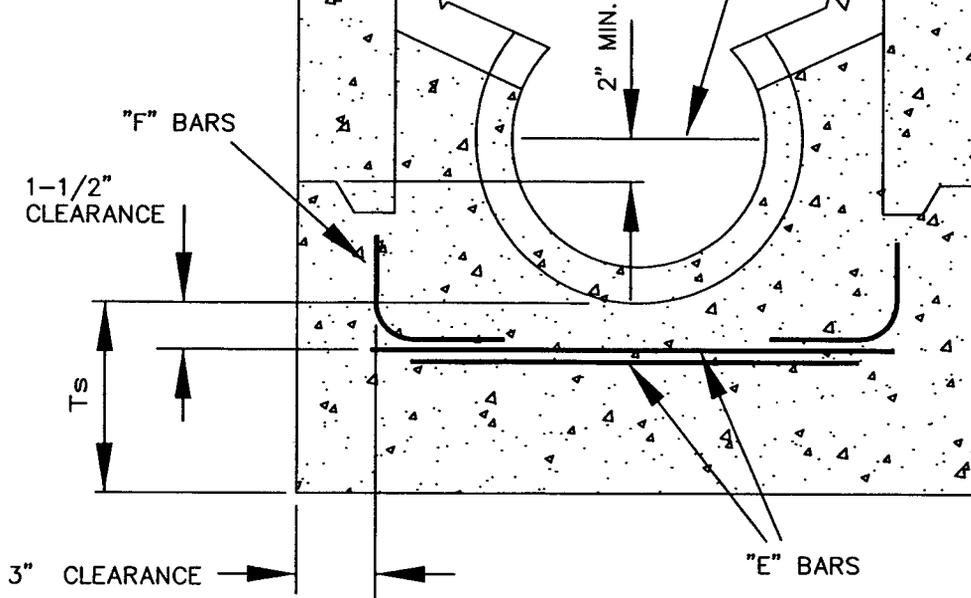


PUBLIC WORKS STANDARDS

WALL THICKNESS PER MANUF. RECOMMENDATIONS

ALSO SEE DETAIL DRAWING S-2035

SPRINGLINE

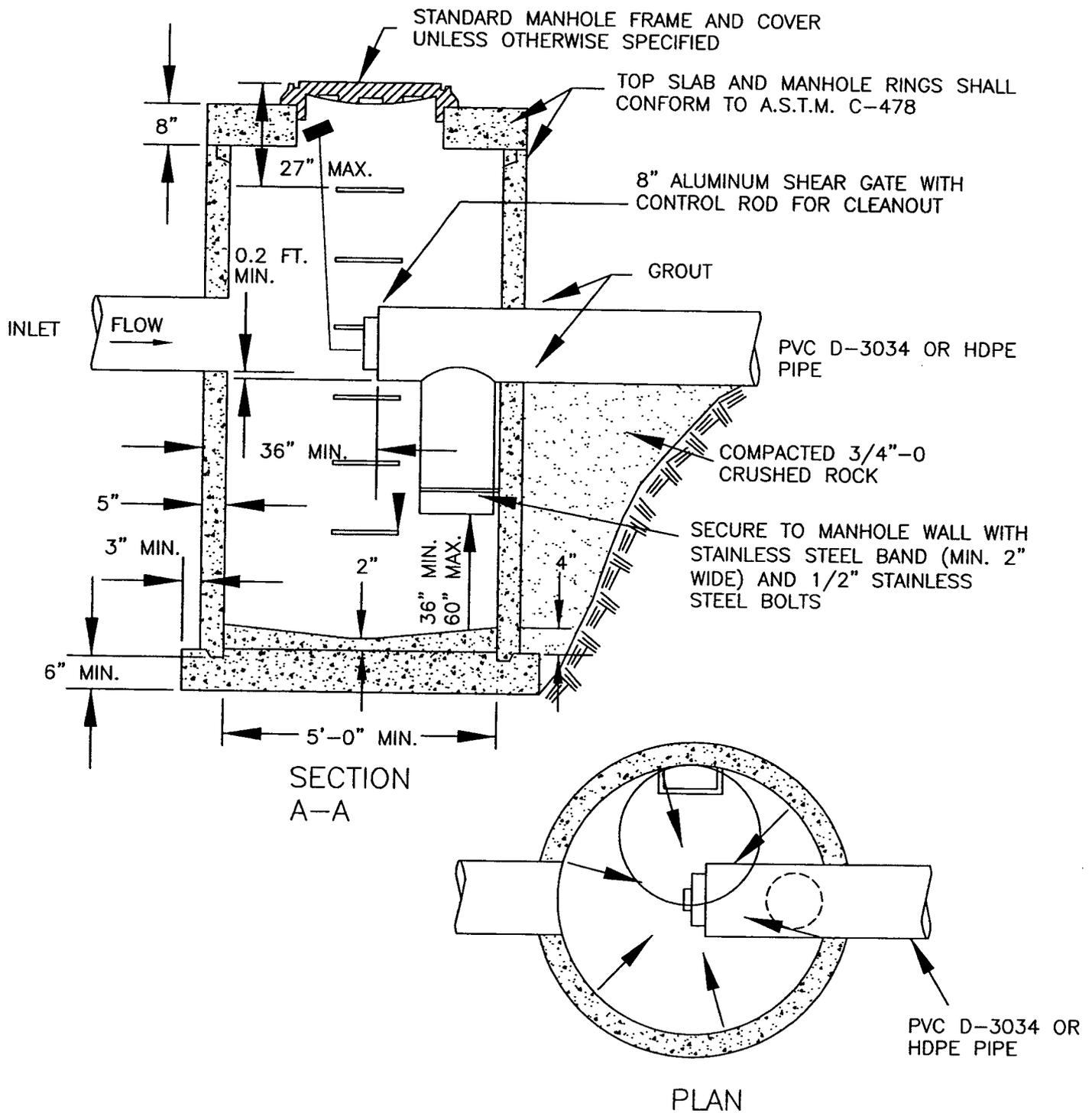


| BASE I.D.     |          | 60"      |         | 72"     |         |
|---------------|----------|----------|---------|---------|---------|
| TYPE          | DEPTH *  | 0'-15'   | 15'-30' | 0'-15'  | 15'-30' |
| CAST IN PLACE | Ts       | 7.0"     | 9.0"    | 7.0"    | 9.0"    |
|               | "E" BARS | #4 @ 12" | #4 @ 9" | #4 @ 9" | #4 @ 6" |
|               | "F" BARS | #4 @ 12" | #4 @ 9" | #4 @ 9" | #4 @ 6" |
| BASE I.D.     |          | 84"      |         | 96"     |         |
| TYPE          | DEPTH *  | 0'-15'   | 15'-30' | 0'-15'  | 15'-30' |
| CAST IN PLACE | Ts       | 8.0"     | 10.0"   | 9.0"    | 11.0"   |
|               | "E" BARS | #4 @ 8"  | #5 @ 9" | #4 @ 7" | #5 @ 8" |
|               | "F" BARS | #4 @ 8"  | #5 @ 9" | #4 @ 7" | #5 @ 8" |

\* INVERT TO STREET GRADE

NOTE:  
CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3,000 PSI. AT 28 DAYS.  
STEEL f<sub>y</sub> = GRADE 60.

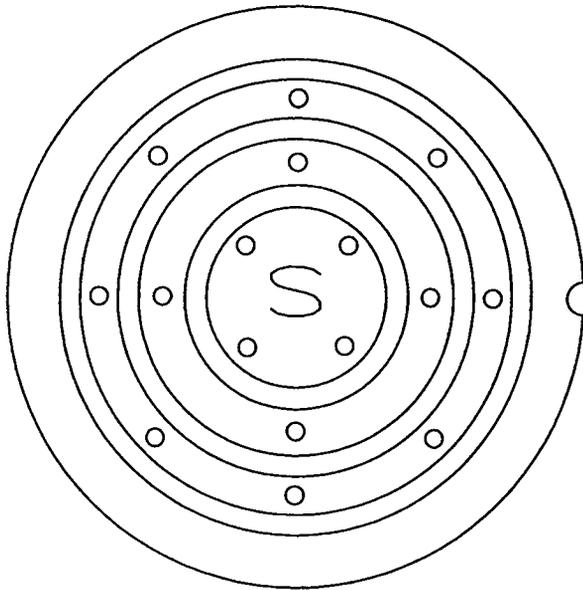
|                                           |                  |                |                                               |  |
|-------------------------------------------|------------------|----------------|-----------------------------------------------|--|
| Large Cast-in-place Concrete Manhole Base |                  |                | CITY OF WILSONVILLE<br>PUBLIC WORKS STANDARDS |  |
| DRAWING NUMBER: S-2045                    | DRAWN BY: GCF    | SCALE: N.T.S.  |                                               |  |
| FILE NAME: S-2045.dwg                     | APPROVED BY: MAS | DATE: 11/01/03 |                                               |  |



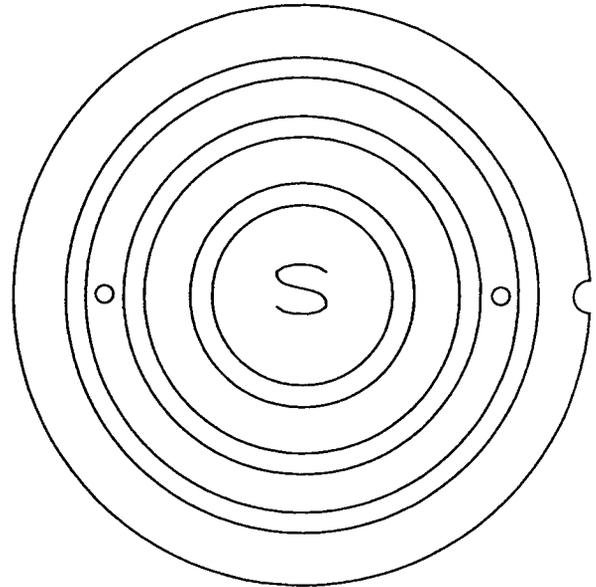
NOTES:

1. ALL PRECAST SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. C-478. ALL POURED IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 4000 PSI. AND 2" TO 4" SLUMP.
2. MANHOLE DIAMETER TO BE DETERMINED BY SIZE OF OUTLET PIPE. 12" - 21" PIPE = 60" DIAMETER MANHOLE. 24"+ PIPE, MANHOLE DIAMETER TO BE DESIGNED. MAX. SUMP DEPTH 5'.
3. ALL STAINLESS STEEL PARTS SHALL BE A-304 GRADE.
4. POUR BOTTOM TO SLOPE TO CENTER.
5. 8" ALUMINUM SHEAR GATE MANUFACTURED BY THOMAS MACHINE & FOUNDRY, LYNWOOD WA, SOLD BY M & R SALES 206-633-4325, OR APPROVED EQUAL.

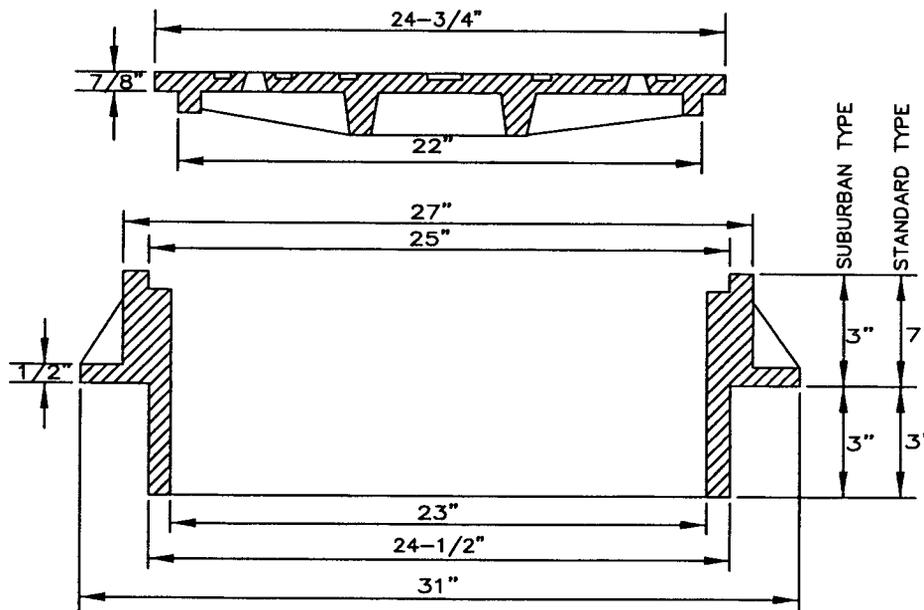
|                                 |                 |                |                        |                                                                                       |
|---------------------------------|-----------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Stormwater Pretreatment Manhole |                 |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: S-2050          | DRAWN BY: SJ    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: S-2050.dwg           | APPROVED BY: SA | DATE: 03/30/06 | PUBLIC WORKS STANDARDS |                                                                                       |



STORM



SANITARY



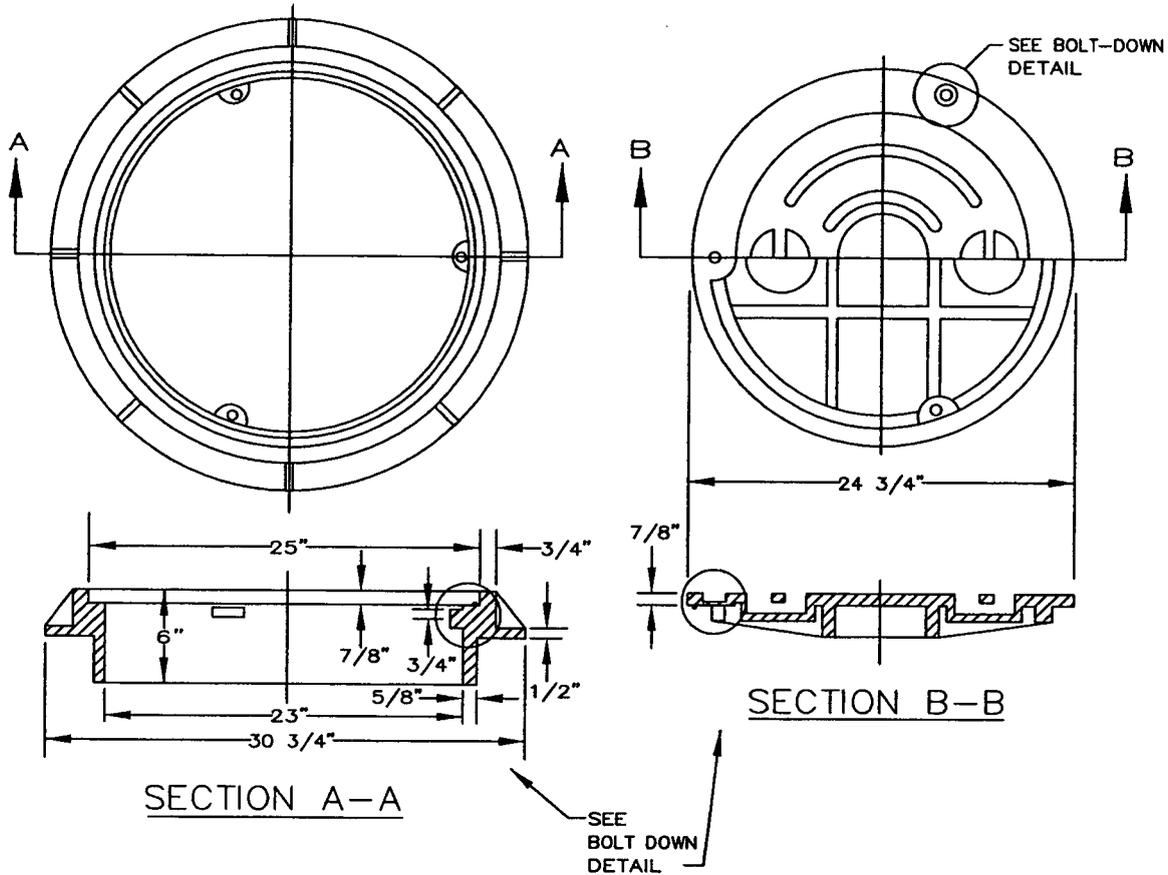
NOTES:

1. SUBURBAN TYPE NOT FOR USE IN PCC STREETS.
2. COVER AND FRAME SHALL BE GRAY CAST IRON ASTM A-48 CLASS 30.
3. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
4. NOTCH LID FOR LIFTING HOOK.

|                                               |                 |                |                        |                                                                                       |
|-----------------------------------------------|-----------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Suburban and Standard Manhole Frame and Cover |                 |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: S-2055                        | DRAWN BY: SJ    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: S-2055.dwg                         | APPROVED BY: SA | DATE: 03/29/06 | PUBLIC WORKS STANDARDS |                                                                                       |

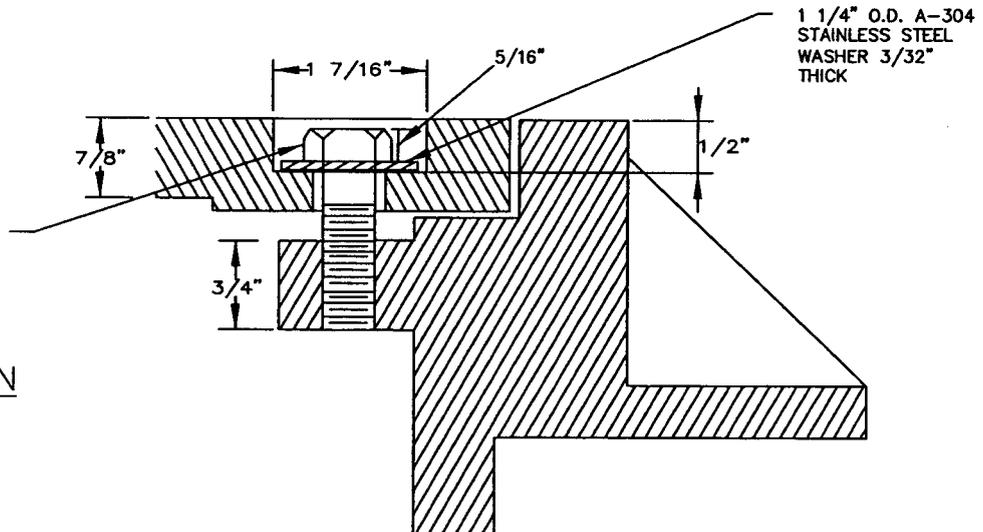
TAMPER PROOF MANHOLE RING

3-BOLT DOWN COVER



1/2"-13 N.C. X 1 1/8" HEX  
HEAD A-304 STAINLESS STEEL  
CAP SCREW. 3 REQ'D. PER  
COVER.

BOLT-DOWN  
DETAIL



NOTE:

1. COVER AND FRAME SHALL BE OF GRAY CAST IRON A.S.T.M. A-48 CLASS 30. TAMPER PROOF (REMOVE GASKETS). CENTER BOLT HOLE WITH MANHOLE STEPS.
2. ALL BOLT THREADS SHALL HAVE ANTI-SEEZE COMPOUND APPLIED PRIOR TO INSTALLATION.
3. ALL BOLTS AND WASHERS TO BE A-304 STAINLESS STEEL.

Tamperproof Manhole Frame and Cover

DRAWING NUMBER: S-2060

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2060.dwg

APPROVED BY: MAS

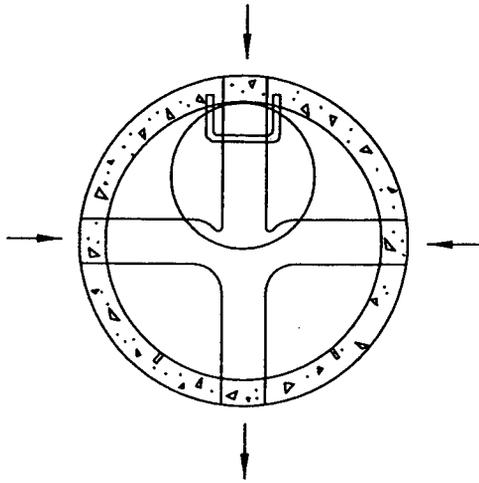
DATE: 11/01/03

CITY OF  
WILSONVILLE

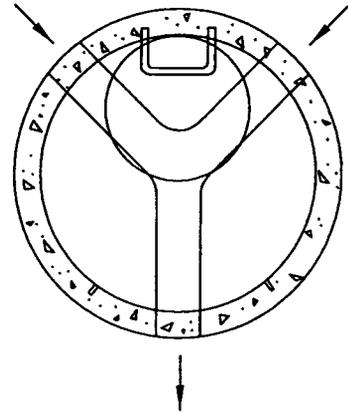


PUBLIC WORKS STANDARDS

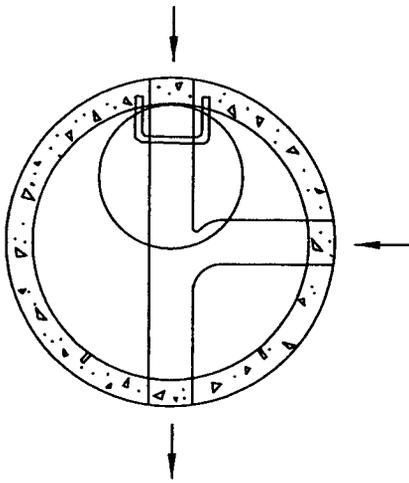
A



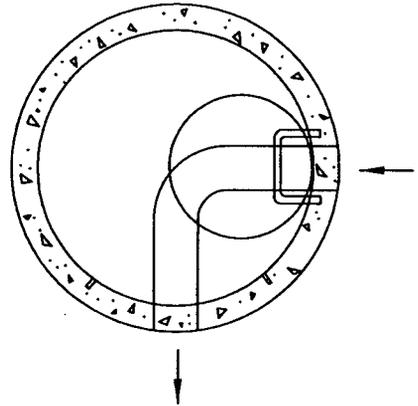
B



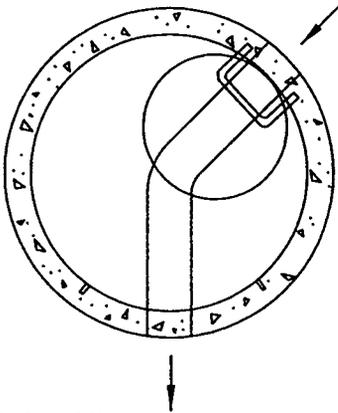
C



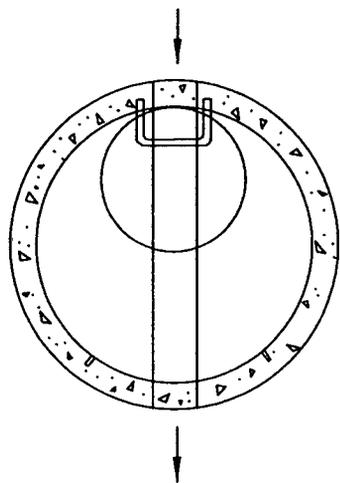
D



E



F



FOR ANGLES >90° AND <180°

NOTES:

- 1. MANHOLE FRAME AND COVER AS PER DETAIL DRAWING S-2055.
- 2. SEE MANHOLE STEP DETAIL DRAWING S-2080.
- 3. ACCESS FOR LARGE DIAMETER MANHOLES PER CITY'S AUTHORIZED REPRESENTATIVE. SEE DETAIL S-2035

Access Location

DRAWING NUMBER: S-2065

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2065.dwg

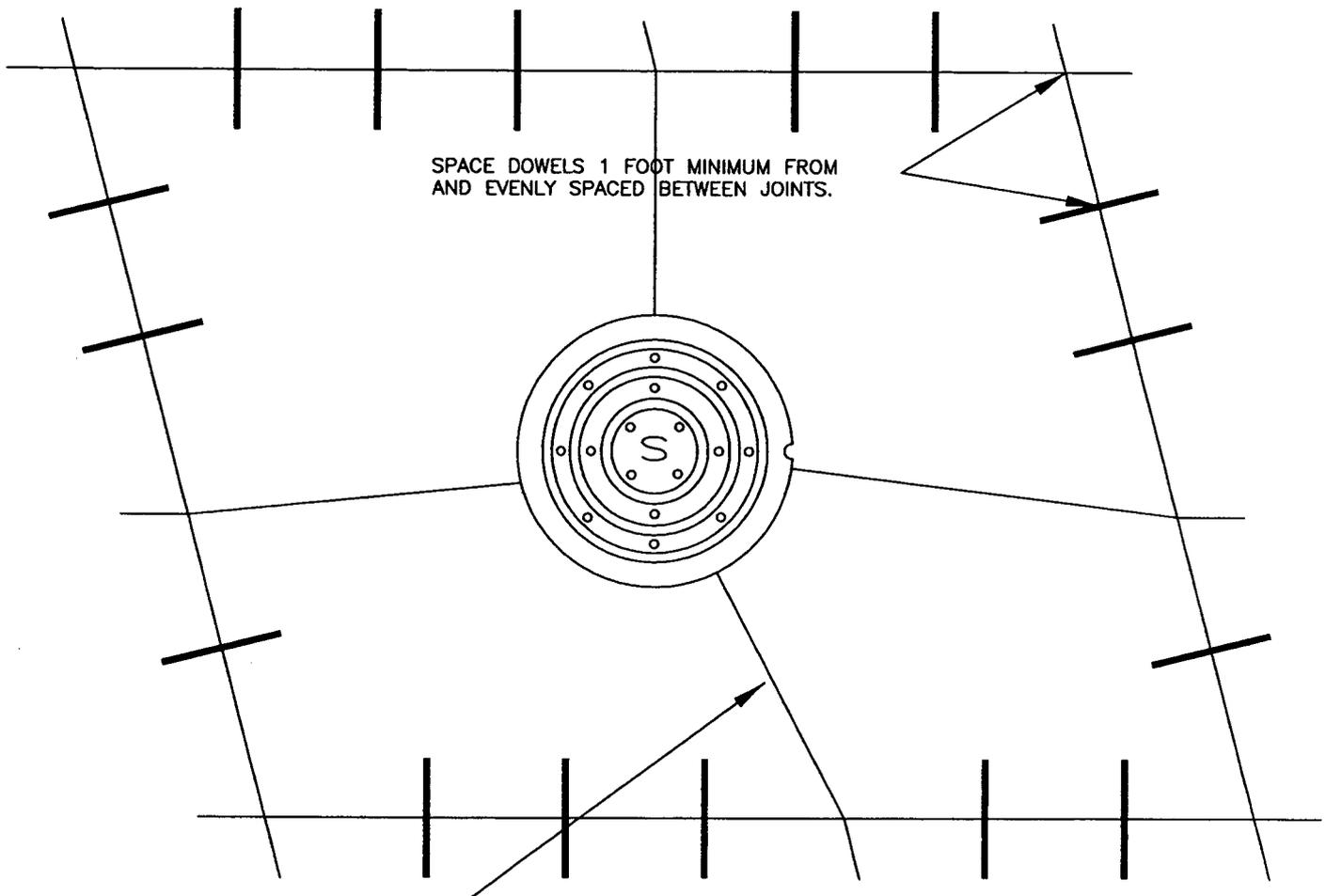
APPROVED BY: SA

DATE: 01/30/06

CITY OF  
WILSONVILLE

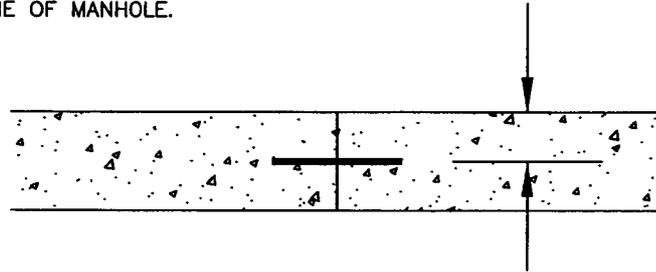


PUBLIC WORKS STANDARDS



SAW CUT EXPANSION JOINTS FROM EXISTING JOINTS TO CENTERLINE OF MANHOLE.

SLAB DEPTH/2



NOTES:

1. USE 4000 PSI. STRENGTH CONCRETE.
2. MATCH THICKNESS OF EXISTING SLAB.
3. INSTALL REBAR AT CENTER OF SLAB THICKNESS.
4. DRILL AND EPOXY 18" X #8 REBAR 2' ON CENTER.
5. SEAL ALL JOINTS WITH POLYMERIC ASPHALT BASED SEALANT.
6. MATCH EXISTING TINE FINISH.
7. SIZE AND LOCATION TO BE DETERMINED BY CITY.

Concrete Street Manhole Repair Detail

DRAWING NUMBER: S-2075

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2075.dwg

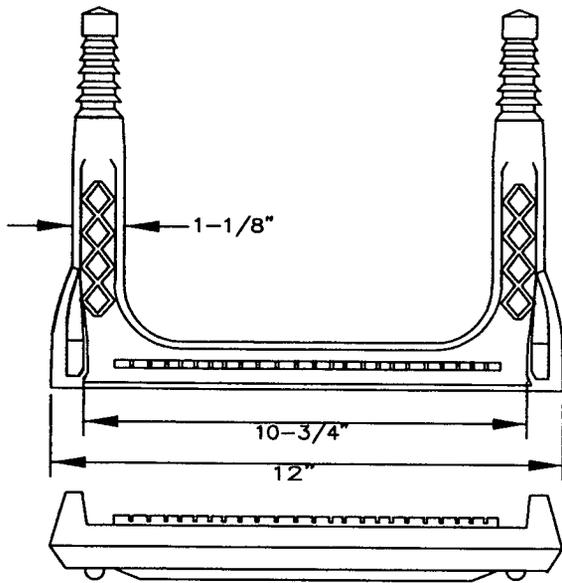
APPROVED BY: SA

DATE: 03/21/06

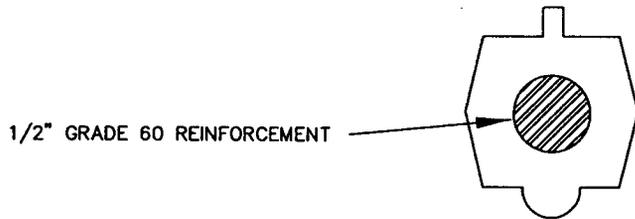
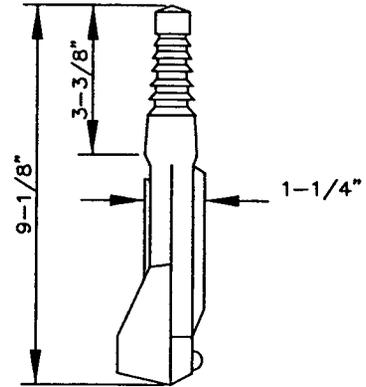
CITY OF WILSONVILLE



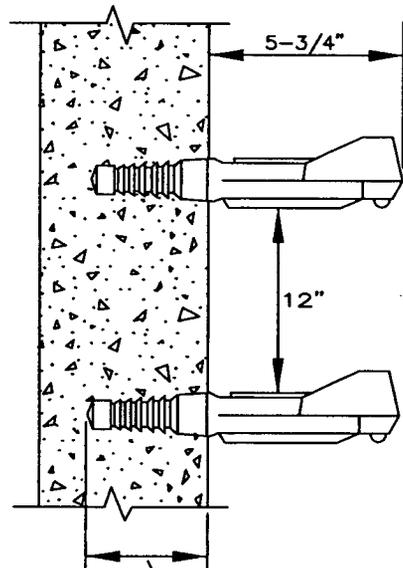
PUBLIC WORKS STANDARDS



COPOLYMER POLYPROPYLENE PLASTIC



1/2" GRADE 60 REINFORCEMENT



3-3/8" FOR PLASTIC SAFETY STEP

NOTE:  
 STEPS IN PREFABRICATED MANHOLE SECTIONS MUST BE TIGHT AND FIRMLY EMBEDDED. THEY MUST ALSO MEET ASTM C-497 TEST FOR WITHSTANDING PULL-OUT.  
 TOP STEP SHALL BE NO GREATER THAN 27" FROM TOP OF CASTING.

MATERIALS:

PLASTIC:

MUST CONFORM WITH ASTM C-478. STEEL REINFORCING BAR MINIMUM 1/2" GRADE 60. MEETING REQUIREMENTS OF ASTM A615 ENCAPSULATED WITH INJECTION MOLDED COPOLYMER POLYPROPYLENE WITH SERRATED SURFACES.

Manhole Step

DRAWING NUMBER: S-2080

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2080.dwg

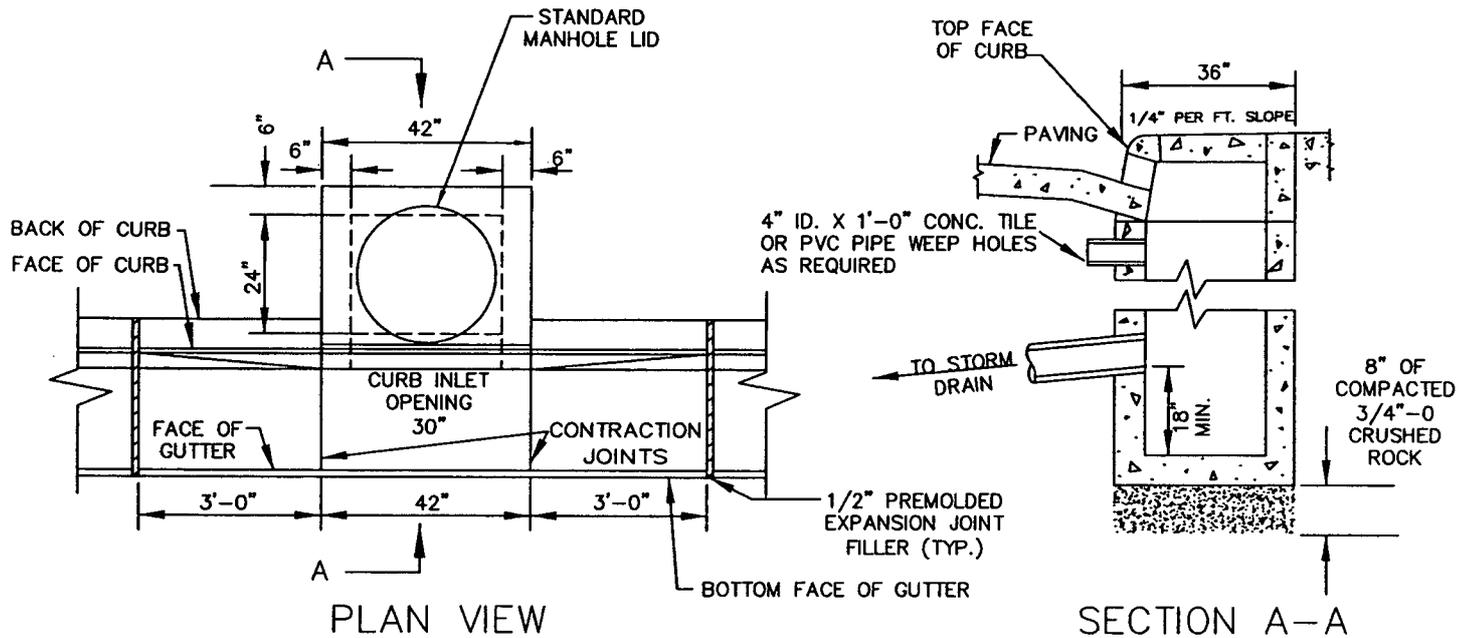
APPROVED BY: SA

DATE: 03/21/06

CITY OF  
 WILSONVILLE

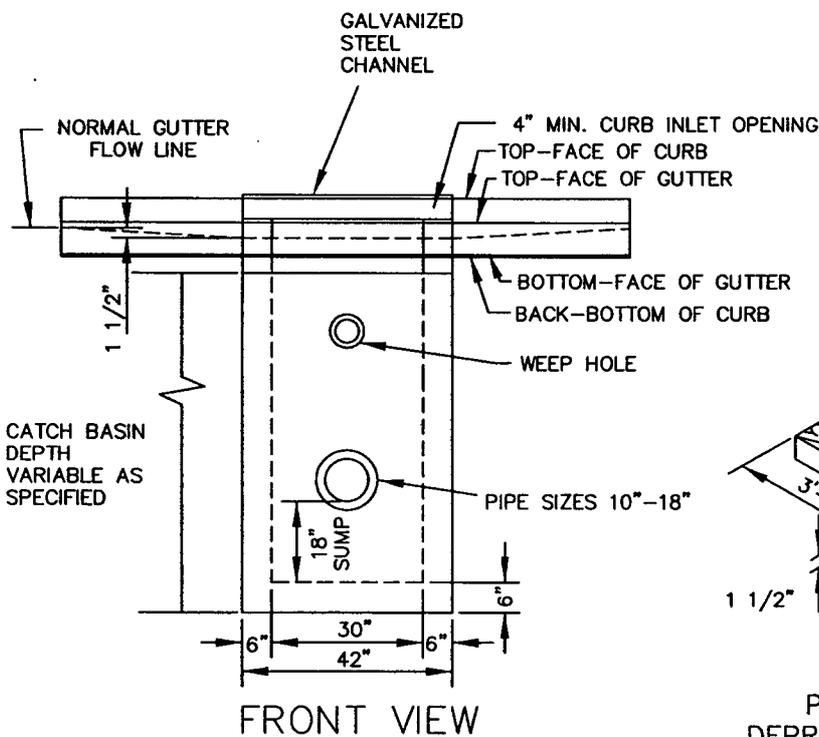


PUBLIC WORKS STANDARDS

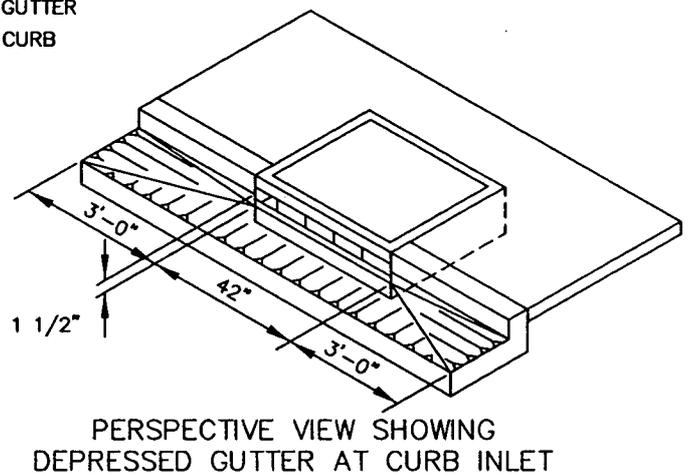
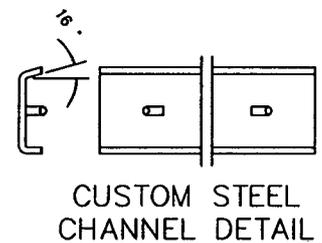


PLAN VIEW

SECTION A-A



FRONT VIEW



NOTES:

1. ALL FABRICATED METAL PARTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
2. CONCRETE SHALL ATTAIN A MIN. COMPRESSIVE STRENGTH OF 3000 PSI. IN 28 DAYS.
3. PRECAST CURB INLET SHALL BE UTILITY VAULT 30" CURB INLET TOP #CI-30-23FC OR APPROVED EQUAL.
4. INSTALL STEPS WHEN DISTANCE FROM GUTTERLINE TO FLOW LINE OF PIPE IS GREATER THAN 5 FEET.

Curb Inlet (CG-30)

CITY OF  
WILSONVILLE



DRAWING NUMBER: S-2085

DRAWN BY: SJ

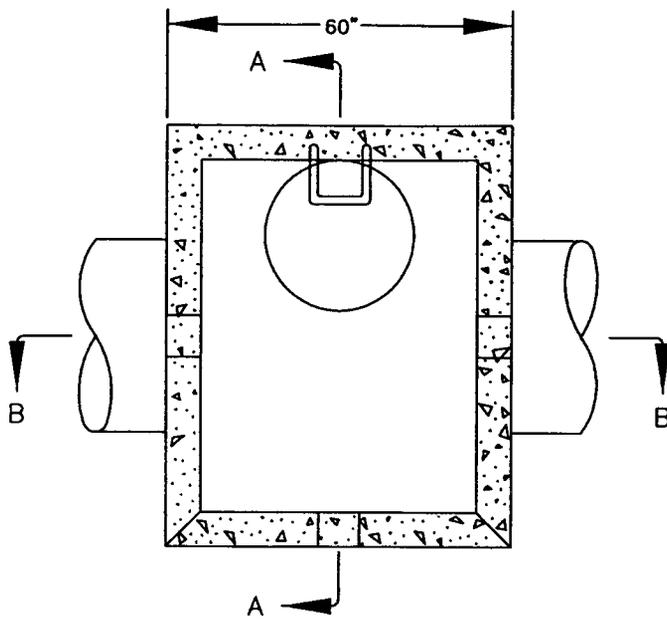
SCALE: N.T.S.

FILE NAME: S-2085.dwg

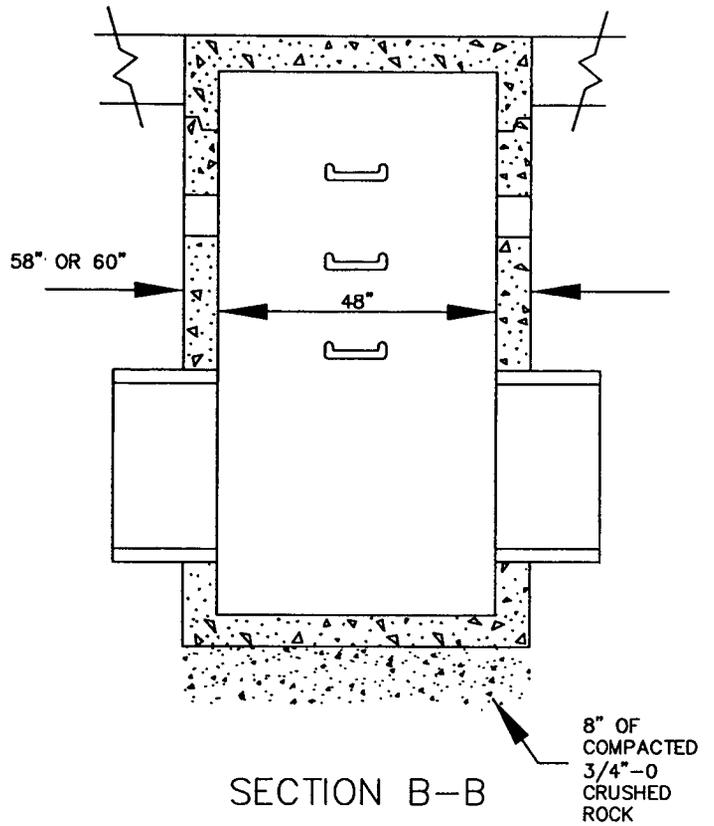
APPROVED BY: SA

DATE: 03/21/06

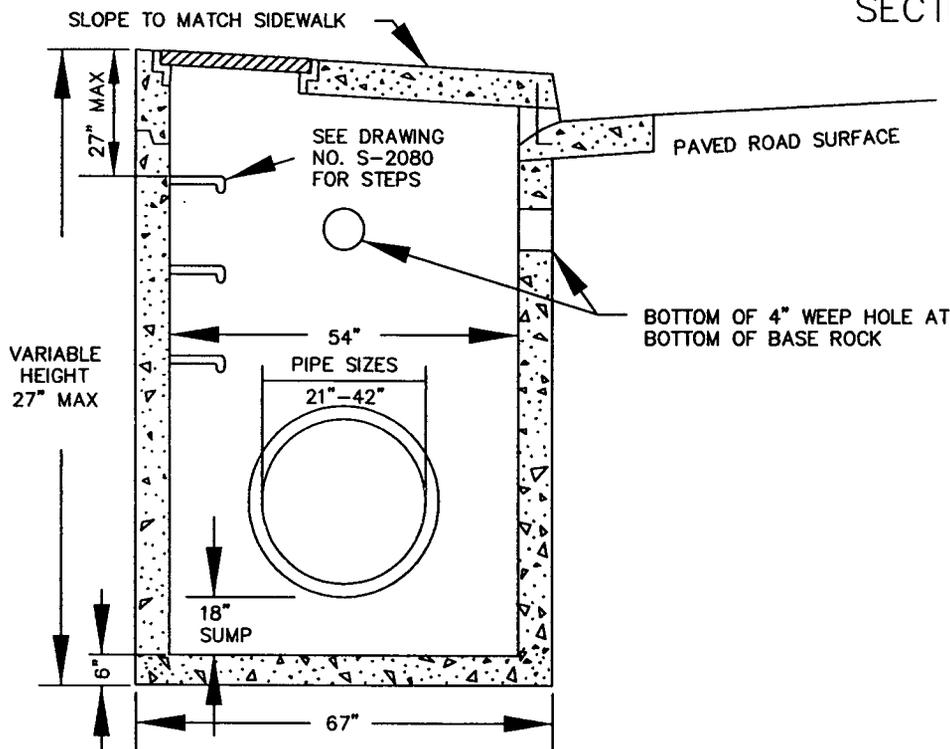
PUBLIC WORKS STANDARDS



PLAN VIEW



SECTION B-B



SECTION A-A

NOTES:

1. ALL FABRICATED METAL PARTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
2. CONCRETE SHALL ATTAIN A MIN. COMPRESSIVE STRENGTH OF 3000 PSI. IN 28 DAYS.
3. PRECAST CURB INLET SHALL BE UTILITY VAULT 48" CURB INLET TOP #WIL-CI-48MH-332P OR APPROVED EQUAL.
4. NON-SUMP CATCH BASIN SHALL BE CHanneLED

Curb Inlet (CG-48)

DRAWING NUMBER: S-2090

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2090.dwg

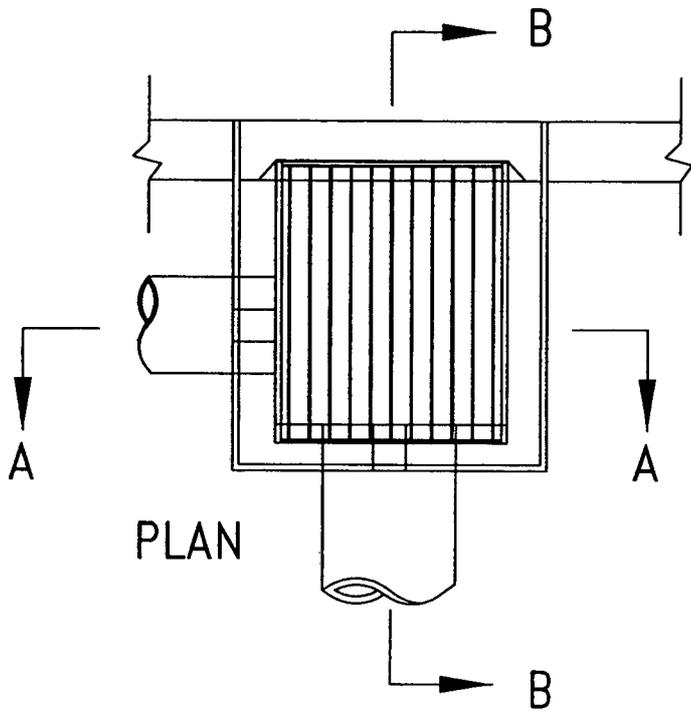
APPROVED BY: SA

DATE: 03/21/06

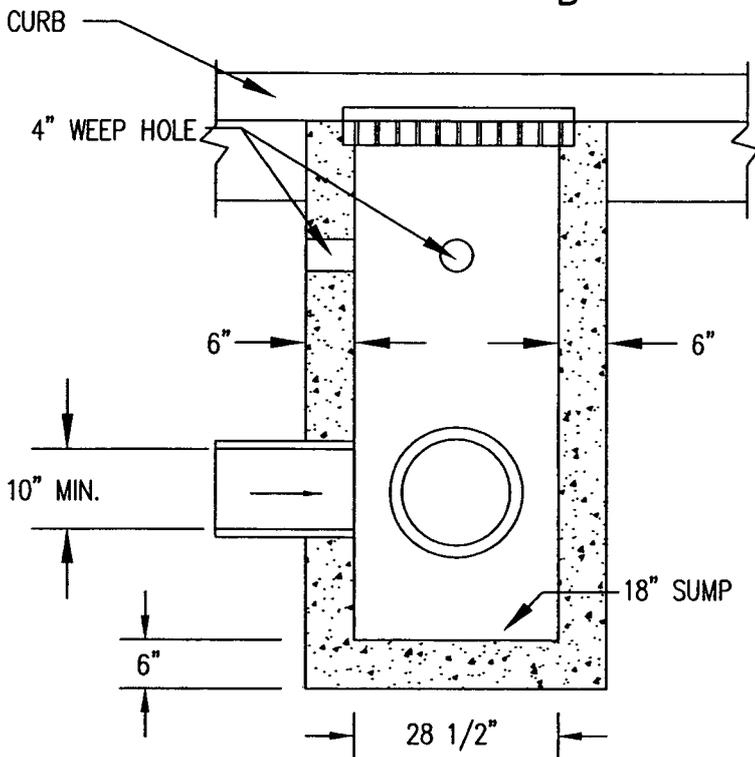
CITY OF  
WILSONVILLE



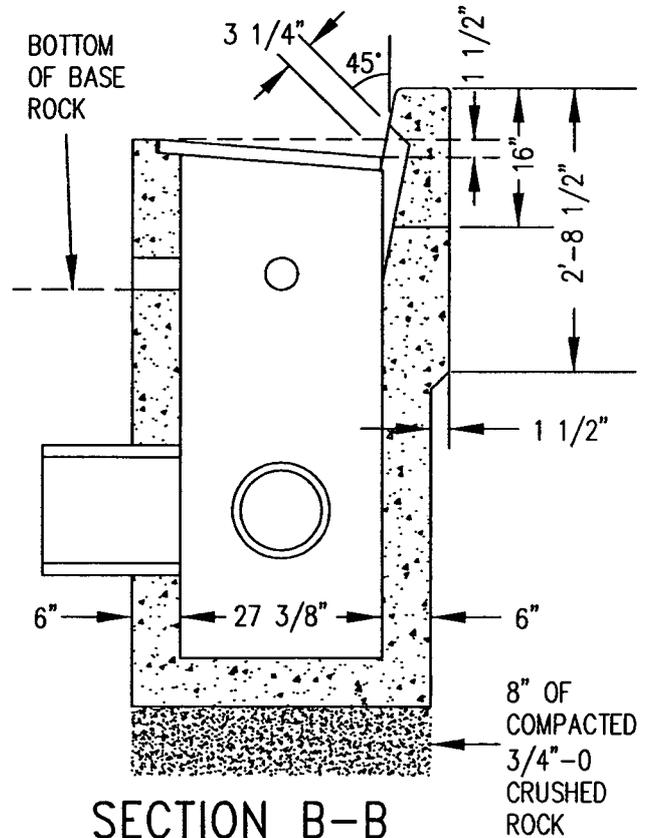
PUBLIC WORKS STANDARDS



FOR FRAME AND GRATE DETAIL SEE DWG. NO. S-2100.



SECTION A-A



SECTION B-B

NOTES:

1. CATCH BASIN TO BE USED ONLY IN AREAS WHERE GUTTER INLET CONFLICTS WITH UNDERGROUND UTILITIES AND WITH THE APPROVAL OF THE CITY'S AUTHORIZED REPRESENTATIVE.
2. CONCRETE SHALL ATTAIN A MIN. COMPRESSIVE STRENGTH OF 3000 PSI. IN 28 DAYS.
3. BATTER OF 1/4" TO 1" TO FACILITATE FORM REMOVAL WILL BE ALLOWED.
4. BOTTOM OF WEEP HOLE AT BOTTOM OF BASE ROCK.
5. SEE DETAIL S-2096 FOR REBAR SPACING AND HOOK BAR DETAIL

Catch Basin

DRAWING NUMBER: S-2095

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2095.dwg

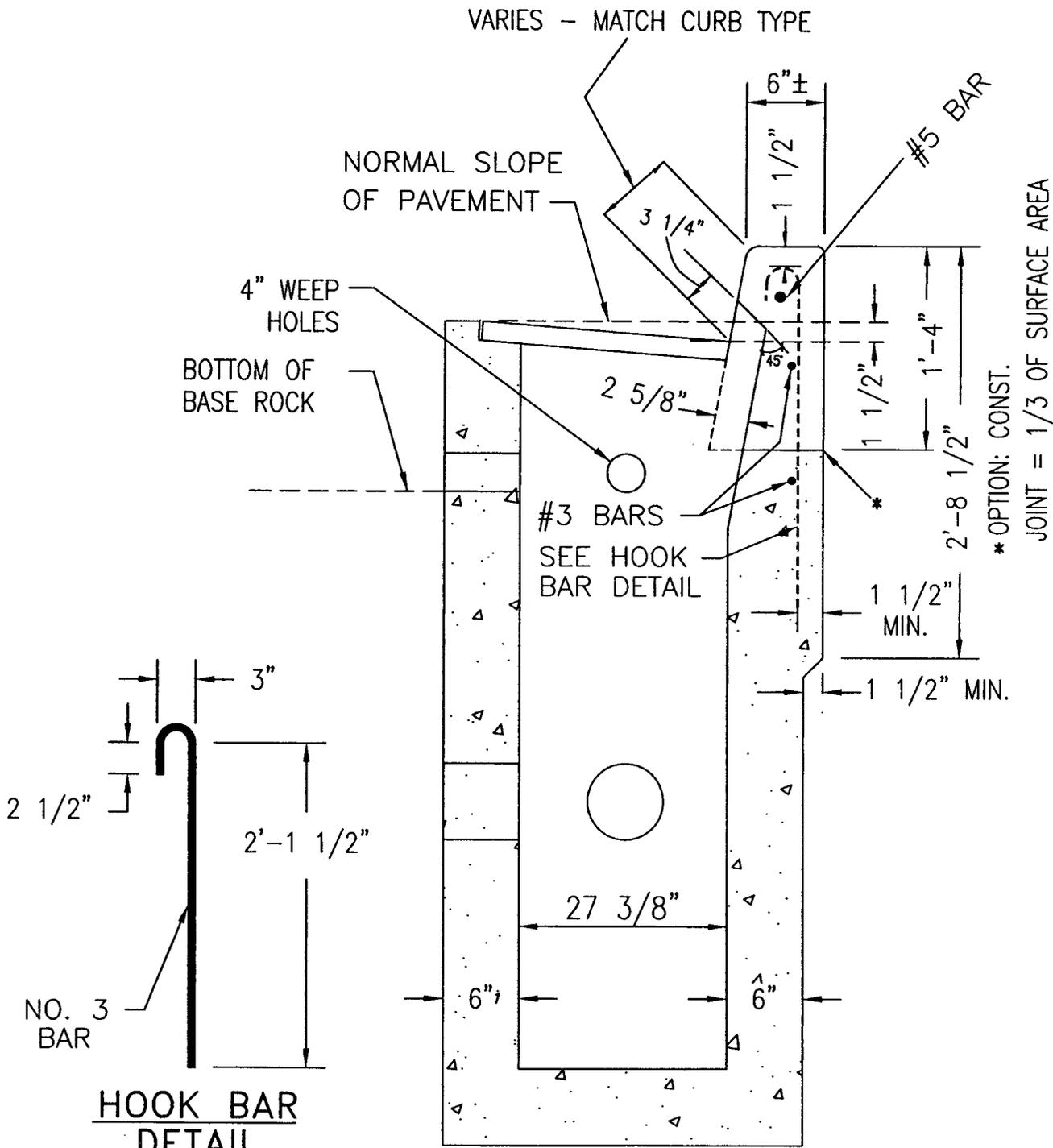
APPROVED BY: SA

DATE: 03/21/06

CITY OF WILSONVILLE



PUBLIC WORKS STANDARDS

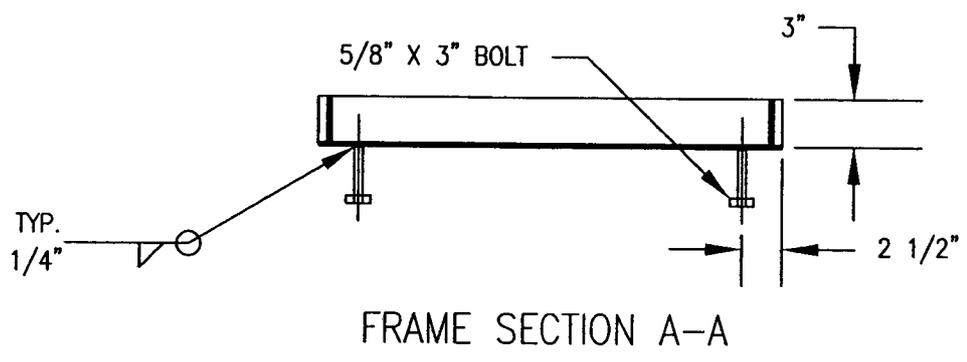
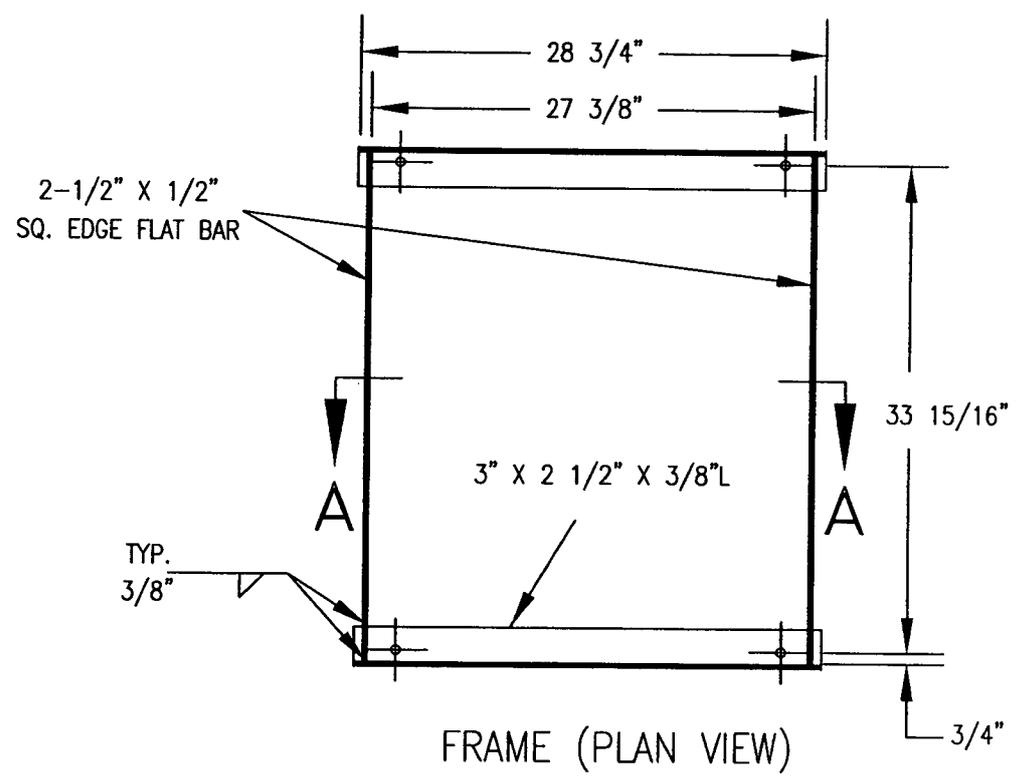
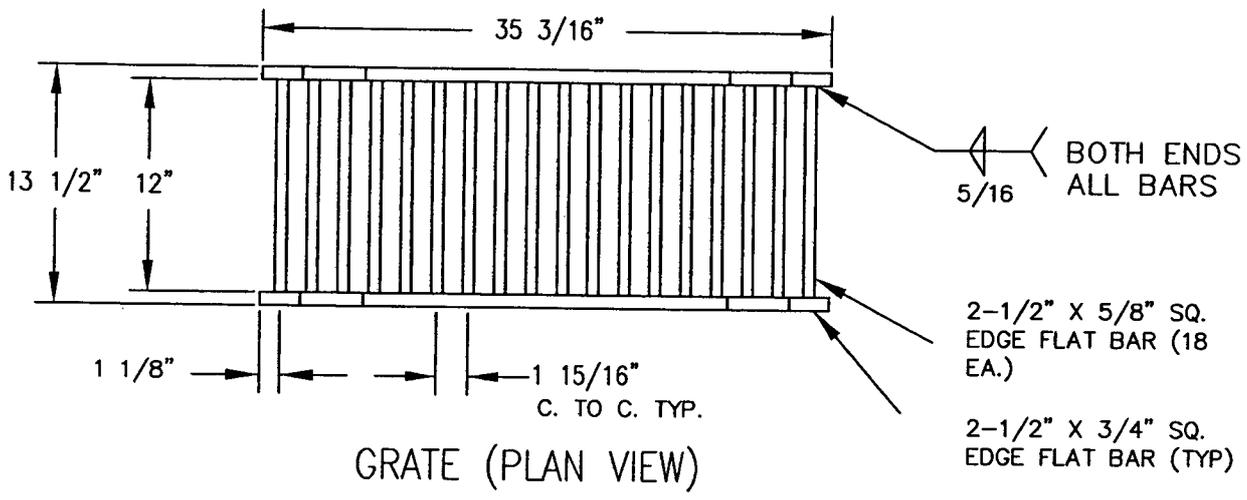


\* OPTION: CONST.  
JOINT = 1/3 OF SURFACE AREA

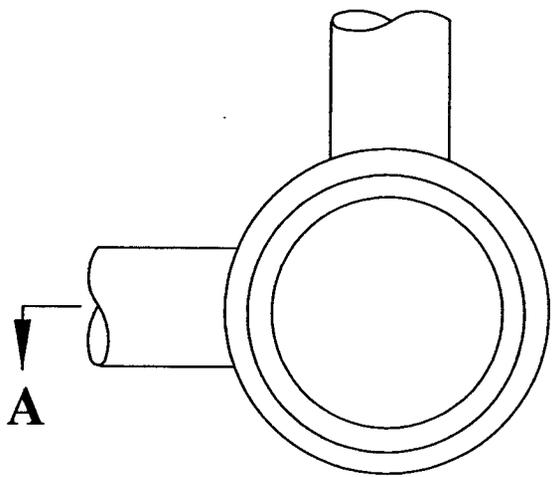
**HOOK BAR  
DETAIL**

**NOTE:** FOR PLAN AND ELEVATION  
SEE DRAWINGS NO. S-2105 & S-2110

|                                   |                       |                                                                                                           |
|-----------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------|
| Catch Basin - Rebar Reinforcement | SCALE: N.T.S.         | CITY OF WILSONVILLE  |
|                                   | Date: 03/21/06        |                                                                                                           |
| Drawing Number: S-2096            | File Name: S-2096.dwg | PUBLIC WORKS STANDARDS                                                                                    |
| DRAWN BY: SJ                      |                       |                                                                                                           |

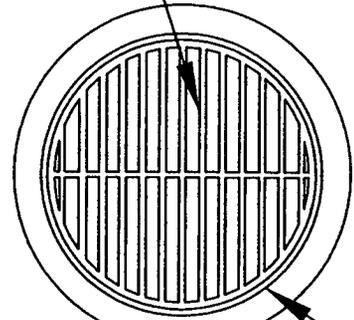


|                             |                  |                |                        |                                                                                       |
|-----------------------------|------------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Catch Basin Grate and Frame |                  |                | CITY OF WILSONVILLE    |  |
| DRAWING NUMBER: S-2100      | DRAWN BY: GCF    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: S-2100.dwg       | APPROVED BY: MAS | DATE: 11/01/03 | PUBLIC WORKS STANDARDS |                                                                                       |



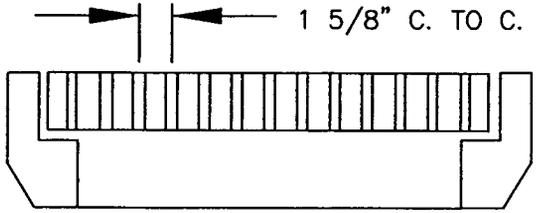
PLAN

1/2" X 2" SQ.  
EDGE FLAT BAR



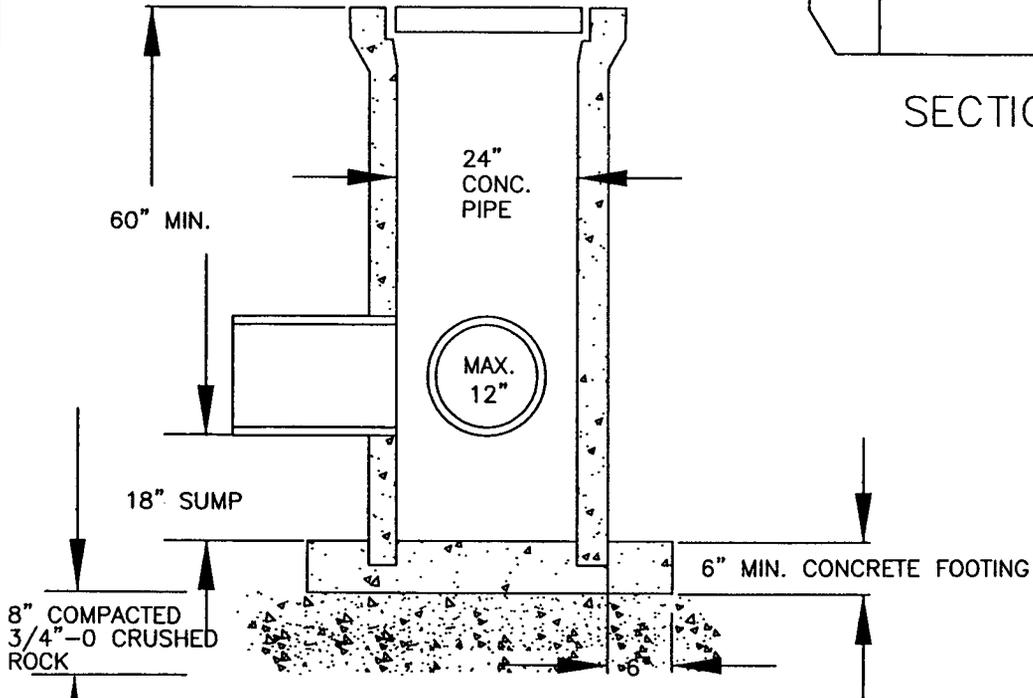
PLAN

1/4"



SECTION B-B

SECTION A-A



NOTES:

1. CONCRETE BASE TO CONFORM WITH ASTM C-478 FOR COMPRESSIVE STRENGTH
2. 24" PIPE TO CONFORM WITH ASTM C-76 CL 111
3. 8" OF COMPACTED 3/4"-0 CRUSHED ROCK BASE MATERIAL
4. GRATE TO BE FLAT BANK STEEL OR APPROVED EQUAL
5. 18" SUMP REQUIRED

Area Drain and Grate (Type 1)

DRAWING NUMBER: S-2105

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2105.dwg

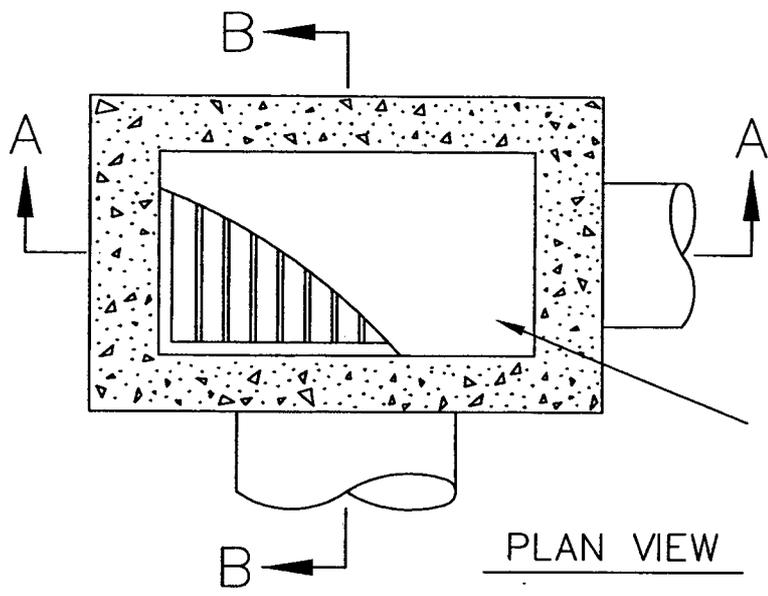
APPROVED BY: SA

DATE: 03/29/06

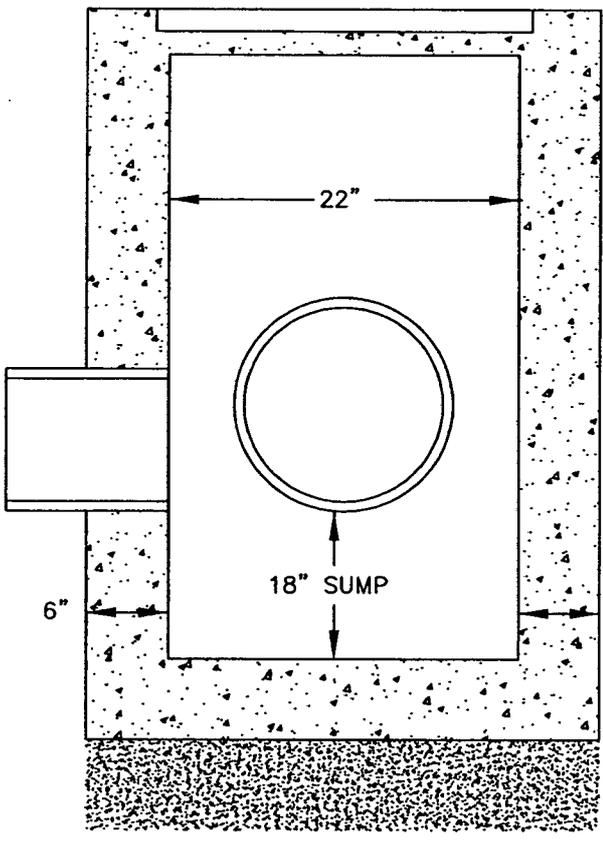
CITY OF  
WILSONVILLE



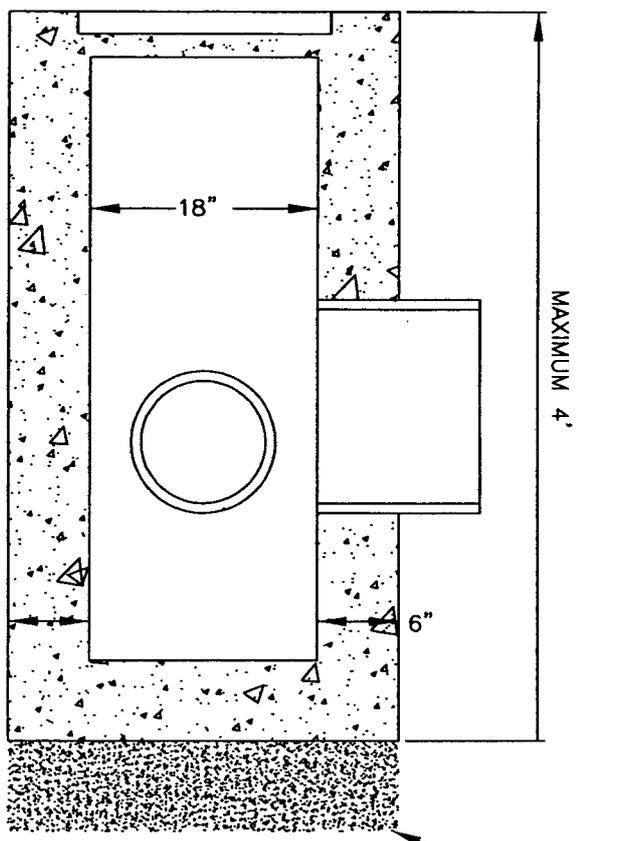
PUBLIC WORKS STANDARDS



PLAN VIEW



SECTION A-A



SECTION B-B

8" OF  
COMPACTED  
3/4"-0  
CRUSHED  
ROCK

NOTES:

1. AREA DRAIN CONSTRUCTION IN ACCORDANCE WITH ASTM C-478.
2. 8" OF COMPACTED 3/4"-0 CRUSHED ROCK BASE MATERIAL.
3. PRECAST SHALL HAVE MINIMUM WALL THICKNESS OF 5", REINFORCEMENT TO BE REBAR MEETING ASTM A615 GRADE 60 OR WELDED WIRE MEETING ASTM A497.

Area Drain (Type 2)

CITY OF  
WILSONVILLE



DRAWING NUMBER: S-2110

DRAWN BY: SJ

SCALE: N.T.S.

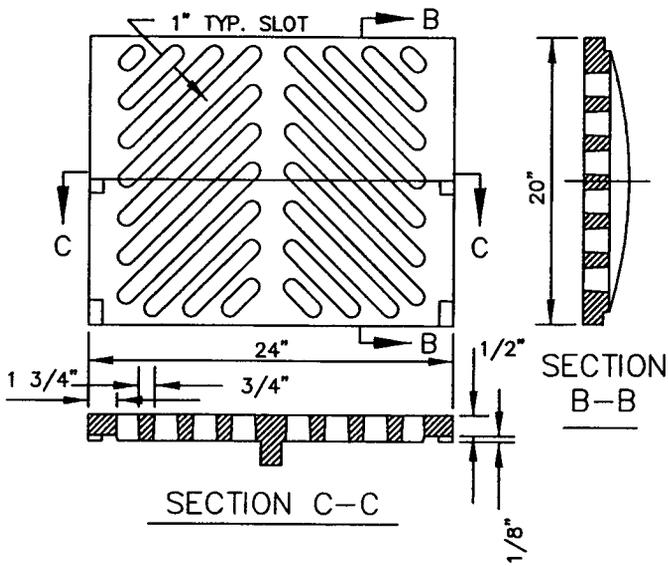
FILE NAME: S-2110.dwg

APPROVED BY: SA

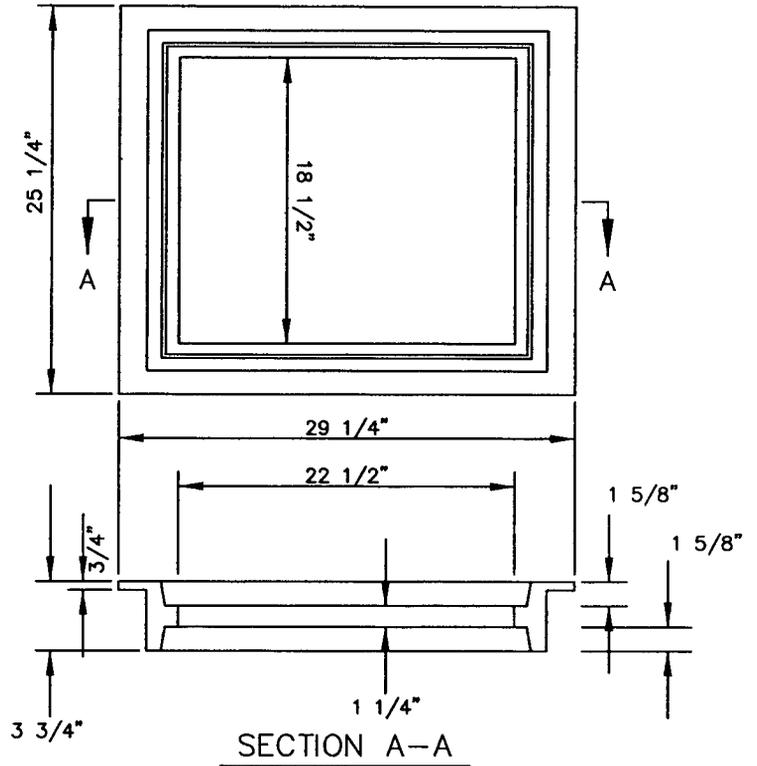
DATE: 3/21/06

PUBLIC WORKS STANDARDS

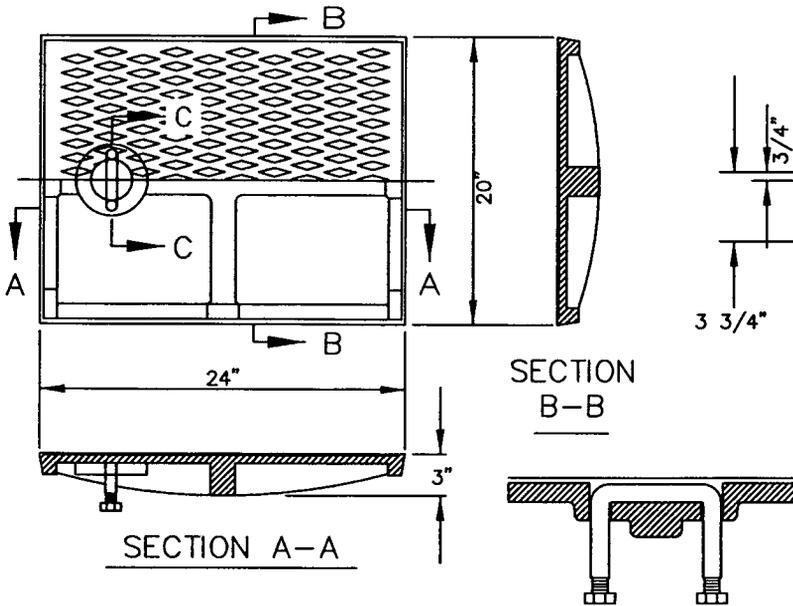
### SLOTTED GRATE



### INTERCHANGEABLE FRAME



### SOLID COVER



**NOTES:**

1. FRAME, GRATE AND COVER TO MEET ASTM A4883 CLASS 30 GRAY IRON OR ASTM A536-80 CLASS 30 DUCTILE IRON, OR APPROVED EQUAL.
2. SLOTTED GRATE AND SOLID COVER SHALL BE INTERCHANGEABLE.
3. SLOTTED GRATE SHALL BE USED IN DRAINAGE AREAS.
4. SOLID COVER SHALL BE USED IN NON-DRAINAGE AREAS.

Area Drain (Type 2) Grate, Cover, and Frame

DRAWING NUMBER: S-2115

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2115.dwg

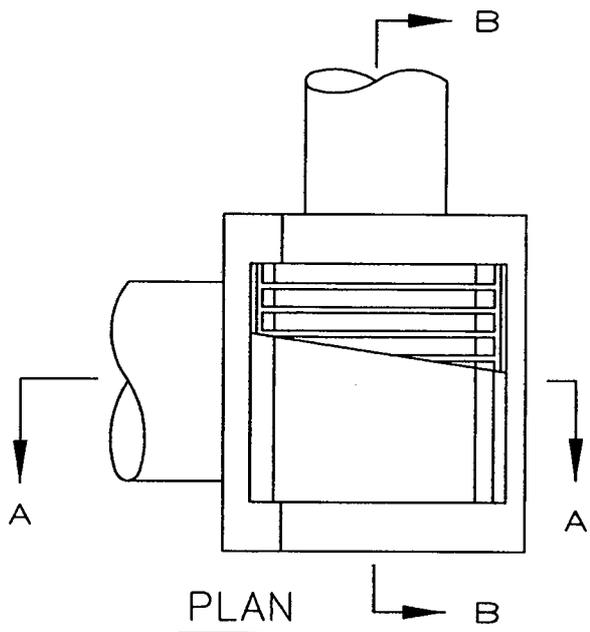
APPROVED BY: MAS

DATE: 11/01/03

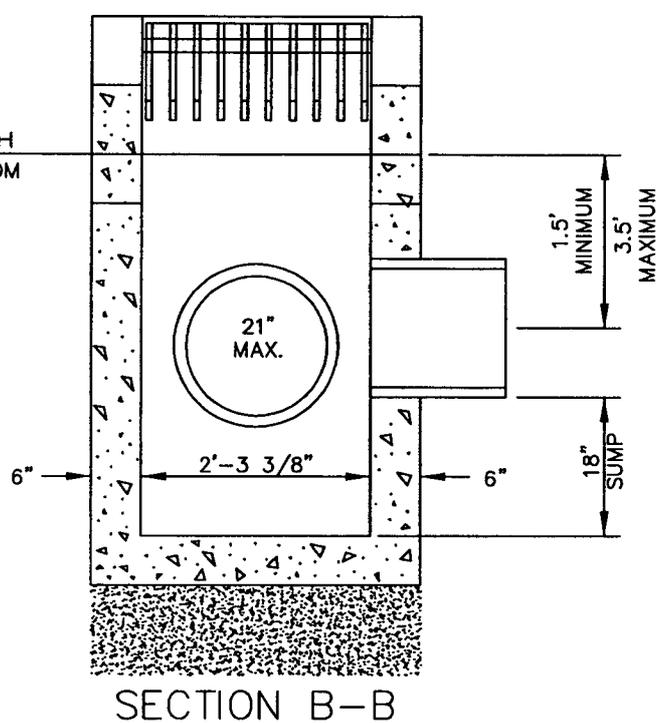
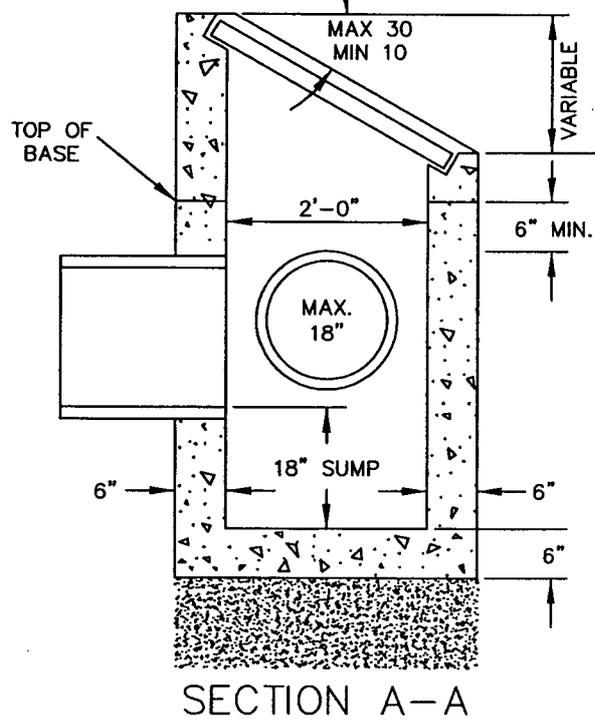
CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



SEE DRAWING NO. S-2125  
FOR FRAME AND GRATE



NOTES:

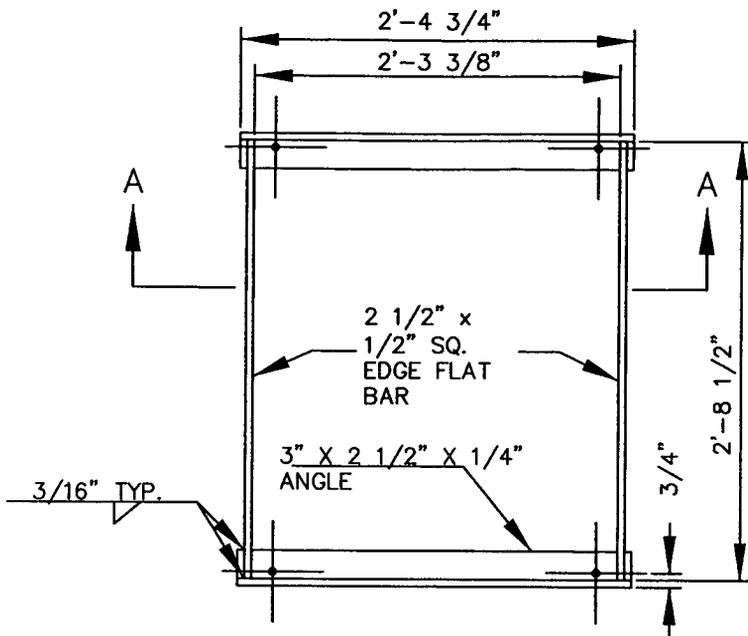
1. DITCH INLET CONSTRUCTION IN ACCORDANCE WITH ASTM C-478
2. 8" OF COMPACTED 3/4"-0 CRUSHED ROCK BASE MATERIAL REQUIRED..
3. PRIOR APPROVAL REQUIRED FOR DITCH INLET STRUCTURES FOR PIPE SIZES 24" OR LARGER.
4. PRECAST MINIMUM WALL THICKNESS TO BE 5", REINFORCEMENT TO BE REBAR MEETING ASTM A615 GRADE 60 OR WELDED WIRE MEETING ASTM A497.

Ditch Inlet

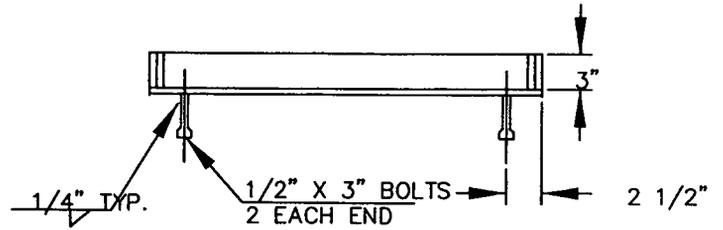
|                        |                  |                |
|------------------------|------------------|----------------|
| DRAWING NUMBER: S-2120 | DRAWN BY: GCF    | SCALE: N.T.S.  |
| FILE NAME: S-2120.dwg  | APPROVED BY: MAS | DATE: 11/01/03 |

CITY OF WILSONVILLE

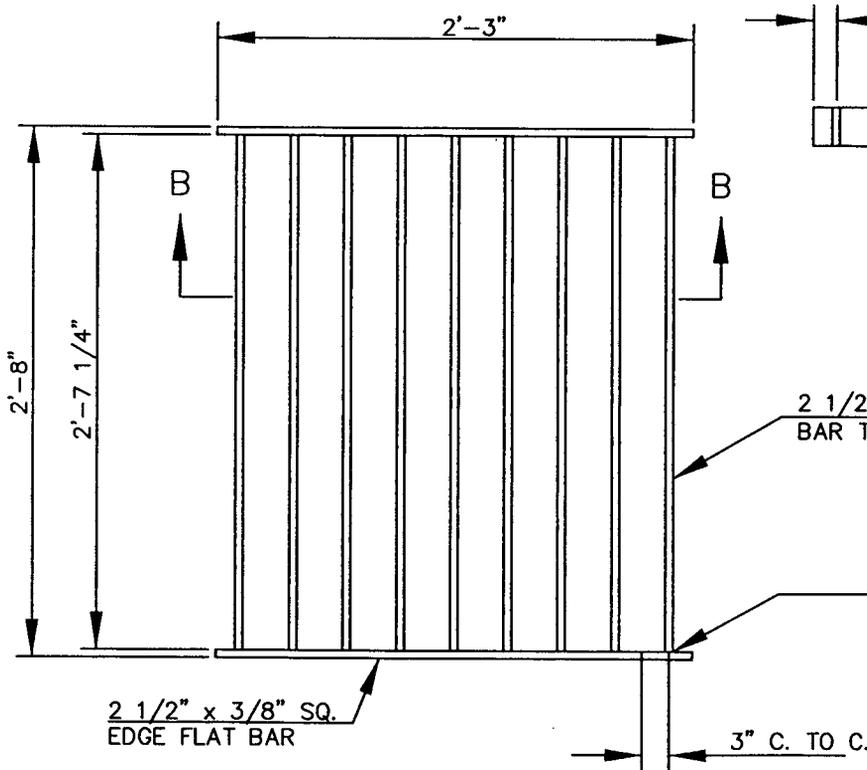
PUBLIC WORKS STANDARDS



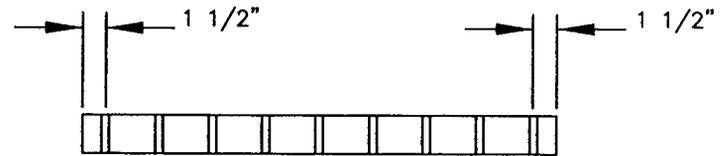
PLAN



SECTION A-A



PLAN



SECTION B-B

2 1/2" x 1/4" SQ. EDGE FLAT BAR TYP. GRATE BAR (9 EA.)

3/16" TYP.

NOTE:  
FRAME AND GRATE TO BE FLAT BAR STEEL OR APPROVED EQUAL.

Ditch Inlet Frame and Cover

DRAWING NUMBER: S-2125

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2125.dwg

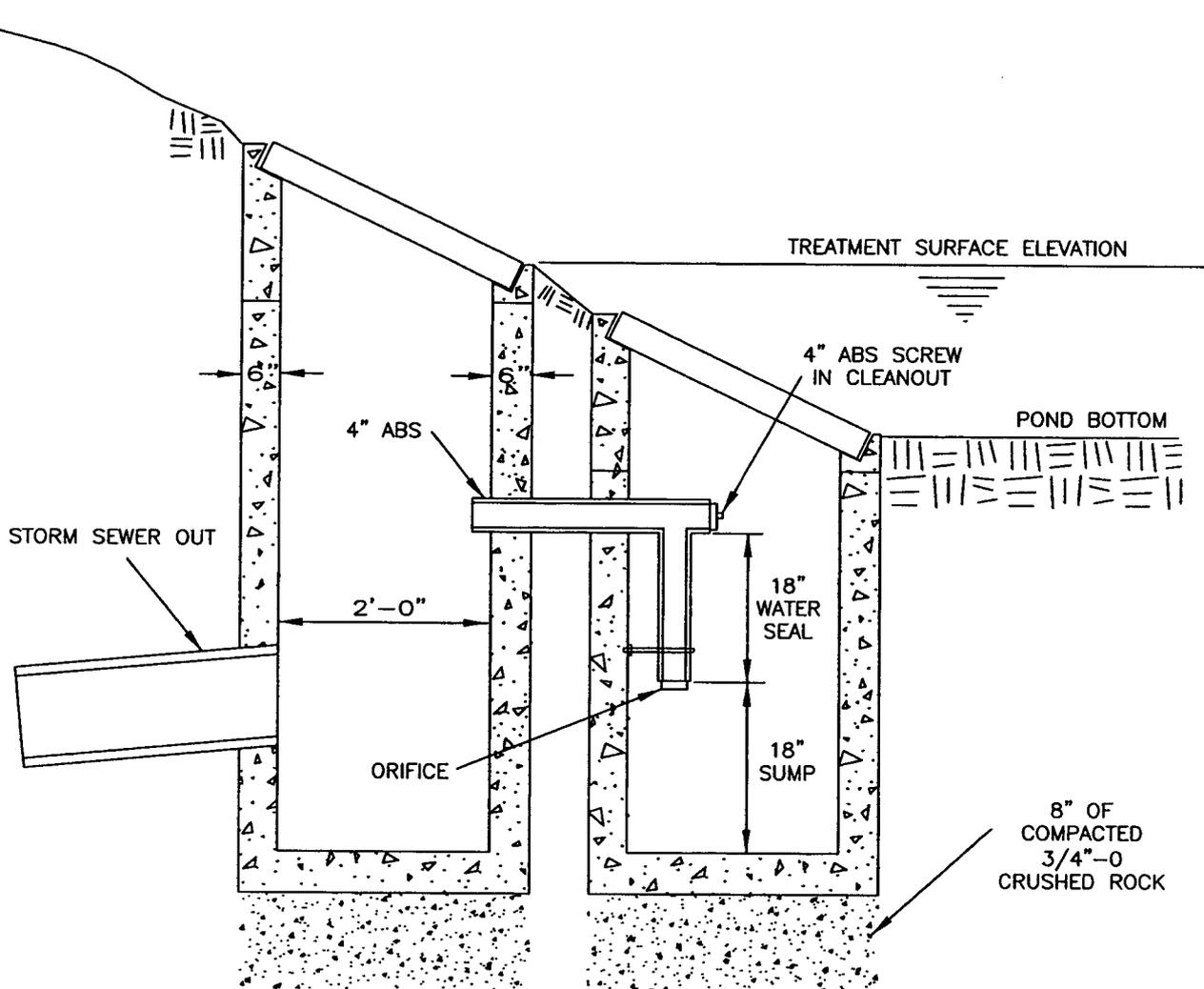
APPROVED BY: SA

DATE: 03/29/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



NOTES:

1. OUTFLOW BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C-478.
2. STRUCTURES SHALL BE SET ON 8" OF COMPACTED 3/4"-0 CRUSHED ROCK BASE MATERIAL.
3. PRECAST MINIMUM WALL THICKNESS SHALL BE 5", REINFORCEMENT SHALL BE REBAR MEETING ASTM A615 GRADE 60 OR WELDED WIRE MEETING ASTM A497

Water Quality Pond Outflow Device

DRAWING NUMBER: S-2130

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2130.dwg

APPROVED BY: SA

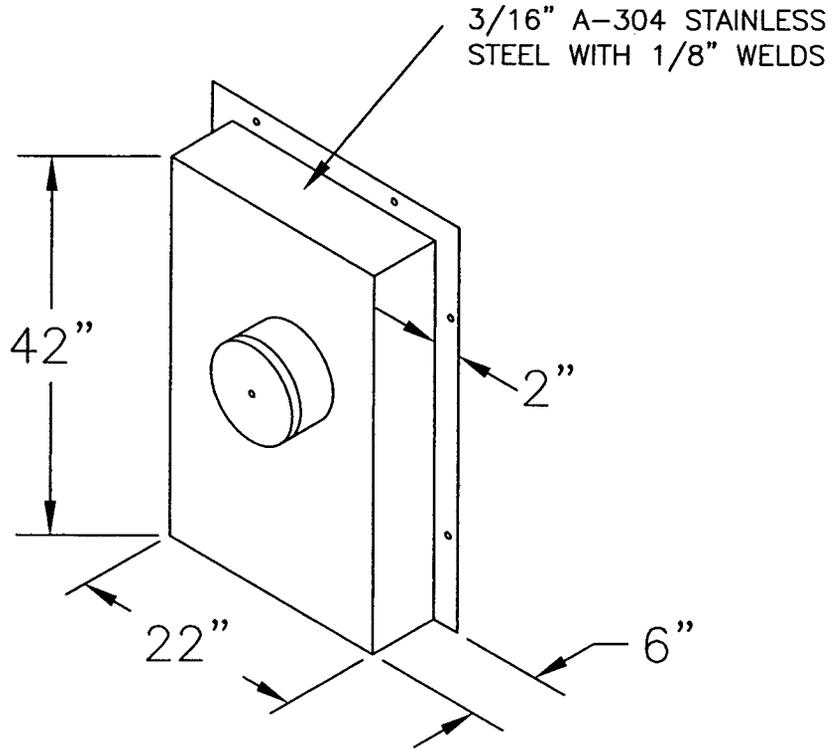
DATE: 03/21/06

CITY OF  
WILSONVILLE

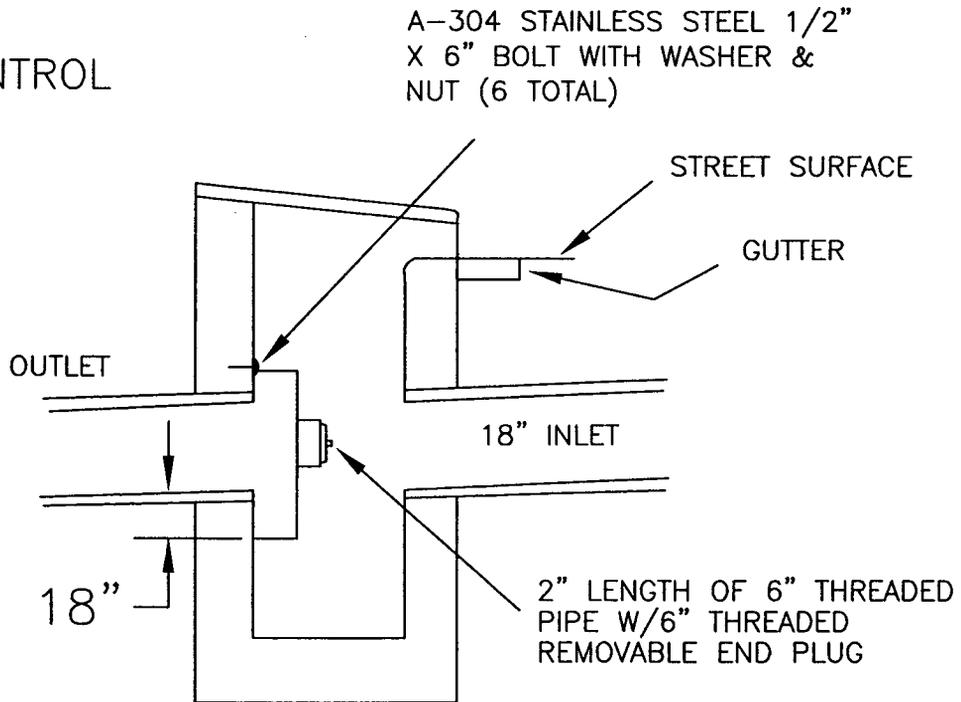


PUBLIC WORKS STANDARDS

WEIR PLATE  
DETAIL



POLLUTION CONTROL  
STRUCTURE



Gutter Inlet Pollution Control Device

DRAWING NUMBER: S-2135

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2135.dwg

APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



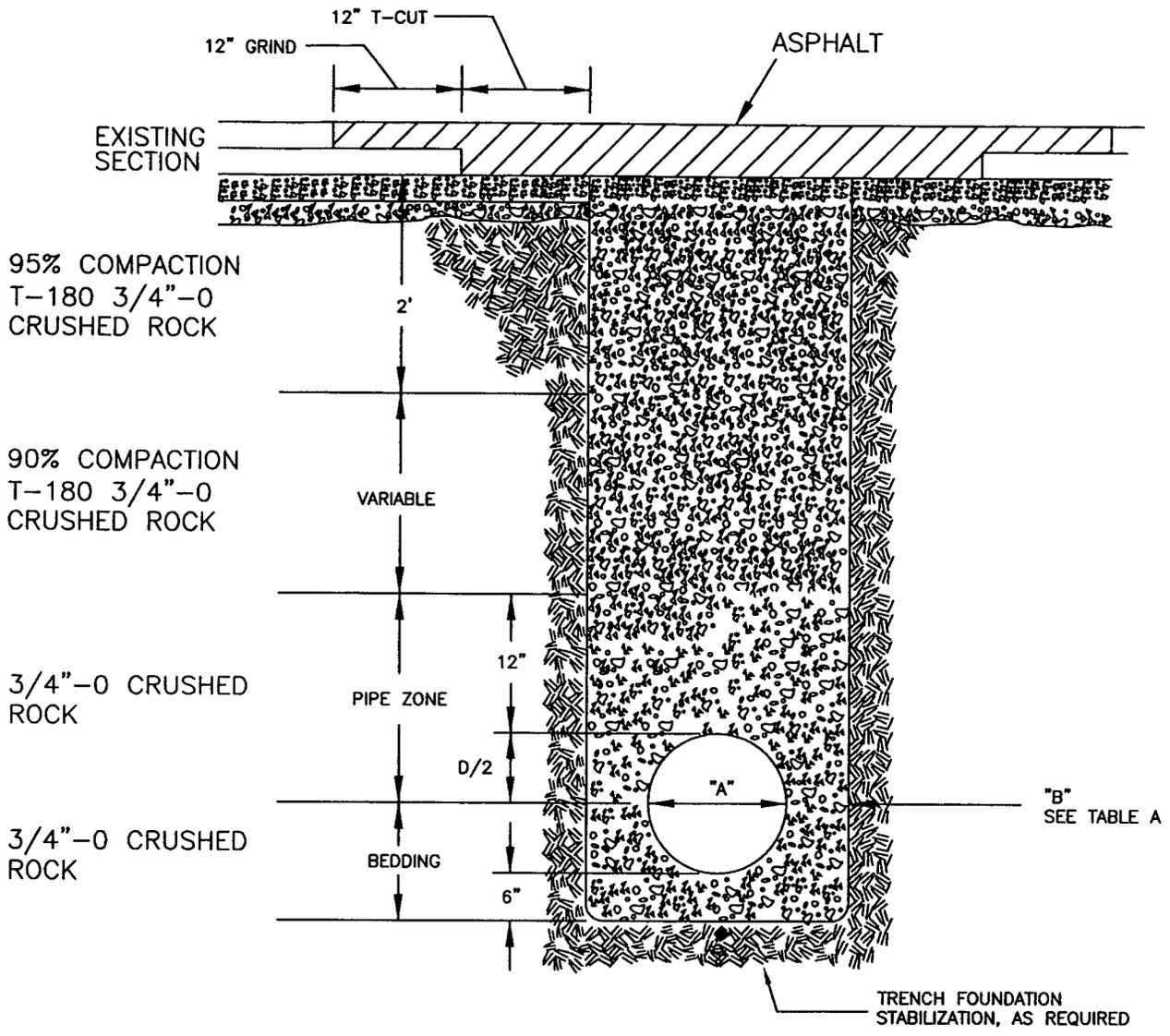


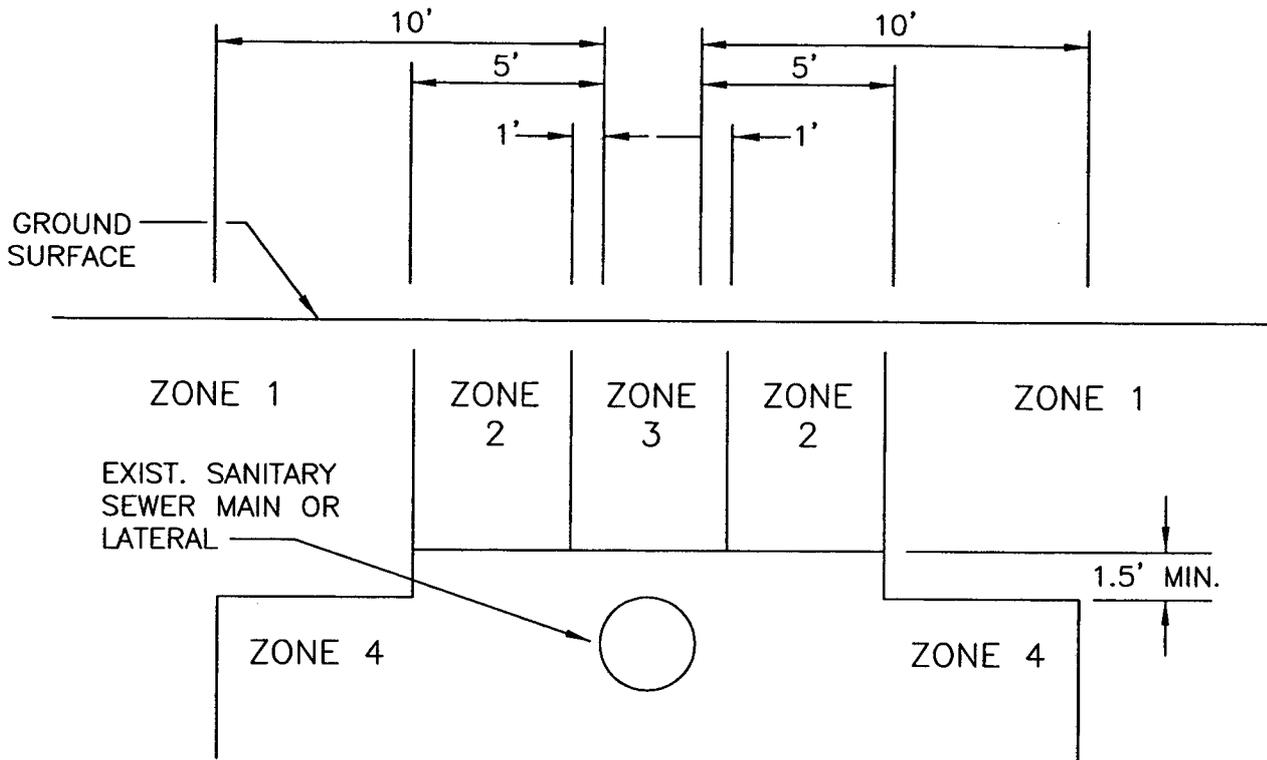
TABLE A

|     |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| "A" | 4" | 6" | 8" | 10" | 12" | 15" | 18" | 21" | 24" | 30" | 36" | 42" | 48" | 54" | 60" | 66" | 72" |
| "B" | 6" | 6" | 6" | 6"  | 6"  | D/2 | 24" | 24" | 24" | 24" | 24" |

NOTES:

1. COMMERCIALLY MIXED CDF MAY BE SUBSTITUTED FOR 3/4"-0 BACKFILL.
2. CDF SHALL BE PLACED TO TOP OF BASE ROCK OR 4" FROM FINISHED GRADE ASPHALT, WHICHEVER IS GREATER.
3. ASPHALT SHALL BE PLACED IN LIFTS NOT EXCEEDING 3" AND COMPACTED TO 92% OF RICE DENSITY
4. IF S/W IS AGAINST CURB, FILL ROCK TO BACK OF S/W.
5. IF S/W IS NOT AGAINST CURB, FILL ROCK 2' BACK FROM CURB.
6. 12" TEE CUT TO BE MADE AFTER INSTALLATION AND COMPACTION OF CRUSHED AGGREGATE.

|                          |                 |                |                        |                                                                                       |
|--------------------------|-----------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Moratorium Street Repair |                 |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: S-2145   | DRAWN BY: SJ    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: S-2145.dwg    | APPROVED BY: SA | DATE: 03/21/06 | PUBLIC WORKS STANDARDS |                                                                                       |

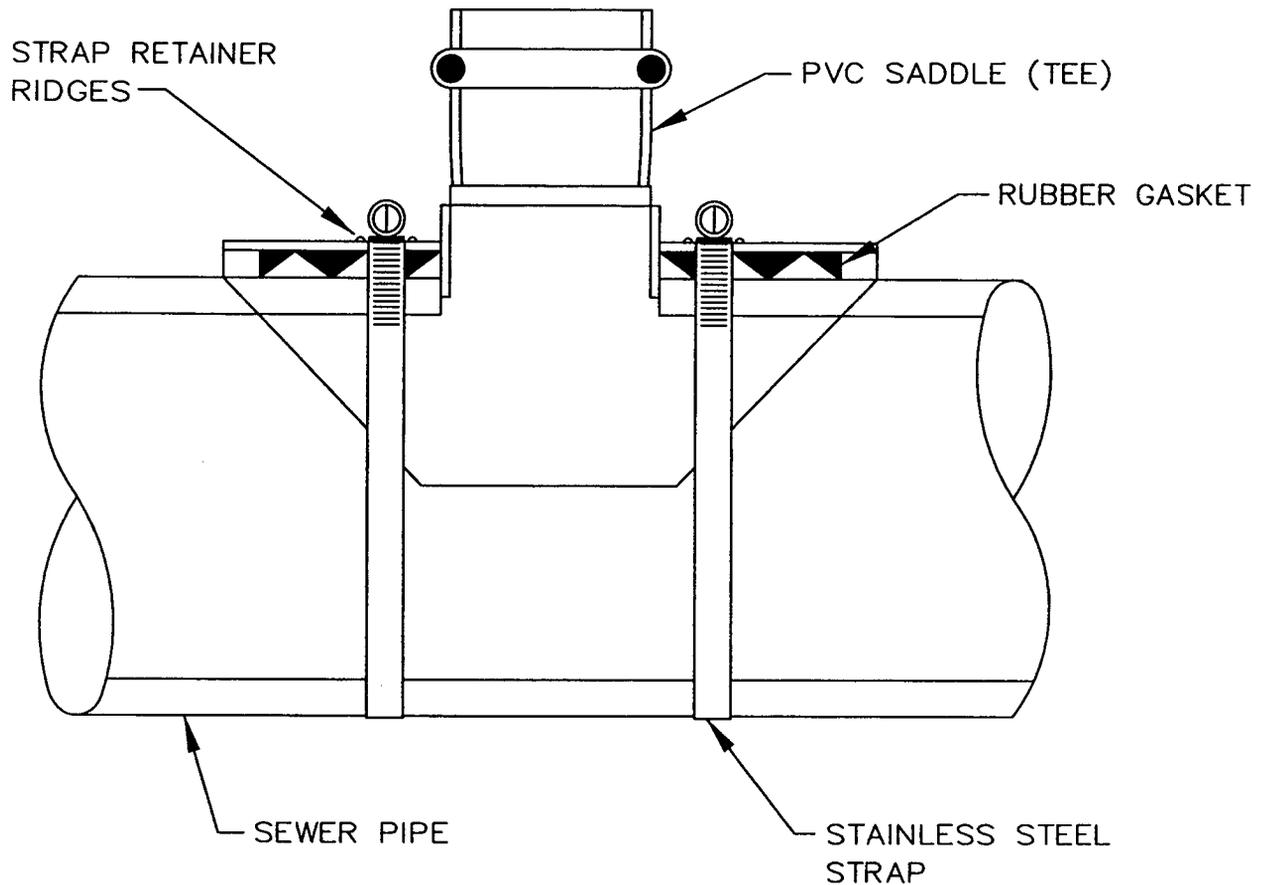


- ZONE 1: ONLY CROSSING RESTRICTIONS APPLY
- ZONE 2: CASE-BY-CASE DETERMINATION
- ZONE 3: PARALLEL WATERLINE PROHIBITED
- ZONE 4: PARALLEL WATERLINE PROHIBITED

**NOTES:**

1. WHERE THE PROPOSED WATERLINE WILL BE INSTALLED PARALLEL TO AN EXISTING GRAVITY SANITARY SEWER MAIN OR LATERAL LINE, THE SEPARATION BETWEEN THE TWO SHALL BE AS INDICATED ABOVE.
2. CROSSINGS:
  - a.) WHEREVER POSSIBLE, THE BOTTOM OF THE WATERLINE SHALL BE 1.5 FEET ABOVE THE TOP OF THE SEWER LINE, AND ONE FULL LENGTH OF WATERLINE SHALL BE CENTERED AT THE CROSSING.
  - b.) WHERE IT IS NOT POSSIBLE FOR THE WATER LINE TO BE 1.5 FEET ABOVE THE SEWER LINE, OR THE WATERLINE PASSES UNDER THE SEWER LINE, THE EXISTING SEWER LINE SHALL BE EXPOSED FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING, AND SHALL BE REPLACED WITH C-900 PVC OR CLASS 50 DUCTILE IRON PIPE AS APPROVED BY THE ENGINEER, AND A LENGTH OF WATER PIPE SHALL BE CENTERED AT THE CROSSING, OR AS APPROVED BY THE ENGINEER.

|                         |                  |                |                        |                                                                                       |
|-------------------------|------------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Sanitary Sewer Crossing |                  |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: S-2150  | DRAWN BY: GCF    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: S-2150.dwg   | APPROVED BY: MAS | DATE: 11/01/03 | PUBLIC WORKS STANDARDS |                                                                                       |



NOTES:

1. PVC SADDLE SHALL BE ASTM D-3034 SDR35.
2. PVC COMPOUNDS SHALL BE ASTM D1784 WITH CELL CLASS OF 12454-B/C OR 12364-C.
3. ALL ELASTOMERIC SEALS (RUBBER GASKETS) SHALL BE ASTM F477.
4. STAINLESS STEEL BANDS SHALL BE 300 SERIES, FULL 9/16" WIDTH BAND, 5/16' SHOULDERED HEX HEAD, SLOTTED SCREW AND IS CADMIUM PLATED, CARBON STEEL.
5. INSERTION HOLE SHALL BE CORE DRILLED.

PVC Gasket Saddle

DRAWING NUMBER: S-2155

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2155.dwg

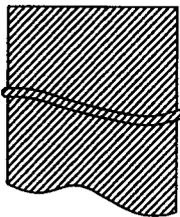
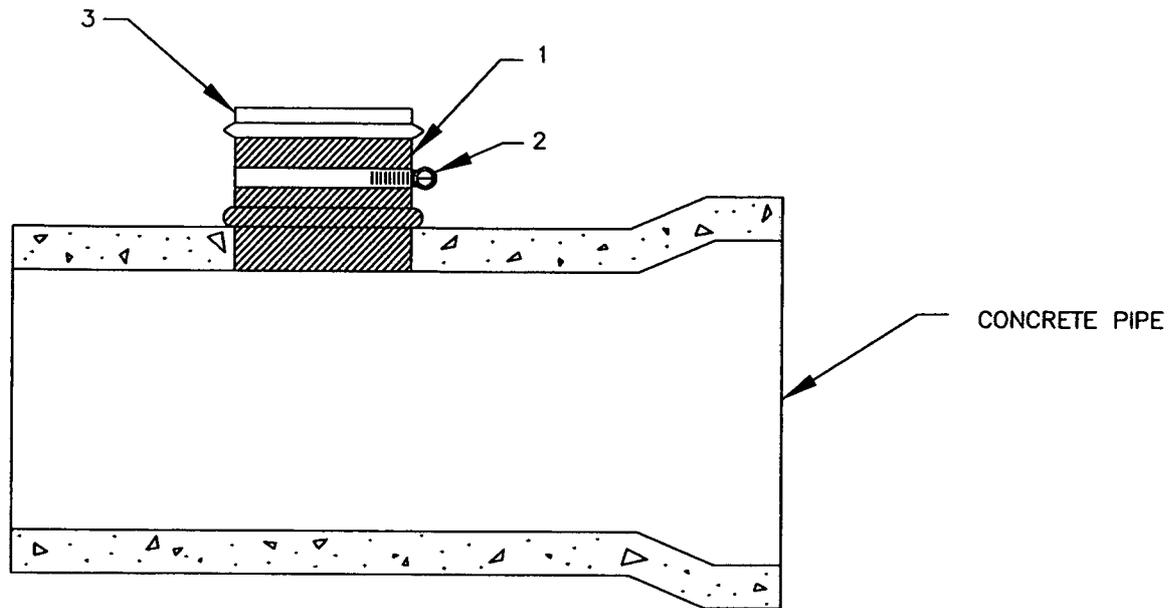
APPROVED BY: MAS

DATE: 11/01/03

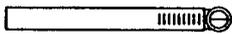
CITY OF  
WILSONVILLE



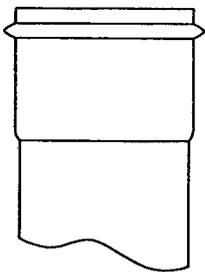
PUBLIC WORKS STANDARDS



1. COMPLETE RUBBER SLEEVE (ASTM C-443) INCLUDES A MOLDED SEGMENT THAT HOLDS IT IN PLACE.



2. STAINLESS STEEL BAND (9/16" SERIES 316) SECURES UPPER HALF OF RUBBER SLEEVE TO THE PVC HUB.



3. PVC HUB (ASTM C-3034 SDR 35) DRIVE INTO CENTER OF RUBBER SLEEVE AFTER SLEEVE IS PLACED IN HOLE.

NOTE: ALL INSERTA-TEE HOLES SHALL BE MACHINE DRILLED.

Inserta-Tee

DRAWING NUMBER: S-2160

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2160.dwg

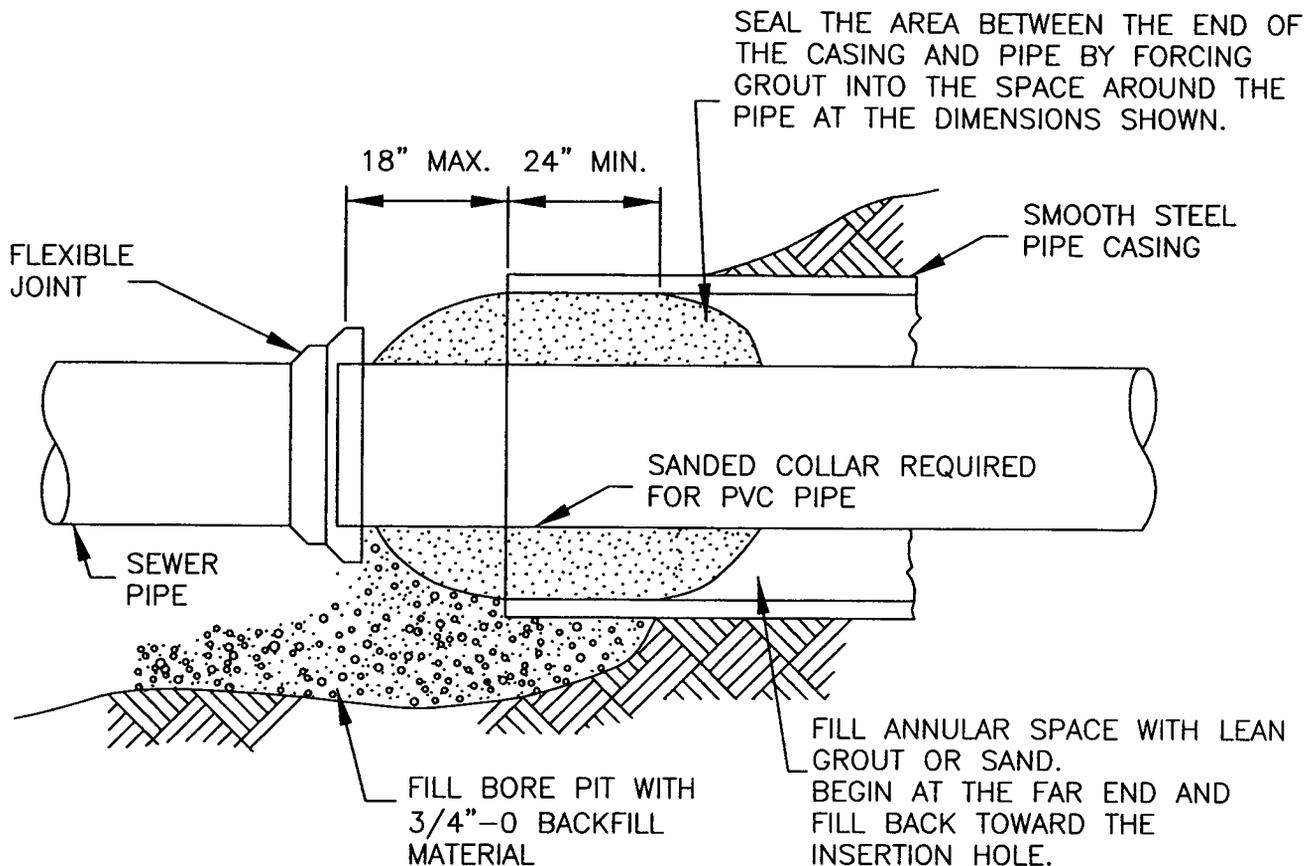
APPROVED BY: MAS

DATE: 11/01/03

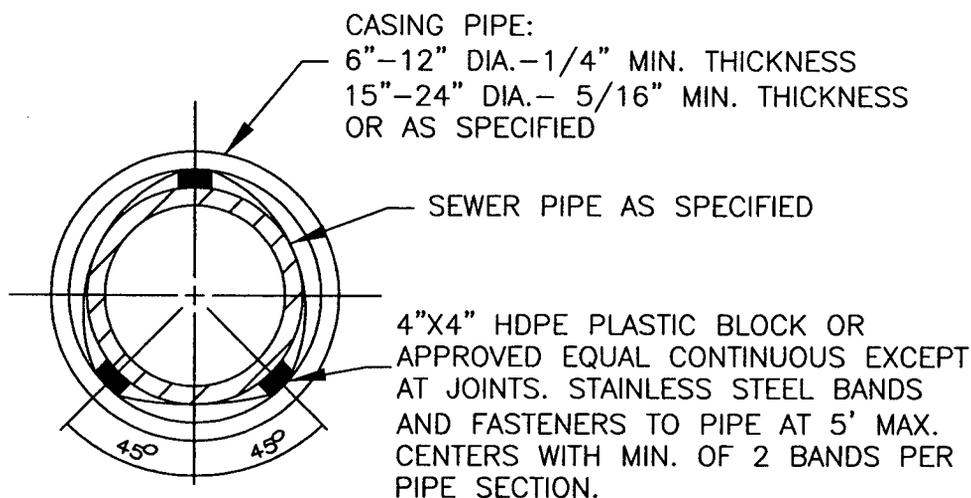
CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



PIPE SEAL DETAIL



CASING SECTION

Bore Detail

DRAWING NUMBER: S-2165

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2165.dwg

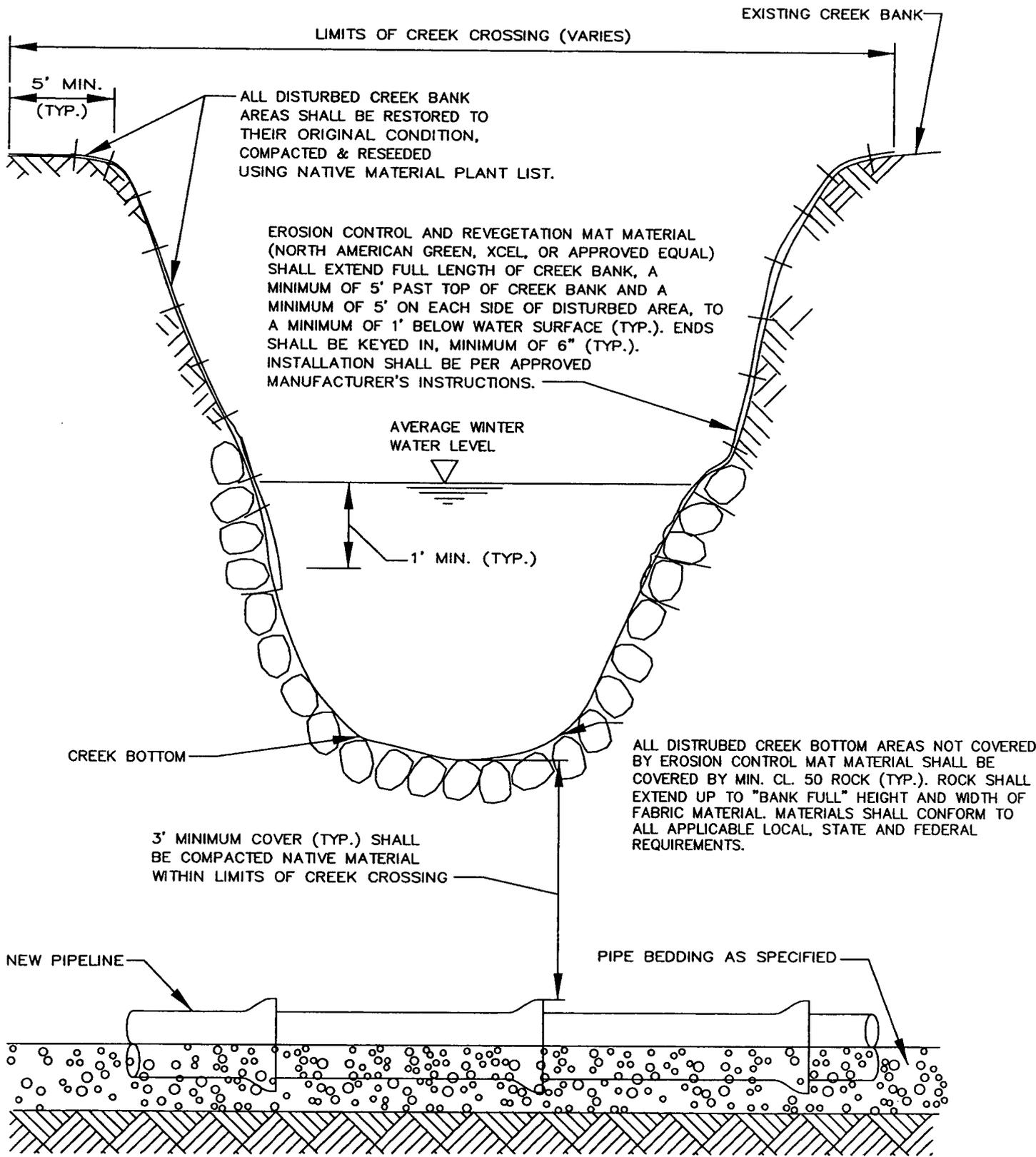
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



Creek Crossing Restoration

DRAWING NUMBER: S-2170

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2170.dwg

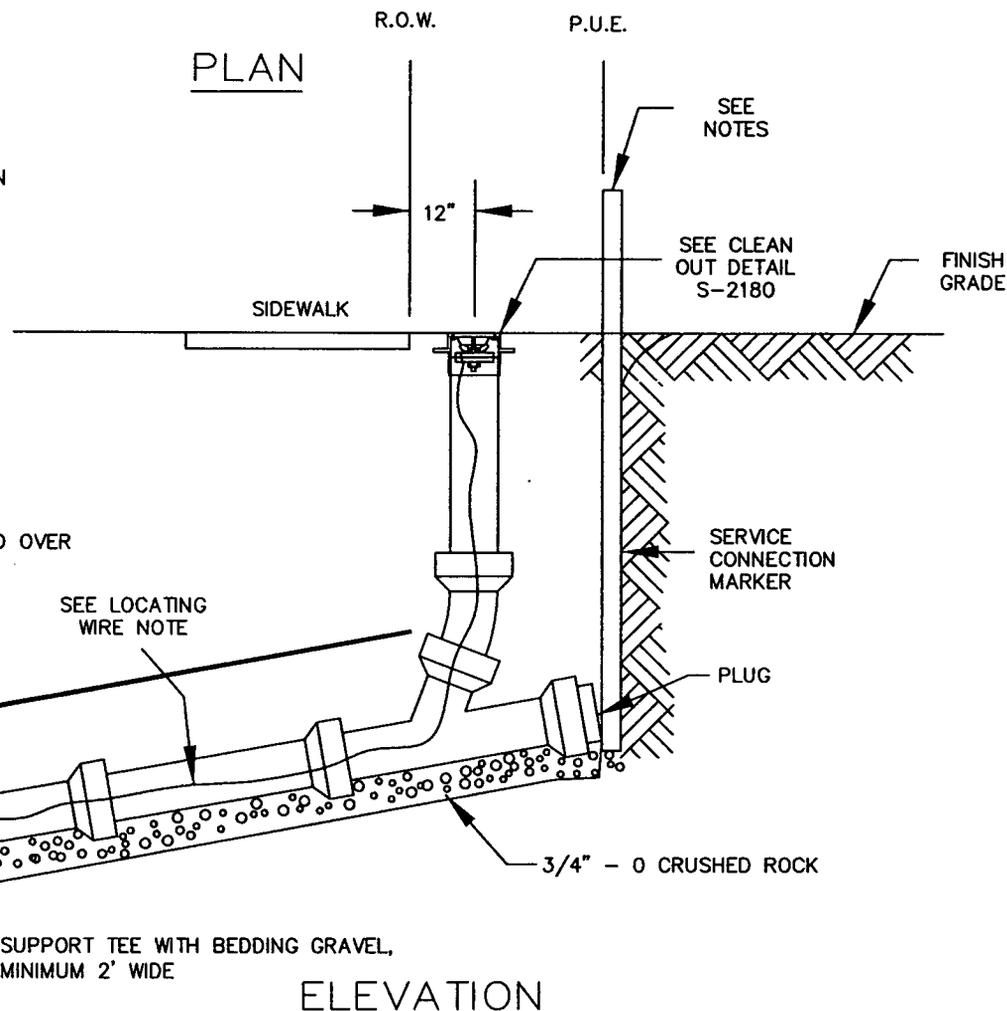
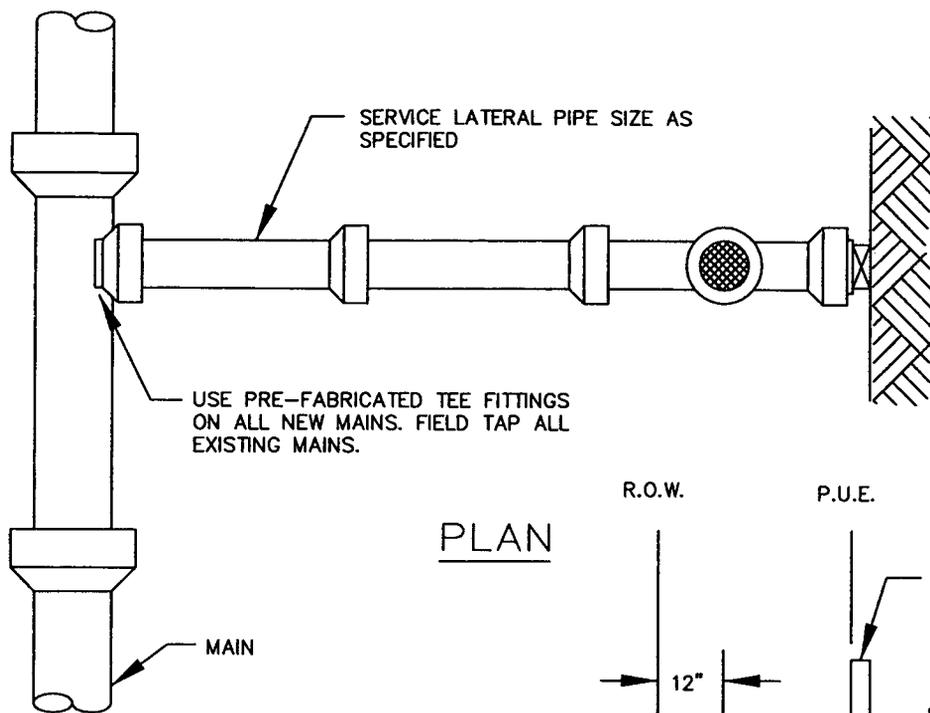
APPROVED BY: SA

DATE: 03/22/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



CAUTION TAPE TO BE CENTERED OVER AND 12" ABOVE ALL LATERALS.

SEE LOCATING WIRE NOTE

SEE NOTES

SEE CLEAN OUT DETAIL S-2180

SERVICE CONNECTION MARKER

PLUG

3/4" - 0 CRUSHED ROCK

SUPPORT TEE WITH BEDDING GRAVEL, MINIMUM 2' WIDE

ELEVATION

NOTES:

1. SERVICE CONNECTION MARKER SHALL BE 2X4 PLACED AGAINST PLUG TO PREVENT BLOWOFF AND SECURED WITH TRENCH BACKFILL.
2. MARKER SHALL EXTEND AT LEAST 2 FEET ABOVE FINISHED GRADE AND PAINTED GREEN FOR SANITARY OR WHITE FOR STORM.
3. MINIMUM SIZE SHALL BE 6" FOR STORM LATERALS AND 4" FOR SANITARY LATERALS.
4. USE 4" PVC TO 4" D.I. FERNCO OR CAULDER COUPLINGS FOR 4" D.I. LATERALS.
5. MINIMUM SLOPE FOR 6" LATERALS = 0.010. MINIMUM SLOPE FOR 4" LATERALS = 0.020.
6. LOCATING WIRE SHALL BE 12 GAUGE, CONTINUOUS, AND TIED TO MAIN AND TO CLEANOUT PLUG. WIRE SHALL BE PLACED ALONG THE SPRING-LINE OF LATERAL WITH EXTRA 2' LENGTH PROVIDED AT THE CLEANOUT. USE GREEN WIRE FOR SANITARY AND WHITE WIRE FOR STORM.

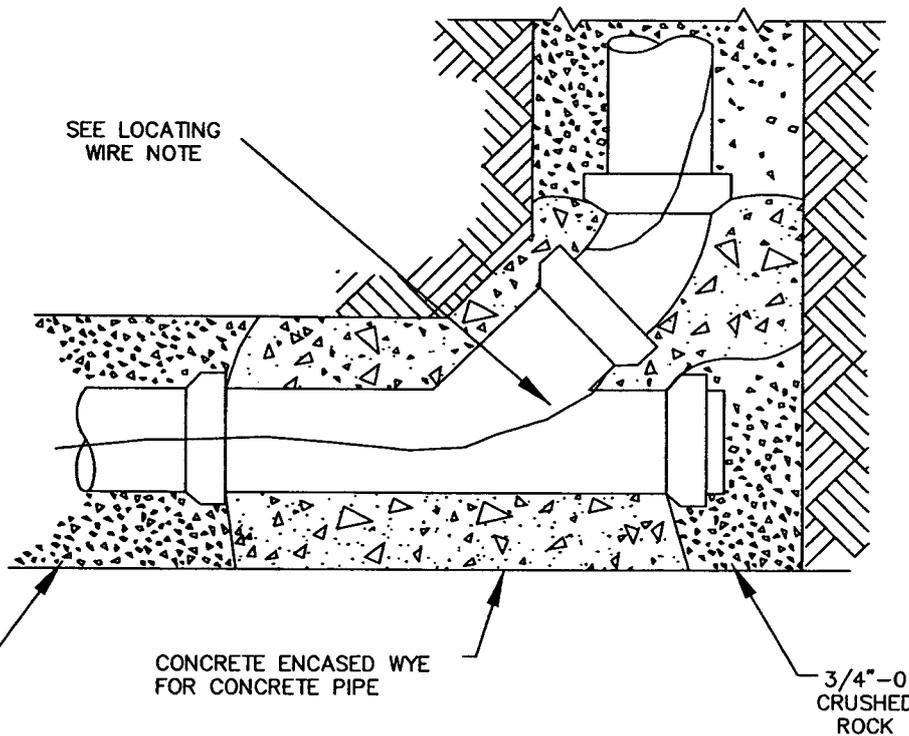
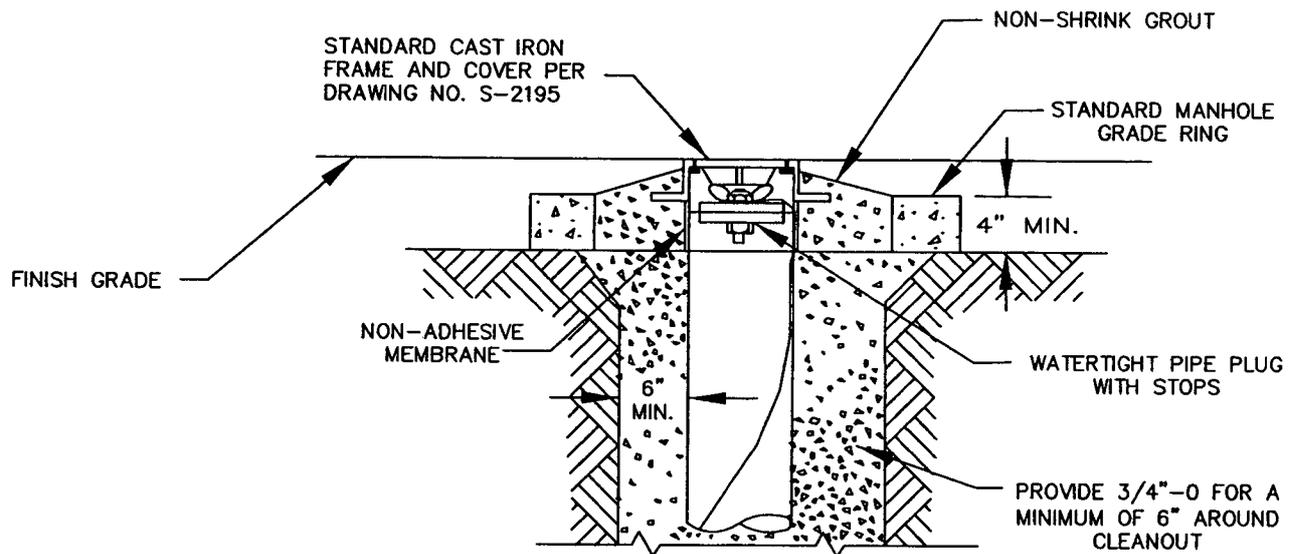
Service Lateral

|                        |                  |                |
|------------------------|------------------|----------------|
| DRAWING NUMBER: S-2175 | DRAWN BY: GCF    | SCALE: N.T.S.  |
| FILE NAME: S-2175.dwg  | APPROVED BY: MAS | DATE: 11/01/03 |

CITY OF WILSONVILLE



PUBLIC WORKS STANDARDS



**NOTE:**

1. CLEANOUT INSTALLATIONS ARE LIMITED TO EASEMENT AREAS OR MAY BE ALLOWED ON A TEMPORARY BASIS IN RIGHT-OF-WAYS.
2. CONCRETE ENCASE ENTIRE WYE SECTION AND 45° BEND IF CONCRETE PIPE.
3. CLEANOUTS SHALL BE PLACED OUTSIDE OF SIDEWALKS AND DRIVEWAYS.
4. CLEANOUTS IN PLANTER STRIPS SHALL BE LOCATED NEXT TO SIDEWALK.
5. LOCATING WIRE SHALL BE 12 GAUGE, CONTINUOUS, AND TIED TO MAIN AND TO CLEANOUT PLUG. WIRE SHALL BE PLACED ALONG THE SPRING-LINE OF LATERAL WITH EXTRA 2' LENGTH PROVIDED AT THE CLEANOUT. USE GREEN WIRE FOR SANITARY AND WHITE FOR STORM.

Standard Cleanout

DRAWING NUMBER: S-2180

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2180.dwg

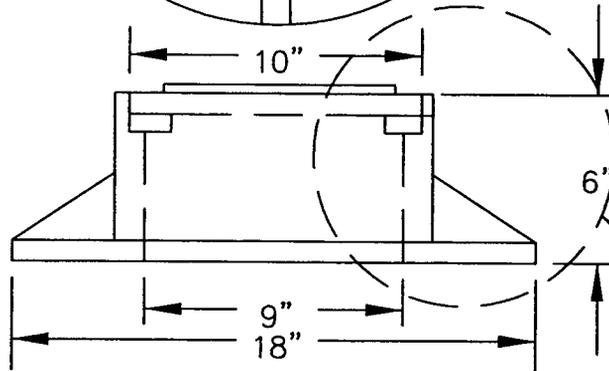
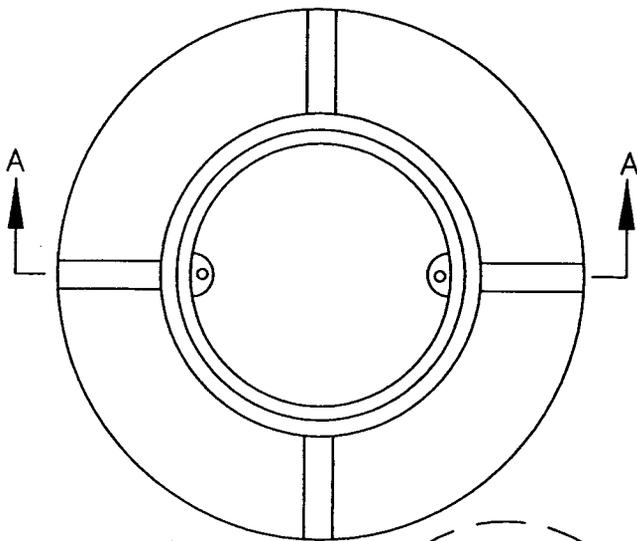
APPROVED BY: SA

DATE: 01/28/06

CITY OF  
WILSONVILLE

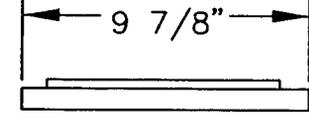
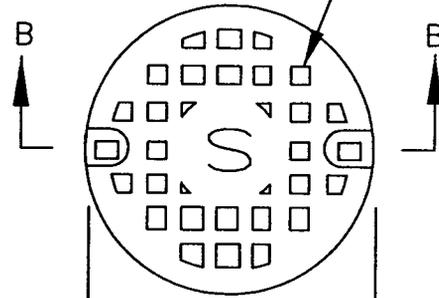


PUBLIC WORKS STANDARDS



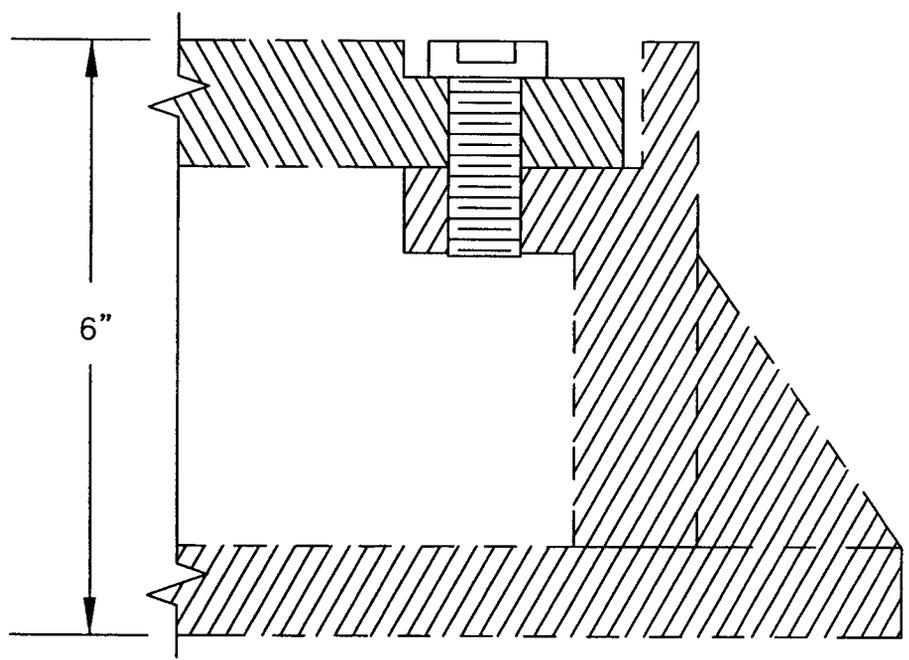
SECTION A-A

3/4" SQUARE



SECTION B-B

SEE DETAIL



DETAIL

NOTES:

1. 1/4" A-304 STAINLESS STEEL ALLEN HEAD BOLTS 1" LONG RECESSED.
2. ALL PERMANENT CLEANOUTS TO HAVE BOLT DOWN COVER.
3. FRAME AND COVER SHALL BE GRAY CAST IRON (ASTM A 48 CLASS 30).
4. ANTI-SEEZE COMPOUND TO BE APPLIED TO ALL BOLTS.

Cleanout Frame & Cover

DRAWING NUMBER: S-2185

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2185.dwg

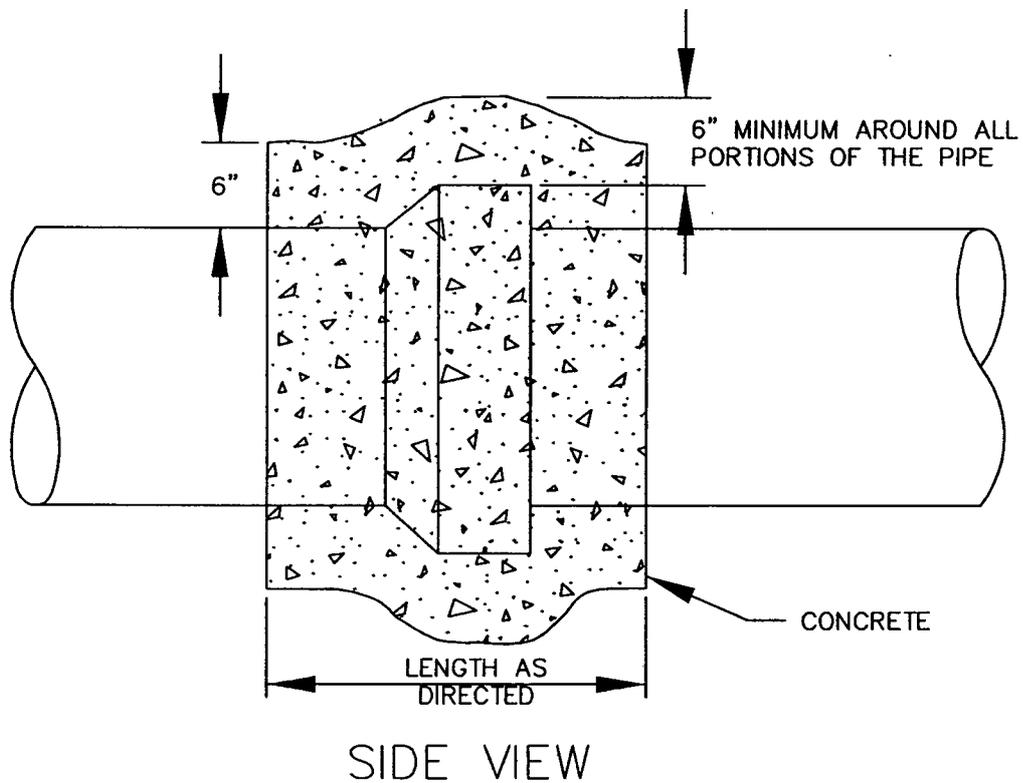
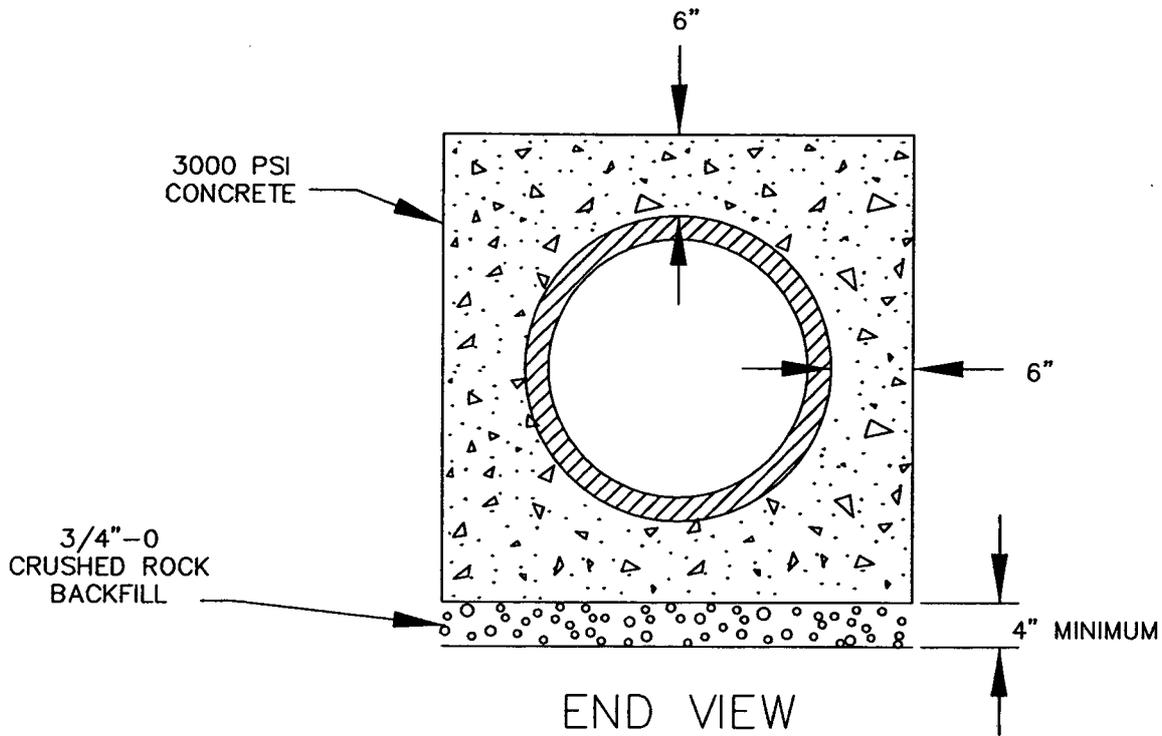
APPROVED BY: MAS

DATE: 11/01/03

CITY OF WILSONVILLE



PUBLIC WORKS STANDARDS



NOTE:  
WRAP JOINT WITH 8 MIL. MINIMUM PLASTIC.

Concrete Encasement/Closure Collar

DRAWING NUMBER: S-2190

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2190.dwg

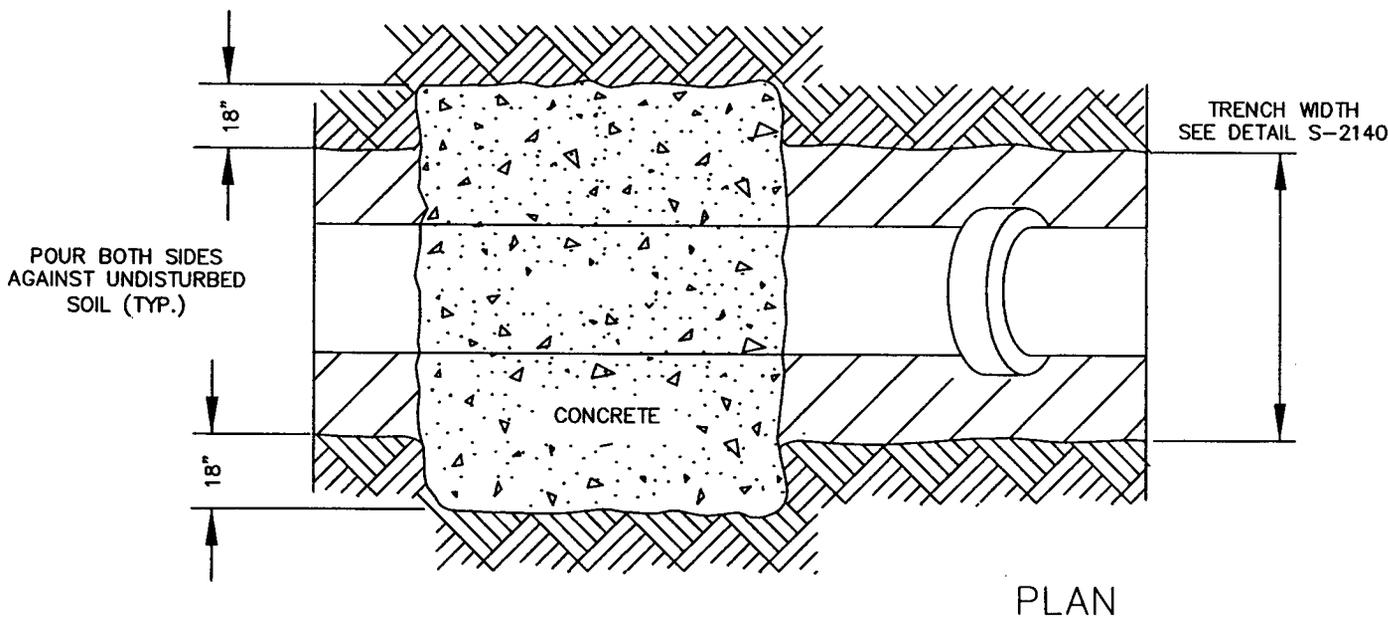
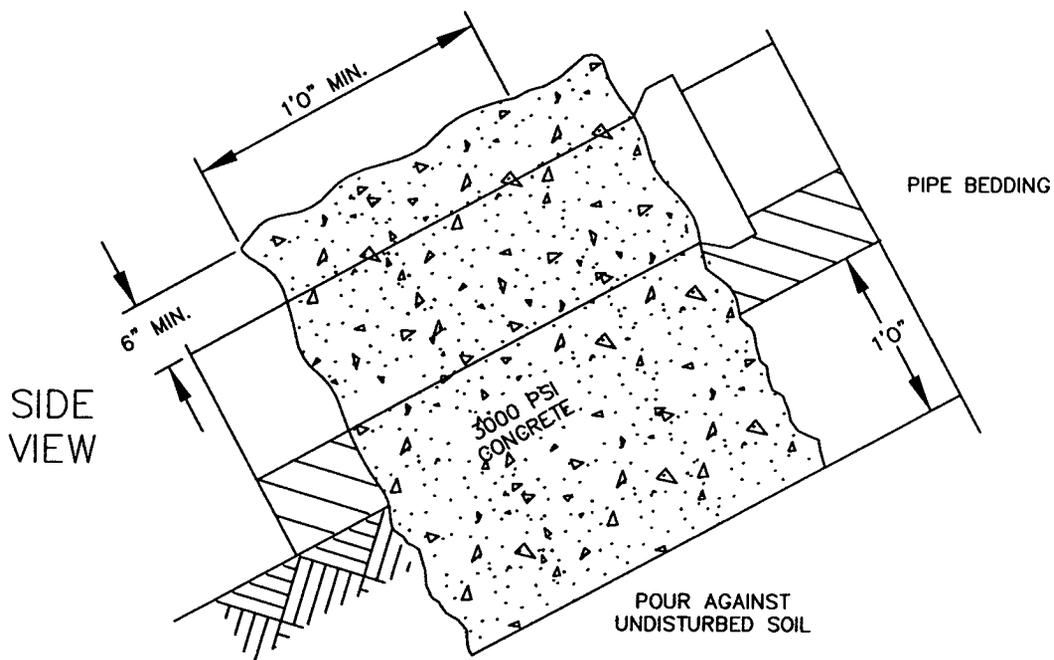
APPROVED BY: SA

DATE: 1/30/06

CITY OF  
WILSONVILLE

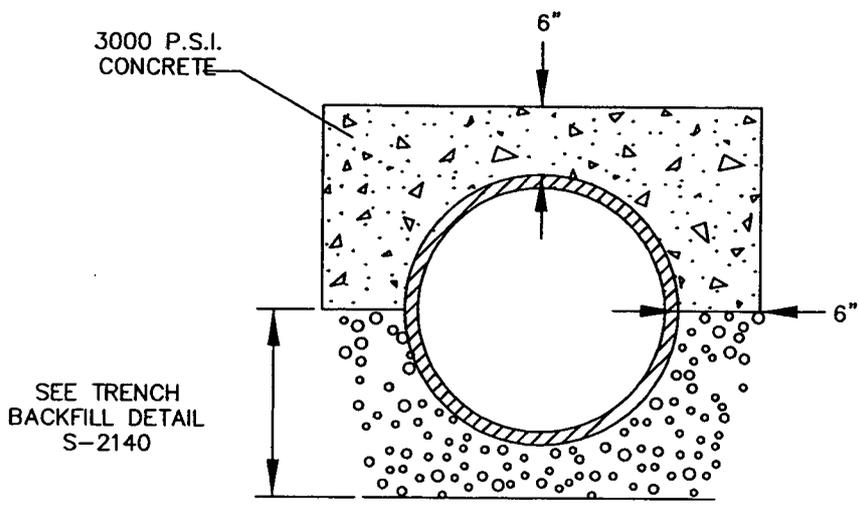


PUBLIC WORKS STANDARDS

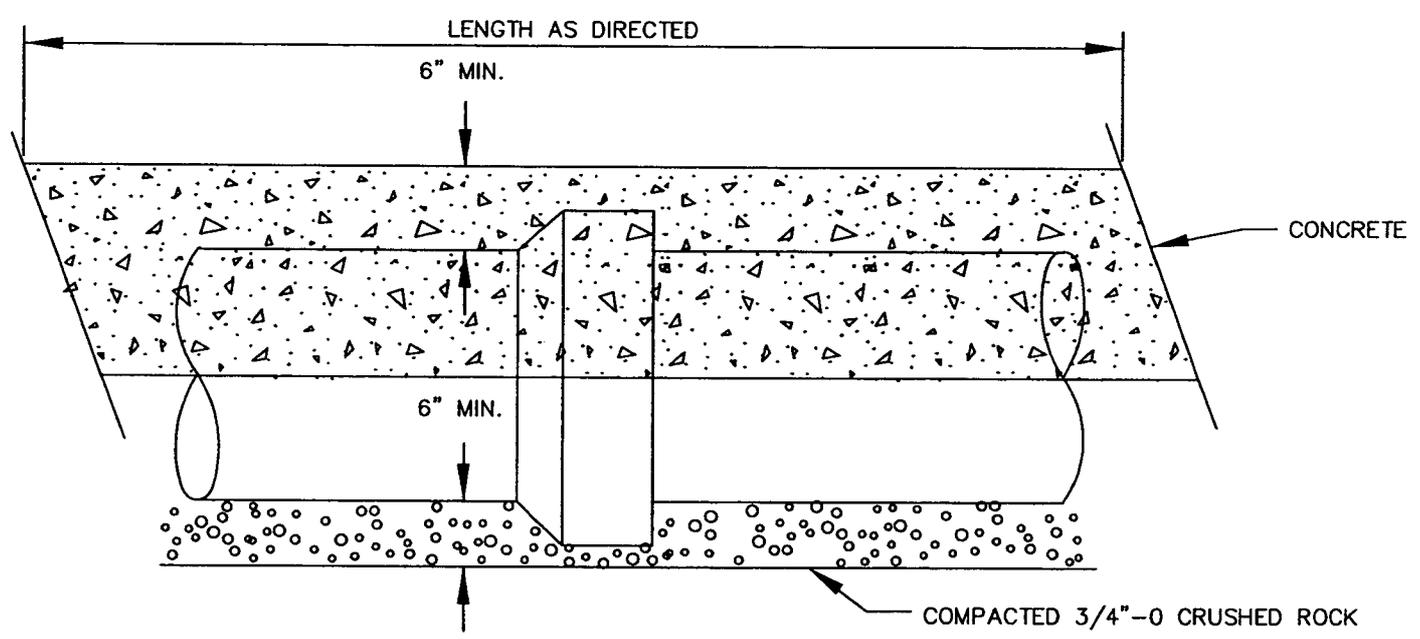


| SLOPE       | MIN. ANCHOR SPACING<br>CENTER TO CENTER |
|-------------|-----------------------------------------|
| 0.20 - 0.34 | 35'                                     |
| 0.35 - 0.50 | 25'                                     |
| 0.50+       | 15' OR CONC.<br>ENCASEMENT              |

|                        |                 |                |                                                                                                                                               |
|------------------------|-----------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Anchor Wall            |                 |                | CITY OF<br>WILSONVILLE<br><br><br>PUBLIC WORKS STANDARDS |
| DRAWING NUMBER: S-2195 | DRAWN BY: SJ    | SCALE: N.T.S.  |                                                                                                                                               |
| FILE NAME: S-2195.dwg  | APPROVED BY: SA | DATE: 03/21/06 |                                                                                                                                               |



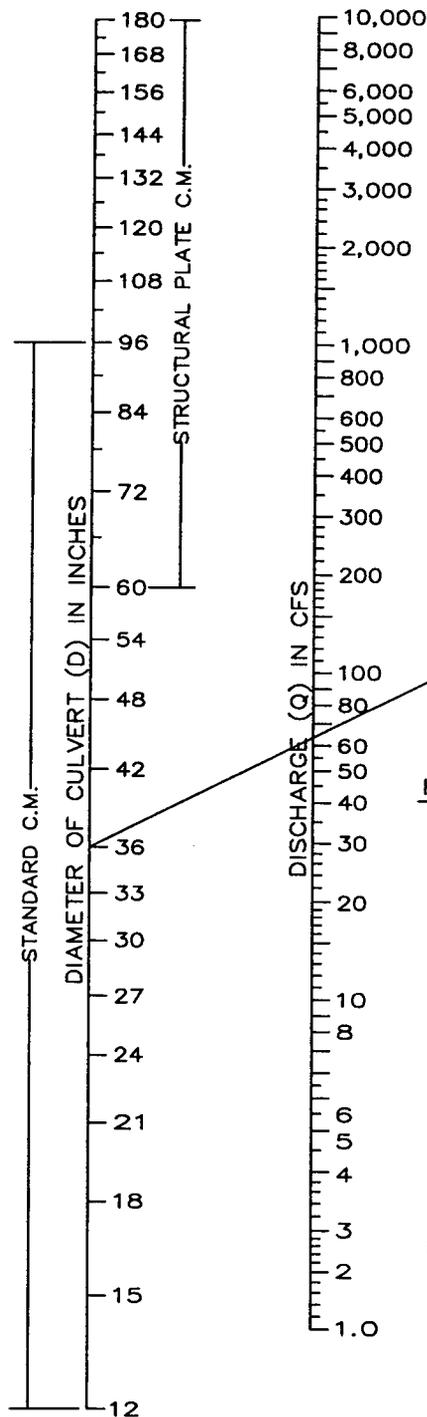
END VIEW



SIDE VIEW

|                        |                 |                |                                               |
|------------------------|-----------------|----------------|-----------------------------------------------|
| Concrete Cap           |                 |                | CITY OF WILSONVILLE<br>PUBLIC WORKS STANDARDS |
| DRAWING NUMBER: S-2200 | DRAWN BY: SJ    | SCALE: N.T.S.  |                                               |
| FILE NAME: S-2200.dwg  | APPROVED BY: SA | DATE: 03/21/06 |                                               |





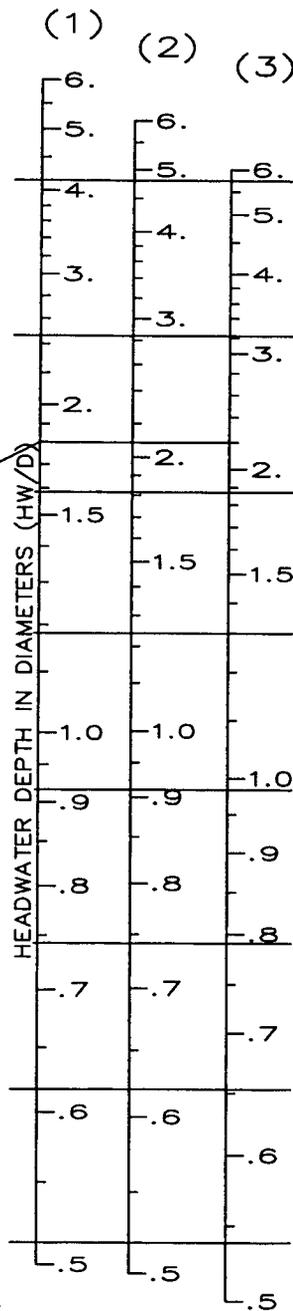
**EXAMPLE**  
 D=36 inches (3.0 feet)  
 Q=66 cfs

|     | HW*<br>D | HW<br>(feet) |
|-----|----------|--------------|
| (1) | 1.8      | 5.4          |
| (2) | 2.1      | 6.3          |
| (3) | 2.2      | 6.6          |

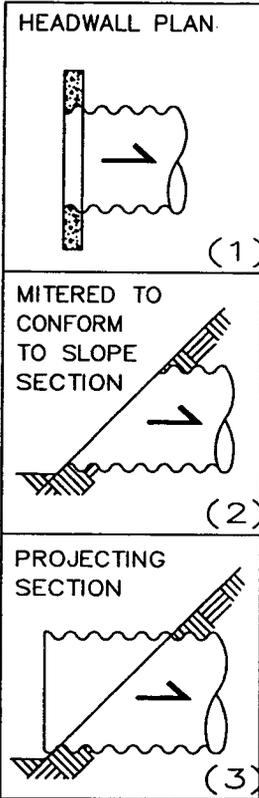
\*D in feet

| HW<br>D SCALE | ENTRANCE<br>TYPE            |
|---------------|-----------------------------|
| (1)           | Headwall                    |
| (2)           | Mitered to conform to slope |
| (3)           | Projecting                  |

To use scale (2) or (3) project horizontally to scale (1), then use straight inclined line through D and Q scales, or reverse as illustrated.



**ENTRANCE TYPE**



Headwater Depth For Corrugated Pipe W/Inlet Control

DRAWING NUMBER: S-2205

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2205.dwg

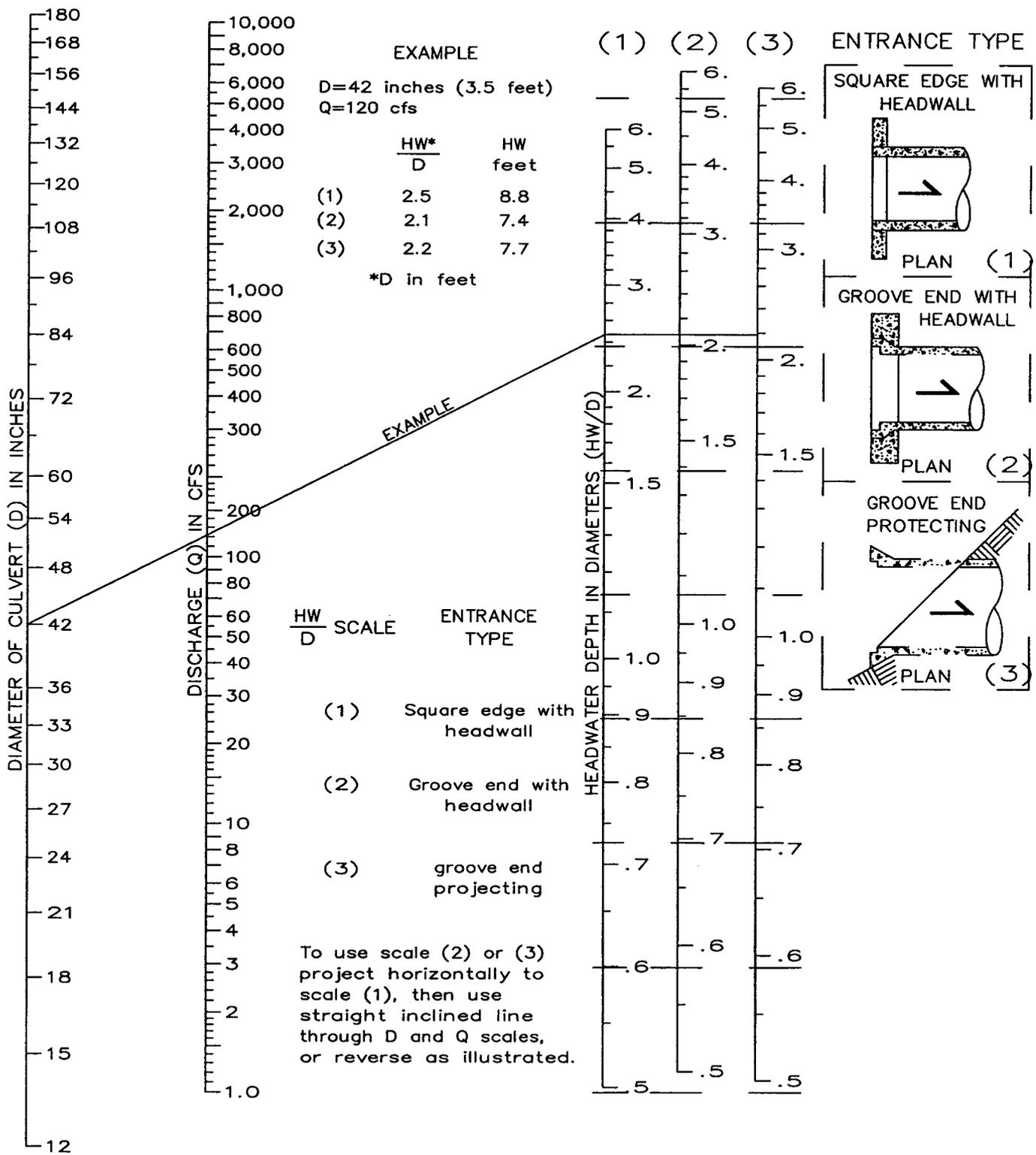
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



Headwater Dept For Smooth Interior Pipe Culverts  
W/Inlet Control

DRAWING NUMBER: S-2210

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2210.dwg

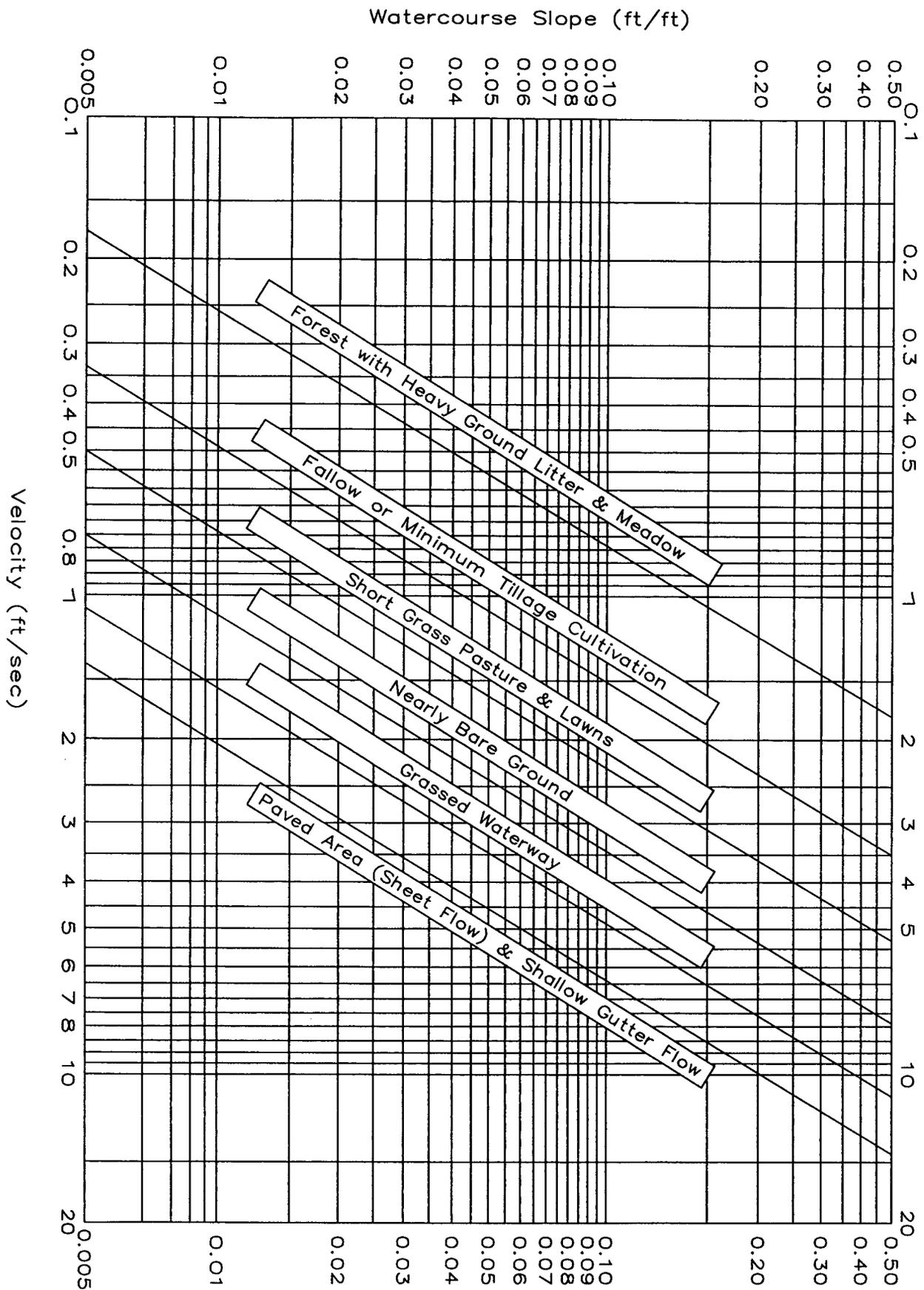
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



Average Velocities For Estimating Travel Time for Overland Flows

DRAWING NUMBER: S-2215

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2215.dwg

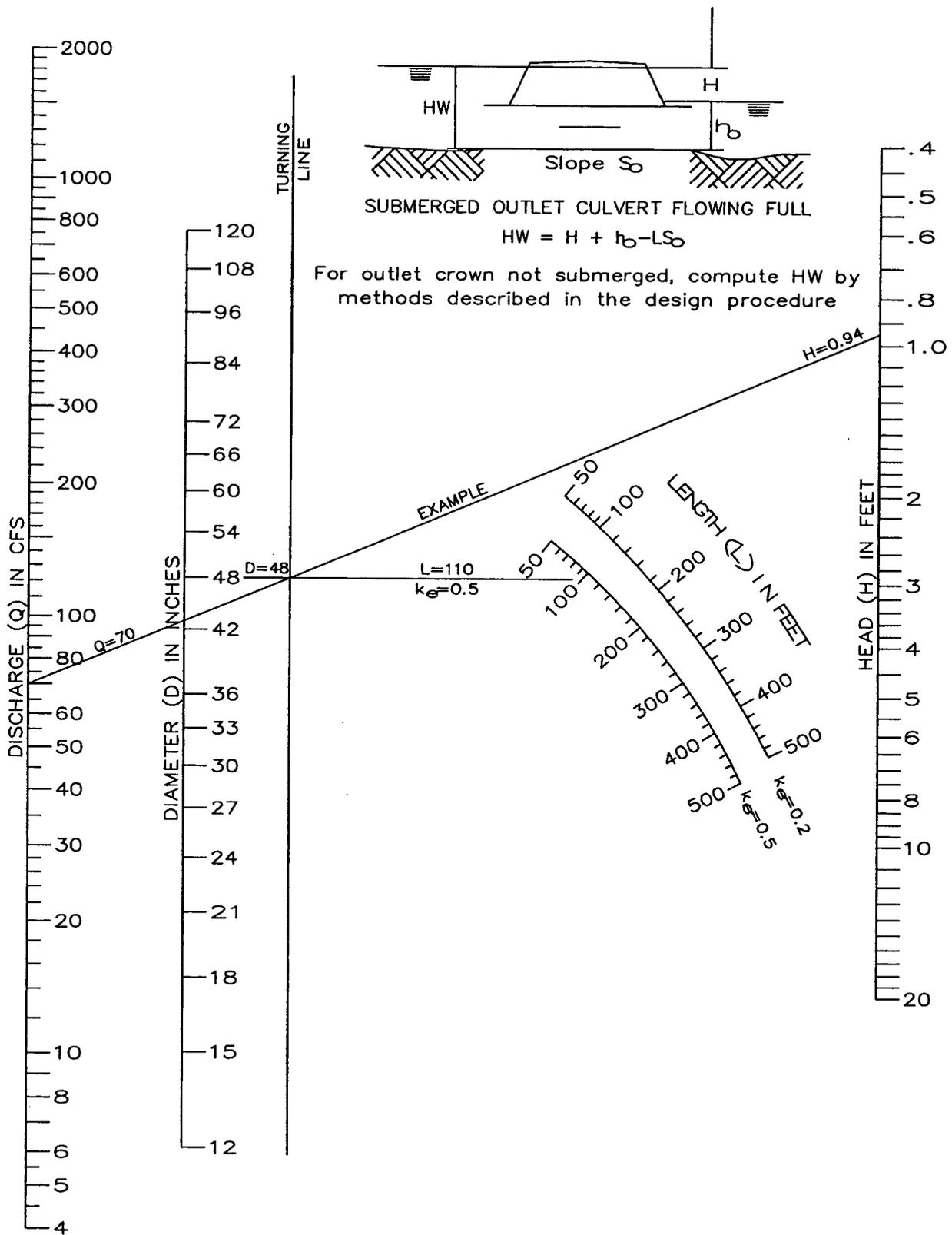
APPROVED BY: MAS

DATE: 11/01/03

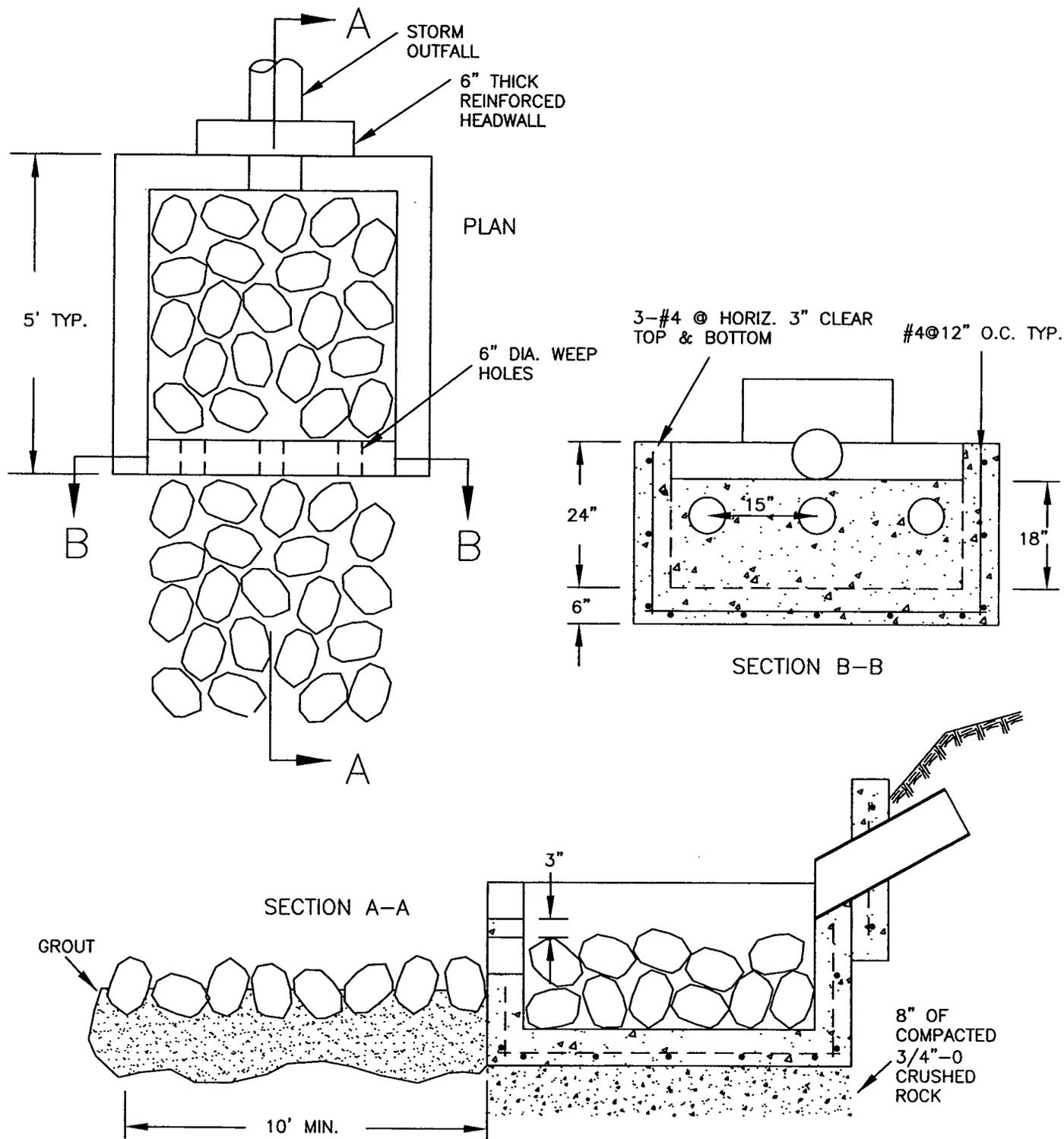
CITY OF WILSONVILLE



PUBLIC WORKS STANDARDS



|                                                                  |                  |                |                                                                                                                                        |
|------------------------------------------------------------------|------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Head For Culverts ( $n=0.012$ ) Flowing Full With Outlet Control |                  |                | CITY OF WILSONVILLE<br><br>PUBLIC WORKS STANDARDS |
| DRAWING NUMBER: S-2220                                           | DRAWN BY: GCF    | SCALE: N.T.S.  |                                                                                                                                        |
| FILE NAME: S-2220.dwg                                            | APPROVED BY: MAS | DATE: 11/01/03 |                                                                                                                                        |



NOTES:

1. RIP RAP SHALL BE 6" MIN. AND GROUTED IN PLACE, 3" THICK.
2. RIP RAP SHALL BE PRESSED INTO WET GROUT. SHOTCRETE WILL NOT BE ACCEPTED.
3. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 3000 PSI. AT 28 DAYS.

Swale Inflow Spreader

DRAWING NUMBER: S-2225

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2225.dwg

APPROVED BY: SA

DATE: 03/21/06

CITY OF  
WILSONVILLE



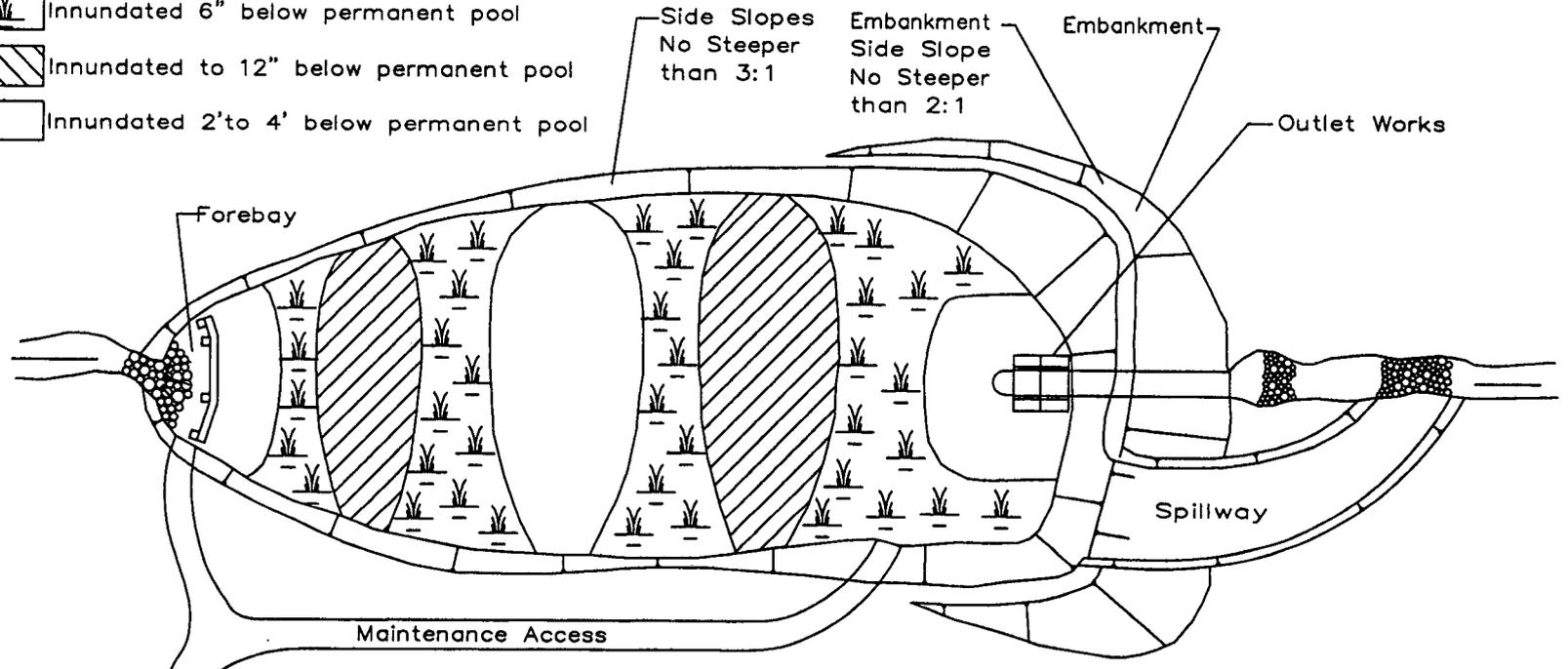
PUBLIC WORKS STANDARDS

DRAWING NUMBER: S-22230  
 FILE NAME: S-22230.dwg  
 DRAWN BY: GCF  
 APPROVED BY: MAS  
 SCALE: N.T.S.  
 DATE: 11/01/03

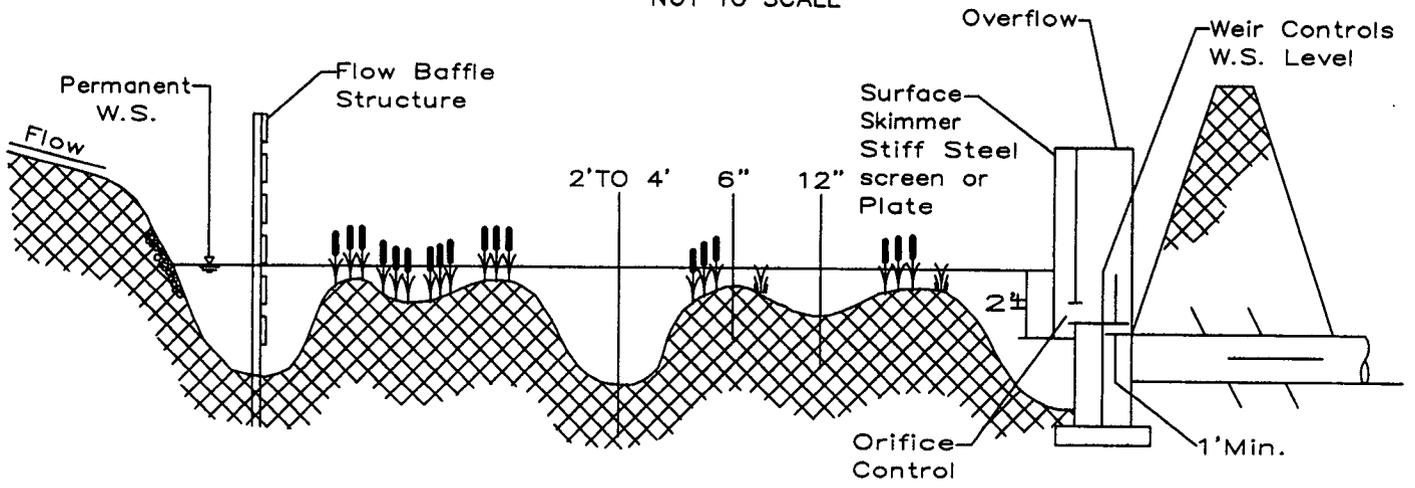
Wetland Pond

DEPTH VARIATION LEGEND

-  Innundated 6" below permanent pool
-  Innundated to 12" below permanent pool
-  Innundated 2'to 4' below permanent pool



**PLAN**  
 NOT TO SCALE

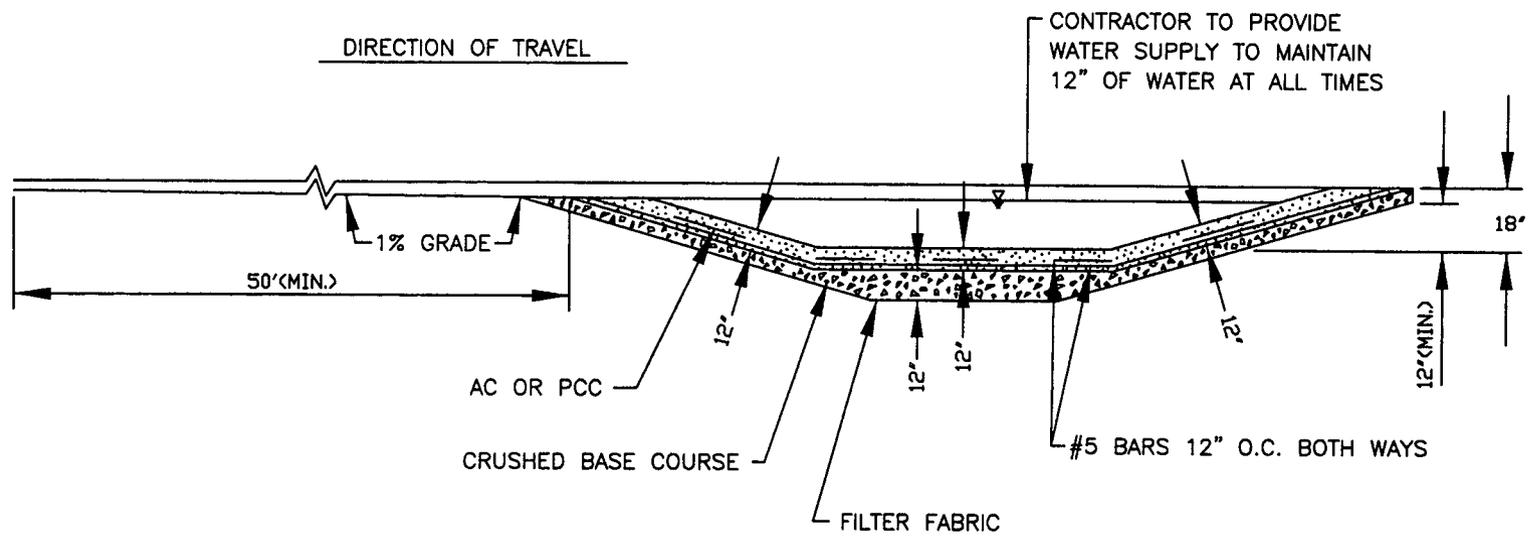
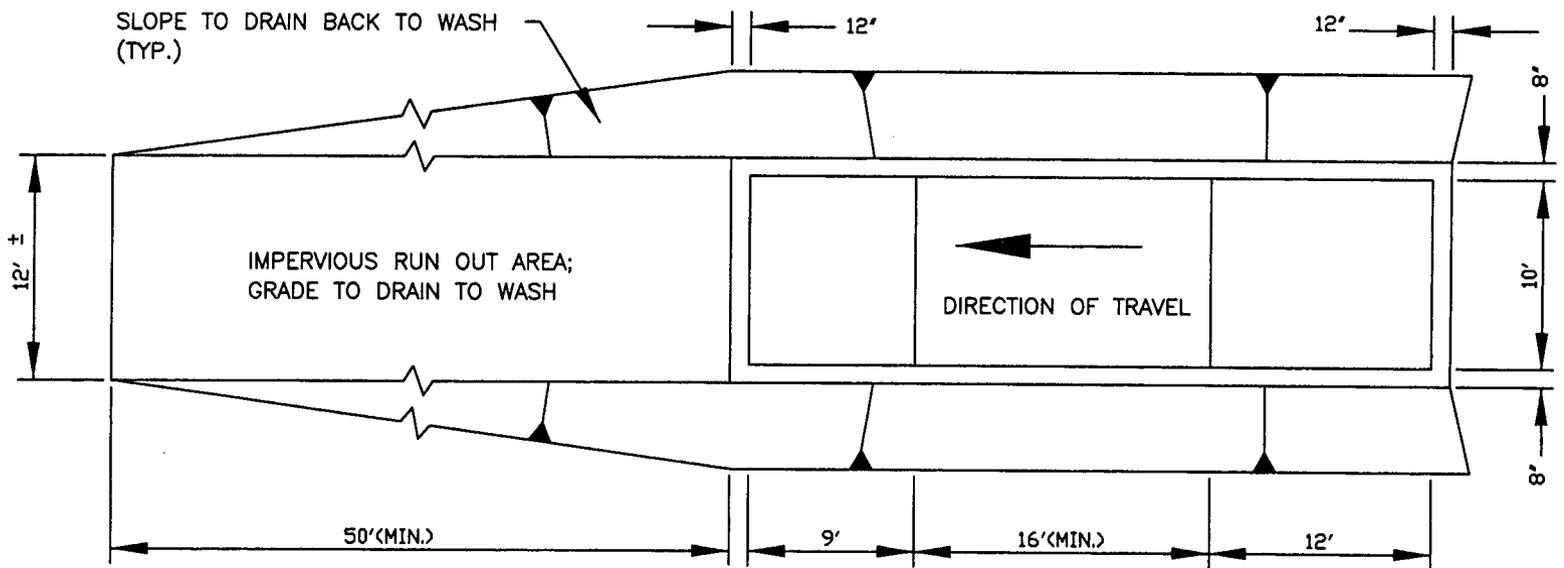


**PROFILE**  
 NOT TO SCALE

CITY OF  
 WILSONVILLE  
 PUBLIC WORKS STANDARDS



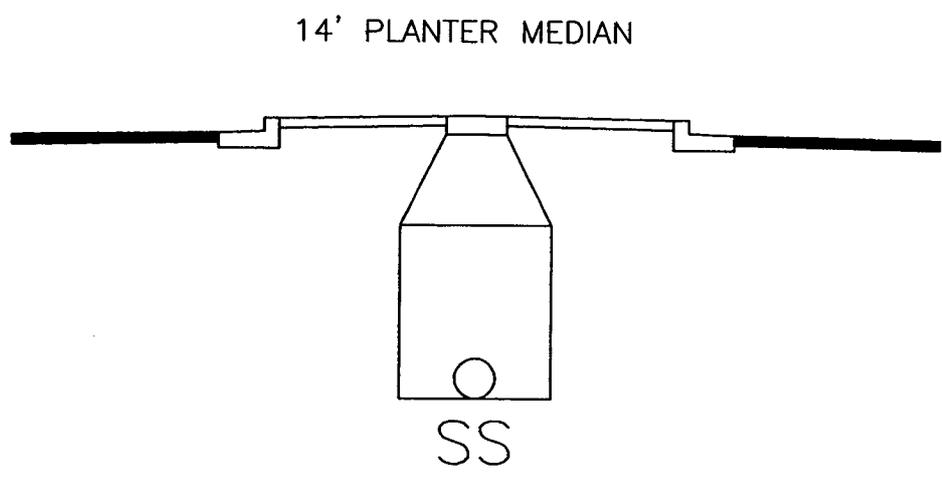
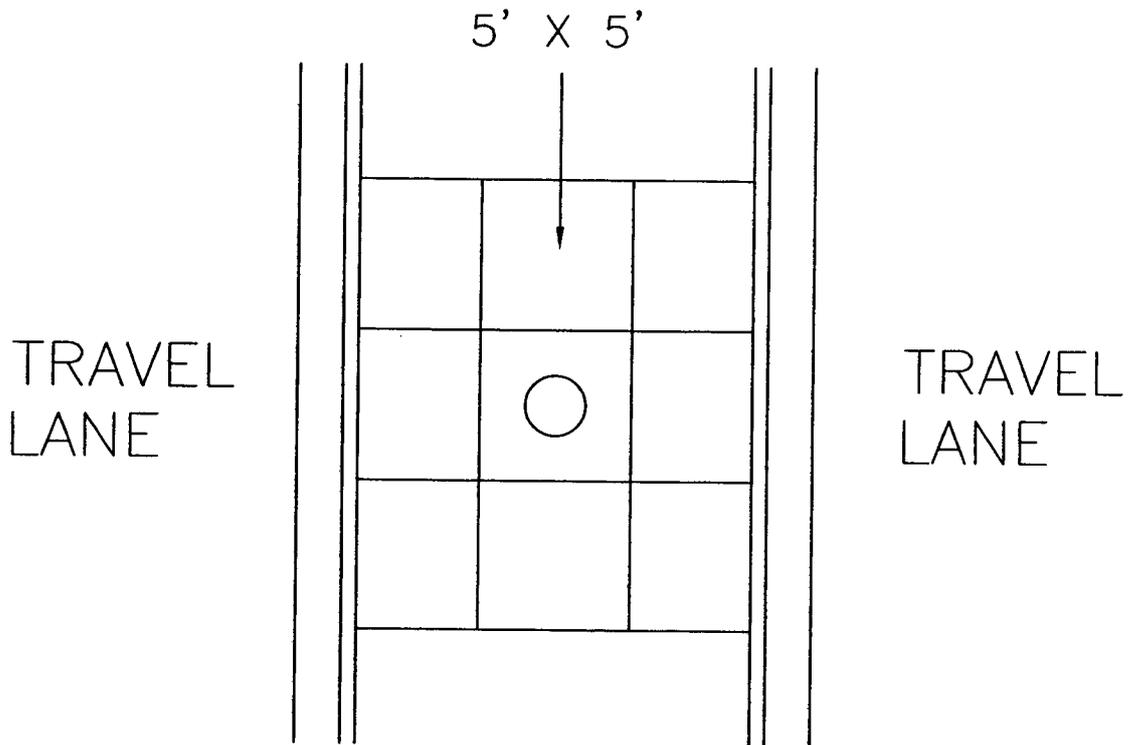
|                       |                        |                 |                |
|-----------------------|------------------------|-----------------|----------------|
| FILE NAME: S-2235.dwg | DRAWING NUMBER: S-2235 | APPROVED BY: SA | DATE: 01/30/06 |
| DRAWN BY: SJ          |                        | SCALE: N.T.S.   |                |
| Wheel Wash            |                        |                 |                |



NOTES:  
 CONTRACTOR TO REMOVE ACCUMULATED SEDIMENT FROM WHEEL WASH; MAY BE PIPED TO AN APPROVED SEDIMENT TRAP.

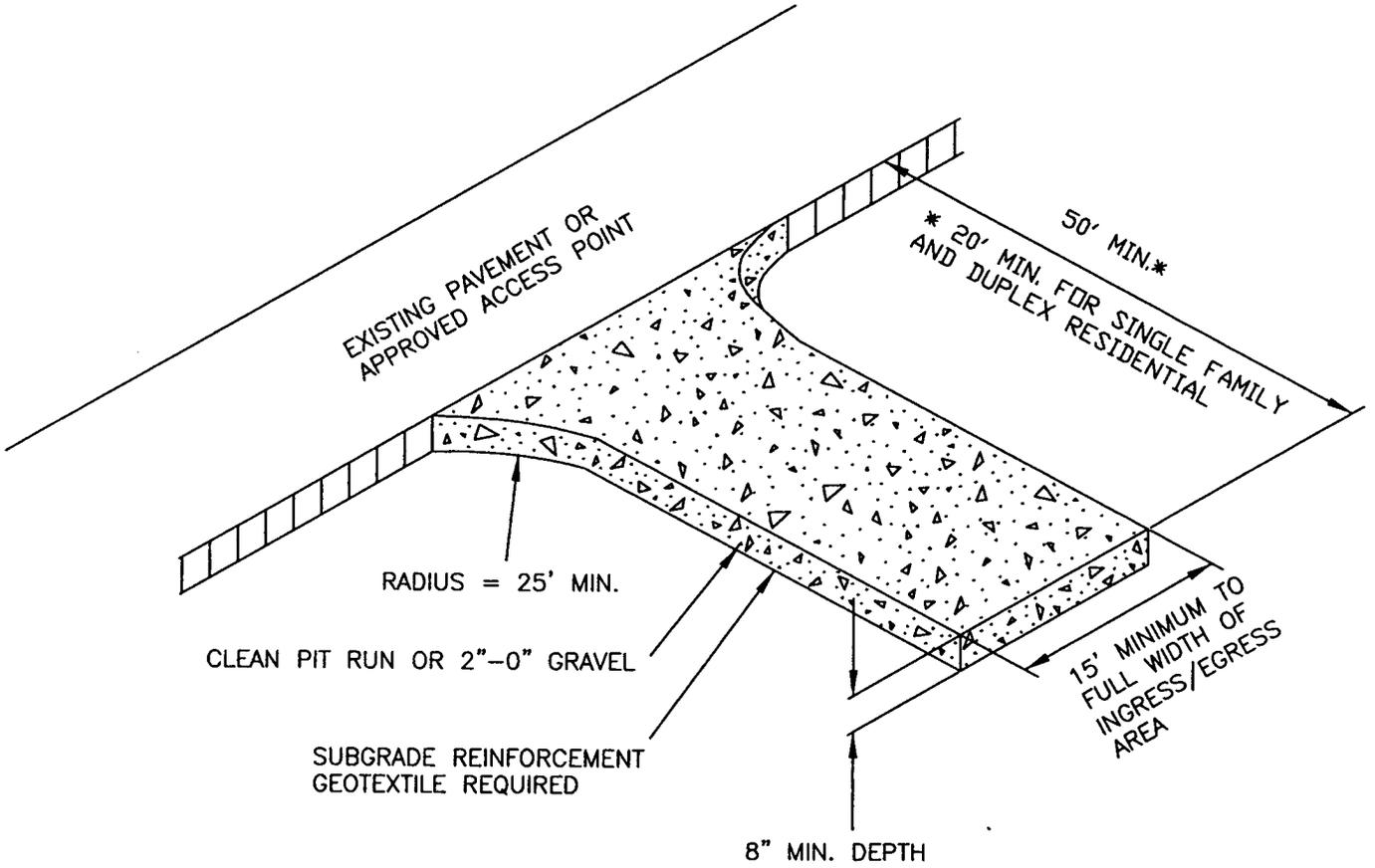
CITY OF  
 WILSONVILLE

PUBLIC WORKS STANDARDS



NOTES:  
 1. SEE CONCRETE SIDEWALK DETAIL DRAWING R-1080 FOR CONCRETE PAD REQUIREMENTS.

|                         |                 |                |                                                                                                                                           |
|-------------------------|-----------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Planter Median Manholes |                 |                | CITY OF<br>WILSONVILLE<br><br>PUBLIC WORKS STANDARDS |
| DRAWING NUMBER: S-2238  | DRAWN BY: SJ    | SCALE: N.T.S.  |                                                                                                                                           |
| FILE NAME: S-2238.dwg   | APPROVED BY: SA | DATE: 01/30/06 |                                                                                                                                           |



Gravel Construction Entrance

DRAWING NUMBER: S-2240

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2240.dwg

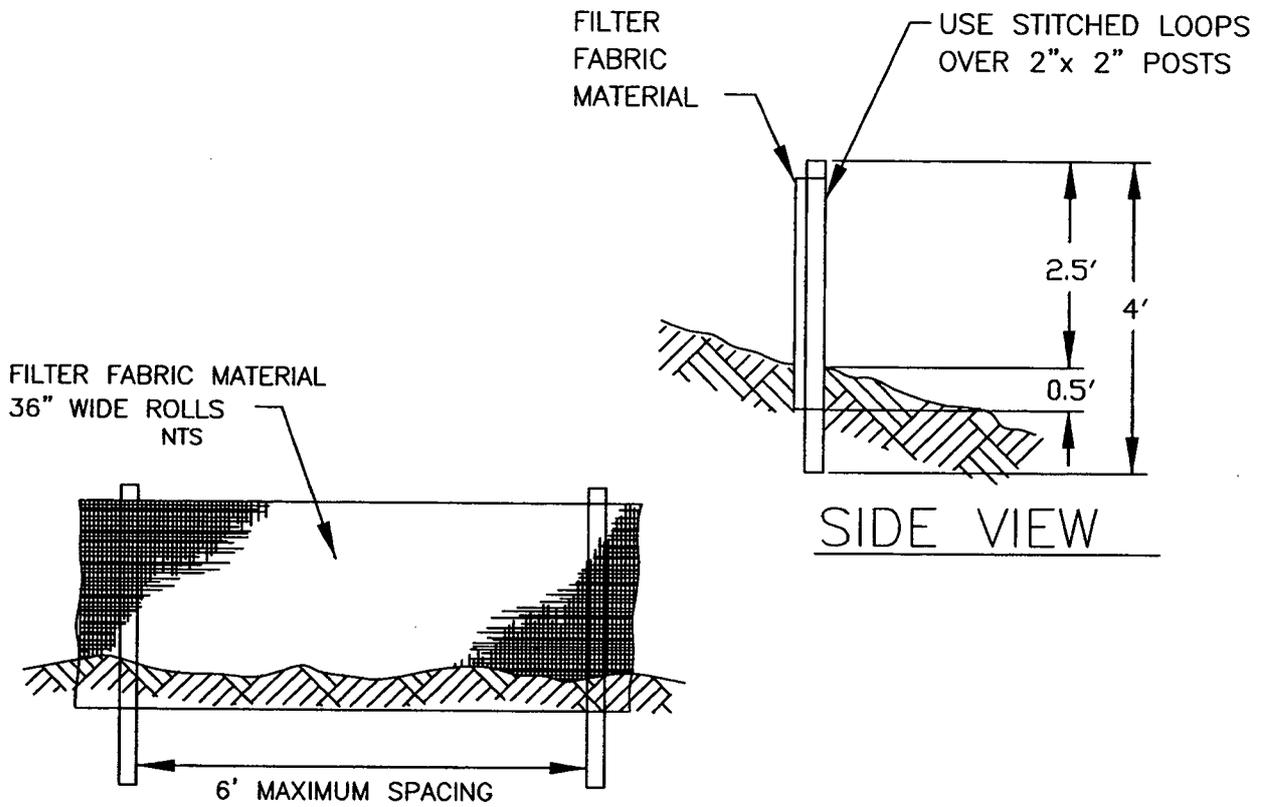
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE

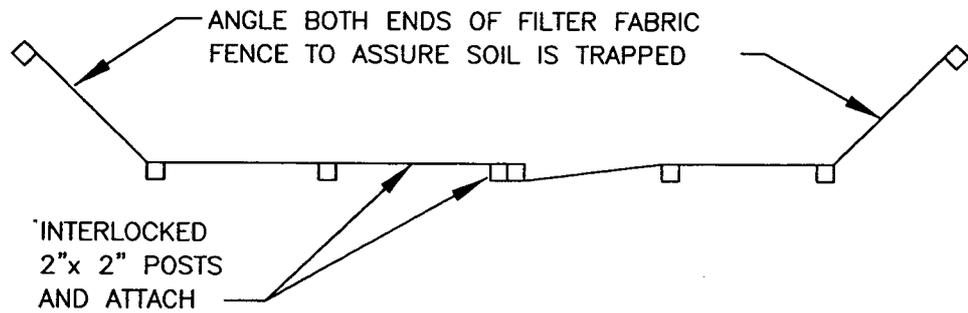


PUBLIC WORKS STANDARDS



FRONT VIEW

SIDE VIEW



TOP VIEW

NOTE:

1. SEDIMENT FENCING SHALL BE INSTALLED AS PER MANUFACTURER RECOMMENDATIONS.

Sediment Fence

DRAWING NUMBER: S-2245

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2245.dwg

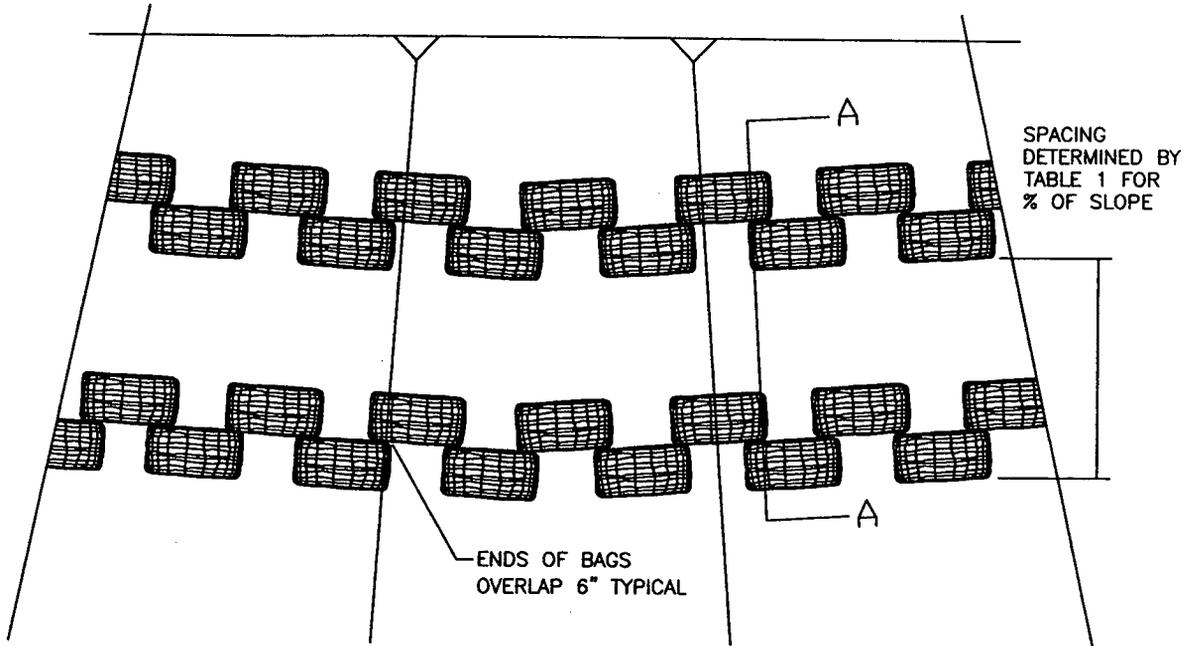
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE

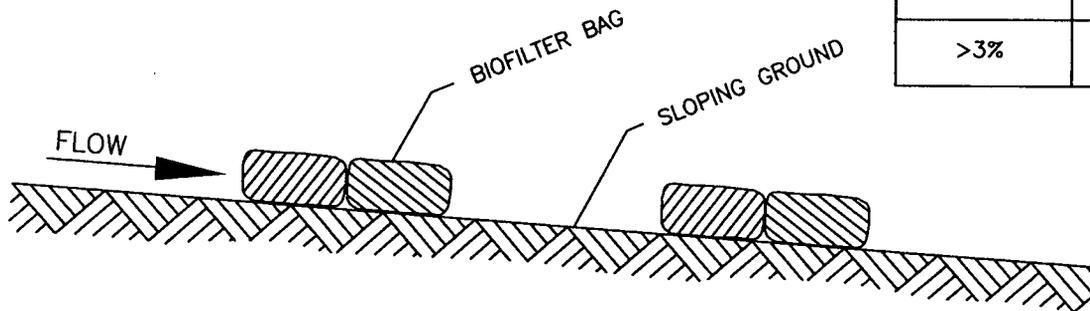


PUBLIC WORKS STANDARDS



PLAN VIEW

| TABLE 1 |               |
|---------|---------------|
| SLOPE   | SPACING       |
| < 2%    | 25'           |
| 2% - 3% | 15'           |
| >3%     | NOT PERMITTED |



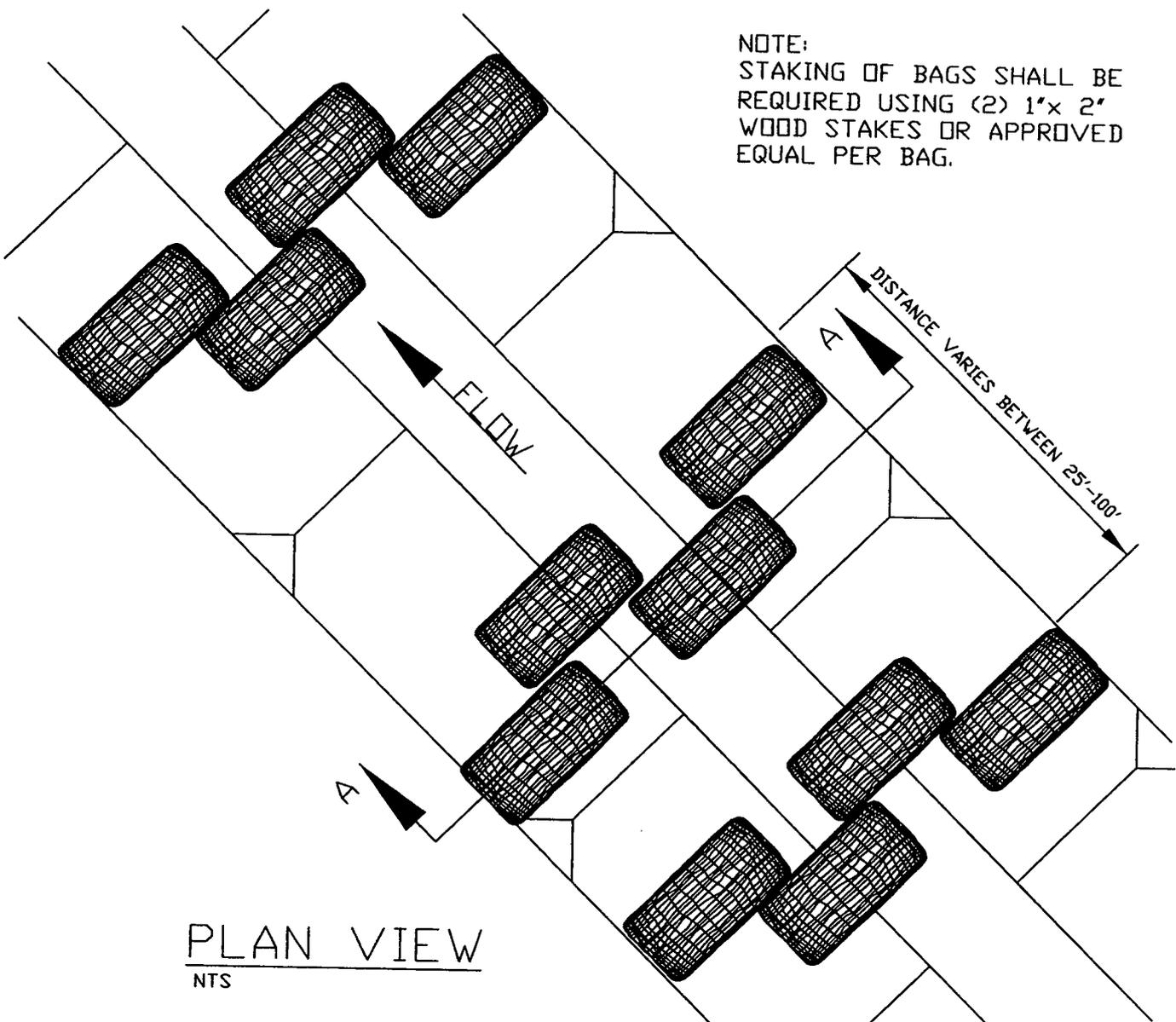
SECTION A - A

ALTERNATE #1  
NTS

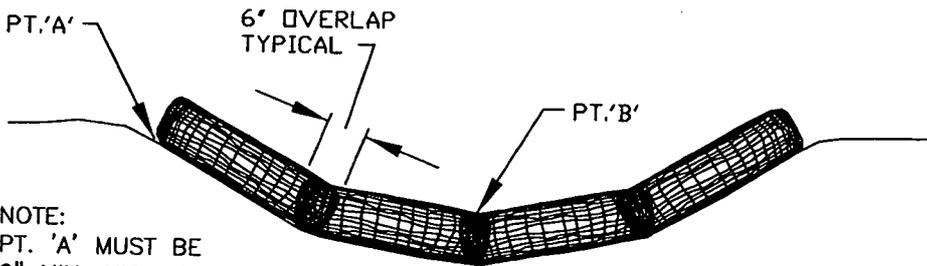
NOTE:  
STAKING OF BAGS SHALL BE REQUIRED USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.

|                             |                  |                |                        |                                                                                       |
|-----------------------------|------------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Biofilter Bag Overland Flow |                  |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: S-2250      | DRAWN BY: GCF    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: S-2250.dwg       | APPROVED BY: MAS | DATE: 11/01/03 | PUBLIC WORKS STANDARDS |                                                                                       |

NOTE:  
 STAKING OF BAGS SHALL BE  
 REQUIRED USING (2) 1" x 2"  
 WOOD STAKES OR APPROVED  
 EQUAL PER BAG.



PLAN VIEW  
 NTS



NOTE:  
 PT. 'A' MUST BE  
 6" MIN. HIGHER  
 THAN PT. 'B'

SECTION A-A  
 NTS

Biofilter Bag Ditches And Swales

DRAWING NUMBER: S-2255

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2255.dwg

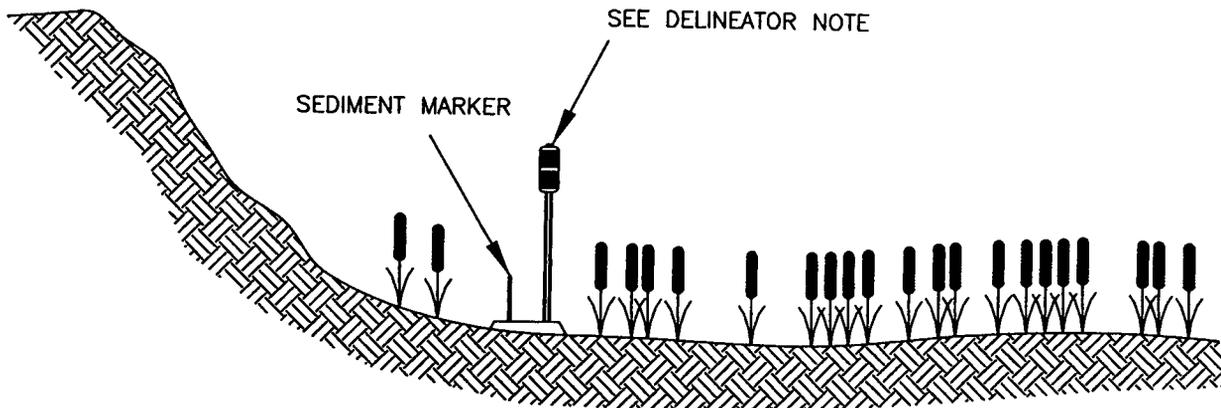
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
 WILSONVILLE

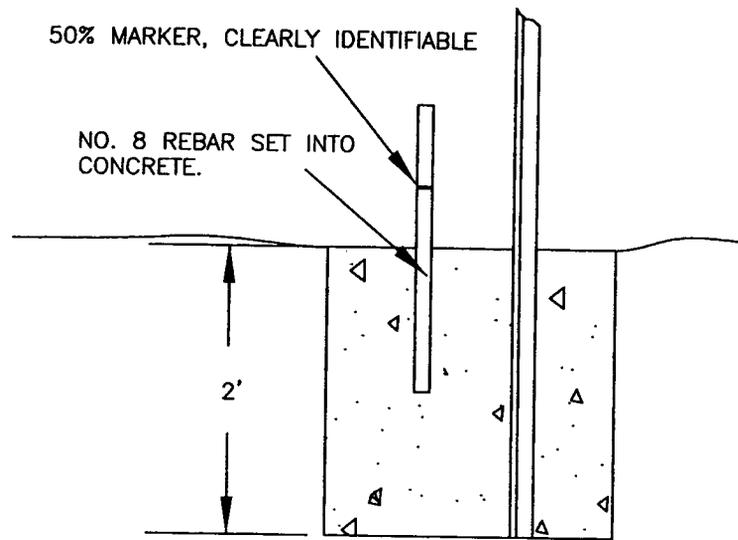


PUBLIC WORKS STANDARDS



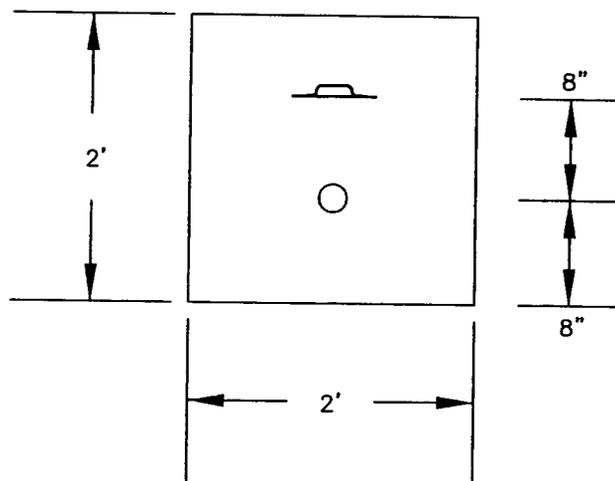
50% MARKER, CLEARLY IDENTIFIABLE

NO. 8 REBAR SET INTO CONCRETE.



SIDE VIEW

TOP VIEW



NOTES:

1. DELINEATOR SHALL MEET THE FOLLOWING REQUIREMENTS:
  - 7' TALL TYPE 1 TRAFFIC DELINEATOR
  - ALUMINUM TARGET
  - TWO 3"X4" WHITE REFLECTIVE SHEETS
2. SET DELINEATOR 2' INTO CONCRETE BASE.
3. FACE DELINEATOR TOWARD TOP OF BANK
4. SET SEDIMENT MARKER 1' INTO CONCRETE BASE IN FRONT OF DELINEATOR WHEN VIEWED FROM TOP OF BANK.
5. SEDIMENT MARKER SHALL BE 2 FEET IN HEIGHT, OR HEIGHT OF DESIGN SEDIMENT STORAGE.

Sediment Marker

DRAWING NUMBER: S-2260

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: S-2260.dwg

APPROVED BY: SA

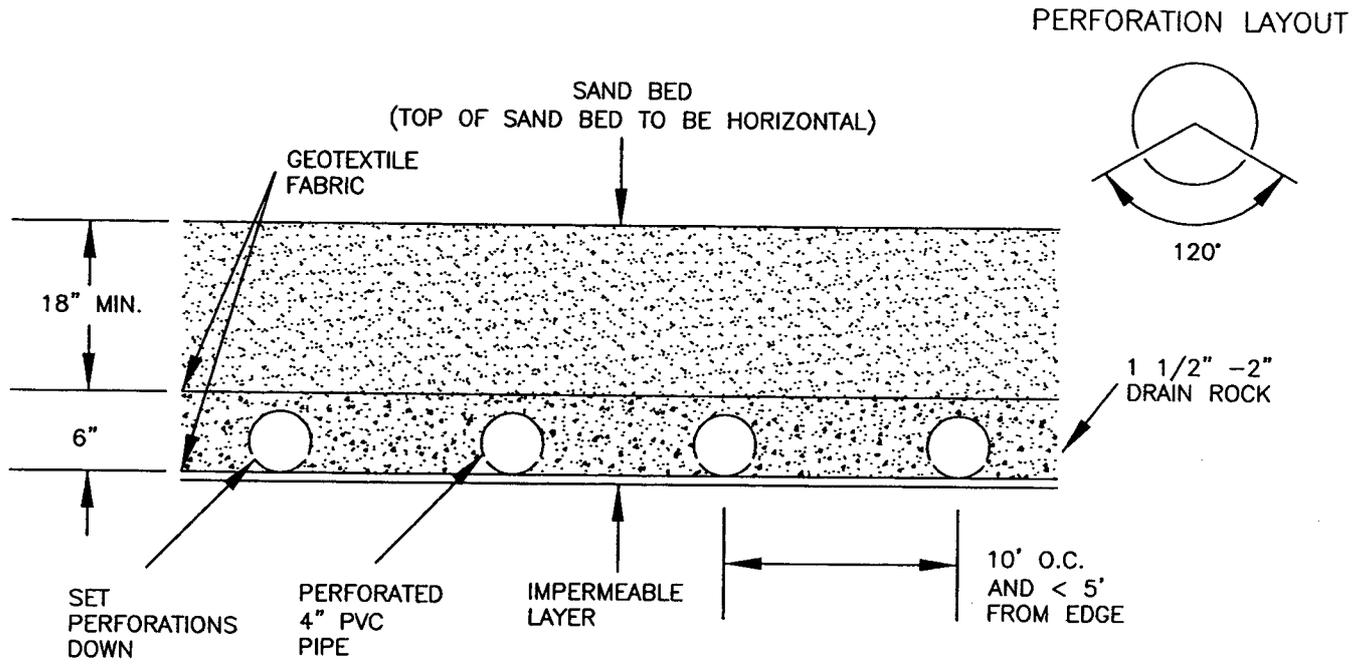
DATE: 03/29/06

CITY OF  
WILSONVILLE

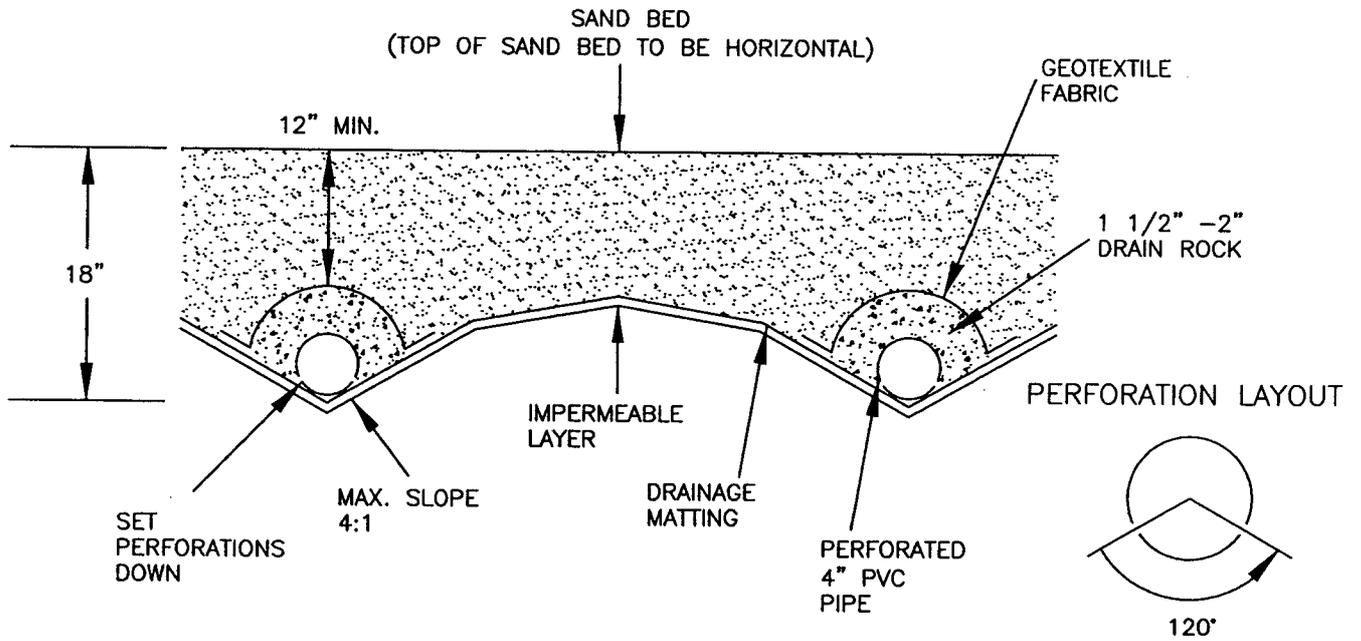


PUBLIC WORKS STANDARDS

### SAND BED PROFILE (WITH GRAVEL LAYER)



### SAND BED PROFILE (TRENCH DESIGN)



**NOTES:**

1. GEOTEXTILE MATERIAL SHALL MEET SPECIFICATIONS PROVIDED IN PUBLIC WORKS STANDARDS TABLE E.2.
2. DRAINAGE MATTING SHALL MEET SPECIFICATIONS PROVIDED IN PUBLIC WORKS STANDARDS TABLE E.3.

Water Quality Sand Bed

DRAWING NUMBER: S-2270

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2270.dwg

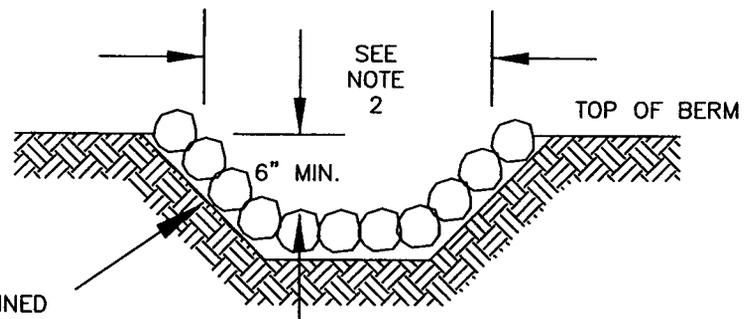
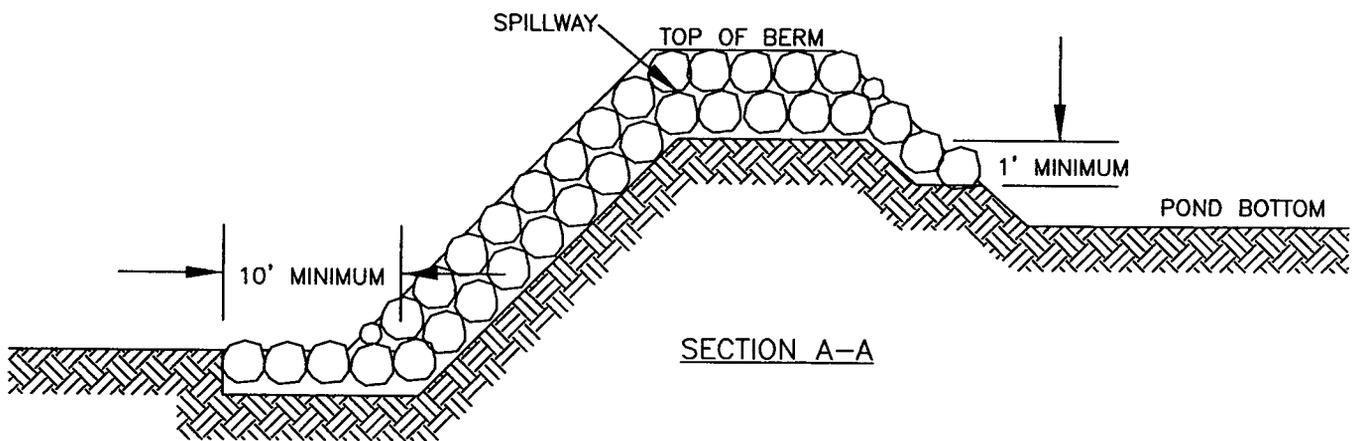
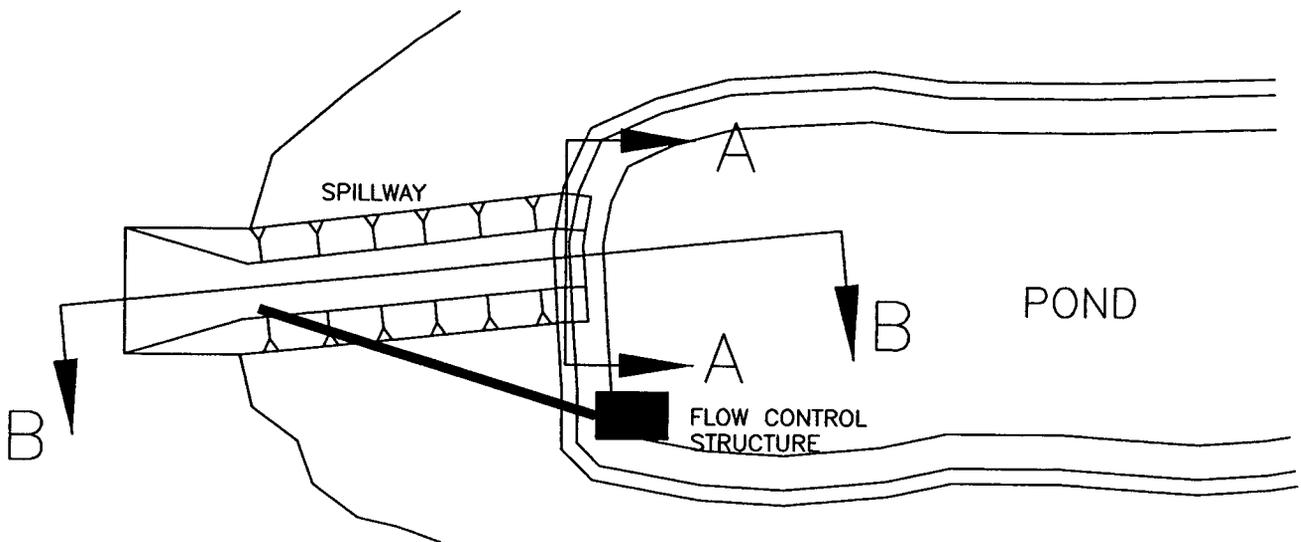
APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



RIP-RAP LINED  
EMERGENCY  
OVERFLOW CHANNEL.  
SEE NOTE 3.

SECTION B-B

NOTES:

1. RIP-RAP SIZE PER DESIGN ENGINEER (CLASS 100 MINIMUM)
2. SPILLWAY SHALL BE DESIGNED TO ACCOMMODATE A 100 YEAR STORM EVENT.  
PROVIDE AN EMERGENCY SPILLWAY SIZED TO PASS THE 100-YEAR STORM EVENT OR AN APPROVED HYDRAULIC EQUIVALENT. THE EMERGENCY SPILLWAY SHALL BE LOCATED IN EXISTING SOILS WHEN FEASIBLE AND ARMORED WITH RIPRAP
3. RIP-RAP SHALL BE PRESSED INTO WET GROUT TO A DEPTH OF 1/2 THE DIAMETER OF THE RIP-RAP.
4. GROUTED RIP-RAP CHANNEL SHALL EXTEND A MINIMUM DEPTH OF 1' INTO POND AREA.

Emergency Overflow

DRAWING NUMBER: S-2275

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: S-2275.dwg

APPROVED BY: MAS

DATE: 11/01/03

CITY OF  
WILSONVILLE



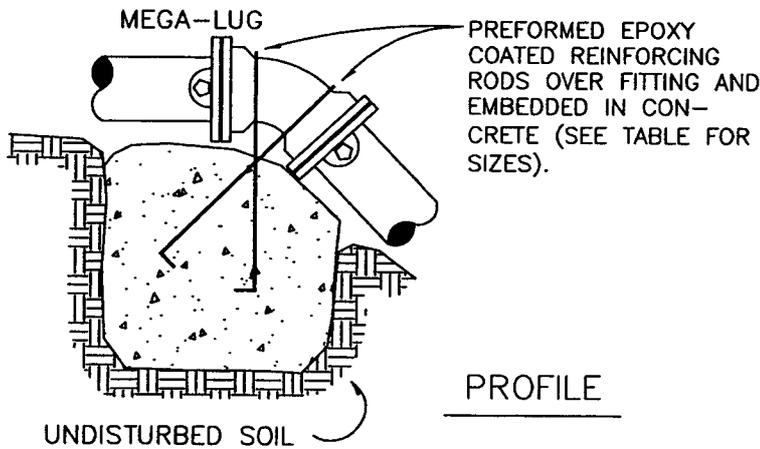
PUBLIC WORKS STANDARDS

# **Water System Details**

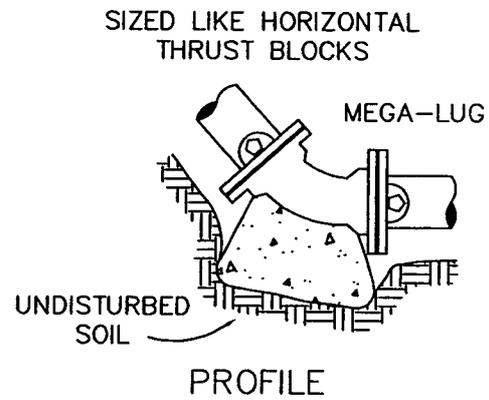


NOTES:

1. GRAVITY VERTICAL THRUST BLOCKS SHALL BE DESIGNED BY THE ENGINEER.
2. KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES. FITTINGS SHALL BE WRAPPED IN PLASTIC (8 MIL. MINIMUM) PRIOR TO PLACEMENT OF CONCRETE.
3. CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH.
4. CONCRETE MIX SHALL BE COMMERCIAL MIX HAVE A MIN. 28 DAY STRENGTH OF 3000 PSI.
5. THRUST BLOCK VOLUMES FOR VERTICAL BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED ON TEST PRESSURE OF 150 PSIG. AND THE WEIGHT OF CONCRETE = 4050 LBS./CU.YD.
6. VERTICAL BENDS THAT REQUIRE A THRUST BLOCK VOLUME EXCEEDING 5 CUBIC YARDS REQUIRE SPECIAL BLOCKING DETAILS. SEE PLANS FOR VOLUMES SHOWN INSIDE HEAVY LINE IN TABLE.
7. ALL REBAR SHALL BE PREFORMED EPOXY COATED IN ACCORDANCE WITH AASHTO M-284. REBAR SHALL BE PREFORMED, AND LAST 4" OF BAR SHALL BE BENT 90° WITH A 1/2" RADIUS BEND. REBAR SHALL BE TIGHTLY FIT TO RESTRAINED FITTING.
8. FOR HORIZONTAL THRUST BLOCK DETAILS SEE DRAWING NO. W-3000.



GRAVITY VERTICAL THRUST BLOCK



NORMAL VERTICAL THRUST BLOCK

| VOLUME OF THRUST BLOCK IN CUBIC YARDS (VERTICAL BENDS) |            |         |         |
|--------------------------------------------------------|------------|---------|---------|
| FITTING SIZE                                           | BEND ANGLE |         |         |
|                                                        | 45°        | 22 1/2° | 11 1/4° |
| 4                                                      | 1.1        | 0.4     | 0.2     |
| 6                                                      | 2.7        | 1.0     | 0.4     |
| 8                                                      | 4.0        | 1.5     | 0.6     |
| 10                                                     | 6.0        | 2.3     | 0.9     |
| 12                                                     | 8.5        | 3.2     | 1.3     |
| 14                                                     | 11.5       | 4.3     | 1.8     |
| 16                                                     | 14.8       | 5.6     | 2.3     |

| FITTING SIZE  | ROD SIZE | EMBEDMENT |
|---------------|----------|-----------|
| 12" AND LESS  | #6       | 30"       |
| 18" OR LARGER | *        | *         |

\* THRUST BLOCKS FOR PIPES 18" OR LARGER WILL BE INDIVIDUALLY DESIGNED BY THE ENGINEER.

Vertical Thrust Block

DRAWING NUMBER: W-3005

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: W-3005.dwg

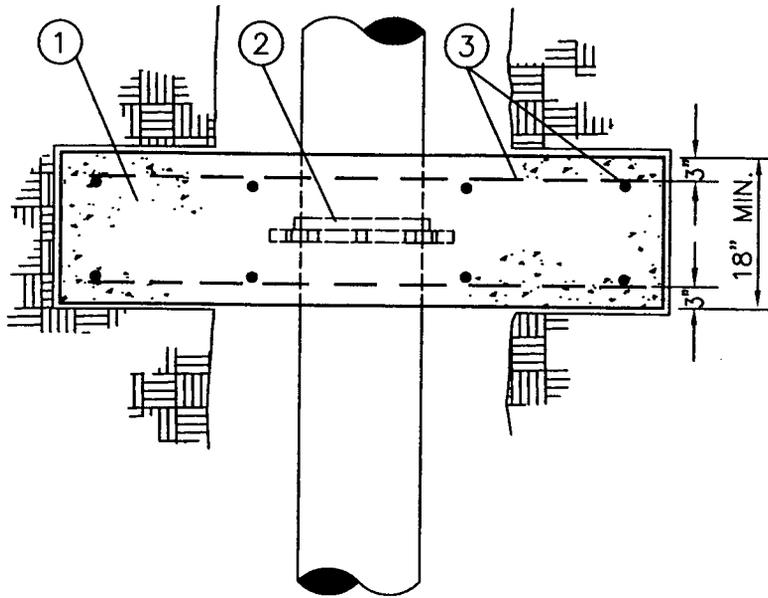
APPROVED BY: MAS

DATE: 11/01/03

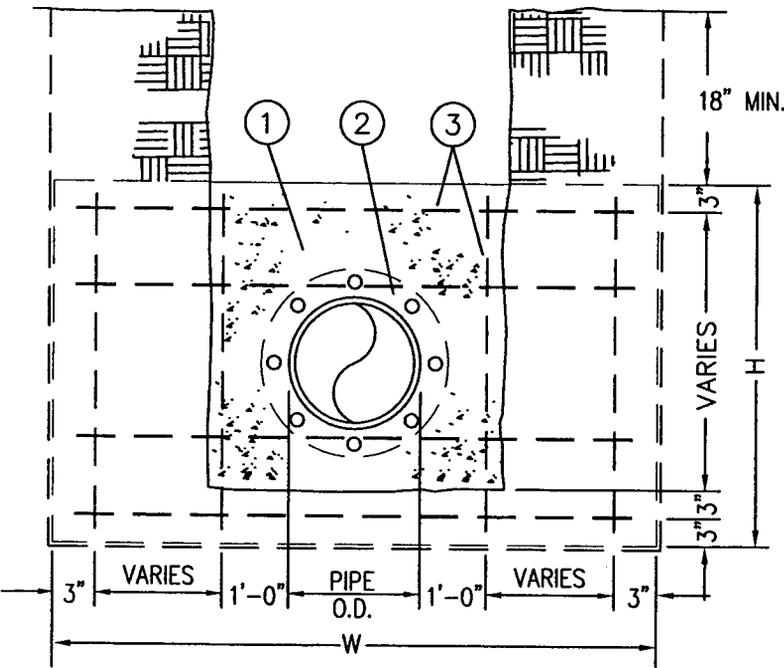
CITY OF WILSONVILLE



PUBLIC WORKS STANDARDS



TOP VIEW



FRONT VIEW

MATERIALS:

- ① CONCRETE STRADDLE BLOCK.
- ② MEGA LUG OR APPROVED EQUAL
- ③ #4 REBAR EACH WAY, 12" O/C.

NOTES:

1. STRADDLE BLOCKS SHALL BE DESIGNED INDIVIDUALLY BY THE ENGINEER AND SHALL BE BASED ON THE FOLLOWING:
  - A.) 200 PSI. WATER PRESSURE
  - B.) SOIL BRG. CAPACITY, STEEL SIZE AND SPACING BY THE ENGINEER.
2. BEARING AREA OF BLOCK SHALL BE AGAINST UNDISTURBED SOIL.
3. STRADDLE BLOCK SHALL HAVE A MINIMUM OF 18" COVER.
4. CONCRETE SHALL BE COMMERCIAL MIXED AND HAVE A MIN. 28-DAY STRENGTH OF 3000 PSI.
5. STRADDLE BLOCK HEIGHT(H) & WIDTH(W) SHALL BE DETERMINED BY THE ENGINEER.

Standard Straddle Block

DRAWING NUMBER: W-3010

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: W-3010.dwg

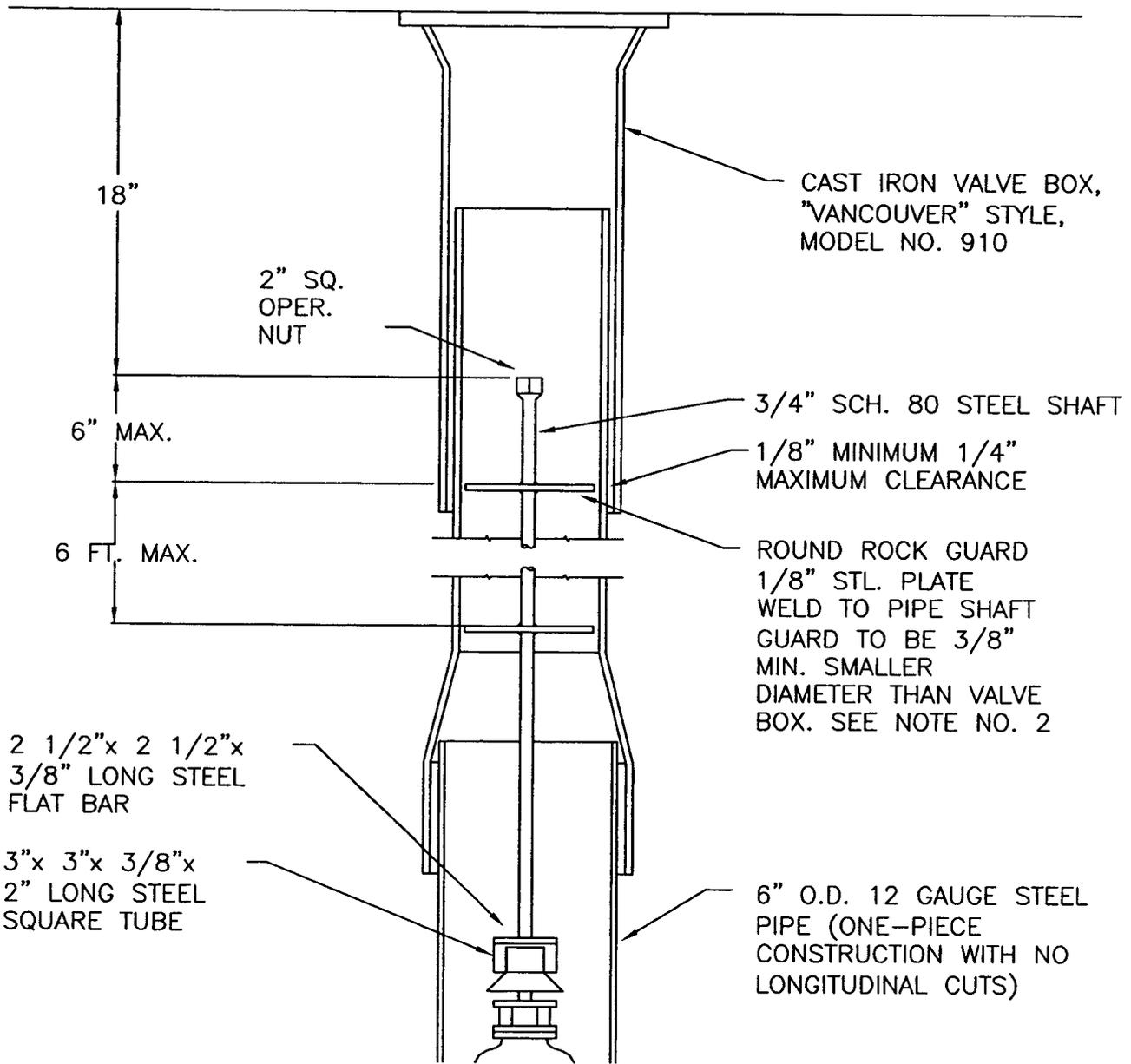
APPROVED BY: SA

DATE: 01/30/06

CITY OF  
WILSONVILLE



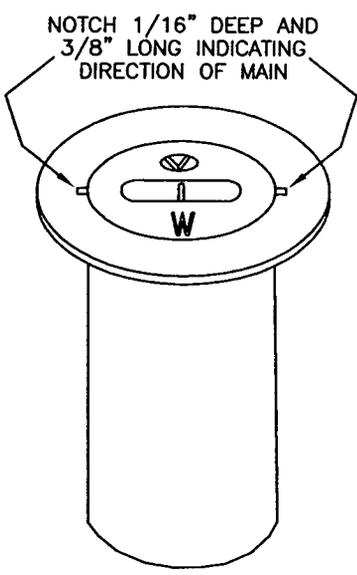
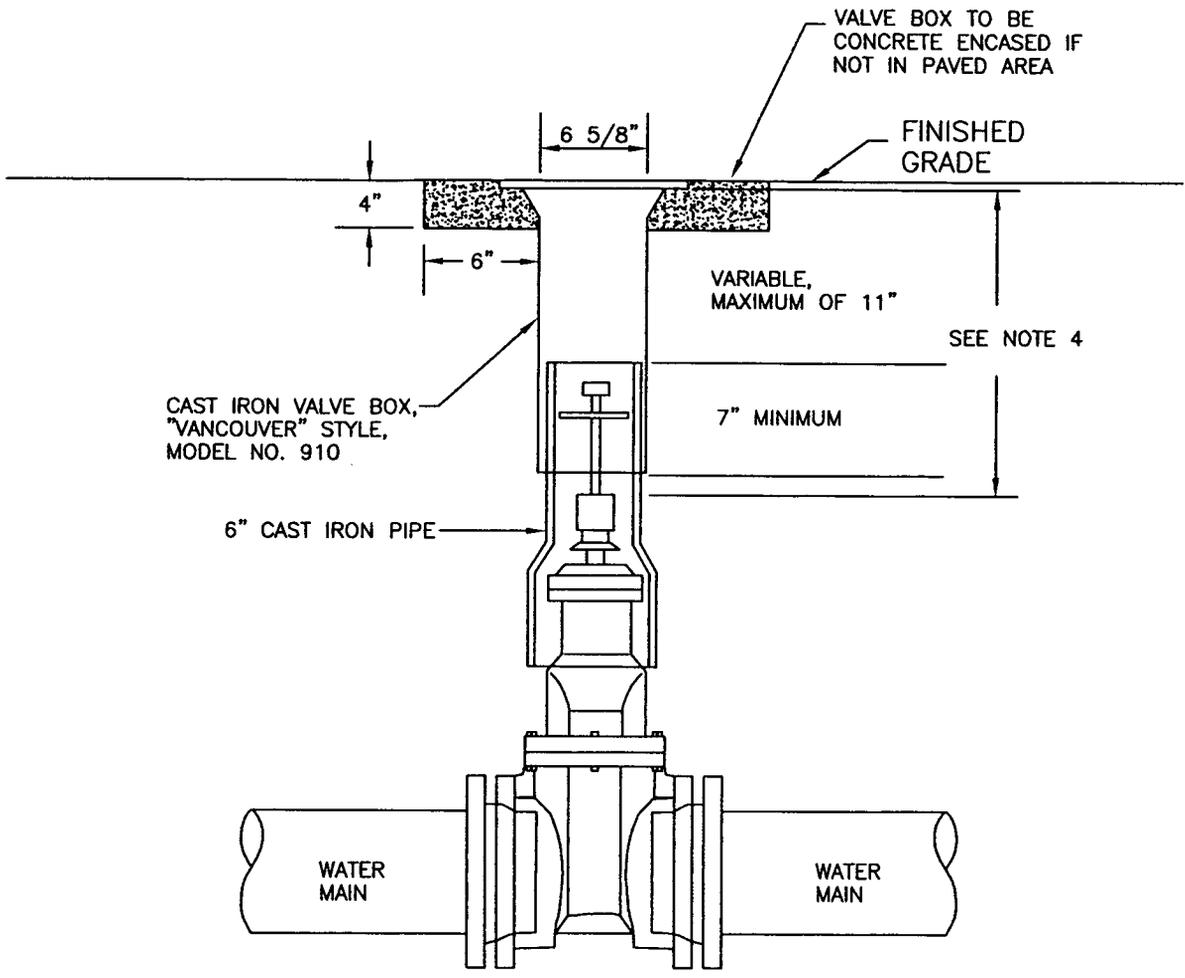
PUBLIC WORKS STANDARDS



NOTES:

1. EXTEND 2" NUT TO WITHIN 18" OF FINISH GRADE WHEN VALVE NUT IS DEEPER THAN 3 FEET FROM FINISHED GRADE.
2. WHERE DEPTH IS OVER 6 FEET. A SECOND PLATE WILL BE INSTALLED EQUIDISTANT BETWEEN FIRST ROCK GUARD AND 2" VALVE NUT.
3. WATERLINE DEEPER THAN 4 FEET SHALL BE APPROVED BY CITY'S AUTHORIZED REPRESENTATIVE.

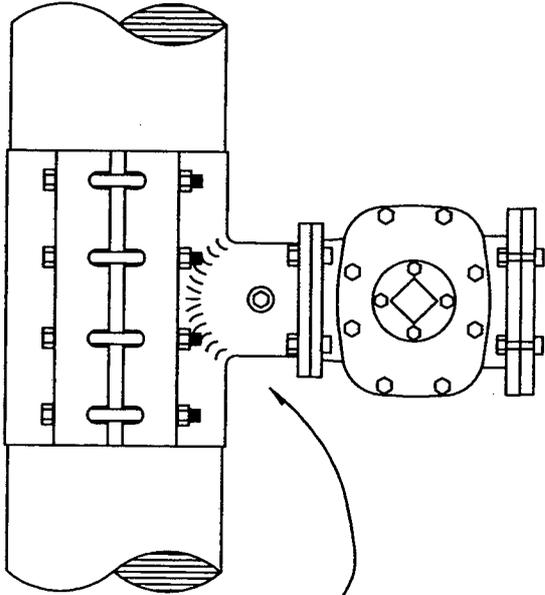
|                          |                  |                |                        |                                                                                       |
|--------------------------|------------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Valve Operator Extension |                  |                | CITY OF<br>WILSONVILLE |  |
| DRAWING NUMBER: W-3015   | DRAWN BY: GCF    | SCALE: N.T.S.  |                        |                                                                                       |
| FILE NAME: W-3015.dwg    | APPROVED BY: MAS | DATE: 11/01/03 | PUBLIC WORKS STANDARDS |                                                                                       |



- NOTES:
1. VALVE BOXES SHALL BE CENTERED DIRECTLY OVER THE VALVE NUT IN A VERTICAL POSITION.
  2. VALVE BOX TOP SHALL BE ADJUSTED TO MEET FINISHED GRADE.
  3. CAST IRON SHALL BE ONE CONTINUOUS PIECE - NO BELLS OR COUPLERS.
  4. WHERE DEPTH OF OPERATING NUT IS GREATER THAN 3 FEET PROVIDE OPERATING EXTENSION TO A POINT 18" BELOW FINISH GRADE.

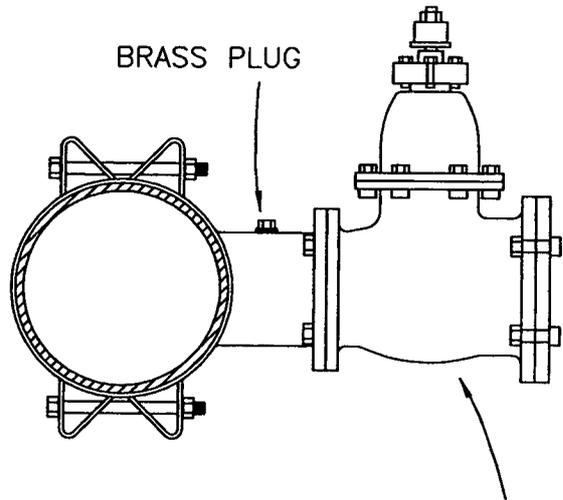
"VANCOUVER" STYLE, MODEL NO. 910  
18" TALL VALVE BOX

|                        |                 |                |                                                                                                                                           |
|------------------------|-----------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Standard Valve Box     |                 |                | CITY OF<br>WILSONVILLE<br><br>PUBLIC WORKS STANDARDS |
| DRAWING NUMBER: W-3020 | DRAWN BY: SJ    | SCALE: N.T.S.  |                                                                                                                                           |
| FILE NAME: W-3020.dwg  | APPROVED BY: SA | DATE: 01/30/06 |                                                                                                                                           |



JCM 452 ALL STAINLESS STEEL TAPPING SLEEVE OR APPROVED EQUAL

TOP VIEW



MUELLER RESILIENT WEDGE TAPPING GATE VALVE OR APPROVED EQUAL.

SIDE VIEW

NOTES:

1. ALL BOLTS, WASHERS, AND NUTS SHALL BE A-304 STAINLESS STEEL.
2. WATER MAIN SHALL BE CLEANED BEFORE ATTACHING SLEEVE.
3. SLEEVE AND VALVE SHALL BE PRESSURE TESTED BEFORE MAKING TAP.
4. PRESSURE TEST AND TAP SHALL BE MADE IN THE PRESENCE OF A CITY AUTHORIZED REPRESENTATIVE.
5. PROPER TAPPING MACHINE SHALL BE USED TO MAKE TAP.
6. 3/4"-0 CRUSHED AGGREGATE SHALL BE PLACED AND COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180.
7. THRUST BLOCKING REQUIREMENTS SHALL BE DETERMINED BY THE ENGINEER AND SHALL NOT BE LESS THAN THE REQUIREMENTS AS SHOWN IN STANDARD DETAIL DRAWING W-3000 .
8. TAP SHALL BE MADE NO CLOSER THAN 18 INCHES FROM THE OUTSIDE EDGE OF THE SLEEVE TO THE BEGINNING OF THE BELL FLARE OR END OF THE MJ FITTING.
9. SLEEVE AND VALVE SHALL BE WRAPPED WITH PLASTIC (8 MIL. MINIMUM) PRIOR TO INSTALLATION OF THRUST BLOCK AND BACKFILL.

Standard Wet Tap

DRAWING NUMBER: W-3025

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: W-3025.dwg

APPROVED BY: MAS

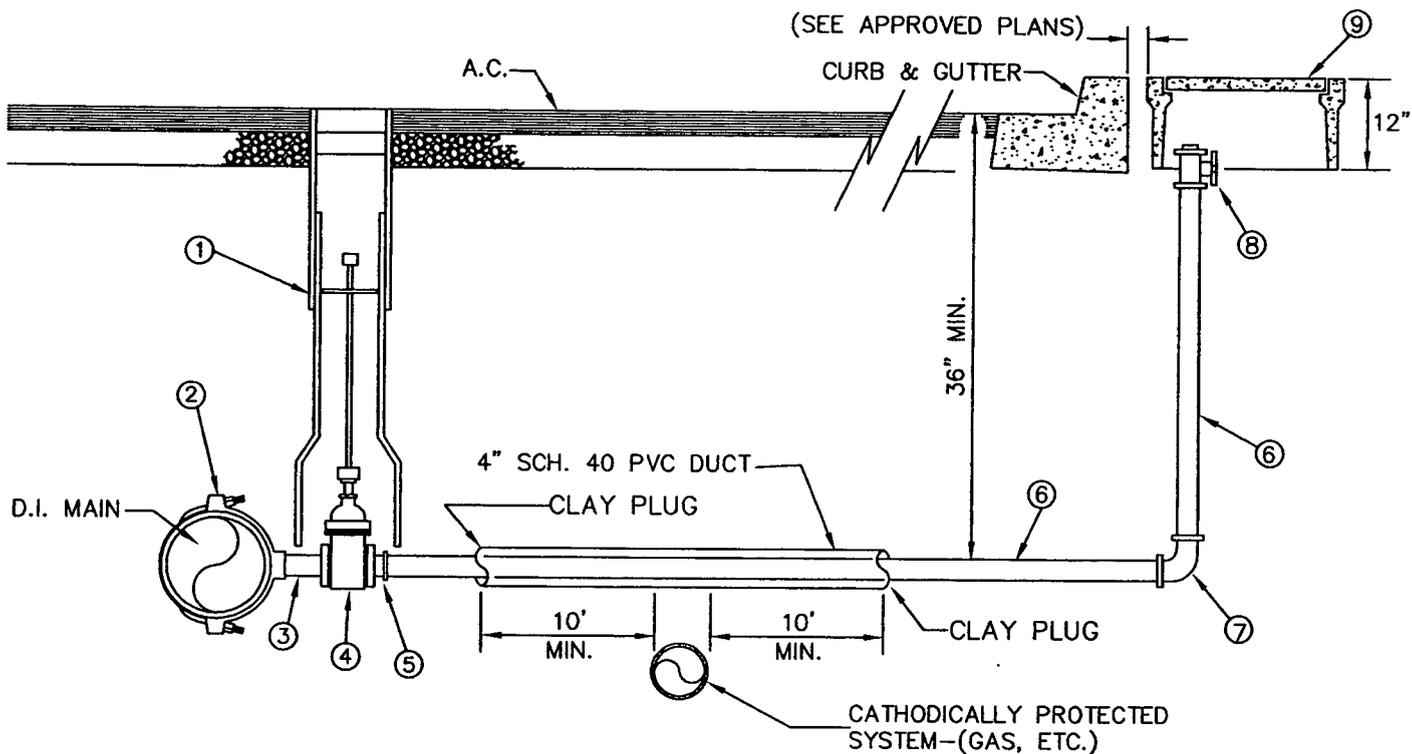
DATE: 11/01/03

CITY OF WILSONVILLE



PUBLIC WORKS STANDARDS





**MATERIALS:**

1. CAST IRON VALVE BOX, "VANCOUVER" STYLE MODEL NO. 910 AND LID (SEE STANDARD DETAIL W-3020).
2. PIPE O.D. X 2" TEE OR ROCKWELL NO. 317 SERVICE SADDLE
3. 2" X 6" BRASS I.P.T. NIPPLE
4. 2" I.P.T. X I.P.T. GATE VALVE (MUELLER NO. A-2360-8)
5. 2" X 3" I.P.T. X COP. MUELLER 110 COMP. COUPLING.
6. 2" ASTM B-88 TYPE 'K' COPPER TUBING. RIGID REQ'D. WITH COMPRESSION FITTINGS.
7. 2" 90° ELL, COP. MUELLER 110 CTS COMPRESSION.
8. 1 1/2"-2" ANGLE METER STOP, MUELLER NO. 14276 OR 14277, FORD NO. FV23-777W
9. APPROVED BOX, COVER AND LID:
  - ARMORCAST METER BOX NO. P6001534 (UP&S 090668)
  - ARMORCAST BOX COVER NO. A6001643DZ-H1 (UP&S 090677)
  - ARMORCAST DROP-IN LID NO. A6000482 (UP&S 090680)

**NOTES:**

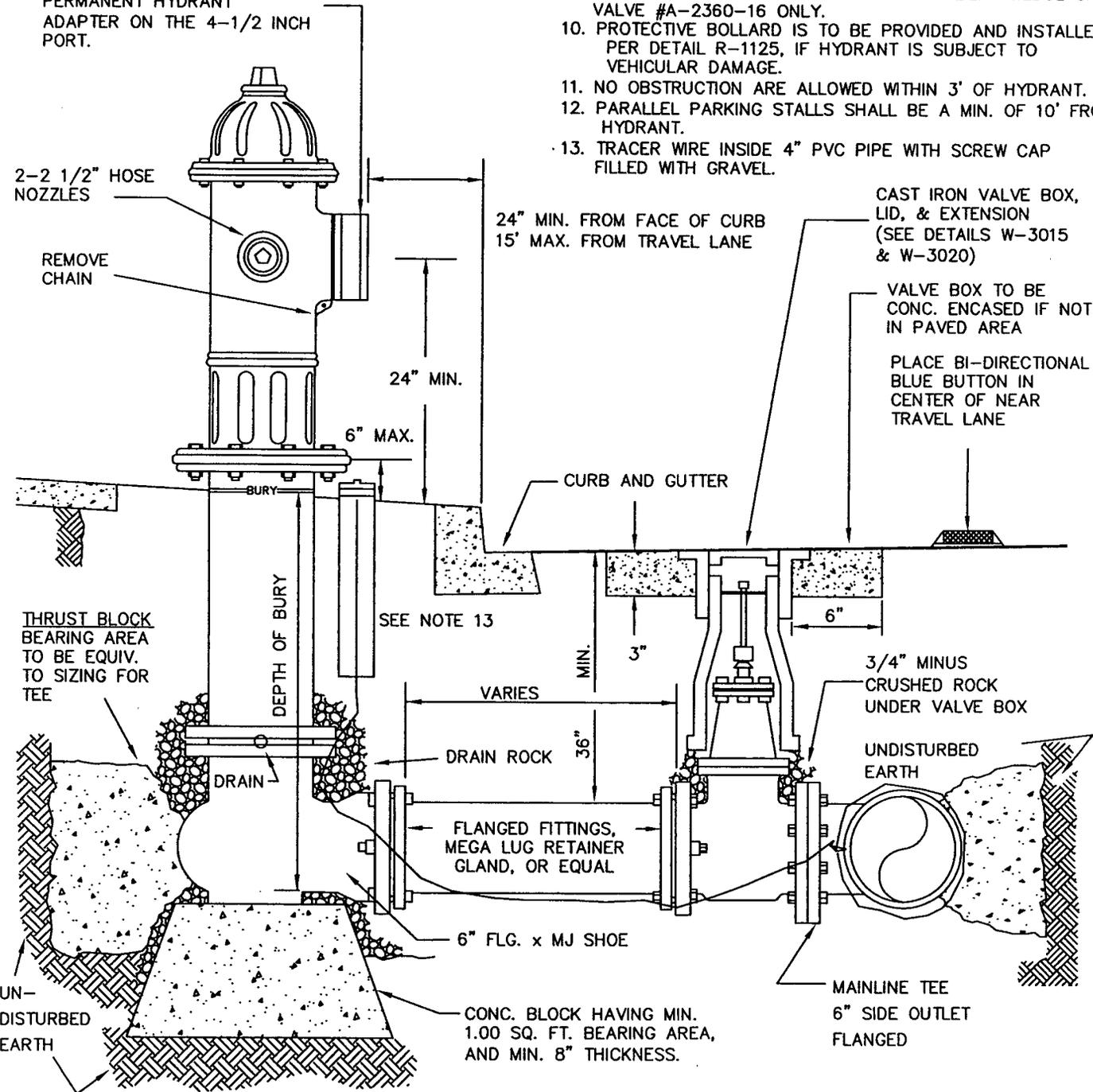
1. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED PRIOR TO CONSTRUCTION BY THE CITY WATER DEPARTMENT.
2. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING 3/4"-0 CRUSHED AGGREGATE AND COMPACTED TO 95% MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180.
3. WHEN AN ACTIVE CATHODIC PROTECTED SYSTEM IS ENCOUNTERED, SCH. 40 PVC SHALL BE INSTALLED AS SHOWN WITH CLAY PLUG.
4. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER AND FITTING ASSEMBLY
5. METER BOX SHALL BE LOCATED IN LANDSCAPED AREAS ONLY.
6. IF REQUIRED, CUSTOMER SHALL INSTALL AN APPROVED BACKFLOW PREVENTION DEVICE AND OBTAIN THE NECESSARY PERMITS AND INSPECTIONS FROM THE BUILDING DEPARTMENT.

|                            |                 |                |                                                                                                                                           |
|----------------------------|-----------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 1 1/2" - 2" Single Service |                 |                | CITY OF<br>WILSONVILLE<br><br>PUBLIC WORKS STANDARDS |
| DRAWING NUMBER: W-3035     | DRAWN BY: SJ    | SCALE: N.T.S.  |                                                                                                                                           |
| FILE NAME: W-3035.dwg      | APPROVED BY: SA | DATE: 01/30/06 |                                                                                                                                           |

NOTES:

1. APPROVED FIRE HYDRANTS;  
WATEROUS PACER  
MUELLER CENTURION
2. HYDRANT COLOR TO BE RUST-OLEUM #7645 INDUSTRIAL  
LOW V.O.C. EQUIPMENT ENAMEL YELLOW
3. ALL FITTINGS IN CONTACT WITH CONCRETE SHALL BE  
WRAPPED IN PLASTIC (8 MIL. MINIMUM). HYDRANT DRAIN  
HOLES TO REMAIN OPEN TO DRAIN ROCK AND  
OPERATIONAL
4. MIN. 4 CU. FT. OF 1 1/2"-3/4" CLEAN DRAIN ROCK SHALL  
BE PLACED AROUND SHOE UP TO A MIN. OF 6" ABOVE  
DRAIN OUTLETS.
5. WHERE PLANTER STRIP EXISTS, HYDRANT SHALL BE PLACED  
SO FRONT PORT IS A MINIMUM OF 24" BEHIND FACE OF  
CURB.
6. WHERE INTEGRAL S/W & CURB EXISTS, HYD. SHALL BE  
PLACED 18" BACK OF SIDEWALK OR AS DIRECTED BY  
ENGINEER.
7. BURY OF HYDRANT SHALL BE MEASURED FROM FINISHED  
GRADE TO BOTTOM OF CONNECTING PIPE.
8. THRUST BLOCK AT FIRE HYDRANT TEE SHALL HAVE A MIN.  
3.7 SQ. FT. BEARING AREA.
9. HYDRANT VALVE SHALL BE MUELLER RESILIENT WEDGE GATE  
VALVE #A-2360-16 ONLY.
10. PROTECTIVE BOLLARD IS TO BE PROVIDED AND INSTALLED,  
PER DETAIL R-1125, IF HYDRANT IS SUBJECT TO  
VEHICULAR DAMAGE.
11. NO OBSTRUCTION ARE ALLOWED WITHIN 3' OF HYDRANT.
12. PARALLEL PARKING STALLS SHALL BE A MIN. OF 10' FROM  
HYDRANT.
13. TRACER WIRE INSIDE 4" PVC PIPE WITH SCREW CAP  
FILLED WITH GRAVEL.

INSTALL STORZ HPHA50-45NH  
PERMANENT HYDRANT  
ADAPTER ON THE 4-1/2 INCH  
PORT.



Fire Hydrant Assembly

DRAWING NUMBER: W-3040

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: W-3040.dwg

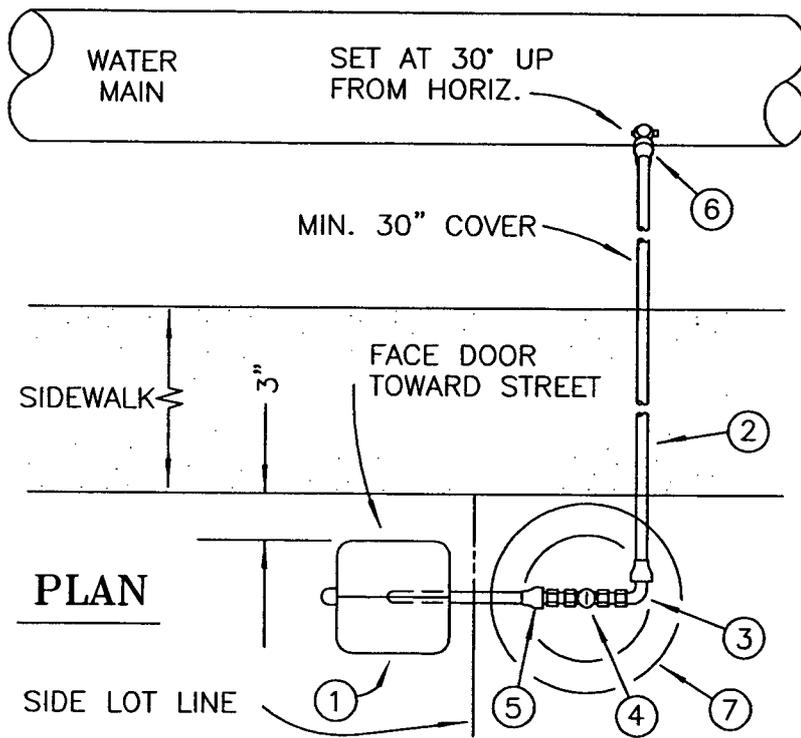
APPROVED BY: SA

DATE: 03/29/06

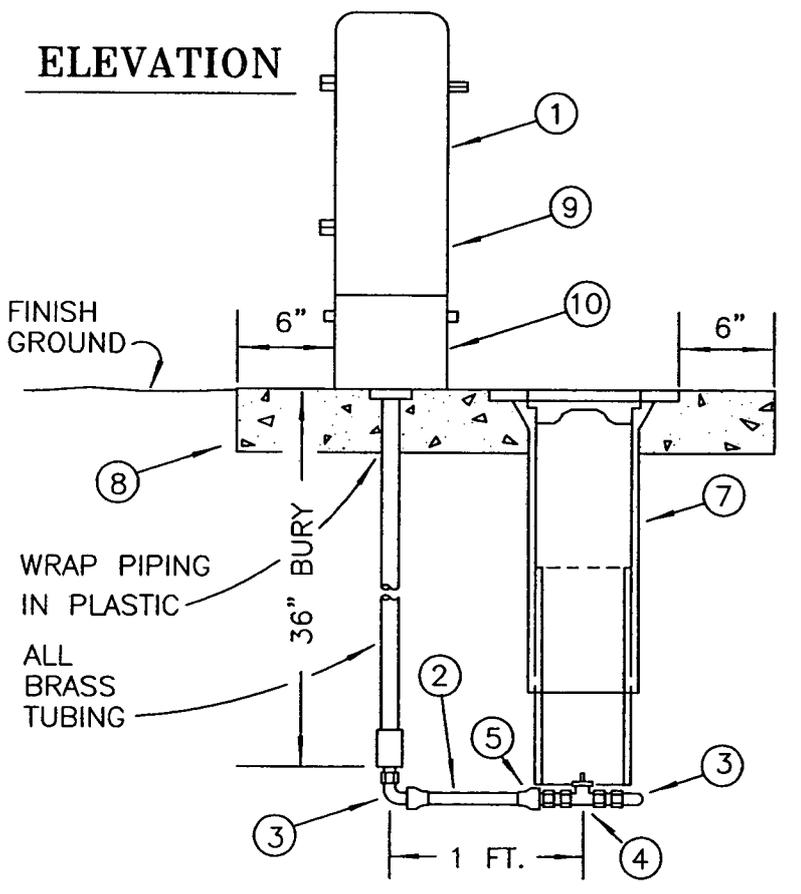
CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

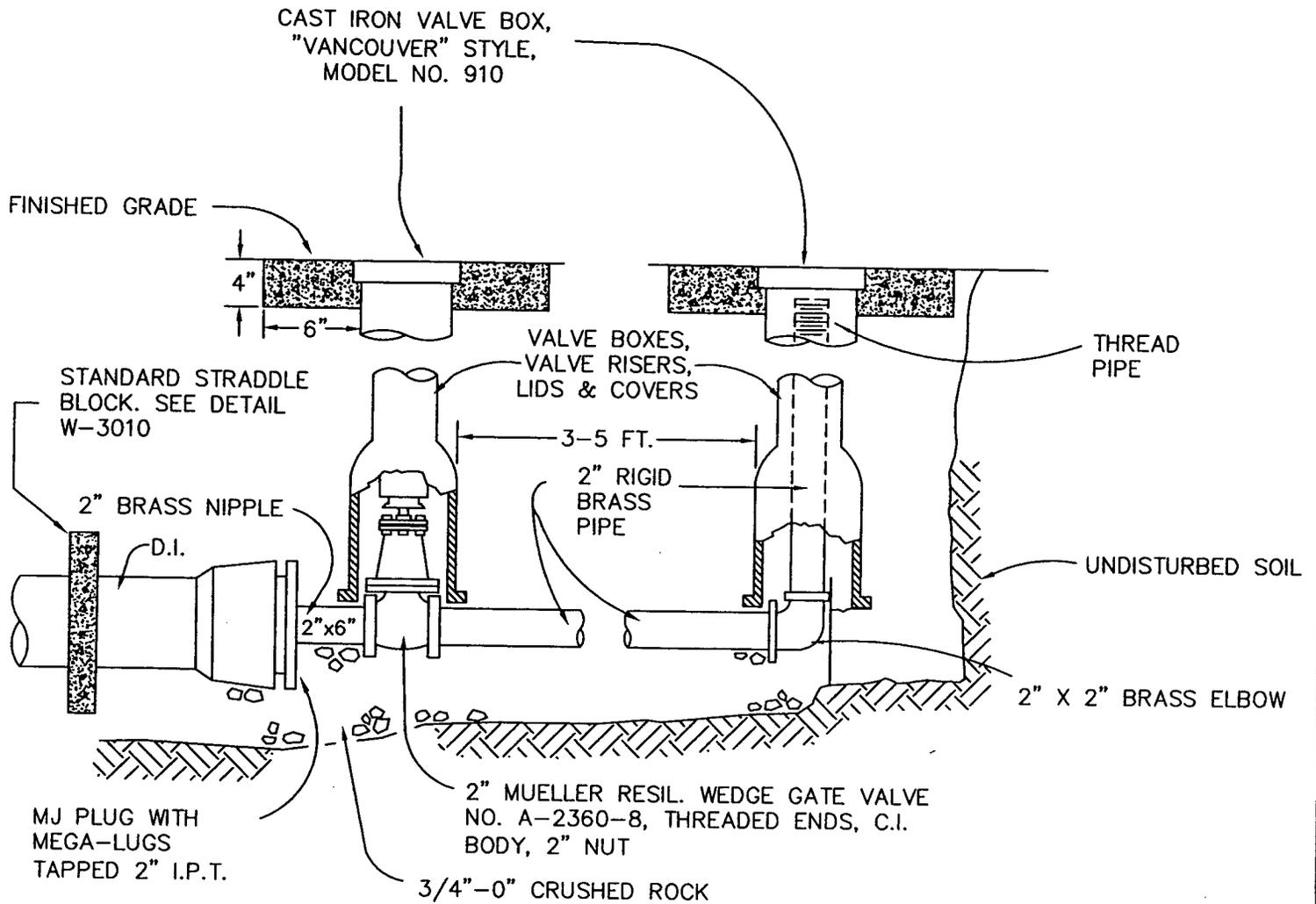


- MATERIALS**
1. ECLIPSE NO. 88 SAMPLING STATION WITH THREADED OUTLET NOZZLE AND OPTIONAL BRASS STANDPIPE (KUPFERLE FOUNDRY).
  2. 3/4" TYPE 'K' SOFT TEMPER COPPER TUBING.
  3. 3/4" MALE IRON PIPE THREAD X COPPER 1/4 BEND MUELLER, FORD
  4. 3/4" BALL VALVE, MUELLER B-20200, FORD B11-333W.
  5. 3/4" MIP x COP STRAIGHT COUPLING, MUELLER, FORD
  6. 3/4" CORP. STOP, MUELLER H-15000, FORD F600.
  7. STD. 'VANCOUVER' VALVE BOX.
  8. PCC PAD (3000 PSI. STRENGTH AT 28 DAYS), 4" THICK, 34" LONG BY 19" WIDE.
  9. PAINT TOP WITH MILLER PAINT, SAFETY BLUE ENAMEL, NO. 2543.
  10. PAINT BASE WITH MILLER PAINT, WHITE ENAMEL, NO. 3000.



- NOTES**
1. ALL PIPE AND STRUCTURES SHALL BE BACKFILLED WITH 3/4"-0" CRUSHED ROCK COMPACTED TO 95% OF MAX. DENSITY PER AASHTO T-180.
  2. SET STATION AT SIDE LOT LINE WHERE NO METERS ARE LOCATED.
  3. WHEN CROSSING CATHODICALLY PROTECTED SYSTEM, INSTALL PVC SLEEVE (SEE DETAIL DRAWING W-3030).

|                        |                  |                |                                                                                                                                           |
|------------------------|------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Water Sampling Station |                  |                | CITY OF<br>WILSONVILLE<br><br>PUBLIC WORKS STANDARDS |
| DRAWING NUMBER: W-3045 | DRAWN BY: GCF    | SCALE: N.T.S.  |                                                                                                                                           |
| FILE NAME: W-3045.dwg  | APPROVED BY: MAS | DATE: 11/01/03 |                                                                                                                                           |



NOTES:

1. VALVE BOX SHALL BE PER DETAIL DRAWING W-3020.
2. VALVE BOX TO BE CONCRETE ENCASED AS SHOWN, IF NOT IN PAVED AREA.
3. BLOW-OFF UNIT SHALL BE BACKFILLED WITH 3/4"-0 CRUSHED ROCK AND COMPACTED TO 95% OF MAX. DENSITY DETERMINED BY AASHTO T-180.
4. BLOW-OFF NOT TO BE LOCATED IN GUTTER OR DITCH.
5. 2" BLOW-OFF FOR USE ON PIPE SIZES UP TO 12 INCHES IN DIAMETER.

2" Standard Blow-off

DRAWING NUMBER: W-3050

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: W-3050.dwg

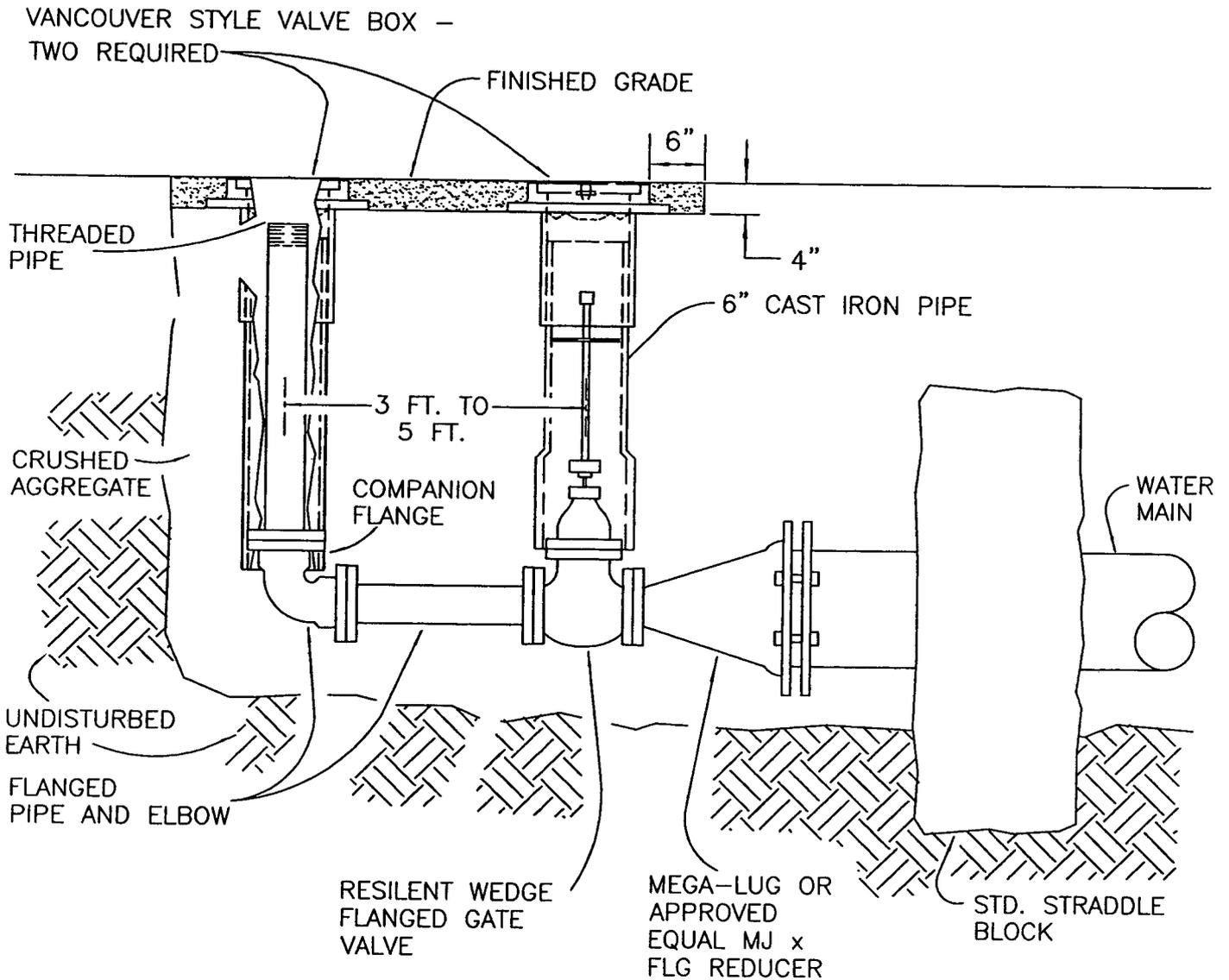
APPROVED BY: SA

DATE: 01/30/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



NOTES:

1. ALL PIPE FITTINGS SHALL BE DUCTILE IRON.
2. VALVE BOXES SHALL BE PER DETAIL DRAWING W-3020.
3. VALVE BOXES SHALL BE CONCRETE ENCASED AS SHOWN, IF NOT IN PAVED AREA.
4. BLOW-OFF SHALL BE BACKFILLED WITH 3/4"-0 CRUSHED ROCK AND COMPACTED TO 95% OF MAX. DENSITY DETERMINED BY AASHTO T-180.
5. BACKFILL SHALL BE A MINIMUM WIDTH OF 6" ON ALL SIDES.
6. BLOW-OFF NOT TO BE LOCATED IN GUTTER OR DITCH.
7. 6" BLOW-OFF FOR USE ON PIPE SIZES 18" IN DIAMETER OR LARGER.

6" Standard Blow-off

DRAWING NUMBER: W-3055

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: W-3055.dwg

APPROVED BY: SA

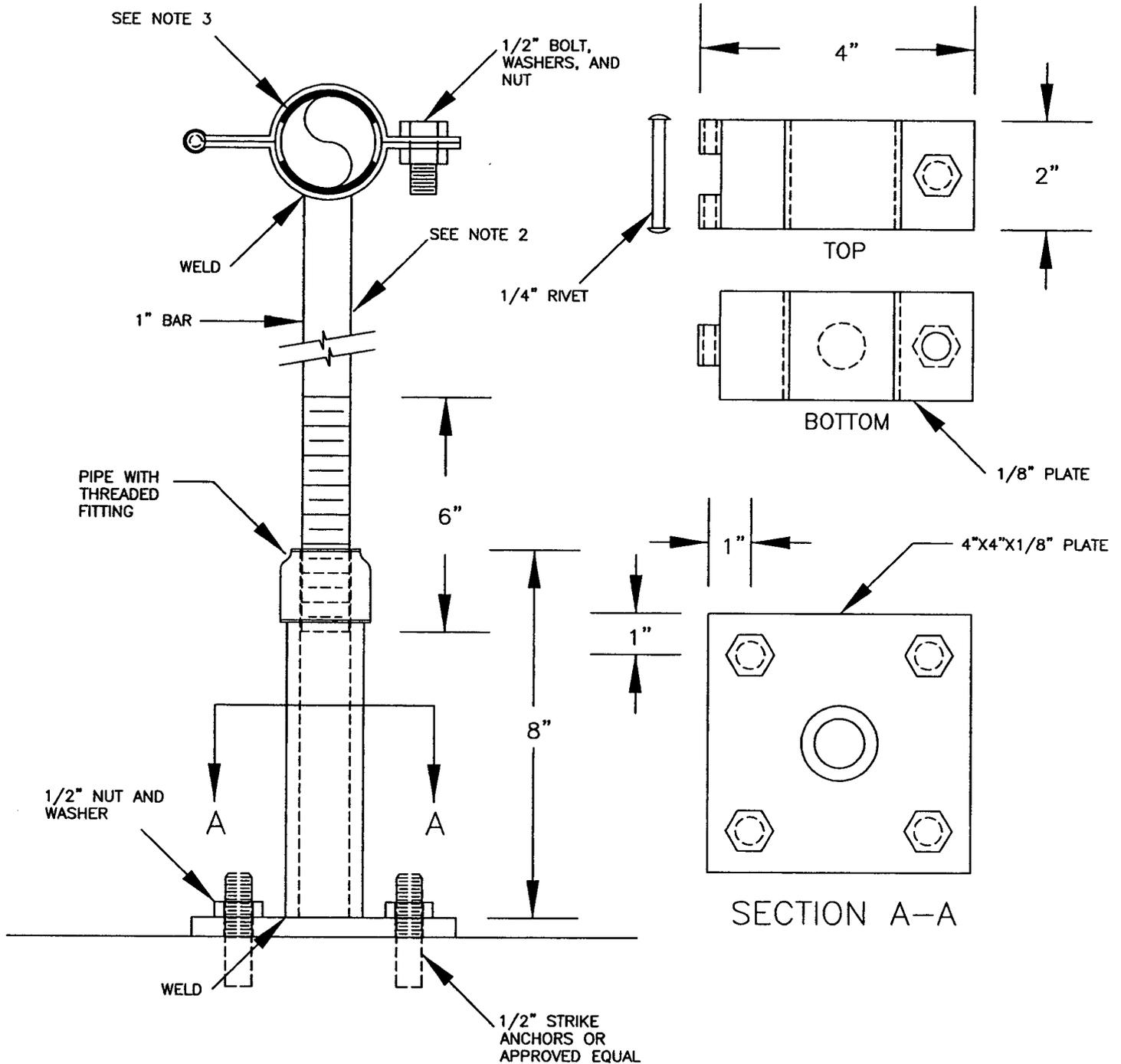
DATE: 03/21/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS





NOTES:

1. ALL PARTS SHALL BE A-304 STAINLESS STEEL.
2. UNTHREADED LENGTH VARIES AND SHALL NOT EXCEED 9 INCHES
3. 1/8" RUBBER GASKET MATERIAL TO BE PLACED ABOVE AND BELOW RESTRAINED PIPE.

Stainless Steel Saddle Support

DRAWING NUMBER: W-3065

DRAWN BY: GCF

SCALE: N.T.S.

FILE NAME: W-3065.dwg

APPROVED BY: MAS

DATE: 11/01/03

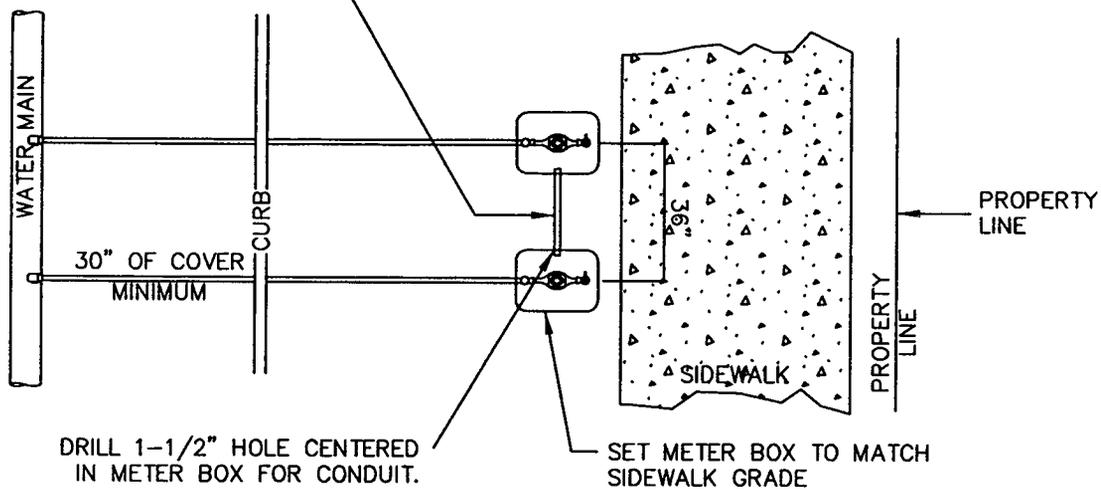
CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

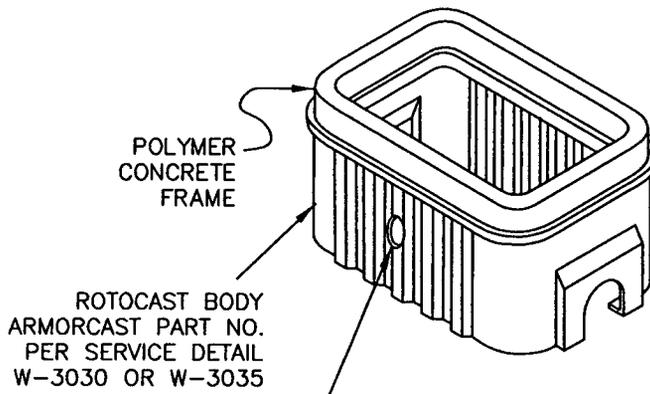
RIGID CONDUIT, PVC SCHEDULE 40,  
1-1/4" DIAMETER (GRAY). CLEAN OUT  
CONDUIT AND DUCT TAPE OR PLUG  
ENDS. PIPE SHALL EXTEND INTO THE  
METER BOX 1-1/2" TO 2"

METER INSTALLED BY CITY WATER  
DEPT.



DRILL 1-1/2" HOLE CENTERED  
IN METER BOX FOR CONDUIT.

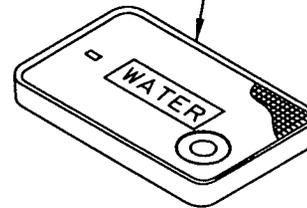
SET METER BOX TO MATCH  
SIDEWALK GRADE



POLYMER CONCRETE METER BOX

DRILL HOLE CENTERED IN METER  
BOX FOR PVC CONDUIT.

COVER FOR DROP IN LID  
ARMORCAST PART NO. PER SERVICE  
DETAIL W-3030 OR W-3035



**NOTES:**

1. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED PRIOR TO CONSTRUCTION BY THE CITY'S AUTHORIZED REPRESENTATIVE.
2. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING 3/4"-0 CRUSHED AGGREGATE AND COMPACTED TO 95% MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180.
3. WHEN AN ACTIVE CATHODIC PROTECTED SYSTEM IS ENCOUNTERED, SCH. 40 PVC SHALL BE INSTALLED AS SHOWN IN DETAILS W-3030 OR W-3035.
4. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY.
5. METER BOX SHALL BE LOCATED IN PLANTER AREAS ONLY.
6. METER BOX SHALL MATCH SIDEWALK GRADE (IF SIDEWALK EXISTS) OTHERWISE SET FLUSH WITH SURROUNDING GROUND SURFACE.
7. WHEN CURB-TIGHT SIDEWALK IS INSTALLED, PLACE WATER METERS BETWEEN SIDEWALK AND PROPERTY LINE.

DUAL REMOTE READER

DRAWING NUMBER: W-3070

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: W-3070.dwg

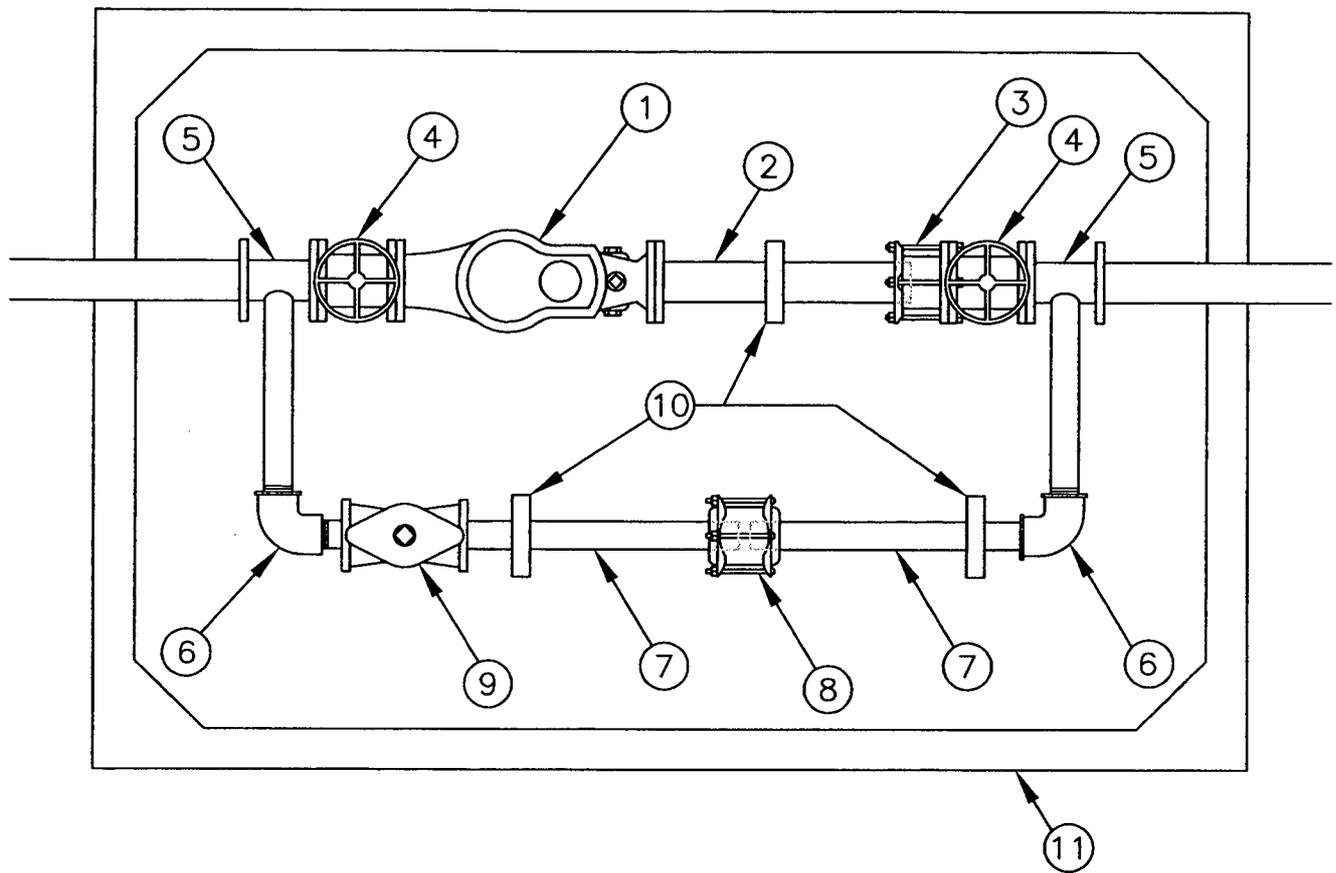
APPROVED BY: SA

DATE: 03/21/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



NOTES:

1. 3" SENSUS COMPOUND METER (INSTALLED BY CITY).
2. SPOOL PIECE.
3. ROMAC FLANGED COUPLING ADAPTER OR APPROVED EQUAL.
4. 3" CLOW RESILIENT WEDGE GATE VALVE OR APPROVED EQUAL.
5. FLG. BY M.J. TEE.
6. 2" BRASS ELBOW.
7. 2" BRASS PIPE
8. FORD STYLE FC3 STANDARD STEEL COUPLING OR APPROVED EQUAL.
9. 2" THREADED CLOW RESILIENT WEDGE VALVE OR APPROVED EQUAL.
10. 3 EPOXY COATED "STAND-ON" PIPE SUPPORTS.
11. UTILITY VAULT 577LA (577-B BASE, 57-T-2-332P TOP, 352P FRAME AND DOOR).

3" Compound Meter Pg. 1

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

DRAWING NUMBER: W-3075

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: W-3075.dwg

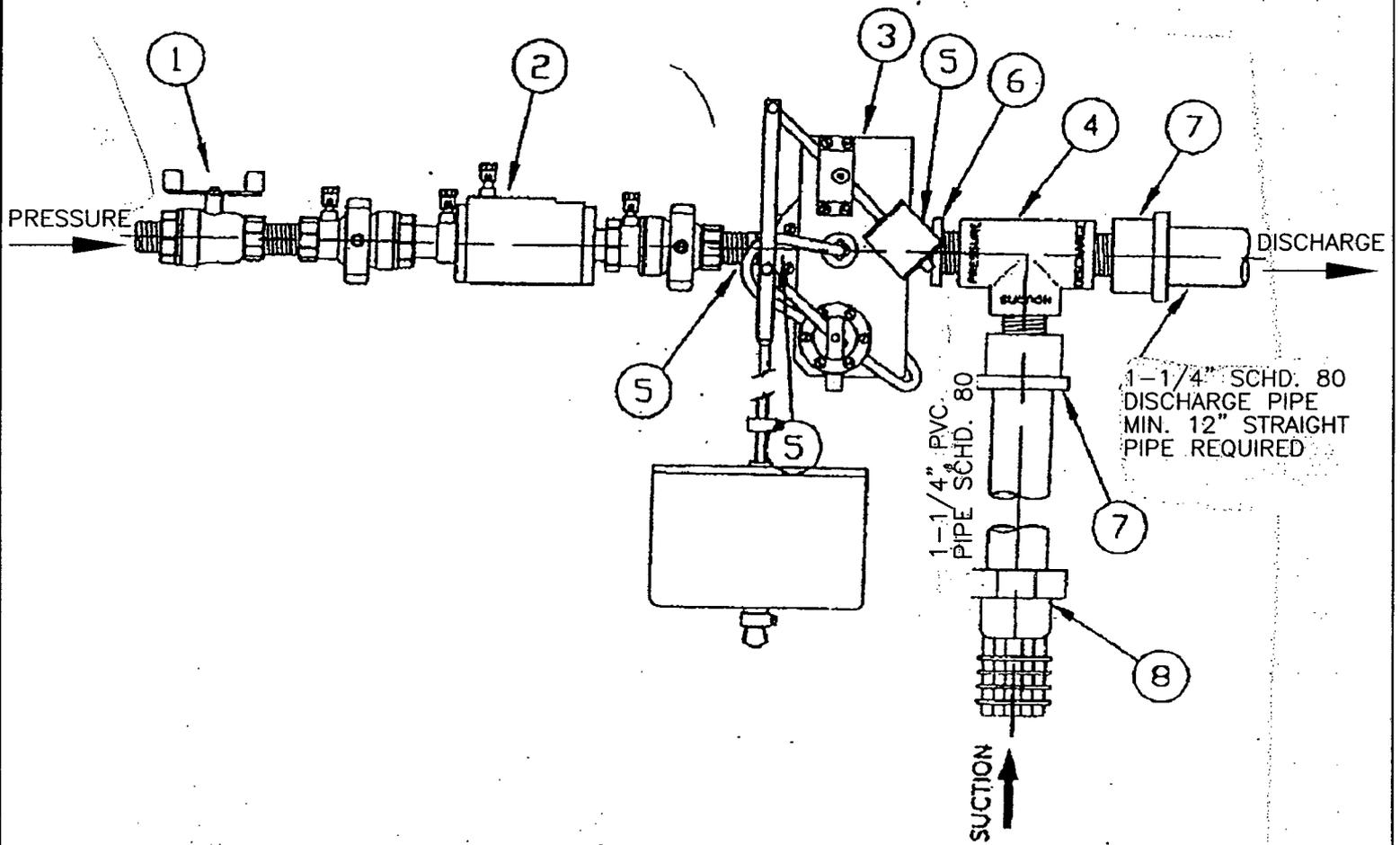
APPROVED BY: SA

DATE: 03/29/06

NOTES:

1. METER TO BE INSTALLED BY THE CITY.
2. ALL VAULT WALL OPENINGS SHALL BE CORE DRILLED AND SEALED WITH NON-SHRINK GROUT.
3. TOP OF VAULT SHALL BE A MINIMUM OF 6" ABOVE PROPOSED GRADE.
4. INSTALL 4" DRAIN FROM VAULT TO DAYLIGHT OR STORM DRAIN WITH A BACKWATER CHECK VALVE ACCESSIBLE FROM VAULT. COORDINATE DRAINAGE SYSTEM WITH BACKFLOW DEVICE VAULT INSTALLATION.
5. VAULT SHALL BE CLEAN AND FREE OF DEBRIS PRIOR TO METER INSTALLATION.
6. ALL MECHANICAL JOINTS SHALL HAVE MEGALUG RESTRAINER GLANDS.
7. SERVICE LINE INTO VAULT SHALL BE RESTRAINED BETWEEN DISTRIBUTION WATERLINE AND VAULT.
8. SERVICE LINE INTO VAULT SHALL BE COMPLETELY BACKFILLED WITH SELECT BACKFILL BETWEEN DISTRIBUTION LINE AND VAULT.
9. INSTALL A MINIMUM OF 3 PIPE SUPPORTS IN VAULT AS SHOWN.
10. PIPE TO BE A MINIMUM OF 12" AND A MAXIMUM OF 48" ABOVE THE FLOOR OF THE VAULT.
11. ONLY APPROVED RESILIENT WEDGE GATE VALVES ARE ALLOWED.
12. ALL VAULT DOORS TO BE UTILITY VAULT NO 2-332P.
13. VAULT SHALL BE EQUIPPED WITH AN APPROVED LADDER. IF VAULT DEPTH IS GREATER THAN 5 FT., AN APPROVED EXTENSION LADDER SHALL BE INSTALLED.
14. PIPE BETWEEN THE TWO TEES SHALL BE ONE CONTINUOUS PIECE - NO JOINTS.
15. ALL SERVICE PIPING WILL BE CHLORINATED AND TESTED TO CITY SPECIFICATIONS
16. IF GRAVITY DRAIN IS NOT POSSIBLE AN APPROVED SUMP PUMP DRAINAGE SYSTEM SHALL BE INSTALLED.
17. ALL FITTINGS, VALVES AND PIPING THROUGH ENTIRE VAULT SHALL BE LEVEL AT COMPLETION OF INSTALLATION.

|                                                               |                   |                        |                                                                                       |
|---------------------------------------------------------------|-------------------|------------------------|---------------------------------------------------------------------------------------|
| Standard Compound Meter Installations-<br>4X2, 6X3, 8X6 Pg. 2 | SCALE: N.T.S.     | CITY OF<br>WILSONVILLE |  |
|                                                               | DRAWN BY: SJ      |                        |                                                                                       |
| Drawing Number: W-3075A                                       | REVISED: 01/26/06 | APPROVED: SA           | PUBLIC WORKS STANDARDS                                                                |



| ITEM | QTY | DESCRIPTION                                                             |
|------|-----|-------------------------------------------------------------------------|
| 1    | 1   | 3/4" MAS B-3 BALL VALVE - THREADED.                                     |
| 2    | 1   | 3/4" #850 DOUBLE CHECK BACKFLOW PREVENTER                               |
| 3    | 1   | 3/4" CLA-VAL MODEL 124 FLOAT VALVE C/W 2' LONG PVC FLOAT ROAD AND FLOAT |
| 4    | 1   | 1" EJECTOR                                                              |
| 5    | 3   | BRASS CLOSE NIPPLE                                                      |
| 6    | 1   | BRASS REDUCING BUSHING                                                  |
| 7    | 2   | PVC MPT X SOCKET ADAPTER                                                |
| 8    | 1   | 1 1/4" PVC FOOT VALVE                                                   |

Sump Drain Assembly

DRAWING NUMBER: W-3080

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: W-3080.dwg

APPROVED BY: SA

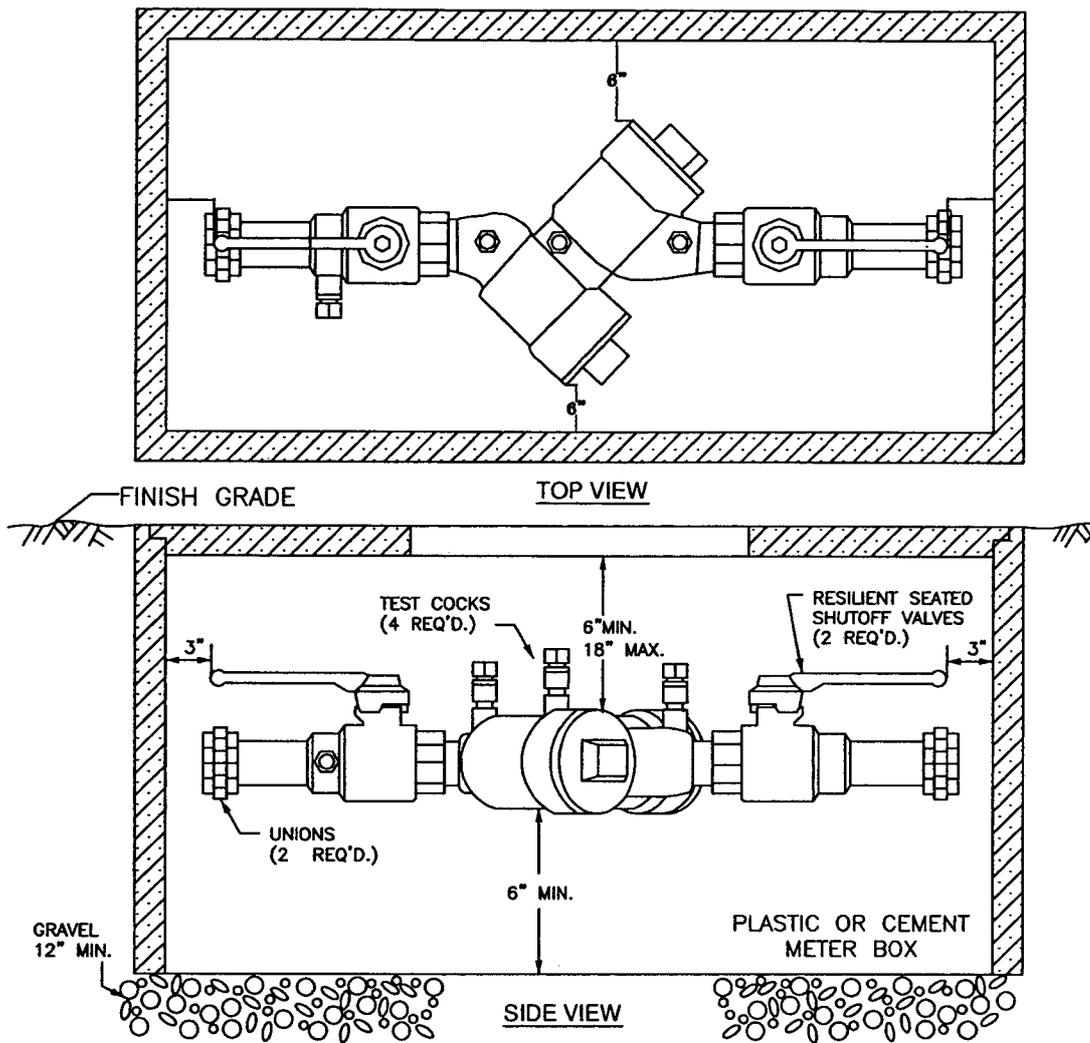
DATE: 03/22/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

# **Building and Planning Details**



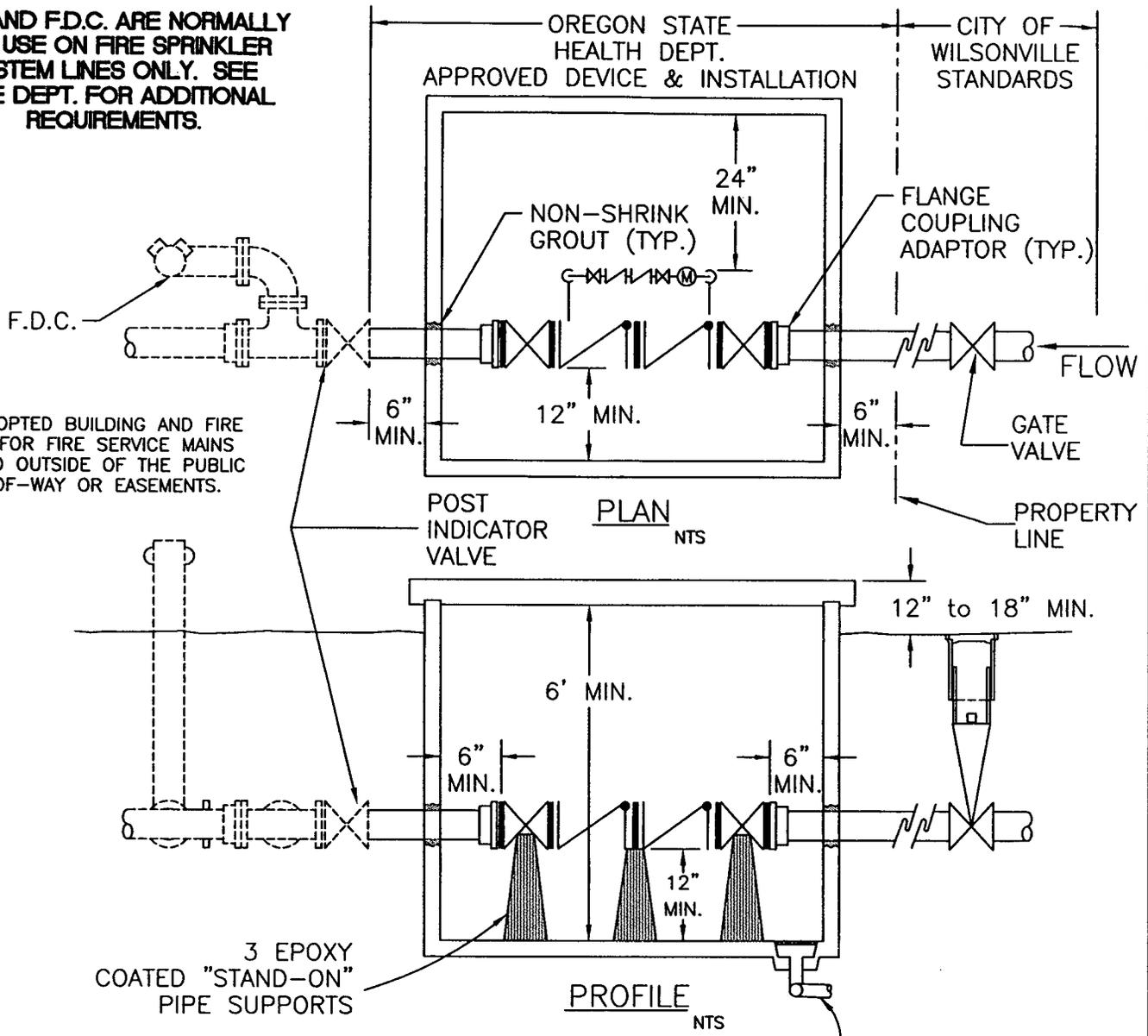
NOTE:

- 1 - APPROVED DOUBLE CHECK VALVE ASSEMBLY TO LAY HORIZONTAL WITH GROUND. (VERTICAL IF D.O.H. APPROVED)
- 2 - DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
- 3 - TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
- 4 - THOROUGHLY FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
- 5 - THE DCVA MAY BE INSTALLED ABOVE OR BELOW GROUND PROVIDED ALL CLEARANCES ARE MET.
- 6 - DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
- 7 - MUST BE ACCESSIBLE.
- 8 - MUST BE PROTECTED FROM FREEZING CONDITIONS.
- 9 - THE BACKFLOW ASSEMBLY SHALL BE A STATE APPROVED MODEL.
- 10 - A PLUMBING PERMIT IS REQUIRED - PLEASE CONTACT CITY OF WILSONVILLE BUILDING DIVISION.
- 11 - MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY AN OREGON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER. TEST RESULTS SHALL BE SENT TO THE CITY OF WILSONVILLE PUBLIC WORKS DEPARTMENT.

|                                                        |                       |                                                                                                                                           |
|--------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Standard Double Check Valve Assembly 2"<br>and Smaller | SCALE: N.T.S.         | CITY OF<br>WILSONVILLE<br><br>PUBLIC WORKS STANDARDS |
|                                                        | Date: 03/21/06        |                                                                                                                                           |
| Drawing Number: B-4000                                 | File Name: B-4000.dwg | DRAWN BY: SJ                                                                                                                              |

•P.I.V. AND F.D.C. ARE NORMALLY FOR USE ON FIRE SPRINKLER SYSTEM LINES ONLY. SEE FIRE DEPT. FOR ADDITIONAL REQUIREMENTS.

SEE ADOPTED BUILDING AND FIRE CODES FOR FIRE SERVICE MAINS LOCATED OUTSIDE OF THE PUBLIC RIGHT-OF-WAY OR EASEMENTS.



DRAIN TO DAYLIGHT OR STORM DRAIN SYSTEM, OR SUMP PUMP & HIGH WATER ALARM TO DAYLIGHT AS APPROVED BY WATER UTILITY

| D.D.C. SIZE | UTILITY VAULT for DOUBLE DETECTOR CHECK DEVICE |                   |
|-------------|------------------------------------------------|-------------------|
|             | VAULT                                          | LID               |
| 3"          | 577-LA                                         | LID 57-TL2-332P   |
| 4"          | 577-LA                                         | LID 57-TL2-332P   |
| 6"          | 676-WA                                         | LID 676-TL2-332P  |
| 8"          | 687-WA                                         | LID 687-TL2-332P  |
| 10"         | 5106-WA                                        | LID 5106-TL3-332P |



To ensure proper operation and accessibility of all backflow prevention device assemblies, the following requirements shall apply to installation of these devices, unless specifically approved by the City Engineer.

1. No part of the backflow prevention device shall be submerged in water or installed in a location subject to flooding. If installed in a vault or chamber, adequate drainage shall be provided by either drainage to daylight or by sump pump with high water alarm system. Test cocks shall be plugged. The plugs shall not be of dissimilar metals.
2. The device assembly must be protected from freezing and other severe weather conditions.
3. Only devices approved for vertical installation may be installed vertically.
4. The device assembly shall be readily accessibly with adequate room for maintenance and testing. Devices 2 inches and smaller shall have at least a 12-inch clearance below and on both sides of the device assembly; and if located in a vault, the top of the device assembly shall be between 12 and 24 inches below grade.

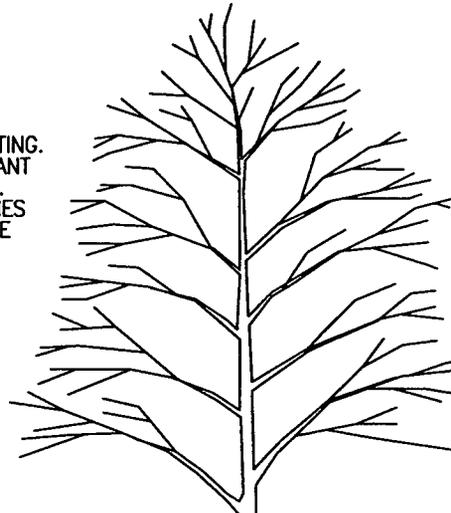
All device assemblies larger than 2 inches shall have a 12-inch clearance on the backside, a 24-inch clearance on the test-cock side, and 12 inches below the device assemblies. Adequate clearance (3 inches minimum) must be maintained above operating stem and yoke, gate-valve stem. Headroom of 6'0" is required in vaults. Access to the device and to any vault or chamber shall remain clear at all times. An OR/OSHA approved chamber ladder that extends 3 ft above surface of vault shall be installed.

5. No post indicating valves are allowed on Double Check Device assemblies.
6. Only approved Double Check Detector Check Valve Assemblies are to be used for system containment on fire line services in the City of Wilsonville. The meter on bypass assembly shall read in cubic feet.
7. If a Fire Line Flow, or Tamper Switch is installed, it must be connected to a monitored Fire Alarm System approved by the Fire Marshal. No installation will modify the backflow device assembly or interfere with its operation or maintenance.
8. All backflow devices shall be installed at the service connection to the premises per Oregon Administrative Rules 333-61-070, Cross Connection Control Requirements, unless specifically approved by the Water Division Engineer. (service connection - a location where the public water facilities end at or near the property line)
9. All pipe between main and device shall be restrained. Use Mega-Lug retainer glands on mj fittings and Field-Lok gaskets on bell joints. Uni-Flange adapters may be used in vaults.
10. All check valve assemblies are required to be UL Tested or Factory Mutual Approved as well as State of Oregon Approved per NFPA 13 & 24.

|                                   |                       |                |                        |                                                                                       |
|-----------------------------------|-----------------------|----------------|------------------------|---------------------------------------------------------------------------------------|
| Double Detector Check Vault Pg. 2 |                       | SCALE: N.T.S.  | CITY OF<br>WILSONVILLE |  |
|                                   |                       | Date: 07/01/02 |                        |                                                                                       |
| Drawing Number: B-4010            | File Name: B-4010.dwg | DRAWN BY: GF   | PUBLIC WORKS STANDARDS |                                                                                       |

DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.

SEE TREE STAKING DETAIL FOR STAKING INSTRUCTIONS



MARK THE NORTH SIDE OF THE TREE IN THE NURSERY, AND ROTATE TREE TO FACE NORTH AT THE SITE WHEN EVER POSSIBLE.

SET TOP OF ROOT BALL FLUSH TO GRADE OR 25-50 MM (1-2 IN.) HIGHER IN SLOWLY DRAINING SOILS.

200 MM (8 IN.)

50 MM (2 IN.) MULCH. DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK. MAINTAIN THE MULCH WEED-FREE FOR A MINIMUM OF THREE YEARS AFTER PLANTING.

NOTE: FOR DIMENSIONS OF PLANTING AREAS, TYPES OF SOIL AMENDMENTS, OR SOIL REPLACEMENT, SEE "SOIL IMPROVEMENT DETAILS."

MULCH RING  
1800 MM (6 FT.) DIAM. MIN.  
2400 MM (8 FT.) DIAM. PREFERRED

EACH TREE MUST BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL. TREES WHERE THE TRUNK FLARE IS NOT VISIBLE SHALL BE REJECTED. DO NOT COVER THE TOP OF THE ROOT BALL WITH SOIL.

100 MM (4 IN.) HIGH EARTH SAUCER BEYOND EDGE OF ROOT BALL.

REMOVE ALL TWINE, ROPE AND WIRE, AND BURLAP FROM TOP HALF OF ROOT BALL

IF PLANT IS SHIPPED WITH A WIRE BASKET AROUND THE ROOT BALL, CUT THE WIRE BASKET IN FOUR PLACES AND FOLD DOWN 200 MM (8 IN.) INTO PLANTING HOLE.

PLACE ROOT BALL ON UNEXCAVATED OR TAMPED SOIL.

TAMP SOIL AROUND ROOT BALL BASE FIRMLY WITH FOOT PRESSURE SO THAT ROOT BALL DOES NOT SHIFT. DO NOT TAMP OR STEP ON ROOT BALL

NOTE: WIDTH OF PLANTING HOLE IS 3 TIMES ROOT BALL DIAMETER IN HIGHLY COMPACTED SOIL; 2 TIMES THE ROOT BALL DIAMETER MINIMUM IN ALL OTHERS.  
THIS DETAIL ASSUMES THE PLANTING SPACE IS LARGER THAN 2400 MM (8 FT.) SQUARE, OPEN TO THE SKY, AND NOT COVERED BY ANY PAVING OR GRATING.

Tree Planting Detail - B & B Trees in all Soil Types

DRAWING NUMBER: P-5000

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: P-5000.dwg

APPROVED BY: SA

DATE: 3/22/06

CITY OF  
WILSONVILLE

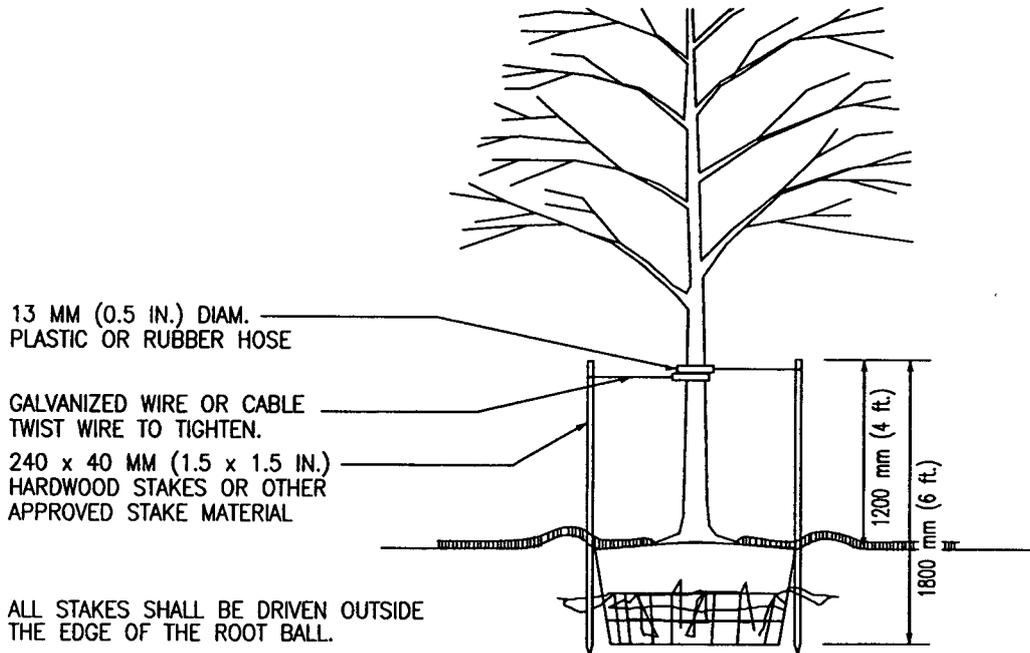


PUBLIC WORKS STANDARDS

WIRE OR CABLE SIZES SHALL BE AS FOLLOWS:  
 TREES UP TO 65 MM (2.5 IN.) CALIPER - 14 GAUGE  
 TREES 65 MM (2.5 IN.) TO 75 MM (3 IN.) CALIPER - 12 GAUGE

TIGHTEN WIRE OR CABLE ONLY ENOUGH TO KEEP FROM SLIPPING. ALLOW FOR SOME TRUNK MOVEMENT. PLASTIC OR RUBBER HOSE SHALL BE LONG ENOUGH TO ACCOMMODATE 35MM (1.5 IN.) OF GROWTH AND BUFFER ALL BRANCHES FROM THE WIRE.

TUCK ANY LOOSE ENDS OF THE WIRE OR CABLE INTO THE WIRE WRAP SO THAT NO SHARP WIRE ENDS ARE EXPOSED.



ASSURE THAT THE BEARING SURFACE OF THE PROTECTIVE COVERING OF THE WIRE OR CABLE AGAINST THE TREE TRUNK IS A MINIMUM OF 12 MM (0.5 IN.).

REMOVE ALL STAKING AS SOON AS THE TREE HAS GROWN SUFFICIENT ROOTS TO OVERCOME THE PROBLEM THAT REQUIRED THE TREE TO BE STAKED. STAKES SHALL BE REMOVED NO LATER THE END OF THE FIRST GROWING SEASON AFTER PLANTING.

TREES NORMALLY DO NOT NEED TO BE STAKED AND STAKING CAN BE HARMFUL TO THE TREE. STAKING SHOULD BE DONE ONLY WITH THE APPROVAL OF THE CITY IF IT IS EXPECTED THAT THE TREE WILL NOT BE ABLE TO SUPPORT ITSELF.

THE FOLLOWING ARE REASONS WHY TREES DO NOT REMAIN STRAIGHT.

- o TREES WITH POOR - QUALITY ROOT BALLS OR ROOT BALLS THAT HAVE BEEN CRACKED OR DAMAGED. REJECT RATHER THAN STAKE.
- o TREES THAT HAVE GROWN TOO CLOSE TOGETHER IN THE NURSERY, RESULTING IN WEAK TRUNKS. REJECT RATHER THAN STAKE.
- o PLANTING PROCEDURES THAT DO NOT ADEQUATELY TAMP SOILS AROUND THE ROOT BALL. CORRECT THE PLANTING PROCEDURE.
- o ROOT BALLS PLACED ON SOFT SOIL. TAMP SOILS UNDER ROOT BALL PRIOR TO PLANTING.
- o ROOT BALLS WITH VERY SANDY SOIL OR VERY WET CLAY SOIL. STAKING ADVISABLE.
- o TREES LOCATED IN A PLACE OF EXTREMELY WINDY CONDITIONS. STAKING ADVISABLE.

ALTERNATE TREE STAKING METHODS:

1. TREE STAPLES OR EQUIVALENT TREE STAKING SYSTEM MAY BE USED
2. DUCKBILL ROOT KIT STRAP OR EQUIVALENT
  - 40rbk - 2" TREE
  - 68rbk - 3" TREE

Tree Staking Detail - Trees 75MM (3") Caliper or Less

DRAWING NUMBER: P-5005

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: P-5005.dwg

APPROVED BY: SA

DATE: 03/22/06

CITY OF  
WILSONVILLE

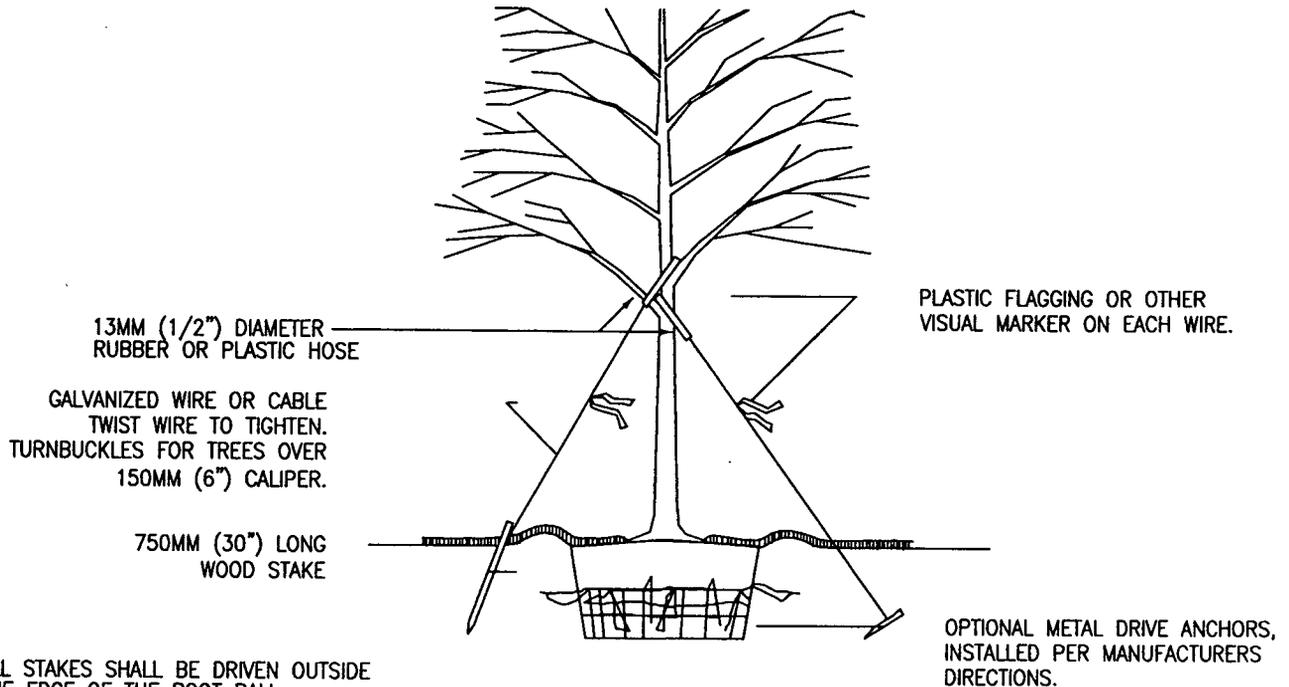


PUBLIC WORKS STANDARDS

WIRE OR CABLE SIZES SHALL BE AS FOLLOWS:  
 TREES UP TO 65 MM (2.5 IN.) CALIPER - 14 GAUGE  
 TREES 65 MM (2.5 IN.) TO 75 MM (3 IN.) CALIPER - 12 GAUGE

TIGHTEN WIRE OR CABLE ONLY ENOUGH TO KEEP FROM SLIPPING. ALLOW FOR SOME TRUNK MOVEMENT. PLASTIC HOSE SHALL BE LONG ENOUGH TO ACCOMMODATE 35MM (1.5 IN.) OF GROWTH AND BUFFER ALL BRANCHES FROM THE WIRE.

TUCK ANY LOOSE ENDS OF THE WIRE OR CABLE INTO THE WIRE WRAP SO THAT NO SHARP WIRE ENDS ARE EXPOSED.  
 INSTALL THREE GUY WIRES PER TREE, SPACED EVENLY AROUND THE TRUNK.



ALL STAKES SHALL BE DRIVEN OUTSIDE THE EDGE OF THE ROOT BALL.

ASSURE THAT THE BEARING SURFACE OF THE PROTECTIVE COVERING OF THE WIRE OR CABLE AGAINST THE TREE TRUNK IS A MINIMUM OF 12 MM (0.5 IN.).

REMOVE ALL STAKING AS SOON AS THE TREE HAS GROWN SUFFICIENT ROOTS TO OVERCOME THE PROBLEM THAT REQUIRED THE TREE TO BE STAKED. STAKES SHALL BE REMOVED NO LATER THE END OF THE FIRST GROWING SEASON AFTER PLANTING.

TREES NORMALLY DO NOT NEED TO BE STAKED AND STAKING CAN BE HARMFUL TO THE TREE. STAKING SHOULD BE DONE ONLY WITH THE APPROVAL OF THE LANDSCAPE ARCHITECT IF IT IS EXPECTED THAT THE TREE WILL NOT BE ABLE TO SUPPORT ITSELF. THE FOLLOWING ARE REASONS WHY TREES DO NOT REMAIN STRAIGHT.

- o TREES WITH POOR-QUALITY ROOT BALLS OR ROOT BALLS THAT HAVE BEEN CRACKED OR DAMAGED. REJECT RATHER THAN STAKE.
- o TREES THAT HAVE GROWN TOO CLOSE TOGETHER IN THE NURSERY, RESULTING IN WEAK TRUNKS. REJECT RATHER THAN STAKE.
- o PLANTING PROCEDURES THAT DO NOT ADEQUATELY TAMP SOILS AROUND THE ROOT BALL. CORRECT THE PLANTING PROCEDURE.
- o ROOT BALLS PLACED ON SOFT SOIL. TAMP SOILS UNDER ROOT BALL PRIOR TO PLANTING.
- o ROOT BALLS WITH VERY SANDY SOIL OR VERY WET CLAY SOIL. STAKING ADVISABLE.
- o TREES LOCATED IN A PLACE OF EXTREMELY WINDY CONDITIONS. STAKING ADVISABLE.

ALTERNATE TREE STAKING METHODS

- (1) TREE STAPLES OR EQUIVALENT TREE STAKING SYSTEM MAY BE USED FOR APPROPRIATE SIZE
- (2) DUCKBILL ROOT KIT STRAP OR EQUIVALENT
  - 68 Rbk 3" Cal
  - 88 Rbk 6" Cal

Tree Staking Detail - Larger Than 3" (75MM)

DRAWING NUMBER: P-5010

DRAWN BY: SJ

SCALE: N.T.S.

FILE NAME: P-5010.dwg

APPROVED BY: SA

DATE: 03/22/06

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS