



City of Port Orchard Council Meeting Agenda
February 26, 2019
6:30 p.m.

Mayor:

Rob Putaansuu
Administrative Official

Councilmembers:

Bek Ashby (Mayor Pro-Tem)
Chair: ED/Tourism/LT Committee
Staff: Development Director
Finance Committee
KRCC / PSRC TransPol / KRCC TransPol
KRCC PlanPol-alt / PRTPO

Shawn Cucciardi
Finance Committee
Land Use Committee
PSRC EDD-alt

Fred Chang
Utilities Committee
Sewer Advisory Committee (SAC)
Staff: Public Works Director

Jay Rosapepe
ED/Tourism/LT Committee
Utilities Committee
Chair: Lodging Tax Committee
Sewer Advisory Committee (SAC)
KRCC-alt / KRCC TransPol-alt
Kitsap Transit-alt

John Clauson
Chair: Finance Committee
Staff: Finance Director
Kitsap Public Health District-alt
KEDA/KADA-alt

Cindy Lucarelli
Chair: Utilities and SAC Committee
Staff: Public Works Director
Chair: Chimes and Lights Committee
Staff: City Clerk
KEDA/KADA

Scott Diener
Chair: Land Use Committee
Staff: Development Director
ED/Tourism/LT Committee

Department Directors:
Nicholas Bond, AICP
Development Director

Mark Dorsey, P.E.
Director of Public Works/City Engineer

Tim Drury
Municipal Court Judge

Noah Crocker, M.B.A.
Finance Director

Geoffrey Marti
Police Chief

Brandy Rinearson, MMC, CPRO
City Clerk

Contact us:

216 Prospect Street
Port Orchard, WA 98366
(360) 876-4407

1. CALL TO ORDER

A. Pledge of Allegiance

2. APPROVAL OF AGENDA

3. CITIZENS COMMENTS

*(Please limit your comments to **3 minutes** for items listed on the Agenda and that are not for a Public Hearing. When recognized by the Mayor, please state your name for the official record)*

4. CONSENT AGENDA

(Approval of Consent Agenda passes all routine items listed below, which have been distributed to each Councilmember for reading and study. Consent Agenda items are not considered separately unless a Councilmember so requests. In the event of such a request, the item is returned to Business Items.)

A. Approval of Checks and Payroll

EXECUTIVE SESSION: Pursuant to RCW 42.30.1101(i), the City Council will hold a 10-minute executive session to discuss a potential litigation matter.

COLLECTIVE BARGAINING: Pursuant to RCW 42.30.140 (4)b, the Council will be entering in to a 10-minute meeting related to collective bargaining.

5. PRESENTATION

- A. Ready! for Kindergarten (Melissa Pittenger)**
- B. South Kitsap Community Event Center (Sego)**

6. PUBLIC HEARING

7. BUSINESS ITEMS

A. Adoption of an Ordinance Approving the Collective Bargaining Agreement with Teamsters for Public Works (Howard)

B. Adoption of an Ordinance Approving Certain Employee Benefits for Non-Union Represented Employees Classified as FLSA Non-Exempt and Executive Exempt (Howard)

C. Adoption of an Ordinance, Thereby Causing New Chapter 12.36, New Sections 13.04 and 13.06, Adopting the 2019 Public Works Engineering Standards and Specifications (PWESS) and Repealing Resolution No. 006-14 (Dorsey) Page 3

D. Adoption of a Resolution Adopting a Reimbursement Expenditures (Crocker) Page 355

E. Approval of Change Order No. 13 to Contract No. 037-17 with Active Construction Inc, for the Tremont Street Widening Project (Dorsey) Page 359

F. [Approval of the 2019 Comprehensive Plan Amendment Agenda-Docket \(Bond\)](#) **Page 367**

8. DISCUSSION ITEMS (No Action to be Taken)

A. [After Hours Use of City Hall](#) (Mayor) **Page 397**

9. REPORTS OF COUNCIL COMMITTEES

10. REPORT OF MAYOR

11. REPORT OF DEPARTMENT HEADS

12. CITIZEN COMMENTS

(Please limit your comments to 3 minutes for any items not up for Public Hearing. When recognized by the Mayor, please state your name for the official record)

13. ADJOURNMENT

COMMITTEE MEETINGS	Date & Time	Location
Finance	March 26, 2019; 5:30pm	City Hall
Economic Development and Tourism	March 11, 2019; 9:30am	City Hall
Utilities	February 27, 2019; 9:30am	City Hall
Sewer Advisory	April 17, 2019; 6:30pm	SKWRF**
Land Use	February 25, 2019; 9:30am	DCD*
Lodging Tax Advisory	TBD	City Hall
Festival of Chimes & Lights	February 27, 2019; 3:30pm	City Hall
Outside Agency Committees	Varies	Varies

*DCD, Department of Community Development, 720 Prospect Street, Port Orchard

**South Kitsap Water Reclamation Facility – 1165 Beach Drive (Beach Drive and Olney)

CITY COUNCIL GOOD OF THE ORDER

Please turn off cell phones during meeting and hold your questions for staff until the meeting has been adjourned.

The Council may consider other ordinances and matters not listed on the Agenda, unless specific notification period is required.

Meeting materials are available on the City’s website at: www.cityofportorchard.us or by contacting the City Clerk’s office at (360) 876-4407.

The City of Port Orchard does not discriminate on the basis of disability. Contact the City Clerk’s office should you need special accommodations.



City of Port Orchard

216 Prospect Street, Port Orchard, WA 98366
(360) 876-4407 • FAX (360) 895-9029

Agenda Staff Report

Agenda Item No.:	<u>Business Item 7C</u>	Meeting Date:	<u>February 26, 2019</u>
Subject:	<u>Adoption of Ordinance No. 006-19, Thereby</u>	Prepared by:	<u>Mark R. Dorsey, P.E.</u>
	<u>Creating New Chapter 12.43 and Sections</u>		<u>Public Works Director</u>
	<u>13.04 and 13.06 POMC, Adopting the 2019</u>	Atty Routing No:	<u>009-19</u>
	<u>Public Works Engineering Standards &</u>	Atty Review Date:	<u>February 5, 2019</u>
	<u>Specifications, and Repealing Resolution No.</u>		
	<u>006-14</u>		

Summary: On January 28, 2019, the City’s Public Works Department brought forth the draft 2019 Public Works Engineering Standards and Specifications (“Standards”) to the Land Use Committee for initial review and discussion. The purpose of the proposed Ordinance 006-19 is to update the Port Orchard Municipal Code and to adopt new Public Works Engineering Standards and Specifications to provide continued compliance with the City of Port Orchard’s Water System Plan, Comprehensive Sanitary sewer Plan, Transportation Element of the Comprehensive Plan, Stormwater Plan, and the Phase II NPDES Permit via established engineering standards and specifications. Additionally, Resolution No. 006-14 must be repealed to allow the Standards to be integrated within the POMC via codification. At the February 19, 2019 Work Study Session, the matter was discussed by the City Council and referred to the next Regular Meeting for action, as adoption of this ordinance must occur prior to the adoption of the 2019 Zoning Code Update.

Relationship to Comprehensive Plan: Chapter 7 – Utilities, and Chapter 8 - Transportation

Recommendation: Staff recommends adoption of Ordinance No. 006-19 amending the Port Orchard Municipal Code by creating new Chapter 12.34 and new Sections 13.04.300 and 13.06.300; adopting the 2019 Public Works Engineering Standards and Specifications; and repealing Resolution No. 006-14.

Motion for Consideration: I move to adopt Ordinance No. 006-19 amending the Port Orchard Municipal Code by creating new Chapter 12.34 and new Sections 13.04.300 and 13.06.300; adopting the 2019 Public Works Engineering Standards and Specifications; and repealing Resolution No. 006-14, with final form approved by the City Attorney.

Fiscal Impact: None.

Alternatives: Do not approve and provide further direction to staff.

Attachments: Ordinance No. 006-19
2019 Public Works Engineering Standards and Specifications (*provided Prior to the meeting*)

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ORDINANCE NO. 006 -19

AN ORDINANCE OF THE CITY OF PORT ORCHARD, WASHINGTON, ADOPTING A NEW CHAPTER 12.34 STREET AND SIDEWALK STANDARDS; ADOPTING A NEW SECTION 13.04.300 WATER AND SEWER STANDARDS; ADOPTING A NEW SECTION 13.06.300 STORMWATER STANDARDS; ADOPTING THE 2019 PUBLIC WORKS ENGINEERING STANDARDS AND SPECIFICATIONS; REPEALING RESOLUTION 006-14; PROVIDING FOR SEVERABILITY AND CORRECTIONS; SETTING AN EFFECTIVE DATE; AND PROVIDING FOR PUBLICATION.

WHEREAS, in April of 2014, the City adopted Resolution No. 006-14, thereby establishing an update to the 2004 Developer's Handbook, being the 2014 City of Port Orchard Development Guidelines; and

WHEREAS, for continued compliance with the City of Port Orchard's Water System Plan, Comprehensive Sanitary Sewer Plan, Transportation Element of the Comprehensive Plan, Stormwater Plan, and the City's Phase II NPDES Permit, the City of Port Orchard must have Public Works Engineering Standards and Specifications ('Standards') adopted by Ordinance; and

WHEREAS, the City's Departments of Community Development and Public Works have worked cooperatively to integrate a codified 'Standards' Handbook; now, therefore,

THE CITY COUNCIL OF THE CITY OF PORT ORCHARD, WASHINGTON, DOES HEREBY ORDAIN AS FOLLOWS:

SECTION 1. POMC Chapter 12.34 Created. A new Port Orchard Municipal Code chapter 12.34 is hereby adopted to read as follows:

POMC 12.34 Streets and Sidewalk Standards.

12.34.010 Street and Sidewalk Standards. All roads, streets, sidewalks, roadway facilities, and small cell facilities located within the right of way shall be designed and constructed in accordance with the "2019 City of Port Orchard Public Works Engineering Standards and Specification (PWESS)," three copies of which are on file with the City Clerk.

SECTION 2. POMC Section 13.04.300 Water and Sewer Standards Created. A new Port Orchard Municipal Code section 13.04.300 is hereby adopted to read as follows:

POMC 13.04.300 Water and Sewer Standards. All water and sewer improvements shall be designed and constructed in accordance with the “2019 City of Port Orchard Public Works Engineering Standards and Specifications (PWESS),” three copies of which are on file with the City Clerk.

SECTION 3. POMC 13.06.300 Stormwater Standards Created. A new Port Orchard Municipal Code section 13.04.300 is hereby adopted to read as follows:

POMC 13.06.300 Stormwater Standards. All stormwater improvements shall be designed and constructed in accordance with the “2019 City of Port Orchard Public Works Engineering Standards and Specifications (PWESS),” three copies of which are on file with the City Clerk, which shall apply in addition to other adopted stormwater standards including but not limited to POMC 20.140 and 20.150.

SECTION 4. 2019 City of Port Orchard Public Works Engineering Standards and Specifications Adopted. The “2019 City of Port Orchard Public Works Engineering Standards and Specifications (PWESS)” attached and labeled Exhibit 1 hereto and incorporated fully herein by this reference, are hereby adopted in their entirety.

SECTION 5. Resolution 006-14 Repealed. City Council Resolution 006-14 is hereby repealed in its entirety.

SECTION 6. Severability. Should any section, paragraph, sentence, clause, or phrase of this ordinance, or its application to any person or circumstance, be declared unconstitutional or otherwise invalid by a court, board, or tribunal of competent jurisdiction, for any reason, or should any portion of this ordinance be pre-empted by state or federal law or regulation, such decision or preemption shall not affect the validity of the remaining portions of this ordinance or its application to other persons or circumstances.

SECTION 7. Corrections. Upon the approval of the City Attorney, the City Clerk is authorized to make any necessary corrections to this ordinance including, but not limited to, the correction of scrivener’s/clerical errors, references, ordinance numbering, section/subsection numbers, and any reference thereto.

SECTION 8. Effective Date; Publication. This ordinance shall take effect and be in full force and effect five days after publication, as provided by law. An approved summary of this ordinance consisting of the title shall be published in the official newspaper of the City.

Passed by the City Council of the City of Port Orchard, APPROVED by the Mayor and attested by the Clerk in authentication of such passage this 26th day of February 2019.

Robert Putaansuu, Mayor

ATTEST:

SPONSOR:

Brandy Rinearson, MMC, City Clerk

Cindy Lucarelli, Councilmember

APPROVED AS TO FORM:

Sharon Cates, City Attorney

PUBLISHED:

EFFECTIVE DATE:

Introduced by: Assistant City Engineer
Requested by: Public Works Director
Drafted by: Assistant City Engineer
Reviewed by: N/A
Introduced: April 8, 2014
Adopted: April 8, 2014

RESOLUTION NO. 006-14

**A RESOLUTION OF THE CITY OF PORT ORCHARD,
WASHINGTON, AUTHORIZING THE MAYOR TO
ADMINISTRATIVELY ADOPT THE 2014 CITY OF PORT
ORCHARD DEVELOPMENT GUIDELINES.**

WHEREAS, to meet the compliance with the Water System Plan, Comprehensive Sanitary Sewer Plan, Transportation Element of the Comprehensive Plan, and Stormwater Regulations; and

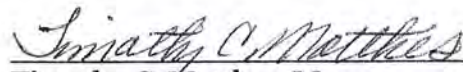
WHEREAS, staff has recommended replacing the existing *2004 Developer's Handbook* with the *2014 City of Port Orchard Development Guidelines*; and

WHEREAS, staff requests the *2014 City of Port Orchard Development Guidelines* be administratively adopted, allowing the Public Works Director to make changes to the manual; now, therefore,

**THE CITY COUNCIL OF THE CITY OF PORT ORCHARD,
WASHINGTON, HEREBY RESOLVES AS FOLLOWS:**


THAT: The City Council authorizes the Mayor to administratively adopt the *2014 City of Port Orchard Development Guidelines*, thus allowing the Public Works Director to make future changes to the manual. The manual shall take effect immediately.

PASSED by the City Council of the City of Port Orchard, SIGNED by the Mayor and attested by the Clerk in authentication of such passage this 8th day of April 2014.



Timothy C. Matthes, Mayor

ATTEST:



Brandy Rinearson, CMC, City Clerk



City of Port Orchard

Public Works Engineering



Standards and Specifications

2019

Prepared by: Mike Pleasants, P.E., Assistant City Engineer



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Chapter 1 Plan Preparation and Bonding

This chapter includes standards for the preparation of documents and submittals to the City and information on bonding requirements. Items included in this chapter:

1.1 Documents and Preparation

- A. Plan Preparation and Application
- B. Standard Plan Notes

1.2 Bond Requirements

- A. General Information
- B. Types of Bonds
- C. Performance Bonds
- D. One-Time Bond Reduction
- E. Maintenance Bonds
- F. Determining Bond Amount
- G. Bond Release

1.1 DOCUMENTS AND PREPARATION

A. Plan Preparation and Application

1. Engineering Plan Preparation

All engineering plans shall meet the following minimum engineering plan preparation standards unless otherwise specified within POMC:

- a. A professional Civil Engineer, licensed in the state of Washington, shall prepare, sign and stamp the engineering plans, in accordance with RCW 18.43.070, prior to submittal to the City of Port Orchard.
- b. Plan sheets shall be 22" x 34" in size, dark line on light background.
- c. The cover sheet shall include:
 - i. Project title.
 - ii. Vicinity map with north arrow.
 - iii. Project Address
 - iv. The Section, Township and Range.
 - v. Index of plan sheets.
 - vi. The applicant and/or developer's name.
 - vii. The name, address, seal, date and signature of the responsible professional engineer.
 - viii. Impervious Area (Existing and Proposed)
 - ix. Legend of symbols and line types used
- d. All subsequent sheets shall include:
 - i. Project title.
 - ii. Project Address
 - iii. The section, Township and range.
 - iv. The name, address, seal, date and signature of the responsible professional engineer.
- e. Plan Views shall include:
 - i. A north arrow and an engineer's scale.
 - a. The north arrow shall be generally oriented to the top or to the right side of the sheet.
 - b. Typical scale for subdivisions: 1" = 50'.
 - c. Typical scale for commercial developments: 1" = 20', 1" = 30' or 1" = 50'.
 - ii. All found and reference survey monuments.

- iii. The vertical datum shall be NAVD 1988 and the horizontal datum shall be NAD 1983 HARN State Plane Washington North FIPS 4601 feet.
 - iv. Proposed road names, centerline bearings, and dimensions for right-of-way, street and easement widths.
 - v. Stationing for street centerline, points of curvature, tangency, and intersections. Street alignments shall read from left to right, and stationing shall increase from west to east and south to north. Negative stationing will not be allowed.
 - vi. All elements of the proposed street section, including centerline, curb and gutter, planter strip, sidewalk, right-of-way, utility easements, medians, turn and/or bike lanes, etc.
 - vii. All existing and proposed utilities. Line work shall be faded into the background, but dark enough to be legible on copy.
 - viii. Section lines, project boundary lines, lot lines, etc.
 - ix. All topographic features within and adjacent to proposed improvements and within sufficient area to assess impacts of slopes, drainage, access, slopes, future extensions, etc.
 - a. Existing and proposed contours shall be shown at 1' intervals for grades less than 10%.
 - b. 2' intervals shall be shown for grades between 10% and 30%.
 - c. 5' intervals for grades greater than 30%.
 - x. All existing and proposed drainage features and facilities, showing direction of flow, size and type of each drainage pipe, structure, channel, pond, etc.
 - xi. Curve data, including radius, arc length, delta and semi-tangent length for all street centerlines, curb returns and cul-de-sac bulbs.
 - xii. Identification of adjacent roads, neighborhoods, addresses or any other information to facilitate locations and future reference.
 - xiii. Plan views should be oriented for the most efficient use of paper.
- f. A separate Plan and Profile sheet shall be prepared for each street alignment.
- Unless otherwise approved by the City Engineer, corresponding plan and profile views shall be presented on a single sheet, of matching street station segment, and oriented with aligning stationing, or best fit.
- g. Profile Views shall include:
- i. An engineer's scale. Horizontal scale shall match corresponding plan view (typical scale: 1" = 50'). Vertical scale should allow for adequate depiction of street, storm, sewer and water grades and structures, while minimizing

- profile breaks (typical scale: 1" = 10', minimum scale: 1" = 5', maximum scale: 1" = 20').
- ii. The datum or benchmark used to establish vertical control. Datum shall be NAVD 1988 unless otherwise approved by the City of Port Orchard.
 - iii. 1" grid lines with station labels at 100' intervals and elevation labels spanning the elevation range of the existing and proposed grades.
 - iv. Existing and proposed centerline elevations at 50' stations, positioned along the bottom of the profile view.
 - v. Existing centerline profile based on topographic survey, accurate to within 0.1' on unpaved surfaces and 0.01' on paved surfaces.
 - vi. Proposed design information, including grades, grade break stations and elevations, and vertical curve information, including length, stations and elevations for PVC, PVI and PVT, A.D., and K-values, and high or low point and elevation, if applicable.
 - vii. Profiles for curbed streets shall show only the tops of both curbs, with breaks at all curb returns. Profiles for half-street improvements shall show the top of curb and the opposite edge of pavement. Profiles for fire access streets, private access streets, alleys and shouldered roads shall show the centerline only.
 - viii. Profiles for street widening (where grind and overlay is not proposed) shall show the existing centerline, the existing street at the saw cut line and the proposed top of curb.
 - ix. Street widening calculations (cross-slopes) shall be included with the submittal of the design plans. Station and elevation labels shall be added to the proposed profile at the start and end of improvements, curb returns, cross-slope transitions, width tapers, and any other spot or segment not defined by the street section.
 - x. Station and centerline labels shall be added to the profile at all intersections.
 - h. Cul-De-Sac designs shall include:
 - i. An alignment of the face of curb, starting at the PC of the bulb (either side), continuing around the bulb and ending at the opposite PC.
 - ii. A profile of the existing ground and proposed face of curb.
 - iii. Reference points at both PCs and PCCs and quarter points around the bulb. Reference points shall be labeled on both the plan and profile views.
 - i. Detail drawings shall include:
 - i. A north arrow and engineer's scale (typical scale: 1" = 20').

- ii. A detail title, description or reference note.
 - iii. Adequate line work, dimensions, spot elevations, sections, views and notes to construct the street element, structure or facility. Irrelevant background information should be removed to avoid detail clutter.
 - iv. Intersection details shall note the station equation and the finished grade elevation at the point of intersection. Curb return information shall include corresponding street stations at all PCs and PTs and top of curb elevations at the ends and quarter points to verify drainage and to facilitate smooth transitions.
- j. Drafting Standards:
- i. Fonts – Lettering shall be legible and easily understood by the reviewer. Lettering shall be of sufficient size and boldness to produce clear and readable text when scanned or copied, but small enough for efficient use of paper. A typical note font should be approximately 0.08" to 0.10" in height. Submitted plans not meeting these criteria will be returned to the design engineer for correction.
 - ii. Line types and Symbols – A list of standard drafting line types and symbols shall be shown on all drawings submitted for review.

Line weights shall be of sufficient boldness to produce clear and legible line work when scanned or copied. Line weights shall differ between line type applications for drawing clarity and efficiency.
 - iii. Save all drawings to AutoCAD 2013.
- k. The order of sheets in a set of engineering plans should follow the natural progression of construction of the development. The typical set of engineering drawings will include the following sheets:
- i. Cover Sheet
 - ii. Notes
 - iii. Existing Conditions/Demolition Plan
 - iv. Erosion and Sediment Control Plan(s)
 - v. Grading Plan(s)
 - vi. Composite Utility Plan (i.e. water, sewer, power, phone, etc.)
 - vii. Street and Drainage Plan(s)
 - viii. Details
 - ix. Channelization Plan
 - x. Lighting Plan
 - xi. Landscape Plan
- l. City of Port Orchard Standard Plans shall be referenced in the construction

notes or added to the engineering plans as independent details. Changes to Standard Plans shall include removal of the City's title block and emphasis on the modification.

- m. City of Port Orchard Standard Plan Notes must be included in all plan sets. The City of Port Orchard Standard Plan Notes are provided in Section 2.4B.

At the applicant's discretion, notes which do not apply to the project may be omitted; however, the remaining notes must not be renumbered. For example, if General Note #3 were omitted, the remaining notes should be numbered 1, 2, 4, 5, etc. If additional site specific notes are considered necessary, they shall be added to the end of the appropriate section.

- n. Bond Quantity Worksheet

A Site Improvement Bond Quantity Worksheet (BQW) shall be completed for every development project.

B. Standard Plan Notes

The following Standard Plan Notes must be included in all plan sets. At the applicant's discretion, notes, which in no way apply to the project, may be omitted; however, the remaining notes must not be renumbered. For example, if General Note #3 were omitted, the remaining notes should be numbered 1, 2, 4, 5, etc. If additional site specific notes are considered necessary, they shall be added to the end of the appropriate section.

General Notes:

1. All construction shall be in accordance with all currently adopted WSDOT and APWA Specifications and Plans, and the City of Port Orchard Municipal Code, the currently adopted City of Port Orchard Developer's Handbook, the currently adopted Surface Water Design Manual and the conditions of preliminary subdivision approval. It shall be the sole responsibility of the applicant and the professional civil engineer to correct any error, omission, or variation from the above requirements found in these plans. All corrections shall be at no additional cost or liability to the City of Port Orchard.
2. The design elements within these plans have been reviewed according to the Port Orchard Design Standards. Some elements may have been overlooked or missed by the City of Port Orchard City Engineer. Any deviation from adopted standards is not allowed unless specifically approved by the City of Port Orchard City Engineer, prior to construction.
3. Approval of these engineering plans such as for roads, grading, or drainage does not constitute an approval of any other design (e.g., water, sewer, gas, electrical, etc.).

4. Before any construction or development activity, a preconstruction meeting must be held between the City of Port Orchard Public Works Department, the Applicant and the Applicant's Construction Representative.
5. Proof of liability insurance shall be submitted to the City of Port Orchard prior to the preconstruction meeting.
6. A copy of these approved plans must be on the job site whenever construction is in progress.
7. Construction noise shall comply with the current POMC Section 9.24.050.
8. It shall be the Applicant /Contractor's responsibility to obtain all right-of-way permits and construction easements necessary before initiating off-site work within a City of Port Orchard street right-of-way.
9. Franchised utilities or other installations that are not shown on these approved plans shall not be constructed unless an approved set of plans is submitted to the City of Port Orchard prior to construction.
10. The vertical datum shall be NAVD 1988 and the horizontal datum shall be NAD 1983 HARN State Plane Washington North FIPS 4601 feet.
11. Groundwater system construction shall be within a right-of-way or appropriate drainage easement, but not underneath the roadway section.
12. All utility trenches shall be backfilled and compacted in accordance with the City of Port Orchard Standards.
13. All roadway subgrade shall be backfilled, compacted to 95% maximum density and prepared for surfacing in accordance with WSDOT Standard Specification 2-06.3.
14. Open cutting of existing roadways is not allowed unless specifically approved by the City of Port Orchard City Engineer and noted on these approved plans. Any open cut shall be restored in accordance with the City of Port Orchard Standard Specifications.
15. The Contractor shall be responsible for providing adequate safeguards, safety devices, protective equipment, flaggers, and any other needed actions to protect the life, health, and safety of the public, and to protect property in connection with the performance of work covered by the contractor. Any work within the traveled right-of-way that may interrupt normal traffic flow shall require at least one flagger for each lane of traffic affected. Refer to "Traffic Control," of the WSDOT Standard Specifications shall apply in its entirety. Traffic control plans shall follow the currently adopted MUTCD Manual as applicable.

To protect significant trees from the impacts of the proposed development, the Applicant shall provide the best protection for significant trees per the regulations. At a minimum, any significant trees to be retained shall be fenced two feet outward from the identified drip line. Trees that sustain damage during construction shall be

replaced pursuant to POMC. A representative of the City of Port Orchard DCD Staff shall verify protective fencing placement per this condition prior to issuance of a notice to proceed for grading and clearing. The City shall inspect for compliance with the tree plan prior to a final inspection. The inspection shall also evaluate the condition of retained trees and any and all corrections will be required to be completed prior to a final inspection and release of any post financial guarantees for the site.

Drainage Notes (also refer to Chapter 9 Surface Water Drainage):

16. All storm pipe and appurtenances shall be laid in accordance with City of Port Orchard Design and Construction Standards. This shall include leveling and compacting the trench bottom, the top of the foundation material and any required bedding to a uniform grade so that the entire drainage facility is supported by a uniformly dense unyielding base.
17. All storm pipe shall be subject to a low-pressure air test in accordance with WSDOT Standard Specification 7-04.3(1)F and a video inspection in accordance with the Port Orchard Design Standards.
18. Storm pipe cover, measured from the finished grade elevation to the top of the outside surface of the pipe, shall be 2 feet minimum, unless authorized by the City of Port Orchard City Engineer under the following circumstances:
 - a. Under driveways the pipe cover may be reduced to 1 foot minimum if the 2-foot cannot be achieved and the cover is consistent with the pipe manufacturer's recommendations.
 - b. In areas not subject to vehicular loads, such as landscape planters and yards, the pipe cover may be reduced to 1 foot minimum.
 - c. If ductile iron pipe or C900 pipe is used, the pipe cover may be reduced to 1 foot minimum.
19. Steel pipe shall be galvanized and have asphalt treatment #1 or better inside and out (WSDOT Standard Specification 9-05.4(3)).
20. Any drainage structure, such as a catch basin or a manhole, not receiving surface runoff and not located within a traveled roadway or sidewalk shall have a solid locking lid. Any drainage structure associated with a permanent retention/detention facility, not receiving surface runoff, shall have a solid locking lid.
21. All catch basin grates shall conform to the currently adopted Stormwater Management Manual and the WSDOT Standard Plans when located within the right-of-way, and shall include a combination inlet frame (open-curb-face frame), when located in a sump condition or before an intersection with a 4% grade or above. A herringbone grate may be used outside the right-of-way. All catch basins within the gutter line shall be installed in accordance with the City of Port Orchard Standard

Details as applicable. Maximum catch basin height from finished grade to pipe invert shall be per the applicable detail.

22. For any curb grade less than 0.8% (0.0080 ft/ft), including curb returns, a professional Land Surveyor, currently licensed in the State of Washington, shall verify that the curb forms or string lines are at the grades noted on the approved plans prior to placement of concrete. The contractor is responsible for survey coordination and costs.
23. For any drainage pipe grade less than 0.5% (0.0050 ft/ft), a professional Land Surveyor, currently licensed in the State of Washington, shall verify that the as-built pipe matches the grades noted on the approved plans prior to completion of subgrade. The contractor is responsible for survey coordination and costs.
24. All driveway culverts located within the City of Port Orchard right-of-way shall be of sufficient length to provide a minimum 3:1 slope from the edge of the driveway to the bottom of the ditch. Culverts shall have beveled end sections to match the side slope.
25. Rock for erosion protection of ditches, where required, must be of sound quarry rock, placed to a depth of one foot (1'), and must meet the following specifications: 100% must pass the 8" sieve, 40% maximum can pass the 3" sieve and 10% maximum can pass the 3/4" sieve.
26. Drainage outlets (stub-outs) shall be provided for each individual lot, except for those lots approved for infiltration by the City of Port Orchard. Stub-outs shall conform to the following:
 - a. Each outlet shall be suitably located at the lowest elevation on the lot to service all future roof downspouts and footing drains, driveways, yard drains, and any other surface or subsurface drains necessary to render the lots suitable for their intended use. Each outlet shall have free-flowing, positive drainage to an approved stormwater conveyance system or to an approved outfall location.
 - b. Outlets on each lot shall be located with a five-foot-high, 2" x 4" stake marked "storm" or "drain". The stub-out shall extend above surface level, be visible, and be secured to the stake.
 - c. Pipe material shall be in accordance with Port Orchard Design Standards. If non-metallic, the pipe shall contain a wire or use other acceptable means of detection.
 - d. Drainage easements are required for drainage systems designed to convey flows through individual lots.
 - e. The Applicant/Contractor is responsible for coordinating the locations of all stub-out conveyance lines with respect to other utilities (e.g., power, gas, telephone, television, etc.).

- f. All individual stub-outs shall be privately owned and maintained by the lot homeowner.

Erosion and Sediment Control Notes (also refer to Chapter 9 Surface Water Drainage):

27. Approval of these Temporary Erosion and Sediment Control (TESC) plans does not constitute an approval of permanent road or drainage design (e.g., size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).
28. The implementation of these TESC plans and the construction, maintenance, replacement, and upgrading of these TESC facilities is the responsibility of the applicant/CESCL until all construction is approved.
29. The boundaries of the clearing limits shown on these plans shall be clearly flagged by a continuous length of survey tape (or fencing, if required) prior to construction. During the construction period, no disturbance beyond the clearing limits shall be permitted. The clearing limits shall be maintained by the applicant/CESCL for the duration of construction.
30. Stabilized construction entrances, in accordance with Standard Details shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures, such as constructed wheel wash systems or wash pads, may be required to ensure that all paved areas are kept clean and track-out to street right-of-way does not occur for the duration of the project.
31. The TESC facilities shown on these plans must be constructed prior to all clearing and grading to ensure that the transport of sediment to surface waters, drainage systems, and adjacent properties is reduced to required levels.
32. The TESC facilities shown on these plans are the minimum requirements for anticipated site conditions. During the construction period, these TESC facilities shall be upgraded as needed for unexpected storm events and modified to account for changing site conditions (e.g., additional cover measures, additional sump pumps, relocation of ditches and silt fences, additional perimeter protection, etc.), as directed by the City Engineer.
33. The TESC facilities shall be inspected daily by the applicant/CESCL and maintained to ensure continued proper functioning. Written records shall be kept of weekly reviews of the TESC facilities and of samples taken during the wet season (October 1 to April 30) and of monthly reviews during the dry season (May 1 to September 30).
34. Any areas of exposed soils, including roadway embankments, that will not be disturbed for two days during the wet season or seven days during the dry season shall be immediately stabilized with the approved TESC methods (e.g., seeding, mulching, plastic covering, etc.).
35. Any area needing TESC measures not requiring immediate attention shall be addressed within seven (7) days.

36. The TESC facilities on inactive sites shall be inspected and maintained a minimum of once a month or within twenty-four (24) hours following a storm event.
37. At no time shall more than one (1) foot of sediment be allowed to accumulate within a catch basin. All catch basins and conveyance lines shall be cleaned prior to final inspection. The cleaning operation shall not flush sediment-laden water into a downstream system.
38. Any permanent flow control facility used as a temporary settling basin shall be modified with the necessary erosion control measures and shall provide adequate storage capacity. If the facility is to function ultimately as an infiltration system, the temporary facility must be graded so that the bottom and sides are at least three (3) feet above the final grade of the permanent facility.
39. Where straw mulch for temporary erosion control is required, it shall be applied at a minimum thickness of 2 to 3 inches.
40. Prior to the beginning of the wet season (October 1), all disturbed areas shall be reviewed to identify which areas can be seeded in preparation for the winter rains. Disturbed areas shall be seeded within one week of the beginning of the wet season. A sketch map of those areas to be seeded and those areas to remain uncovered shall be submitted to the City of Port Orchard City Engineer. The Inspector can require seeding of additional areas in order to protect surface waters, adjacent properties, or drainage facilities.

Structural Notes, (also refer to Chapter 8 Structures):

41. These plans are approved for construction of the standard road and drainage improvements only. Plans for structures such as bridges, vaults, and retaining walls require a separate review, approval and building permit by the City of Port Orchard Department of Community Development prior to construction.
42. Rockeries are considered to be a method of bank stabilization and erosion control. Rockeries shall not be constructed in fill conditions to serve as retaining walls. All rockeries shall be constructed in accordance with the rock wall construction guidelines published by the Associated Rockery Contractors.
43. Mechanically stabilized earth, or reinforced soil, walls shall be designed and stamped by a professional engineer licensed in Washington State.

Recommended Construction Sequence:

44. Conduct a pre-construction meeting with the Public Works Department.
45. Post "Notice of Construction Activity" sign with name and phone number of the CESCL.
46. Flag or fence clearing limits and significant trees.

47. Install catch basin protection, if required.
48. Grade and install construction entrance(s).
49. Install perimeter protection (silt fence, brush barrier, etc.).
50. Construct sediment ponds and traps.
51. Grade and stabilize construction roads.
52. Construct surface water controls (interceptor ditches, pipe slope drains, etc.) simultaneously with clearing and grading for project development.
53. Maintain erosion control measures in accordance with the City of Port Orchard standards and manufacturer's recommendations.
54. Relocate surface water controls and erosion control measures, or install new measures to ensure that as site conditions change the erosion and sediment control is always in accordance with the City of Port Orchard Erosion and Sediment Control Standards.
55. Cover all areas that will be idle for more than seven days during the dry season or two days during the wet season with straw, wood fiber mulch, compost, plastic sheeting, or equivalent.
56. Stabilize all areas that reach final grade within seven days.
57. Seed or sod any areas to remain idle until seed or sod is established.
58. Upon completion of the project, all disturbed areas must be stabilized and best management practices removed, if appropriate.

1.2 BOND REQUIREMENTS

A. General Information

Port Orchard requires Performance and Maintenance Bonds to be posted for most construction projects to ensure all required project improvements are completed prior to final construction approval and subsequent certificate of occupancy. Additional Landscaping bond requirements are found in the Port Orchard Municipal Code. Bond forms are located in Appendix B of this document.

B. Types of Bonds

There are two types of "bonds" or financial guarantees that the City accepts for both Performance and Maintenance bonding.

1. *Bonding Company Bond.* The developer or general contractor obtains a bond from a bonding or insurance company for the total amount of all site improvements plus appropriate contingency as approved by the City Engineer. Only a licensed and bonded company can get a bond from a bonding company. The City has an approved form that may be used by the bonding company (alternate formats will require City approval). A contact person from the bonding company and a phone

number must be specified on page two of this form and the bond must be notarized. Individuals cannot obtain a bonding company bond because they do not have the public liability insurance that the bonding company requires.

2. *Cash set-aside*. This type of bonding allows a developer, owner or general contractor to create a cash set-aside account (place money in a special account) at their bank for the total amount of all site improvements plus appropriate contingency as approved by the City Engineer. Like the bonding company form, this is an approved form that must be notarized, and includes the account number, bank contact person and phone number.

Note: Other types of financial guarantees may also be approved by the City Engineer.

C. Performance Bonds

The City may accept a Performance Bond from the developer, owner or general contractor on a project. The maximum bonding period is five years. The City Engineer determines what public and private improvements are required to be bonded for a specific project and establishes the bond amount based on the approved civil plans and the estimate submitted. Typically, these include, but are not limited to:

- Storm System (conveyance, infiltration, dispersion, detention, treatment, etc.)
- Paving & Striping
- Grading, Temporary Erosion Control, Rockeries/Retaining Walls
- Landscaping: See the landscaping provision in the POMC.
- Right-of-Way Restoration
- Buffer and Sensitive Area Mitigation, Enhancement, and/or Restoration
- Water and Sewer installation

For single family residences and subdivisions (plats and short plats), a performance bond must be posted for all site improvements, both private and public. A separate bond may be obtained for buffer and Sensitive Area Mitigation, Enhancement, and/or Restoration.

D. One-Time Bond Reduction

A one-time bond reduction may be granted upon request of the applicant. Upon request, the City Engineer will conduct an inspection to estimate the percent completion of the project. Percent completion will be based on the approved plans and construction cost estimate. No more than 85% of the original bond amount may be released prior to final construction approval.

E. Maintenance Bonds

Maintenance Bonds are required to ensure the maintenance of the site improvements and to guarantee against defects of workmanship and materials for a period of two years from the date of final project approval. In the case of buffer or sensitive area mitigation, enhancement, and restoration the Maintenance Bond is typically held for either a 3 or 5-

year period depending on the permit requirements. The Maintenance Bond must be in place before the City will inspect and accept the work to release the Performance Bond or Cash set-aside.

F. Determining Bond Amount

Performance bond amounts are determined by an engineer's cost estimate or contractor's bid for the full cost (including labor, material, equipment, supervision, overhead, profit, etc.)

of all required site and public improvements and landscape work, etc., as shown on the approved civil plans. All estimates or bids shall be itemized and must include material, quantities, units and total unit price. The engineer's estimate or contractor's bid must include all site improvements, both public and private. For commercial, multi-family projects, and subdivisions, the estimate or bid must indicate the private and the public improvements separately.

The engineer's estimate or contractor's bid submitted by the developer or his/her designee, will be reviewed and verified by the City Engineer. A contingency will be established per the estimate, this additional amount is added to cover mobilization, prevailing wages, oversight, and other such costs to represent the full cost to the City to complete the construction/installation of the required improvement(s) should the developer fail to do so.

Once the engineer's estimate or contractor's bid is verified and the bond amount established and approved/accepted by the City Engineer, the bond amount will not be subsequently adjusted for changes in scope of work, materials, methods, quantities, increases or decreases, etc. that may be identified/favored by the developer.

G. Bond Release

1. *Performance Bond - Bonding Company.* This type of performance bond, whether for a building permit or short plat/subdivision, cannot be released until all bonded site improvements have been completed and approved. Once all the bonded improvements have been approved by the City's Inspector, the developer must submit to the Public Works Office Manager, a written request to release the performance bond. Before the performance bond can be released, a 2-year maintenance bond must be secured. Once the maintenance bond has been submitted and approved, the City will provide written authorization to the bonding company to release the performance bond.

A one-time bond reduction is available upon request. The contractor shall revise the cost estimate, noting the percent completion on each line item. The request shall be sent to the City Engineer for verification. A maximum of 85% of the bond may be released prior to project completion.

2. *Performance Bond-Cash set-aside*: This type of performance bond, whether for a building permit or short plat/subdivision, cannot be released until all bonded site improvements have been completed and approved. Once all the bonded improvements have been approved by the City's Inspector, the developer must submit to the Public Works Office Manager, a written request to release the performance bond. Before the performance bond can be released, a 2-year maintenance bond must be secured. Once the maintenance bond has been submitted and approved, the City will provide written authorization to the bonding company to release the performance bond.

3. *Maintenance Bond (Bonding Company Bond or Cash set-aside Account)*: Maintenance bonds will only be released upon satisfactory completion of the designated maintenance period. The holder of the bond shall send a written request for an inspection at least 30 days prior to bond expiration. The bonded improvements shall be inspected by the City's representative and written notice will be provided to the applicant that the improvements are either approved and the maintenance bond can be released, or that additional work is necessary before the bond can be released.

CHAPTER 2

STREET TYPES AND GEOMETRICS

2.1 Streets

- A. Street access and design
- B. Street use during construction

2.2 Street Classifications

- A. Function
- B. Terrain

2.3 Street Design Criteria

- A. Public Streets
- B. Private Streets
- C. Half Streets
- D. Cul-de-sacs and Eyebrows
- E. Alleys and Private Access Tracts
- F. Intersections
- G. Maximum Grade and Grade Transitions
- H. Stopping Sight Distance (SSD)
- I. Entering Sight Distance (ESD)
- J. Medians
- K. One-Way Streets
- L. Bus Zones and Turn-Outs
- M. Intersections with State or Federal Highways
- N. Slope, Wall and Drainage Easements
- O. Access and Circulation Requirements
- P. Ingress/Egress and Utility Easements
- Q. Design Variation Request

2.1 Streets – FAQ's

The City of Port Orchard review staff wants to work with you and your design consultant on the access and street frontage features of your development application. Design Elements may include site access design, curb design and location, landscape treatments, sidewalk location and width, street lighting, and paving requirements. Staff will offer guidance on the parking lot design to ensure it does not impede traffic on or to the property.

Developments such as short plats, have minimal impact on traffic volumes of the street system. However, larger retail and office proposals may have considerable impacts. The City Engineer and the Development Review staff review the traffic impacts of development proposals according to City Codes and State Law. For projects which require a Traffic Impact Analysis, the city has provided the parameters for such analysis in Appendix C of this document.

A. Street access and design?

Depending on the City's design standards for your type of project, the access to your development could be a commercial driveway, a private road, a joint-use driveway on an easement, or some other variation.

Review of your access design includes distance from neighboring access points, sight distance for drivers and pedestrians, width of the driveway, lane configurations such as turn lanes and drop-off lanes, and construction elements such as design of the driveway apron and grades.

B. Street use during construction?

Our staff will let you know early in the review process what you can expect as to right of way use requirements. If work is to be done on SR 160 or SR 166, the City will coordinate with WSDOT for concurrence of the proposed work. All roadway systems in Port Orchard have functional classifications (FCC Class); this classification will determine the potential to cut into the street fronting your site for utility work and the extent of subsequent restoration requirements. In addition, you may be required to obtain a right of way use permit for hauling during construction and for any requested street closures. The Public Works Staff processes right of way use permit applications and will work with you to determine optimal haul routes and potential lane closure details.

2.2 Street Classifications

A. Function

Function is the controlling element for classification and shall govern right-of-way, street width and street geometries. Other given elements, such as access, spacing, ADT, etc. are merely typical. City streets are functionally classified in the City of Port Orchard Comprehensive Plan Transportation Element into the four categories listed below. Development Standards are provided in Section 2.3.S, Standard Details.

1. Principal Arterial
2. Minor Arterial

3. Collector
4. Local Access Streets
 - a. Local access streets include all streets that are not functionally classified as arterials or collectors and may be further categorized as follows:
Commercial/Industrial – Commercial or industrial local access streets provide circulation and loading sites, and abut retail stores, warehouse facilities, manufacturing facilities, processing plants, dense multi-family dwellings, office and professional buildings.
 - b. Residential – Residential access streets provide circulation through single-family residential neighborhoods and access to individual lots.
 - c. Sub-Collector – Sub-collector streets provide circulation within neighborhoods and connections to neighborhood collectors and arterials. They have the potential to serve up to 100 single-family dwelling units.
 - d. Sub-Access – Sub-access streets provide connection to sub-collector streets, but do not support through-traffic. They include short through streets, cul-de-sacs and loops. Sub-access streets have the potential to serve up to 35 single-family dwelling units.
 - e. Minor Access – Minor access streets include permanent cul-de-sacs and loops. They have the potential to serve up to 16 single-family dwelling units.
5. Private Street – Private streets are privately owned and maintained, with vehicular access routes serving three or more lots, parcels or tracts, which do not have frontage on a public street right-of-way. The City of Port Orchard does not maintain private streets.

B. Terrain

Terrain is a basis for further classification of geometric requirements.

1. Flat terrain is that condition where roadway sight distances, as governed by both horizontal and vertical restrictions, are generally long or could be made to be so without construction difficulty or major expense. The slope of the existing terrain is from 0 to 5%.
2. Rolling terrain is that condition where the natural slopes consistently rise above and fall below the roadway grade line. Occasional steep slopes restrict normal roadway alignment some. The slope of the existing terrain is from 5 to 15%.
3. Mountainous terrain is that condition where longitudinal and traverse changes in ground elevation, with respect to the roadway, are abrupt and where the roadbed is obtained by frequent benching or side hill excavation. The slope of the existing terrain exceeds 15%.

Terrain classification pertains to the general character of the specific route corridor. Streets in valleys or passes of mountainous areas that have all the characteristics of streets traversing flat or rolling terrain should be classified as flat or rolling. In cases where terrain classification is in question, the City Engineer shall make the final decision.

2.3 Street Design Criteria

A. Public Streets

1. Standards for design and construction of new or reconstruction of existing arterial, commercial and industrial streets in the City of Port Orchard shall follow the criteria in AASHTO's "A Policy on Geometric Design of Highways and Streets".
2. The Developer's Engineer should consider certain factors when specifying the classification of a new public street. These include, but are not limited to, the street function, traffic volume, terrain, density of the proposed or existing development, the surrounding developments, the proposed or existing zoning, the existing roads in the immediate area, and other such factors deemed significant of the proposal being reviewed in light of public health, safety and welfare. In cases where street classification, street width and/or right-of-way width are in question, the City Engineer shall make the final decision.
3. Additional or alternate standards may be required for design and construction of new or reconstruction of existing streets within the downtown zones. Refer to the City of Port Orchard Transportation Element of the Comprehensive Plan.

B. Private Streets

1. While community vehicular access requirements may be served by public streets, owned and maintained by the City, private streets may be appropriate for some local access streets. Usually these are minor access streets, either residential or commercial.
2. Private streets may be approved only when they are:
 - a. Permanently established by tract providing legal access to each affected lot, dwelling unit, or business, and sufficient to accommodate required improvements, to include provision for future use by adjacent property owners when applicable; and
 - b. Built to City of Port Orchard Design and Construction Standards and Specifications for local access, as set forth herein and
 - c. Properly signed and are accessible at all times for emergency and public service vehicle use; and
 - d. Not obstructing, or part of, the present or future public neighborhood circulation plan developed in processes such as the City of Port Orchard Comprehensive Plan, applicable community plan, or Capital Improvement Program; and
 - e. Not going to result in land-locking of present or future parcels; and
 - f. Not needed as public streets to meet the minimum street spacing requirements of these Standards; and
 - g. Designed to serve a minimum potential of two dwelling units when the entire length of the private street system to the nearest public street is considered. The maximum potential is the number of dwelling units that can possibly be served by the street

-
- when physical barriers, zoning or other legal constraints are considered; and
- h. Maintained by a capable and legally responsible homeowners' association or other legal entity made up of all benefited property owners with an escrow account and a road maintenance agreement for all parties involved, under the provisions as established by the City of Port Orchard; and
 - i. Clearly described on the face of the short plat, or other development authorization and clearly signed at street location as a private street, for the maintenance of which City of Port Orchard is not responsible; and
 - j. A road maintenance agreement shall be established for all parcels benefitting from the access and shall be recorded prior to issuance of first Certificate of Occupancy for a structure in the development.
3. The City of Port Orchard will not accept private streets for maintenance as public streets until such streets are brought into conformance with current City of Port Orchard Design and Construction Standards and Specifications and dedicated appropriately. This requirement will include the design standards for the street classification placed upon the private street.
 4. The City of Port Orchard will not accept private streets within short plats when the streets providing access to the plat are private and already have the potential to serve more than the number of lots specified in Section 2.2.A.5 Private Streets. Short plats proposed on properties to which the access is over private streets that do not meet the standards in this section shall be denied.

C. Half Streets

1. A half street may be permitted as an interim facility only when:
 - a. Such street shall not serve as primary access to more than 16 dwelling units or tax lots; and
 - b. Such alignment is consistent with or will establish a reasonable circulation pattern; and
 - c. There is reasonable assurance of obtaining the prescribed additional right-of-way from the adjoining property with topography suitable for completion of a full-section street.
2. A half street shall meet the following requirements:
 - a. Right-of-way width of the half street shall equal at least 33 feet; and
 - b. Should be designed to accommodate ultimate section; and
 - c. Traveled way shall be surfaced the same as the designated street type to a width not less than 20 feet. Curb, planter strip and sidewalk shall be constructed as required for the designated street type; and
 - d. Interim edge of street shall be finished with shoulders, ditches, and/or side slopes so as to assure proper drainage, bank stability, and traffic safety; and

- e. Gravel shoulders shall be provided to a width of 2 feet and adequate drainage provided on the unimproved half of the street; and
 - f. Half streets shall not intersect other half streets unless so approved by the City Engineer.
3. When a half street is eventually completed to a whole street, the completing builder shall saw-cut the existing pavement along the center of right of way to establish the final centerline and shall reconstruct the original half street as necessary to produce a proper full-width street of designated section to include grinding and overlaying the original street segment from intersection to intersection.
 4. The obtaining of any right-of-way needed to accomplish the above shall be the responsibility of the owning builder or developer.

D. Cul-de-sacs and Eyebrows

1. In general, permanent cul-de-sacs and dead-end streets are discouraged in the design of street systems and should only be used when the presence of natural features; topography and/or vehicular safety factors make a vehicular connection impractical. Where cul-de-sacs or dead-end streets are unavoidable, site or subdivision plans shall incorporate provisions for future vehicular connections to adjacent, undeveloped properties, and to existing adjacent development where existing connections are poor.
2. Whenever a cul-de-sac dead end road extends more than 150 feet measured from the centerline of intersecting road to the farthest extent of surfaced traveled way, a widened "bulb" shall be constructed.

A minimum public right-of-way diameter across the bulb section shall be 100 feet. The right-of-way may be reduced with approval of the City Engineer.

Minimum diameter across the bulb shall be per the currently adopted International Fire Code.

Cul-de-sac turnarounds in areas identified as Commercial or Industrial in the adopted City of Port Orchard Comprehensive Plan Map shall have a minimum roadway diameter of 100 feet. When on-street parking is required an additional 16 feet of paving is required.

3. Whenever a non-through (dead end) street serves more than two lots or extends more than 150 feet from centerline of the accessing street to farthest extent of surfaced traveled way a widened "bulb" (cul-de-sac) shall be constructed.
4. The cul-de-sac island is an optional feature for any cul-de-sac, subject to City of Port Orchard approval. If provided, the cul-de-sac island shall have full-depth vertical curb. Minimum radius shall be 10 feet (maximum 15 feet) and shall provide at least 30 feet of paved traveled way width in a curb type section around the circumference. The island shall be landscaped and shall have adequate topsoil to support the growth of acceptable vegetation with a slope from the center of the island to the curb edge adequate to allow water runoff. Artificial materials that mimic plants or grass are not acceptable alternatives to living vegetation. The adjoining lot owners shall maintain the

vegetation.

5. A permanent cul-de-sac shall not be longer than 450 feet measured from centerline of intersecting street to the center of the bulb section along the centerline of the street. Proposed exceptions to this rule will be considered by the City Engineer based on long-term traffic planning factors such as topography and critical areas.
6. The City Engineer may require an off-street walkway and/or an emergency vehicle access to connect the cul-de-sac at its terminus with other streets, parks, schools, bus stops, or other pedestrian traffic generators, if current or future need exists.
7. If a street is temporarily terminated at a plat or phase boundary, and serves more than three parcels or is longer than 150 feet, then a temporary cul-de-sac shall be constructed at the boundary, in accordance with the Standard Details.

A barricade with a sign stating "Street to be Extended in Future" shall be installed at the terminus of the temporary cul-de-sac. Appropriate easements shall be recorded if the temporary cul-de-sac extends into the adjacent property.

Removal of the temporary cul-de-sac, restoration and extension of the sidewalk, landscape strip, storm drainage systems, and street illumination shall be the responsibility of the developer who extends the street. Plat development, as it relates to finished grade, shall allow for the logical extension of said improvements without significantly influencing the existing development and residents.

8. The maximum cross slope in a bulb shall not exceed six (6) percent in any direction.
9. Partial bulbs or eyebrows shall have a minimum paved radius and geometry of a cul-de-sac design as described above. The island shall be offset ten (10) feet from edge of traveled way.

E. Alleys and Private Access Tracts

1. An alley may be public or private.
 - a. Alleys may not create dead ends.
 - b. Alleys tracts and public ROW shall measure 20 feet in width. The minimum pavement width for an alley shall be 16 feet.
 - c. Alley entry shall be provided by a driveway cut for residential use or commercial use.

Modifications to existing alleys serving commercial or industrial properties, in accordance with the above, will be determined on a case-by-case basis subject to approval by the City.

2. Private residential access tracts shall conform to the following:
 - a. Serves a maximum of two remote parcels, where the two adjoining lots to the access tract that abut a public way shall also gain access via the access tract.

Minimum tract width of 20 feet with a maximum length of 150 feet, measured from

centerline of intersecting street to furthest extent of paved tract along the centerline of the street.

- b. Pavement width shall be a minimum of 16 feet.
- c. Easements may be required for utilities and/or drainage.

F. Intersections

1. Intersection Geometry

a. All intersections shall be designed at right angles to the intersecting street, unless approved by the City Engineer. The skew angle shall not vary by more than 15 degrees from a right angle, measured 20 feet beyond the intersecting right-of-way. At four-legged intersections, opposite legs shall lie on a straight alignment.

b. Required curb radius

Streets Classified Collector or higher	30 Feet Local
Access Streets	20 Feet

c. Minimum right-of-way line radius at the back of sidewalk

Local Access	30 Feet
Commercial	35 Feet
Arterial	50 Feet

2. Spacing between adjacent intersecting streets, whether crossing or T-connecting, shall be as follows:

When highest classification involved is: Minimum centerline offset shall be:

Arterial (Principal and Minor)	1,000 Feet
Collector Arterial	500 Feet
Local Access	150 Feet
Alley	100 Feet

3. On sloping approaches at an intersection, landings shall conform to AASHTO standards (Intersection Landing).

G. Maximum Grade and Grade Transitions

1. Acceptable grade to assure proper emergency access, sight distance and stormwater management is an important consideration for the design of a roadway. Maximum grades can vary with road use. A steeper grade may be more acceptable on an urban residential road than on a rural road serving heavy trucks. Intersections on steep grades should be avoided whenever possible, especially in areas with recurring snow and ice problems. Ease of access for an emergency vehicle is also to be considered when establishing grades. For projects, AASHTO's "A Policy on Geometric Design of Highways and Streets" includes tables of maximum grades related to design speed and terrain.

The maximum centerline grade on any new or reconstructed road shall not exceed 12

percent.

The maximum grade across a cul-de-sac bulb shall not exceed 6 percent. With curbed roadways, longitudinal grades should be provided to facilitate surface stormwater management. An appropriate minimum grade is typically 0.5 percent. Particular attention should be given to the design of stormwater inlets and their spacing to keep the distance of water on the traveled way within tolerable limits.

2. Grade transitions shall be constructed as smooth vertical curves except in instances where the difference in grade is one percent or less and upon approval of the City Engineer. The minimum vertical curve length shall be determined by multiplying the algebraic grade difference by the minimum K-value for the vertical curve type and applicable street classification. Maximum K-values for sag vertical curves on residential access streets are required for adequate street drainage.

H. Stopping Sight Distance (SSD)

Stopping sight distance (SSD) for streets please refer to "AASHTO's "A Policy on Geometric Design of Highways and Streets" for specific SSD values based on required design speed.

1. Height of eye is 3.5 feet and height of object is 0.5 feet.
2. Minimum SSD for any downgrade averaging three percent or steeper shall be increased per AASHTO.
3. Sag vertical curves on local access streets with stopping sight distance less than that called for in the table "Residential Access Street Design Elements" in Section 2.3.A may be approved by the City Engineer under the following circumstances:
 - a. No practical design exists,
 - b. Acceptable street lighting is provided throughout the curve, and
 - c. Street lighting is maintained by a franchised utility.
4. Intersecting Stopping Sight Distance.
 - a. Stopping sight distances for the design speeds of proposed commercial access streets, neighborhood collector streets and arterials must be met when intersecting arterials.
 - b. The minimum stopping sight distance on proposed intersection approaches for all other classifications of intersecting streets shall be reviewed with the City Engineer.

I. Entering Sight Distance (ESD)

Entering sight distance (ESD) applies on driveways and on streets approaching intersections. Specific ESD values for required design speeds are listed in the table "Arterial and Commercial/Industrial Street Design Elements" in Section 2.3.A of AASHTO.

1. Entering vehicle eye height is 3.5 feet, measured from 10 feet from edge of traveled way. Approaching vehicle height is 4.25 feet.
2. Requirements in the Standard Details apply to an intersection or driveway approach to a

typical street under average conditions. In difficult topography, the City Engineer may authorize a reduction in the ESD based on factors mitigating the hazard. Such factors may include an anticipated posted or average running speed less than the design speed or the provision of acceleration lanes and/or a median space allowing an intermediate stop by an approaching vehicle making a left turn.

3. Where a significant number of trucks will be using the approach street, the City Engineer may increase the entering sight distance requirements by up to 30 percent for single-unit trucks and 70 percent for semi-trailer combinations.

J. Medians

1. Median width shall be 8 feet wide between travel lanes and three feet wide between a travel and turning lane and be additional to, not part of, the specified width of traveled way.
2. Edges shall be similar to outer street edges, formed with vertical Portland cement concrete curb.
3. Twenty feet of drive surface (which includes traveled way, bike lanes, paved shoulders, and mountable curbing) shall be provided on either side of the median, or as approved by the City Engineer and Fire Marshal.
4. Medians shall be designed so as not to limit turning radii or sight distance at intersections.
5. No portion of a side street median may extend into the right-of-way for an arterial street. However, a bullnose shall be provided at intersections with pedestrian refuge at marked crossings.
6. The City Engineer may require revisions to medians as necessary to maintain required sight distance.
7. Street trees planted in median shall be from the approved list in the POMC unless otherwise approved by the City Engineer.

K. One-Way Streets

Local access streets, including loops, may be designated one-way upon a finding by the City Engineer and Fire Marshall that topography or other site features make two-way traffic impractical or to improve pedestrian safety.

L. Bus Zones and Turn-Outs

During the design of arterials and neighborhood collectors, the designers shall contact Kitsap Transit Service Planning, , and the local school district to determine bus zone (stop) locations and other bus operation needs. The street project shall provide wheel chair accessible landing pads at designated bus zones where required, shall include turn-outs and shelter pads. Pedestrian and handicapped access improvements within the right-of-way to and from the bus-loading zone or turnout from nearby businesses or residences shall also be provided as part of the street improvement. Surfacing requirements may also be affected, particularly on shoulders.

M. Intersections with State or Federal Highways

If the City has jurisdiction on a development that requires the construction or improvement of a residential/commercial/industrial driveway or any classification of street that intersects a state or federal highway, minimum intersection spacing, entering sight distance and landing requirements in accordance with these Standards shall be satisfied in addition to the requirements of all other applicable permits. In the instance State or Federal standards exceed these Standards, State or Federal standards shall govern.

N. Slope, Wall and Drainage Easements

Either the functional classification or particular design features of a street may necessitate slope, sight distance, and wall or drainage easements beyond the right-of-way line. Such easements may be required by the City Engineer in conjunction with dedication or acquisition of right-of-way and required to be obtained by the Developer.

O. Roadway Network Connectivity

All proposed developments must have a connectivity index of 1.4 or greater. The connectivity index shall be calculated by dividing the total number of links (streets including stub-out streets) by the total number of nodes (intersections, cul-de-sac, no-outlets, dead-ends).

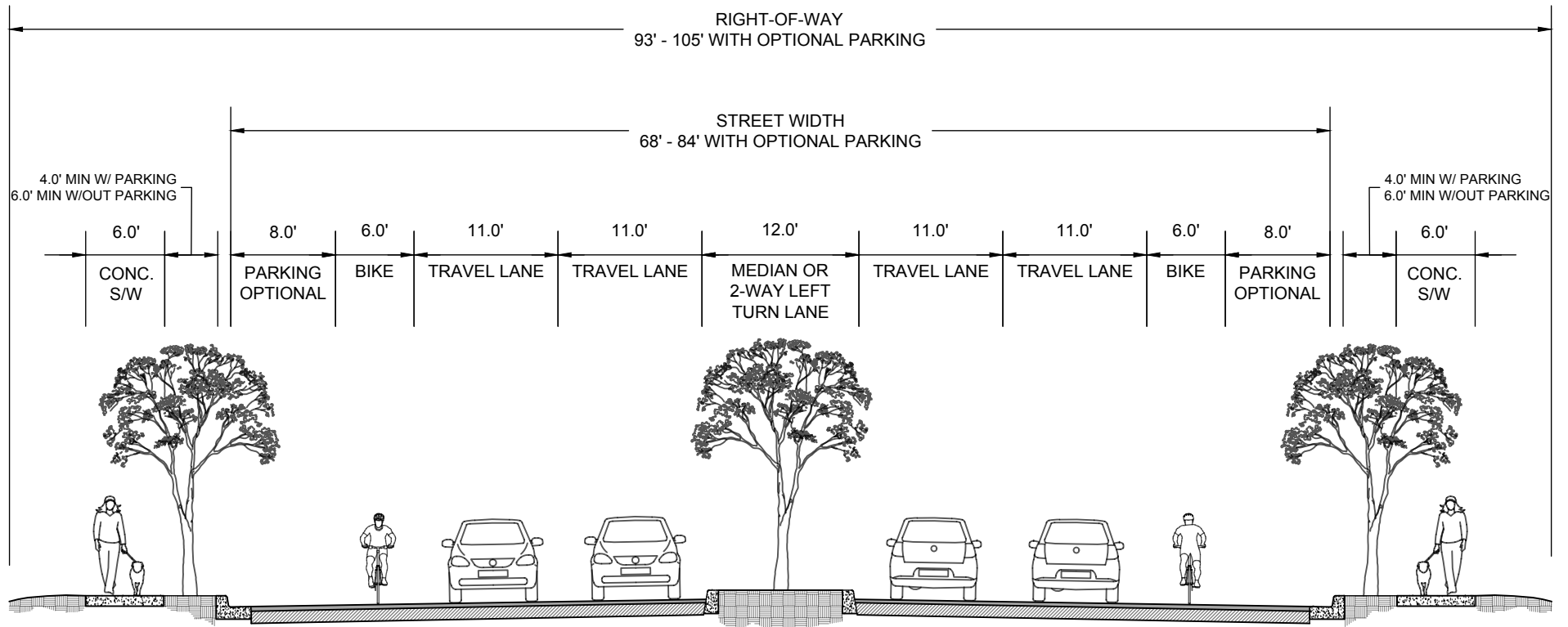
P. Ingress/Egress and Utility Easements

For access to a parcel(s) which must cross a property adjacent to City Right-of-Way, an ingress/egress and utility easement shall be required. The easement shall be a minimum width of 18 feet. The easement shall be recorded and a copy of the recorded document submitted with the Final Plat Application.

Q. Design Variation Request

If the applicant/developer is unable to meet the standards as adopted in the Development Guidelines, a Design Variation Request Application may be submitted to the City Engineer for review. This application shall be submitted as part of the Land Disturbing Activity Permit (LDAP) Application.

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NOTES:

- (1) PROVIDE PAVED CLEAR ZONE THROUGH THE MEDIAN EVERY 400-FT CLEARLY SIGNED FOR EMERGENCY VEHICLES ONLY.
- (2) BIKE LANE TO BE PROVIDED WHERE INDICATED IN CITY'S NON-MOTORIZED TRANSPORTATION PLAN AND IS TO BE OPTION ELSEWHERE.

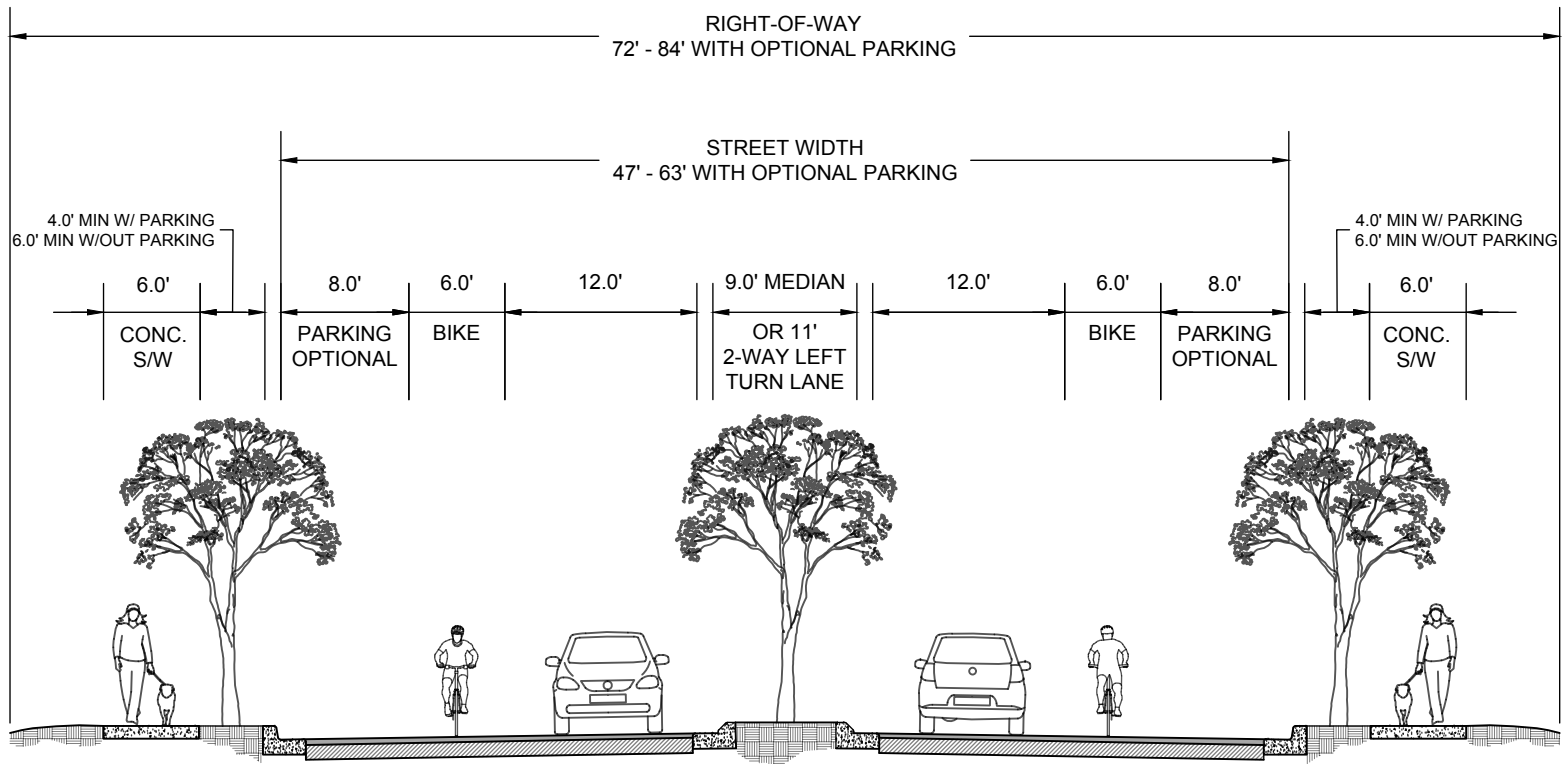


PRINCIPAL ARTERIAL A

FOUR LANES (WITH CENTER LANE OR MEDIAN) & BIKE LANES

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DRAWN BY	IDS
DATE	1/24/2019
SCALE	NTS
DRAWING NUMBER	200



NOTES:

- (1) THE MEDIAN SHALL HAVE MOUNTABLE TRAFFIC CURBS WITH GUTTER PER WSDOT STANDARD PLAN F-10.12-03.
- (2) PROVIDE PAVED CLEAR ZONE THROUGH THE MEDIAN EVERY 400-FT CLEARLY SIGNED FOR EMERGENCY VEHICLES ONLY.
- (3) BIKE LANE TO BE PROVIDED WHERE INDICATED IN CITY'S NON-MOTORIZED TRANSPORTATION PLAN AND IS TO BE OPTION ELSEWHERE.



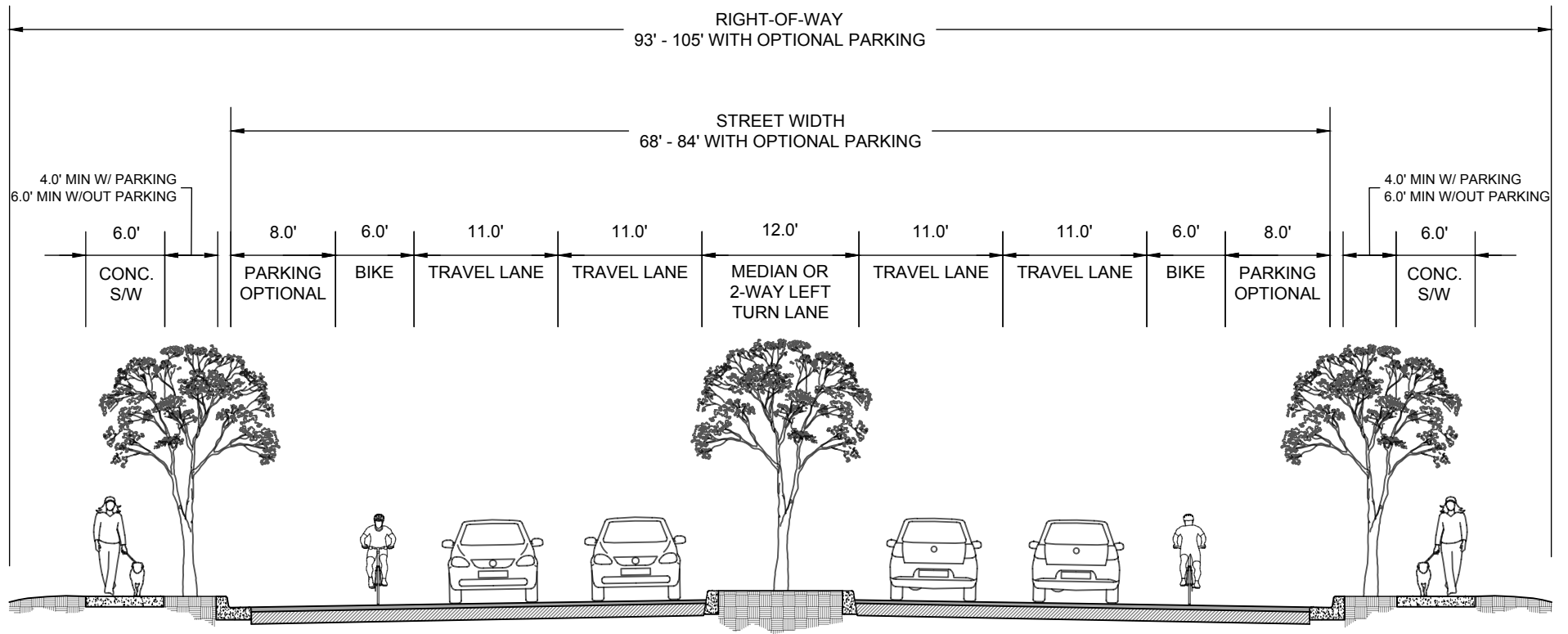
PRINCIPAL ARTERIAL B

TWO LANES (WITH CENTER LANE OR MEDIAN) & BIKE LANES

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NOTES:

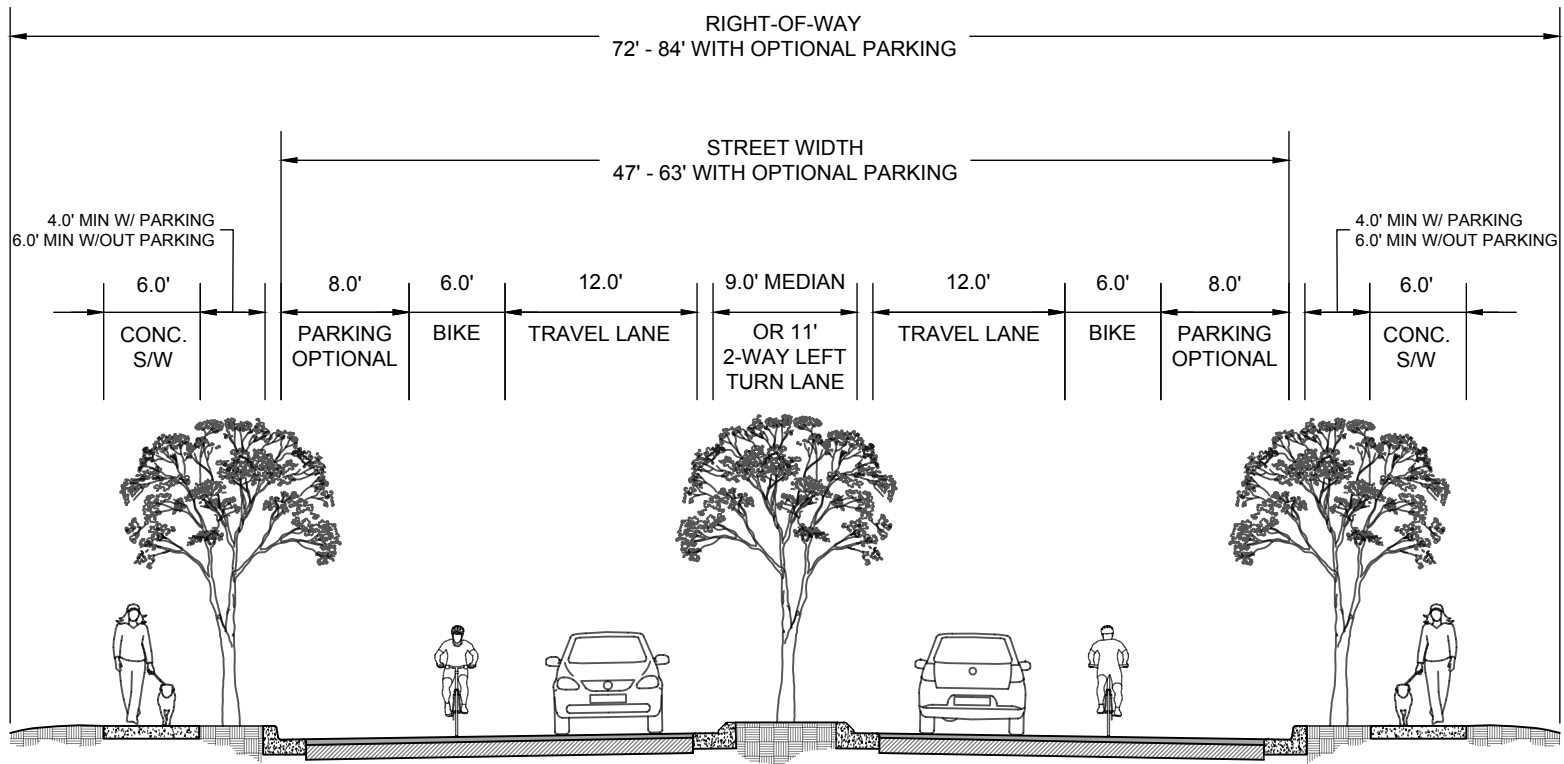
- (1) PROVIDE PAVED CLEAR ZONE THROUGH THE MEDIAN EVERY 400-FT CLEARLY SIGNED FOR EMERGENCY VEHICLES ONLY.
- (2) BIKE LANE TO BE PROVIDED WHERE INDICATED IN CITY'S NON-MOTORIZED TRANSPORTATION PLAN AND IS TO BE OPTION ELSEWHERE.



MINOR ARTERIAL A

FOUR LANES (WITH CENTER LANE OR MEDIAN) & BIKE LANES

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DATE	1/15/2019
SCALE	NTS
DRAWING NUMBER	220



NOTES:

- (1) THE MEDIAN SHALL HAVE MOUNTABLE TRAFFIC CURBS WITH GUTTER PER WSDOT STANDARD PLAN F-10.12-03S
- (2) PROVIDE PAVED CLEAR ZONE THROUGH THE MEDIAN EVERY 400-FT CLEARLY SIGNED FOR EMERGENCY VEHICLES ONLY.
- (3) BIKE LANE TO BE PROVIDED WHERE INDICATED IN CITY'S NON-MOTORIZED TRANSPORTATION PLAN AND IS TO BE OPTION ELSEWHERE.

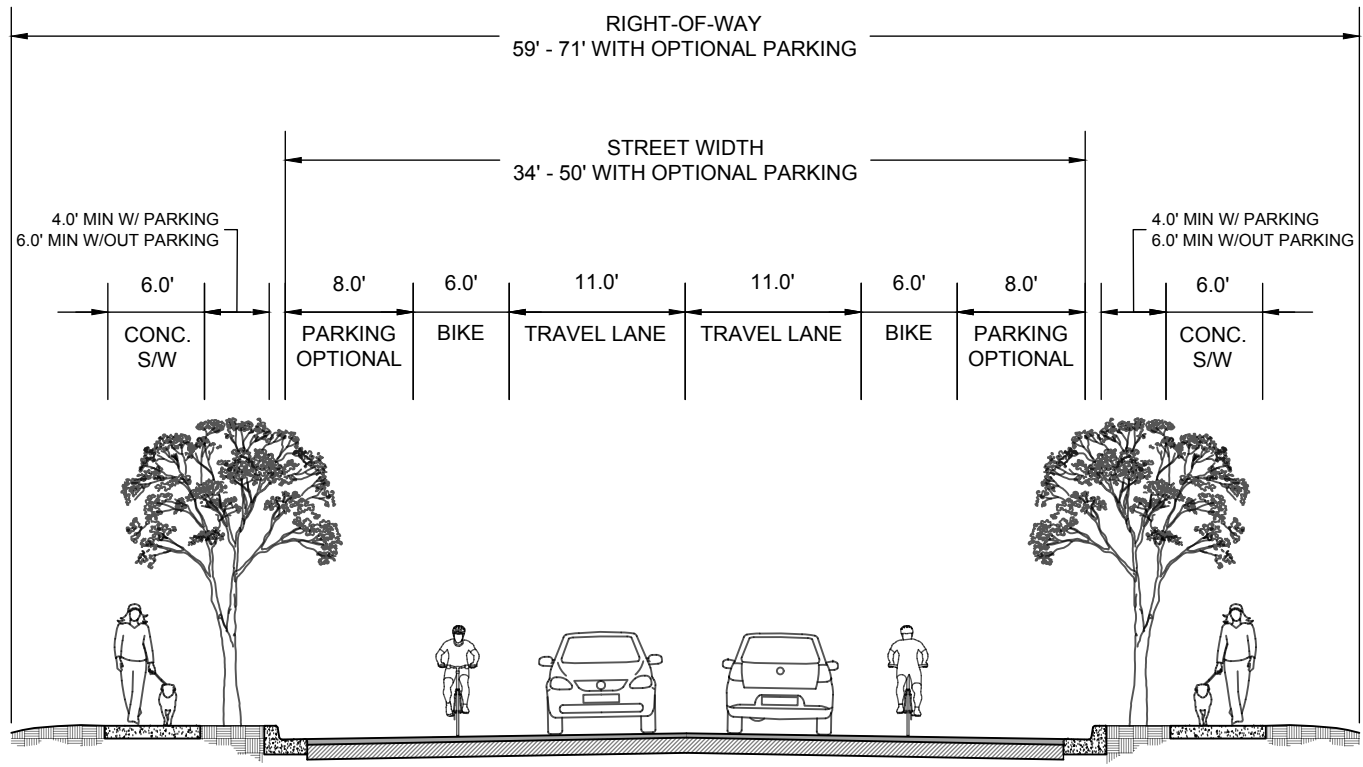


MINOR ARTERIAL B

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NOTES:

(1) BIKE LANE TO BE PROVIDED WHERE INDICATED IN CITY'S NON-MOTORIZED TRANSPORTATION PLAN AND IS TO BE OPTION ELSEWHERE.

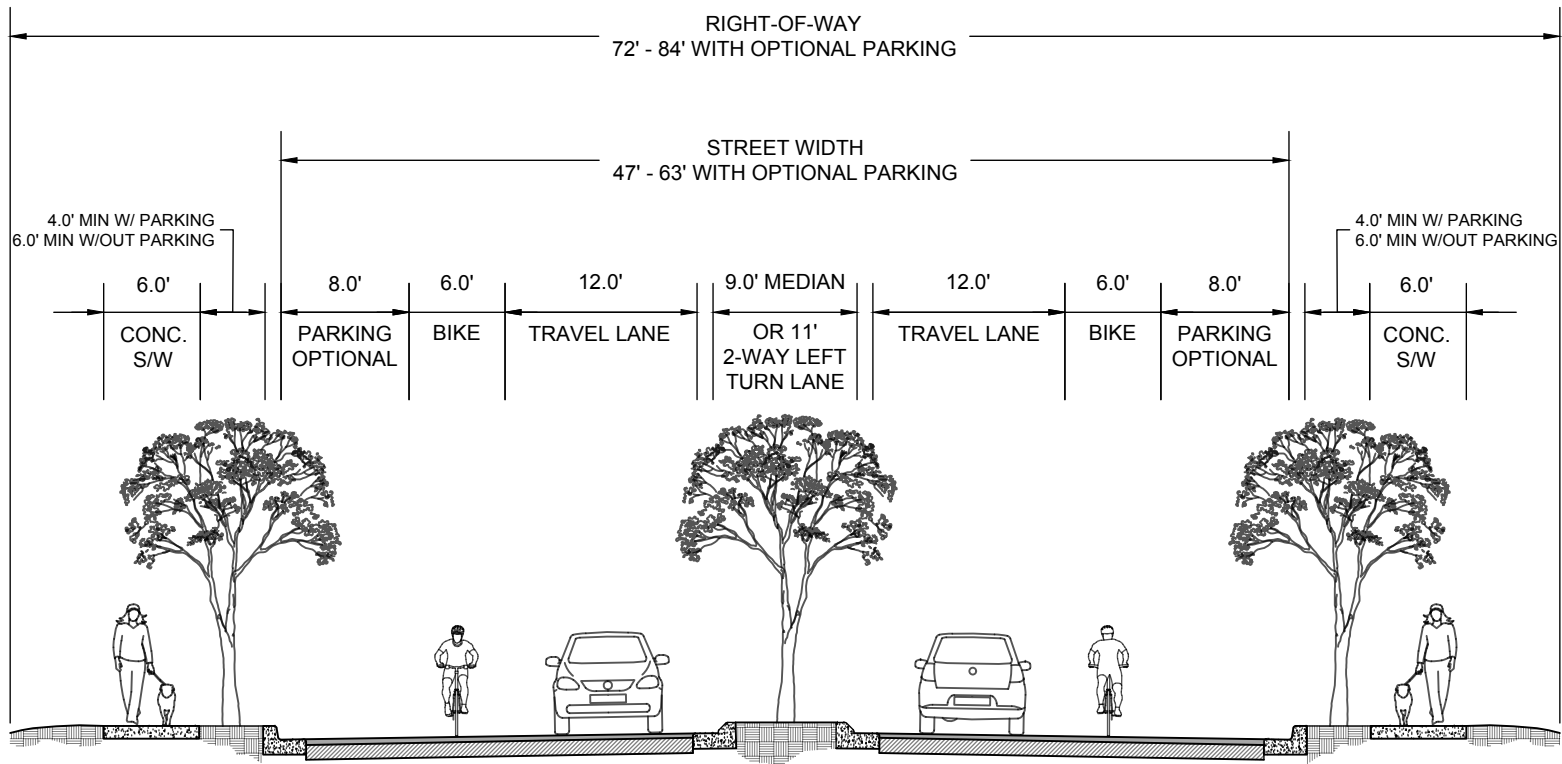


MINOR ARTERIAL C

TWO LANES & BIKE LANES

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SCALE	NTS
DRAWING NUMBER	222



NOTES:

- (1) THE MEDIAN SHALL HAVE MOUNTABLE TRAFFIC CURBS WITH GUTTER PER WSDOT STANDARD PLAN F-10.12-03.
- (2) PROVIDE PAVED CLEAR ZONE THROUGH THE MEDIAN EVERY 400-FT CLEARLY SIGNED FOR EMERGENCY VEHICLES ONLY.
- (3) BIKE LANE TO BE PROVIDED WHERE INDICATED IN CITY'S NON-MOTORIZED TRANSPORTATION PLAN AND IS TO BE OPTION ELSEWHERE.

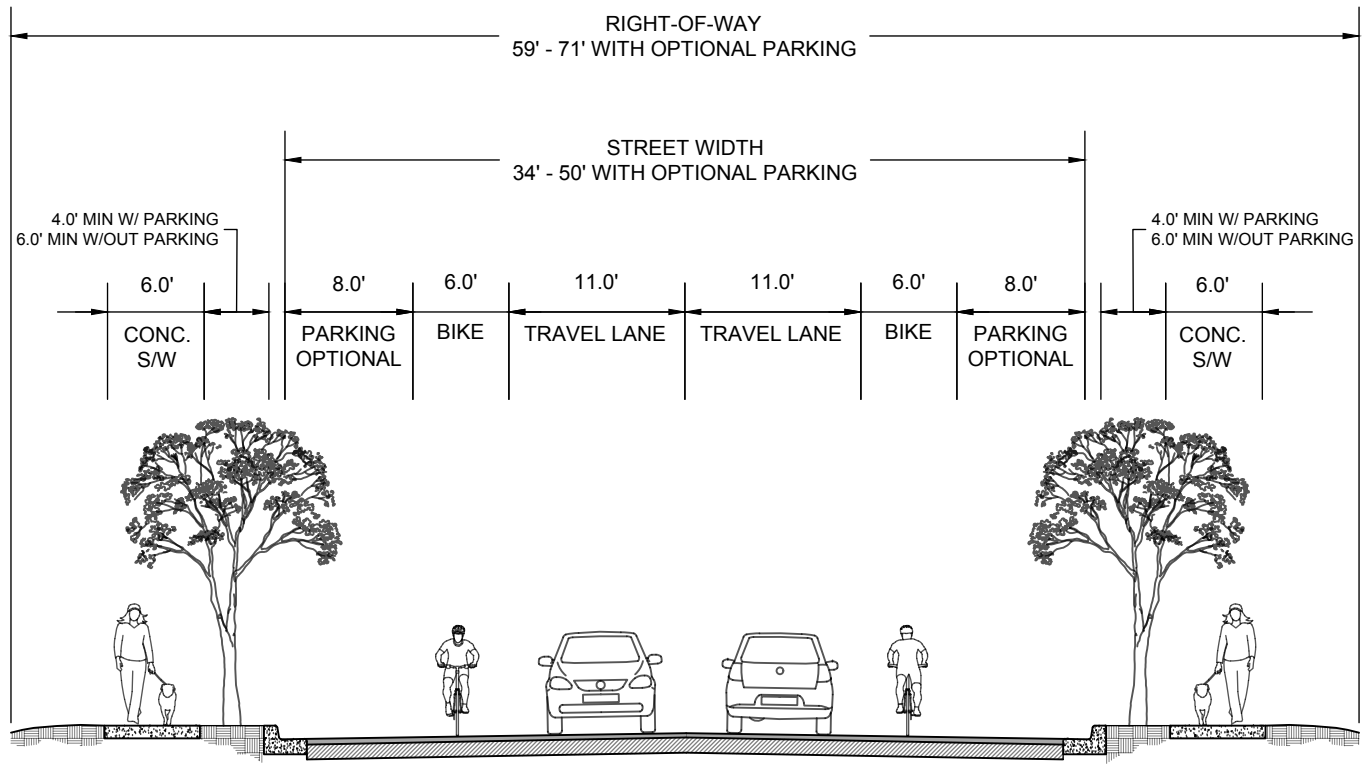


COLLECTOR A

TWO LANES (WITH CENTER LANE OR MEDIAN) & BIKE LANES

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NOTES:

(1) BIKE LANE TO BE PROVIDED WHERE INDICATED IN CITY'S NON-MOTORIZED TRANSPORTATION PLAN AND IS TO BE OPTION ELSEWHERE.



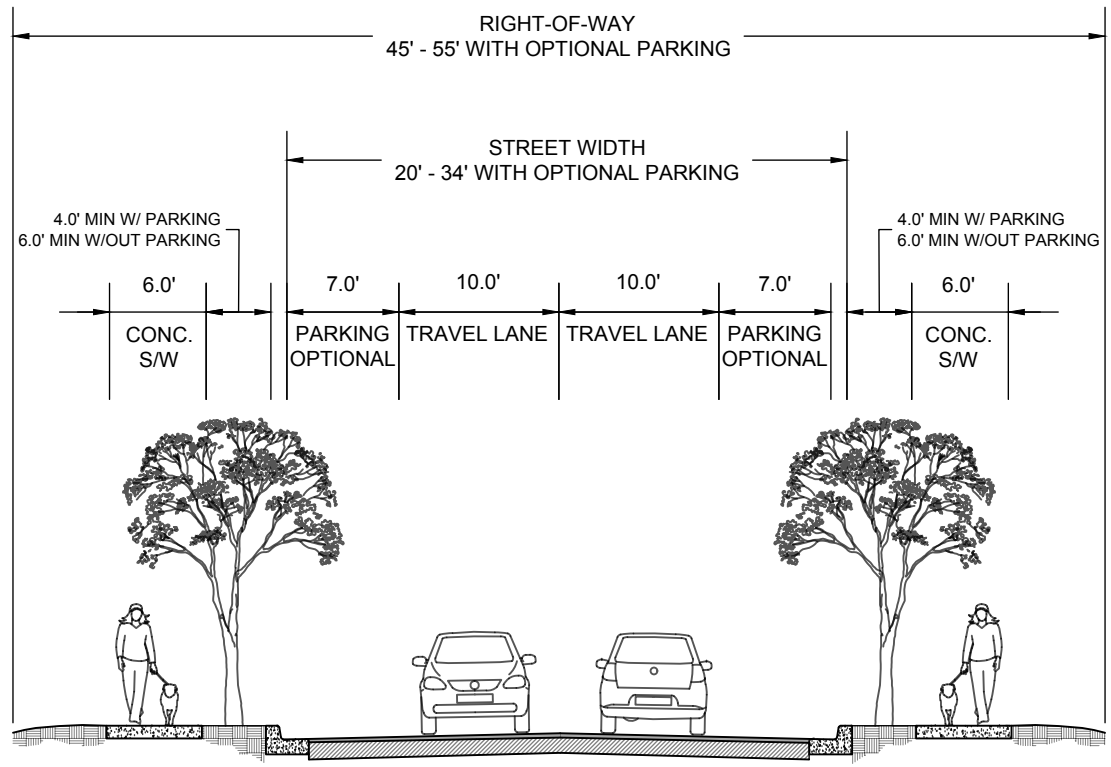
COLLECTOR B

TWO LANES & BIKE LANES

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LOCAL A

TWO LANES
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CHAPTER 3

DRIVEWAYS, SIDEWALKS, CURBS, AND TRAILS

3.1 Overview

3.2 General Design Guidelines

- A. Sub-grade
- B. Surfacing Material
- C. Curbs
- D. Replacement

3.3 Driveways

- A. Driveway Design
- B. New/Replaced Commercial Driveways
- C. Prohibited Driveways

3.4 Sidewalks

- A. Design Guidance
- B. Curb Ramps
- C. Concrete Steps
- D. ADA Access Ramps

3.5 Curb and Gutters

- A. Vertical Curbs and Rolled Curbs

3.6 Expansion Joints

- A. Design Guidance

3.7 Pedestrian and Bicycle Paths

- A. Separated Pedestrian Trails
- B. Bikeways
- C. Asphalt Shoulder Trails

3.1 Overview

This material will provide for uniform design in the City of Port Orchard. This should be used in conjunction with the Port Orchard Municipal Code and the current adopted Standard Specifications for Public Works.

The attached Standard Plans have been comprehensively updated and supersede all previous Standard Plans. In some cases, Standard Plans previously used have been modified or deleted. In other instances, new Standard Plans have been added.

3.2 General Design Guidance – Driveways, Sidewalks, Curbs, and Gutters

A. Sub-grade

Sub-grade compaction for driveways, sidewalks, curbs, and gutters shall meet a minimum 95 percent of maximum density.

B. Surfacing Material

Concrete for driveways, sidewalks, curbs, and gutters shall be Class 4000, furnished and placed in accordance with Sections 5-05, 6-02, 8-04, 8-06 and 8-14 of the current WSDOT Standard Specifications. Cold weather precautions as set forth in WSDOT Standard Specification 5-05.3(14) and 6-02.3(6) A shall apply.

C. Curbs

1. Extruded cement concrete curb shall be anchored to existing pavement by an epoxy resin in conformance with Section 9-26 of the current WSDOT Standard Specifications.
2. Extruded asphalt curbs shall be anchored by means of a tack coat of asphalt in accordance with Section 8-04 of the current WSDOT Standard Specifications.
3. For any curb grade less than 0.8%, including curb returns, a professional Land Surveyor shall verify that the curb forms or string lines are at the grades noted on the approved plans prior to placement of concrete. The contractor is responsible for survey coordination and costs.

D. Replacement

Replacement of any portion of an existing driveway, sidewalk, or curb shall be from nearest joint to nearest joint, as depicted in the Standard Details.

3.3 Driveways

A. Driveway Design

1. Driveway Details
 - a. Dimensions, slope, and detail shall be as indicated in the Standard Details and as further specified in the following subsections. See Standard Detail 320 (DrivewaysA – Entering Sight Distance), for entering sight distance requirements on arterials or commercial/industrial streets.
2. Conditions for Approval
 - a. Driveways directly giving access onto arterials will be denied if alternate access is available.
 - b. All abandoned driveway areas on the same frontage shall be removed and the curbing and sidewalk plus landscape strip installed to these standards shall be properly restored.
 - c. Maintenance of driveway approaches shall be the responsibility of the owner(s) whose property they serve. The City is only responsible for removal of sediment as part of the ditch cleaning process.
 - d. For driveways crossing an open ditch section, culverts shall be adequately sized to carry anticipated stormwater flows and in no case be less than 12 inches in diameter. The property owner making the installation shall be responsible for obtaining a Right-of-Way Permit. The City Engineer shall require the owner to verify the adequacy of pipe size.
3. New/Replaced Residential Driveways
 - a. A residential driveway shall serve only one parcel. A driveway serving more than one parcel shall be classified as a commercial driveway or a private street, except as provided in 3.3.A.3.b.i.
 - b. No portion of the driveway shall be allowed within 5 feet of side property lines or 9 feet in commercial areas.
 - i. A joint use driveway may be used to serve two to four parcels. The minimum driveway width for a joint use driveway shall be a 20-foot paved surface, unless the structures are sprinklered, then it will be 15 foot paved surface with an 18 foot minimum easement.
 - ii. One cul-de-sac bulb as necessary for proposed residential access.
 - c. Maximum driveway grade: 12% residential, 8% commercial.
 - d. Maximum driveway width serving a single-family or duplex use shall consistent with the requirements of POMC 20.139.020, excluding the flared width of the apron ramps. Placement of storm gratings, utility and access covers, ADA ramps, and other appurtenances shall not be located within the width of the driveway.
 - e. Driveway locations and widths shall be shown on the design plans prior to final approval.
 - f. Residential driveways shall be separated by at least 40 feet measured from the centerline of the nearest driveway to the centerline of the proposed driveway and

nearest curb return of nearest road intersection.

- g. Refer to Standard Detail 321 (Driveways B – Residential Driveway).

B. New/Replaced Commercial Driveways

1. For commercial or industrial driveways with heavy traffic volumes or significant numbers of trucks, the City Engineer may require construction of the access as a street intersection. This requirement will be based on traffic engineering analysis submitted by the applicant that considers, among other factors, intersection spacing, sight distance, and traffic volumes. Otherwise, commercial or industrial driveways shall be designed and constructed in accordance with the Standard Details.
2. In commercial, multi-family, and industrial developments, lane connections shall be provided between adjacent properties and parking areas shall be interconnected to allow traffic to move freely between properties without the need to access public streets.
3. Placement of storm gratings, utility and access covers, and other appurtenances shall not be located within the width of the driveway.
4. Driveway locations and widths shall be shown on the design plans prior to final approval.
5. Please refer to Standard Detail 322 (Driveways C – Commercial Driveway).
6. Commercial driveways shall be separated by at least 80 feet measured from the centerline of the nearest driveway to the centerline of the proposed driveway and from nearest curb return of nearest road intersection

C. Prohibited Driveways

Notwithstanding any other provisions, driveways will not be allowed where they are prohibited by separate City Council action or where they are determined by the City Engineer to create a hazard or impede the operation of traffic on the street.

3.4 Sidewalks

A. Design Guidance

1. Sidewalks shall be required on both sides of all public streets and private streets serving more than 9 lots and on one side of private streets serving 1 to 8 residential lots. Refer to Standard Drawings for Street Sections for further information.
2. Covered walkways are allowed within multi-family dwelling complexes and commercial and industrial areas.
3. School access required as part of development approval shall be provided by a concrete sidewalk or asphalt walkway.
4. Sidewalks shall be constructed as follows:
 - a. Abutting planting strips where planting strips are to be constructed.
 - b. At least 6-feet wide where a planting strip is provided and 7-feet when abutting the back of the curb along residential streets. . The full width of sidewalk shall be clear of mailboxes, utilities or other obstructions.
 - c. At least eight feet wide in business/commercial districts where a planting strip is provided and 10 feet when abutting the back of curb.

- d. In designated bus zones to provide a landing area for wheelchair access to transit services.
 - e. With specified width greater than 10 feet where City Engineer determines this is warranted by expected pedestrian traffic volume.
 - f. With Portland cement concrete surfacing as provided in this chapter. See specifications for expansion joints. Refer to Standard Detail 340 (Sidewalks A – Cement Concrete Sidewalk).
5. Utility poles, pedestals, covers or any other appurtenance shall be prohibited within new sidewalks, unless specifically approved by the City Engineer.
 6. Sidewalks shall be designed to create straight pedestrian through movements.
 7. Sidewalks shall not be allowed to abut the back of a vertical curb unless approved by the City Engineer.

B. Curb Ramps

1. See Standard Detail 341 (Sidewalks B – Wheel Chair Ramps).
2. On all streets with vertical curb, ramped sections to facilitate passage of ADA accessible persons shall be constructed through curb and sidewalk at street intersections and other crosswalk locations.
3. Where a ramp is constructed on one side of the street, a ramp shall also be provided on the opposite side of the street. Curb ramps shall be positioned so that a ramp opening is situated within the marked crosswalk or crossing area if unmarked.
4. Placement of storm gratings, utility and access covers, and other appurtenances shall not be located on curb ramps, landings or gutters within the pedestrian access route.
5. Directional curb ramps shall be designed as a continuation of the pedestrian through movement.

C. Concrete Steps

Steps shall only be used where acceptable alternative access is available for ADA access and there is a need for a separate stairway. Where used, concrete steps shall be constructed in accordance with Standard Detail 342 (Sidewalks C – Concrete Steps and Metal Handrail), or other design acceptable to the City Engineer and consistent with ADA standards.

D. ADA Access Ramps

Ramps used to provide ADA access shall have a maximum slope of 12:1 with a maximum rise of 30 inches between landings and a maximum 2% cross-slope in all directions. Landings shall have a minimum dimension of four feet.

3.5 Curb and Gutters

A. Vertical Curbs and Rolled Curbs

1. Please refer to Standard Detail 300 (Curb and Gutter A – Cement Concrete Curb and Gutter).

2. Rolled Curbs are only allowed on residential local access roads.
3. Rolled Curbs are only allowed in conjunction with a landscape strip with a 5-foot minimum width.

3.6 Expansion Joints

A. Design Guidance

1. See Standard Details: 321 (Driveways B – Residential Driveway), 522 (Driveways C – Commercial Driveway), 540 (Sidewalks A – Cement Concrete Sidewalk), and 500 (Curb and Gutter A – Cement Concrete Curb and Gutter).
2. An expansion joint consisting of 3/8" or 1/2" x full depth of pre-molded joint material shall be placed around fire hydrants, poles, posts, and utility castings, and along walls or structures in paved areas. Joint material shall conform to the requirements of ASTM D994 (AASHTO M33-99-UL).
3. A control joint consisting of 3/8" or 1/2" x 2" of pre-molded joint material shall be placed in curbs and sidewalks at 10' intervals. Interval spacing may vary up to 1 ft to create consistent curb and sidewalk section lengths between curb returns, drainage structures, and driveways, and to avoid sections of less than 5 feet.
4. When curbs and/or sidewalks are placed by slip forming, a pre-molded joint strip up to 1/2" thick and up to full depth may be used.
5. Control joints in the sidewalk shall align with the joints in the curb, whether sidewalk is adjacent to curb or separated by planting strip.
6. Tool marks consisting of 1/4" V-grooves shall be made in sidewalk at five-foot intervals or equal to width of sidewalk, intermediate to the control joints.
7. As an alternative to expansion joints around structures, reinforcing bars may be embedded in concrete on four sides of structures.

3.7 Pedestrian, Bicycle, and Equestrian Trails

A. Separated Pedestrian Trails

1. Separated pedestrian trails shall be provided where designated in community and functional plans or where required by the City Engineer because of anticipated significant public usage.
2. Separated facilities are typically located on an easement or within the right-of-way when separated from the street by a drainage ditch, planter strip, or barrier. Where separate walkways, bikeways, or trails intersect with motorized traffic, sight distance marking and signalization (if warranted) shall be as provided.
3. When grade separated pedestrian trails are provided running parallel to an adjacent roadway, required sidewalks on the same side of the road may be waived at the discretion of the City Engineer.

4. Facilities shall be designed as follows:
 - a. Separated asphalt walkways are designed primarily for pedestrians and are typically located within the right-of-way or easement. Minimum width shall be 10 feet wide with asphalt surfacing. Surfacing shall consist of two inches asphalt concrete (AC) over four inches of crushed surfacing base course compacted to a minimum density of 90%.
 - b. Neighborhood pathways or soft surface facilities designed for pedestrians. Such pathways shall be a minimum five feet wide with at least two-foot clearance to obstructions on both sides and 10-foot vertical clearance.
 - c. Pathways shall be designed and located to avoid drainage and erosion problems. Pathways shall be constructed of an ADA compliant material approved by the City Engineer.
 - e. See Standard Detail 360 (Pedestrian, Bicycle and Equestrian Trails A – Separated Pedestrian Trail).
 - f. Multipurpose trails are typically designated for bicycle and pedestrian use and, in general, follow a right-of-way independent from any street. Multipurpose trails shall be designed to bicycle path standards as described in Standard Detail 361 (Pedestrian, Bicycles and Pedestrian Trails B – Bikeways).

B. Bikeways

1. Bikeways are generally shared with other transportation modes, although they may be provided exclusively for bicycle use. Bikeways are categorized below based on degree of separation from motor vehicles and other transportation modes. Bikeways are categorized as follows:
 - a. Bike Lane (Class II): A portion of the street that is designated by pavement striping for exclusive bicycle use. Bicycle lanes may be signed as part of a directional route system. Bicycle lanes are five feet wide on a curbed street and minimum four feet wide as a paved shoulder bike lane.
 - b. Wide Curb Lane (Class III): A street that provides a widened paved outer curb lane to accommodate bicycles in the same lane as motor vehicles. Lane width shall be increased at least three feet.
 - c. Shared Street: All streets not categorized above where bicycles share the street with motor vehicles.
 - d. Please refer to Standard Detail 361 (Pedestrian, Bicycles and Pedestrian Trails B – Bikeways).
2. A bikeway shall be provided:
 - a. When called for in the City of Port Orchard Comprehensive Plan Transportation Element, or another adopted plan.
 - b. When substantial bike usage is expected, which would benefit from construction of a bicycle facility.
3. Striping and signing shall be implemented as follows:
 - a. Pavement markings shall be used on bike lanes and paths according to the current City of Port Orchard adopted MUTCD and WSDOT design manuals.

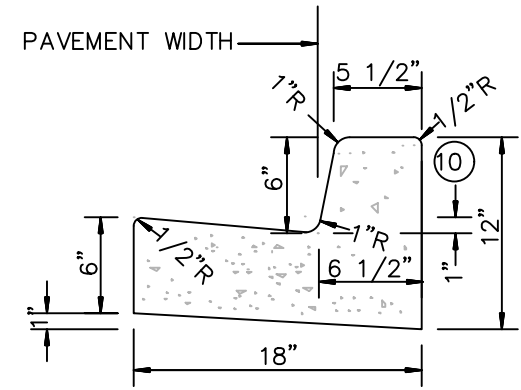
- b. NOTE: Do not use thermoplastic or RPMs in bicycle lane area.
- c. The design of all signalized intersections shall consider bicycle usage and the need for bicyclists to actuate the signal.
- d. The planning and design of bikeways in any category shall be in accordance with Section 1020 of the WSDOT Design Manual and the current edition of the National Association of City Transportation Officials Urban Bikeway Design Guide.

C. Asphalt Shoulder Trails

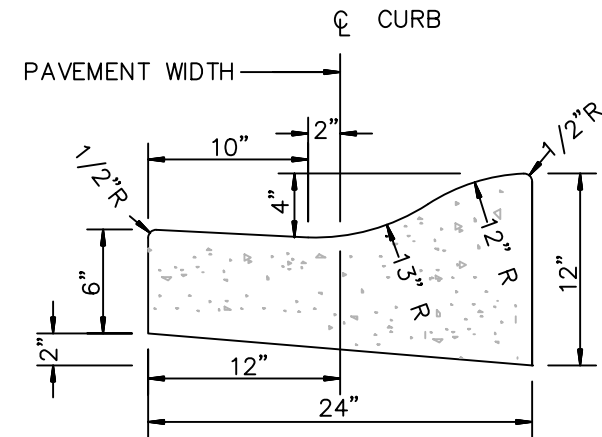
1. Asphalt paved shoulders may be used where approved by the City Engineer on existing streets to provide for bicycle and pedestrian use to provide continuity of design provided the shoulder meets the minimum requirements for a bike lane described in the current edition of the National Association of City Transportation Officials Urban Bikeway Design Guide.
2. Where shoulders are paved on one side only, a six-inch white thermoplastic edgeline shall delineate them.

NOTES:

1. CONSTRUCTION OF CURB DETAILS SHALL BE IN ACCORDANCE WITH THE CURRENTLY ADOPTED STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION AS PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND THE AMERICAN PUBLIC WORKS ASSOCIATION. (WSDOT/APWA SPECIFICATIONS) UNLESS OTHERWISE MODIFIED BELOW.
2. ALL CONCRETE SHALL BE COMMERCIAL CLASS PER WSDOT/APWA SPECIFICATIONS.
3. FORMS SHALL BE TRUE TO LINE AND GRADE AND SECURELY STAKED. STEEL FORMS ONLY SHALL BE USED ON TANGENT SECTIONS. WOOD FORMS MAY BE USED ON CURVED SECTIONS.
4. FULL DEPTH EXPANSION JOINTS CONSISTING OF 3/8 INCH MINIMUM PREMOLDED JOINT MATERIAL SHALL BE PLACED ADJACENT TO CATCH BASINS, INLETS AND AT POINTS OF TANGENCY ON STREETS AND DRIVEWAY RETURNS. MAXIMUM SPACING SHALL BE 20 FEET.
5. CONTRACTION JOINTS (DUMMY JOINTS) CONSISTING OF 3/8" MIN. X 2" OF PREMOLDED JOINT MATERIAL SHALL BE CONSTRUCTED AT INTERVALS OF 10 FEET.
6. ALL JOINTS SHALL BE CLEAN AND EDGED.
7. FINISH SHALL BE A LIGHT BROOM FINISH.
8. FINISHED CURBS AND GUTTERS SHALL BE SPRAYED WITH A CLEAR CURING COMPOUND.
9. SUBGRADE COMPACTION FOR CURBS AND GUTTERS SHALL MEET A MINIMUM 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH SEC. 2-03.3(14) OF THE WSDOT/APWA SPECIFICATIONS.



CEMENT CONCRETE
VERTICAL CURB AND GUTTER

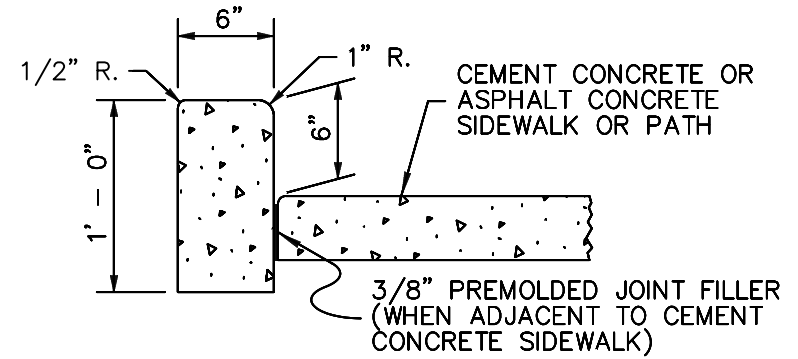


CEMENT CONCRETE
ROLLED CURB AND GUTTER

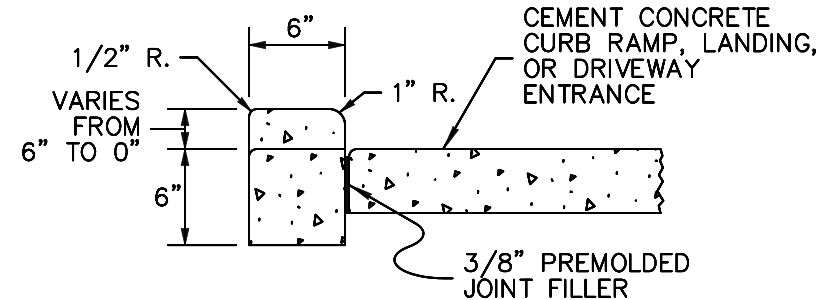
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DATE	1/29/2019
SCALE	NTS
DRAWING NUMBER	300

NOTES:

1. CONSTRUCTION OF CURB DETAILS SHALL BE IN ACCORDANCE WITH THE CURRENTLY ADOPTED STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION AS PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND THE AMERICAN PUBLIC WORKS ASSOCIATION. (WSDOT/APWA SPECIFICATIONS) UNLESS OTHERWISE MODIFIED BELOW.
2. ALL CONCRETE SHALL BE COMMERCIAL CLASS PER WSDOT/APWA SPECIFICATIONS.
3. FORMS SHALL BE TRUE TO LINE AND GRADE AND SECURELY STAKED. STEEL FORMS ONLY SHALL BE USED ON TANGENT SECTIONS. WOOD FORMS MAY BE USED ON CURVED SECTIONS.
4. FULL DEPTH EXPANSION JOINTS CONSISTING OF 3/8 INCH MINIMUM PREMOLDED JOINT MATERIAL SHALL BE PLACED ADJACENT TO CATCH BASINS, INLETS AND AT POINTS OF TANGENCY ON STREETS AND DRIVEWAY RETURNS. MAXIMUM SPACING SHALL BE 20 FEET.
5. CONTRACTION JOINTS (DUMMY JOINTS) CONSISTING OF 3/8" MIN. X 2" OF PREMOLDED JOINT MATERIAL SHALL BE CONSTRUCTED AT INTERVALS OF 10 FEET.
6. ALL JOINTS SHALL BE CLEAN AND EDGED.
7. FINISH SHALL BE A LIGHT BROOM FINISH.
8. FINISHED CURBS AND GUTTERS SHALL BE SPRAYED WITH A CLEAR CURING COMPOUND.
9. SUBGRADE COMPACTION FOR CURBS AND GUTTERS SHALL MEET A MINIMUM 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH SEC. 2-03.3(14) OF THE WSDOT/APWA SPECIFICATIONS.



CEMENT CONCRETE PEDESTRIAN CURB



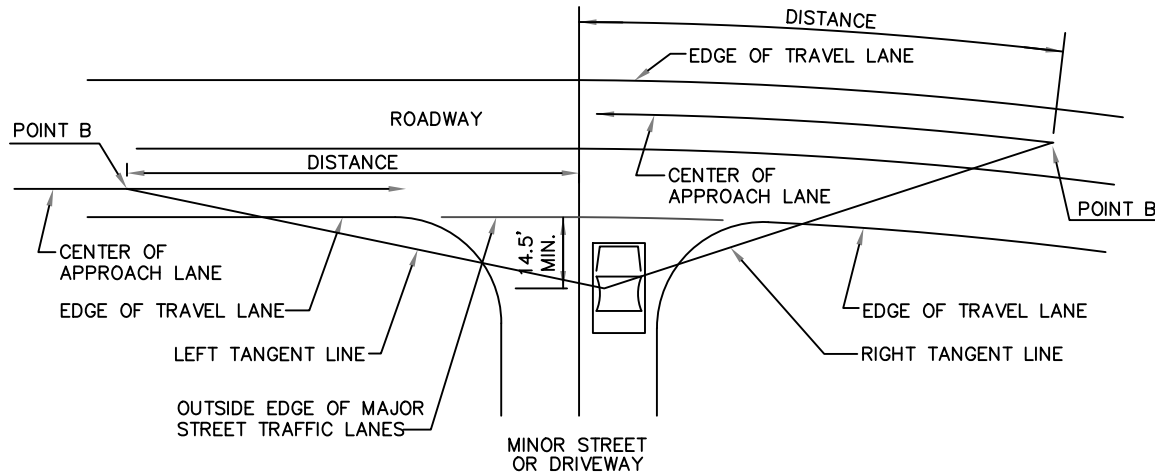
CEMENT CONCRETE PEDESTRIAN CURB AT CURB RAMPS, LANDINGS, AND DRIVEWAY ENTRANCES



CURB AND GUTTER B

CEMENT CONCRETE PEDESTRIAN CURB

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SCALE	NTS
DRAWING NUMBER	301



NOTES

1. PARKING STRIPS OR LANES DESIGNATED FOR PARKING ONLY ARE OUTSIDE THIS REFERENCE LINE AND ARE NOT INCLUDED IN THE MAJOR STREET TRAFFIC LANES.
2. ALL STREET ENDS SHALL BE SIGNED PER THE MUTCD.
3. VALUES FOR SIGHT DISTANCE ARE BASED ON DRIVER'S EYE HEIGHT OF 3.5 FEET SET BACK 14.5 FEET FROM THE EDGE OF TRAVELED WAY WITH AN OBJECT 4.25 FEET IN HEIGHT.

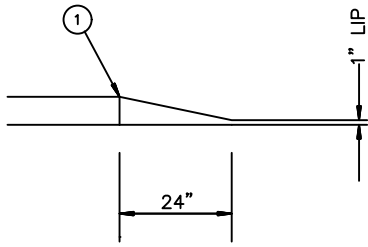
DESIGN SPEED (MPH)	20	25	30	35	40	45	50	55	60	65
LEFT TURN (FEET)	225	280	335	390	445	500	555	610	665	720
CROSSING/RIGHT TURN (FEET)	195	240	290	335	385	430	480	530	575	625



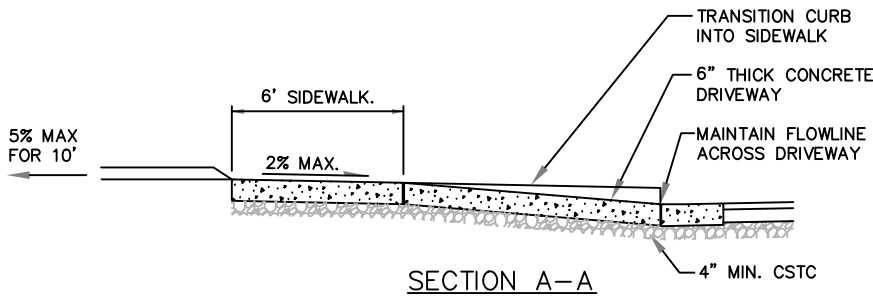
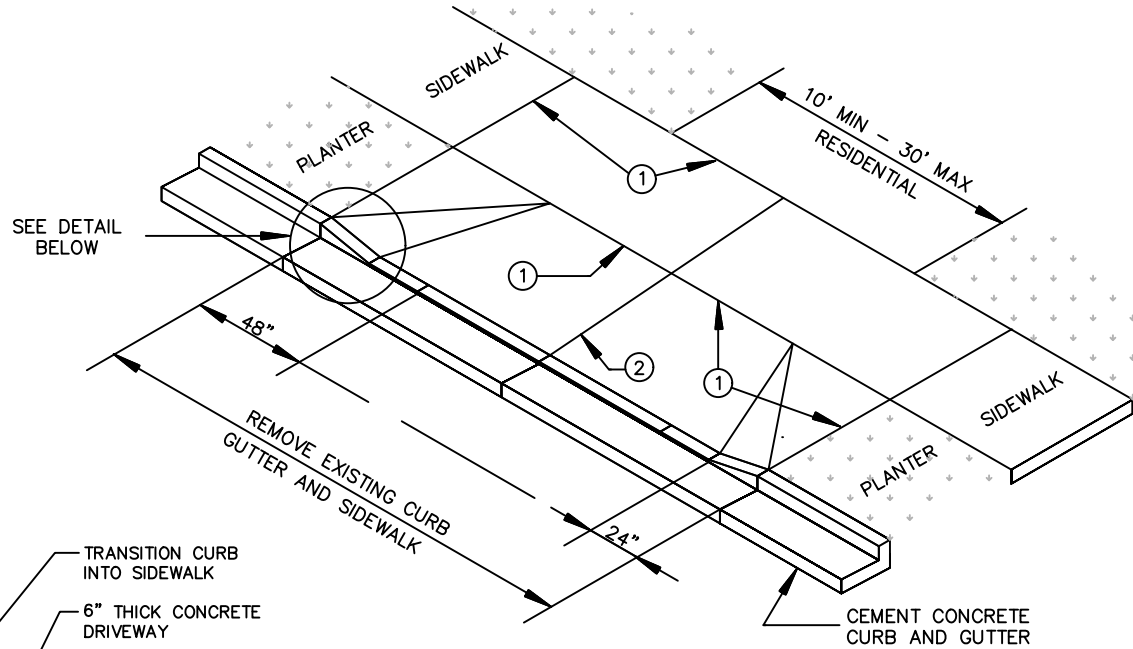
DRIVEWAYS A

ENTERING SIGHT DISTANCE

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SCALE	NTS
DRAWING NUMBER	320



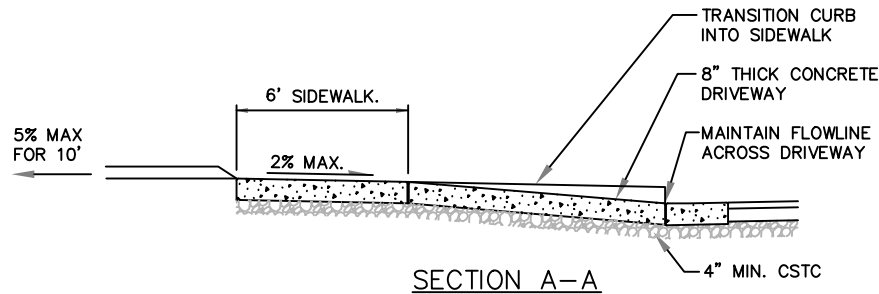
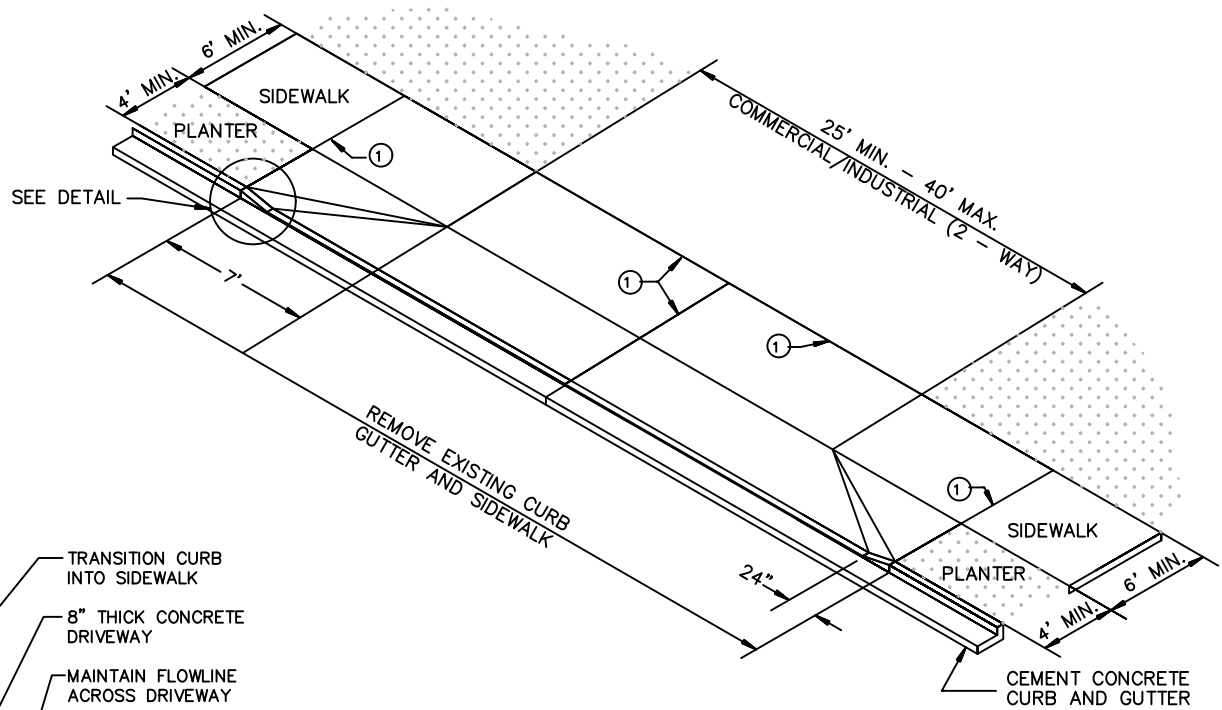
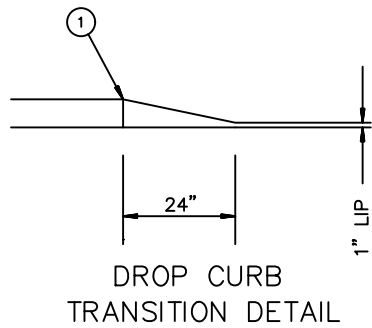
DROP CURB TRANSITION DETAIL



NOTES:

1. FULL DEPTH EXPANSION JOINT, 3/8" MINIMUM THICKNESS.
2. FULL DEPTH EXPANSION JOINT, 3/8" MINIMUM THICKNESS IF WIDTH OF DRIVEWAY IS 15 FEET OR GREATER.
3. DRIVEWAY SECTION WITHIN PUBLIC RIGHT-OF-WAY IS TO BE SURFACED WITH ASPHALT OR CONCRETE.
4. DRIVEWAY CEMENT CONCRETE DEPTH SHALL BE A MINIMUM OF 6" AND PLACED ON COMPACTED GRADE.
5. CONCRETE SHALL BE COMMERCIAL CLASS CONCRETE PER WSDOT/APWA SPECIFICATIONS.
6. CLEAN AND EDGE ALL JOINTS.

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SCALE	NTS
DRAWING NUMBER	321



NOTES:

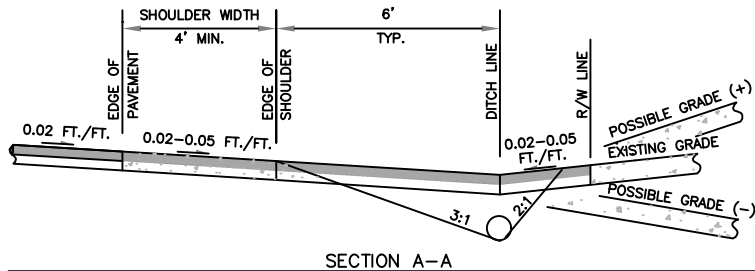
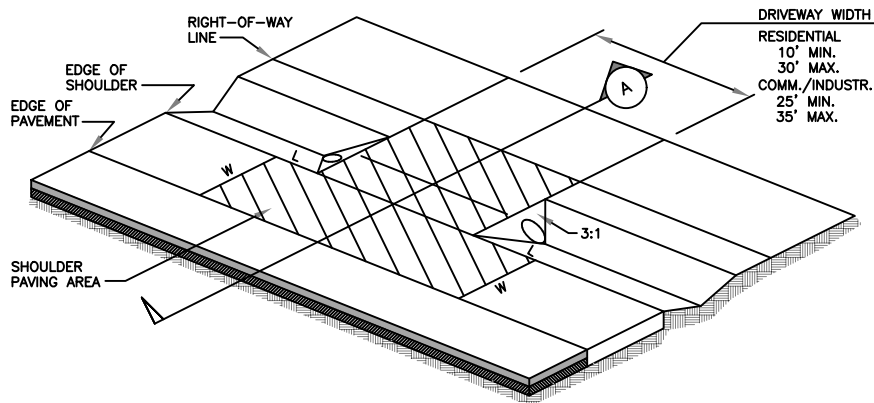
1. FULL DEPTH EXPANSION JOINT, 3/8" MINIMUM THICKNESS.
2. DRIVEWAY SECTION WITHIN PUBLIC RIGHT-OF-WAY IS TO BE SURFACED WITH ASPHALT OR CONCRETE.
3. DRIVEWAY CEMENT CONCRETE DEPTH SHALL BE A MINIMUM OF 6" AND PLACED ON COMPACTED GRADE. DEPENDING ON VEHICLE LOADING, A STRUCTURAL DESIGN OF THE DRIVEWAY MAY BE REQUIRED BY THE ENGINEER.
4. CONCRETE SHALL BE COMMERCIAL CLASS CONCRETE PER WSDOT/APWA SPECIFICATIONS.
5. CLEAN AND EDGE ALL JOINTS.
6. COMMERCIAL AND INDUSTRIAL ACCESS WIDTHS SHOWN ARE FOR TWO-WAY ACCESS ONTO NON-ARTERIALS. MINIMUM WIDTH FOR ACCESS ONTO ARTERIALS IS 35 FEET.



DRIVEWAYS C

COMMERCIAL DRIVEWAY

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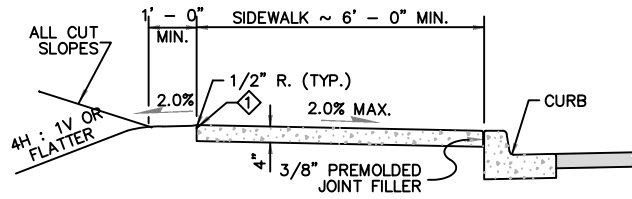


NOTES

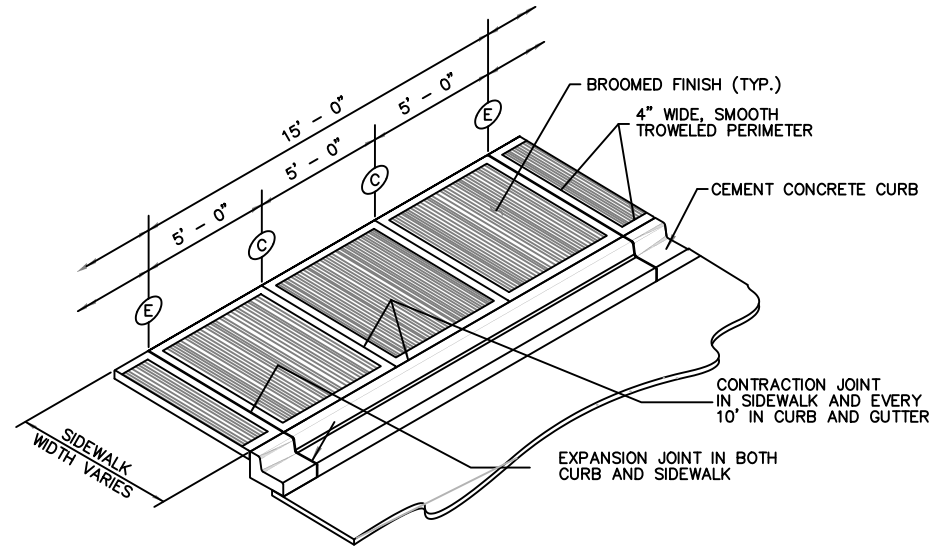
1. COMMERCIAL/INDUSTRIAL DRIVEWAYS WIDER THAN 35 FT. MAY BE APPROVED BY THE CITY ENGINEER CONSIDERING BOTH TRAFFIC SAFETY AND THE ACTIVITY BEING SERVED. ALL COMMERCIAL/INDUSTRIAL DRIVEWAYS SHALL HAVE AN EXPANSION JOINT LOCATED MID-WIDTH.
2. PIPE SHALL BE:
 - A. SIZED TO CONVEY COMPUTED STORM WATER RUNOFF, AND
 - B. MIN. 12" DIAM., AND
 - C. EQUAL TO OR LARGER THAN EXISTING PIPES WITHIN 500 FT. UPSTREAM.
3. EXPOSED PIPE ENDS SHALL BE BEVELED TO MATCH THE SLOPE FACE AND PROJECT NO MORE THAN 2" BEYOND SLOPE SURFACE. PROJECTING HEADWALLS ARE NOT ACCEPTABLE.
4. CONCRETE PIPE SHALL HAVE MIN. COVER OF 6" TO FINISH GRADE. ALL OTHER TYPES OF PIPE SHALL HAVE MIN. 12" COVER.
5. PIPE SHALL BE INSTALLED IN A STRAIGHT UNIFORM ALIGNMENT AT A MIN. 0.5% SLOPE (0.5 FT. PER 100 FT.) WITH THE DOWNSTREAM END LOWER THAN THE UPSTREAM END.
6. PIPE MAY BE OMITTED IF ROADSIDE DITCH DOES NOT EXIST AND DRIVEWAY DOES NOT BLOCK NATURAL DRAINAGE FLOW.
7. DRIVEWAY SLOPE SHALL MATCH TO BACK EDGE OF SHOULDER, BUT SHOULDER SLOPE AND EDGE OF SHOULDER SHALL NOT BE ALTERED AS A RESULT OF DRIVEWAY CONSTRUCTION.
8. PAVED DRIVEWAYS SHALL BE PAVED THROUGH RIGHT-OF-WAY WITH A.C. OR B.S.T., BUT NOT P.C.C.
9. GRAVEL DRIVEWAYS SHALL BE PAVED BETWEEN THE EDGE OF PAVEMENT AND R/W WITH A.C. OR B.S.T. ONLY WITH DIMENSIONS L=W.

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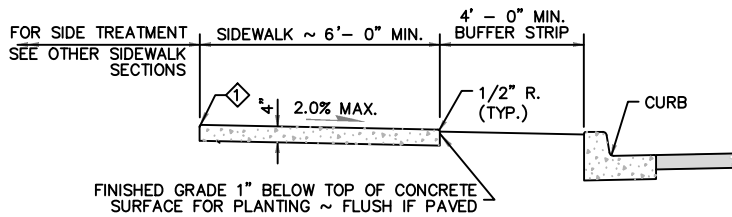
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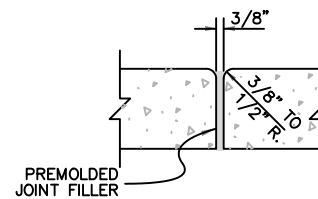
ADJACENT TO CURB



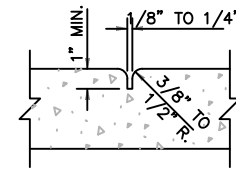
CEMENT CONCRETE SIDEWALK



ADJACENT TO BUFFER STRIP



(E) EXPANSION JOINT



(C) CONTRACTION JOINT

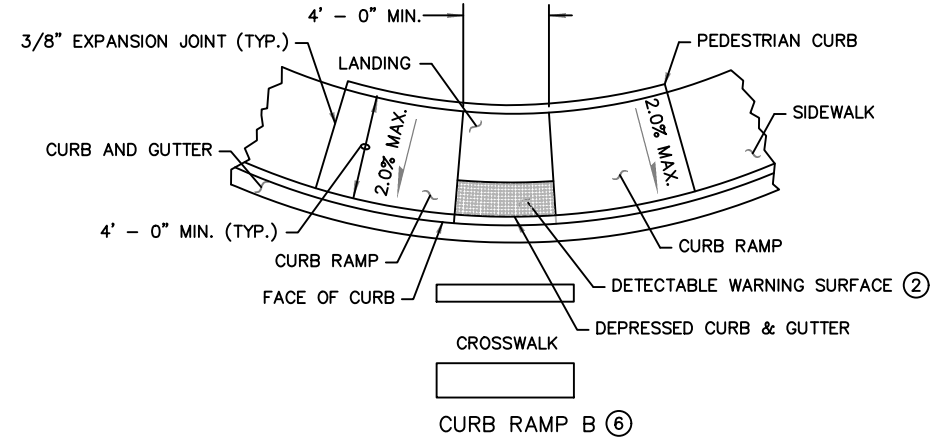
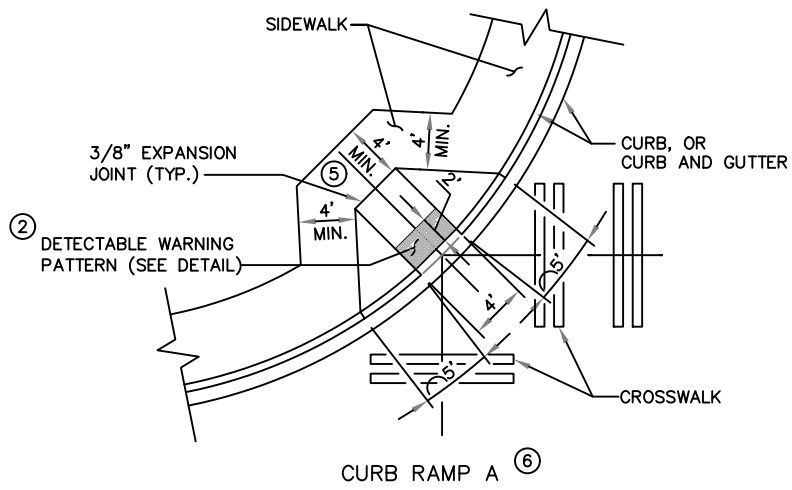


SIDEWALK A

CEMENT CONCRETE SIDEWALK

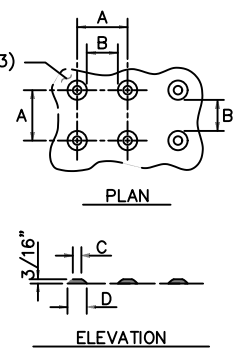
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SCALE	NTS
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DETECTABLE WARNING PATTERN AREA SHALL BE YELLOW, IN COMPLIANCE WITH STD. SPEC. 8-14.3(3)

	MIN.	MAX.
A	1 5/8"	2 3/8"
B	5/8"	1 1/2"
C	7/16"	3/4"
D	7/8"	1 7/16"



DETECTABLE WARNING PATTERN DETAIL

NOTES

1. PLACEMENT OF GRATINGS, ACCESS COVERS AND OTHER APPURTENANCES SHALL NOT BE LOCATED ON CURB RAMPS, LANDINGS AND GUTTERS WITHIN THE PEDESTRIAN ACCESS ROUTE.
- ② RAMPS SHALL BE TEXTURED USING TRUNCATED DOME PATTERN (SEE DETAIL THIS PAGE). DETECTABLE WARNING PATTERN SHALL BE YELLOW IN COMPLIANCE WITH WSDOT STANDARD SPECIFICATION 8-14.3(3)
3. RAMP CENTER LINE SHALL BE PERPENDICULAR TO OR RADIAL TO CURB RETURNS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
4. RAMPS SHALL BE CONSTRUCTED AT CORRESPONDING SIDEWALK LOCATIONS ON OPPOSITE SIDE OF STREETS WHEN RAMPS ARE CONSTRUCTED ON ONE SIDE OF STREET.
- ⑤ LANDING SHALL BE MINIMUM 4 X 4'.
- ⑥ CURB RAMP A MUST BE INSTALLED UNLESS OTHERWISE APPROVED.



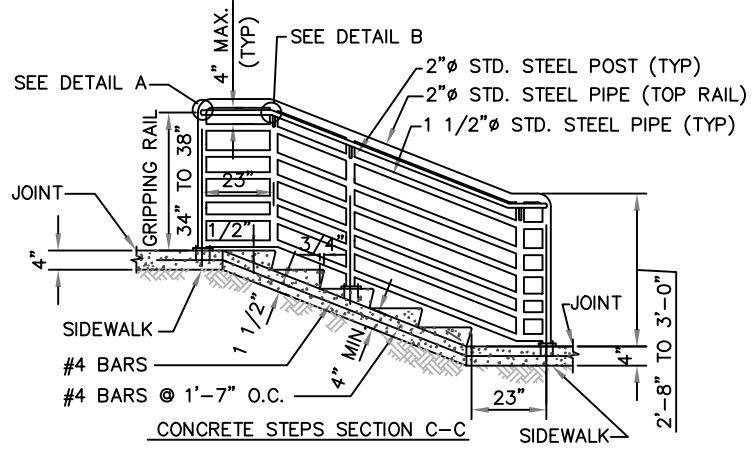
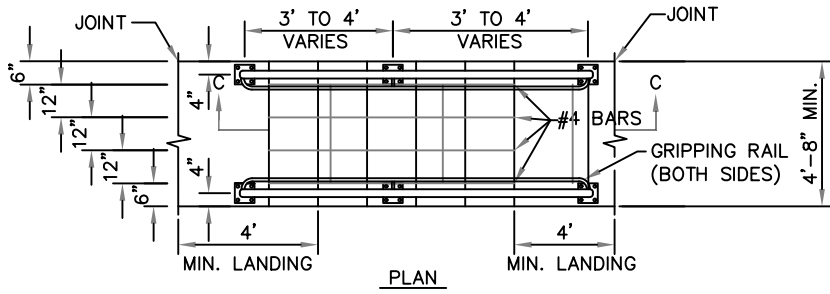
SIDEWALKS B

ADA CURB RAMP

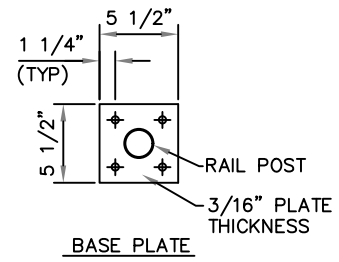
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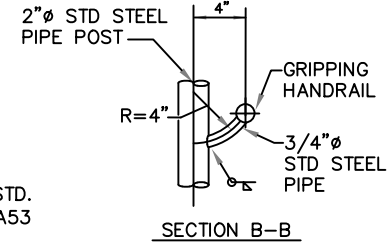
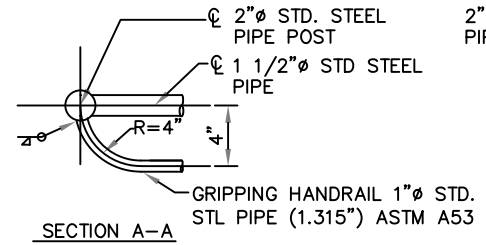
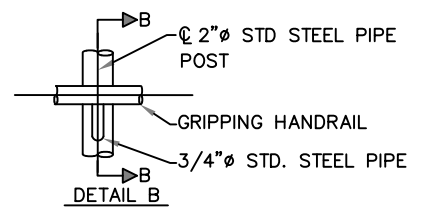
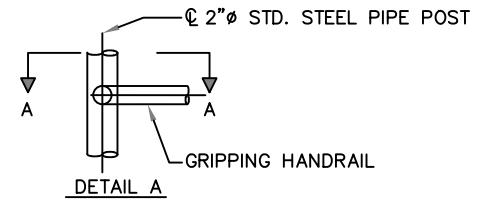
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CONCRETE STEPS



- NOTES:**
1. A307, 1/2 BOLTS MIN.
 2. 2 1/2 INCH. CONCRETE EMBEDMENT MIN.
 3. PLATE MATERIAL MIN. A36



GRIPPING HANDRAIL

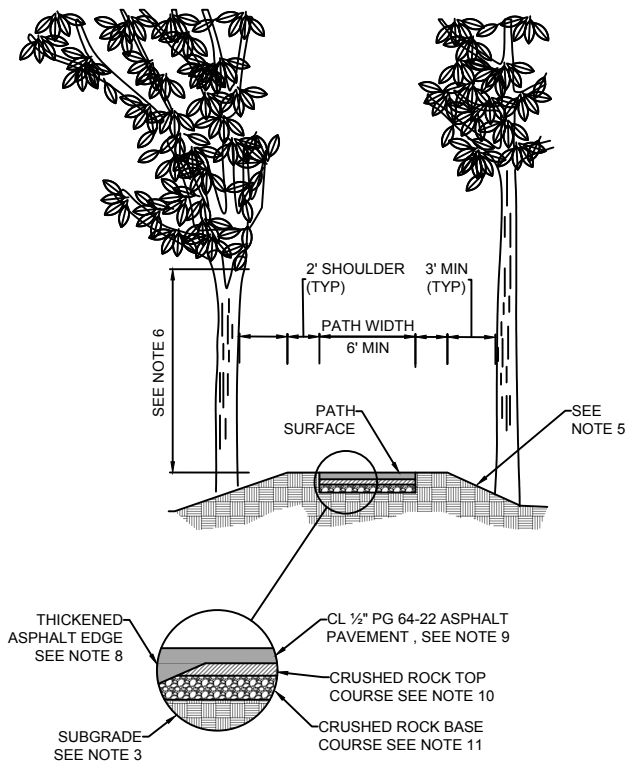
- NOTES:**
1. CONCRETE: CEMENT CONCRETE CLASS 4000.
 2. ALL STEPS: SAME DIMENSIONS, WITHIN 3/8 IN. MAX. DIFFERENCE.
 3. RISERS: 7 1/2 IN. MAX., 5 IN. MIN.
 4. TREADS: 12 IN. MAX., 11 IN. MIN., WITH TRANSVERSE 0.01 FT./FT. SLOPE.
 5. METAL HANDRAIL REQUIRED FOR 4 STEPS OR MORE SEE NOTES BELOW.
 6. REINFORCING BARS SHALL MEET THE REQUIREMENTS OF ASTM A-615, GRADE 60 AND ARE REQUIRED FOR 4 STEPS OR MORE.
 7. MAX. VERTICAL DISTANCE BETWEEN LANDINGS IS 12 FT.



SIDEWALKS C

CONCRETE STEPS AND METAL HANDRAIL

DRAWN BY	IDS
DATE	1/31/2019
SCALE	NTS
DRAWING NUMBER	342



NOTES:

1. ALL PLANS MUST BE APPROVED BY THE CITY ENGINEER PRIOR TO CONSTRUCTION OF THE TRAIL. TRAIL CENTERLINE TO BE STAKED IN THE FIELD BY CONTRACTOR AND APPROVED BY THE CITY ENGINEER.
2. ALL HAZARD TREES AND TREE LIMBS AS DEFINED BY THE WASHINGTON STATE DEPT. OF NATURAL RESOURCES HAZARD BULLETIN SHALL BE FELLED AND REMOVED FROM THE SITE.
3. SUBGRADE SHALL CONSIST OF UNDISTURBED NATIVE SOIL COMPACTED TO 95% DENSITY. SUBGRADE TO BE TREATED WITH AN APPROVED HERBICIDE PRIOR TO INSTALLATION OF ASPHALT. FILTER FABRIC MAY BE REQUIRED BETWEEN SUBGRADE AND BASE COURSE.
4. ROOT BARRIER SHALL BE REQUIRED.
5. MAXIMUM TRAIL SIDE SLOPE IS 5% FOR THE SHOULDER AND 3:1 BEYOND. GRADE WITH COMPACTED TOPSOIL BACKFILL AS REQUIRED. BOTTOM OF SIDE SLOPE SHALL BE GRADED TO PREVENT ACCUMULATION OF RUN-OFF.
6. MINIMUM BRANCH CLEARANCE ABOVE TRAIL SURFACE IS 7 FEET. FOR EQUESTRIAN TRIALS MINIMUM BRANCH CLEARANCE FROM TRAIL SURFACE IS 10 FEET.
7. MINIMUM CROSS-SLOPE FOR TRAIL SURFACE IS 1%. MAXIMUM CROSS-SLOPE FOR TRAIL SURFACE IS 2%.
8. TRAIL SHALL HAVE THICKENED ASPHALT EDGES FOR EROSION PROTECTION: 6" (THICK) x 10" (WIDE) MINIMUM.
9. ASPHALT PAVEMENT SHALL BE HMA CL. 1/2" PG 64-22. THICKNESS TO BE SPECIFIED BY THE CITY ENGINEER. MINIMUM THICKNESS IS 2.5".
10. TOP COURSE SHALL BE PER WSDOT STANDARD SPECIFICATIONS. MINIMUM THICKNESS IS 2".
11. BASE COURSE SHALL BE PER WSDOT STANDARD SPECIFICATIONS. MINIMUM THICKNESS IS 6".

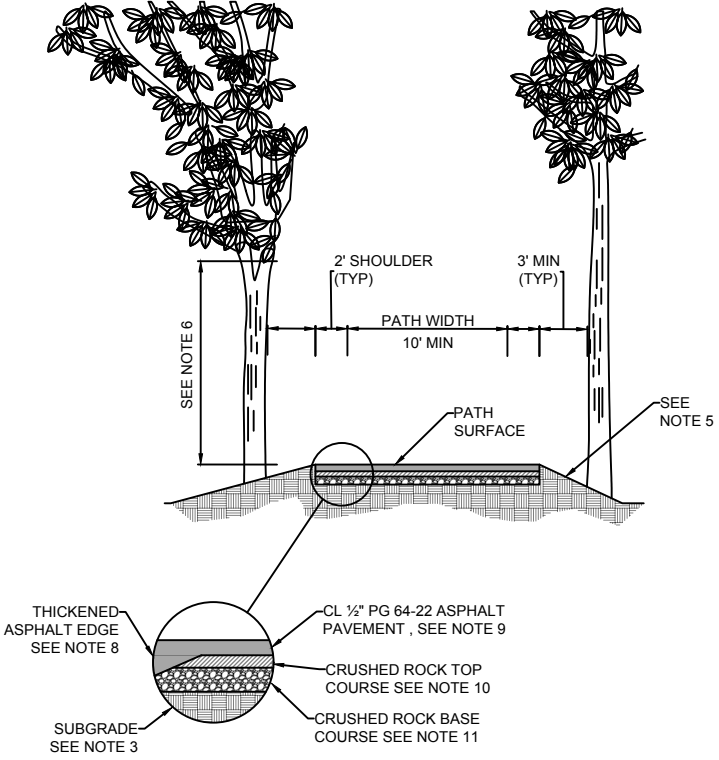


PEDESTRIAN AND BICYCLE PATH A

SEPARATED PEDESTRIAN PATH

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NOTES:

1. ALL PLANS MUST BE APPROVED BY THE CITY ENGINEER PRIOR TO CONSTRUCTION OF THE TRAIL. TRAIL CENTERLINE TO BE STAKED IN THE FIELD BY CONTRACTOR AND APPROVED BY THE CITY ENGINEER.
2. ALL HAZARD TREES AND TREE LIMBS AS DEFINED BY THE WASHINGTON STATE DEPT. OF NATURAL RESOURCES HAZARD BULLETIN SHALL BE FELLED AND REMOVED FROM THE SITE.
3. SUBGRADE SHALL CONSIST OF UNDISTURBED NATIVE SOIL COMPACTED TO 95% DENSITY. SUBGRADE TO BE TREATED WITH AN APPROVED HERBICIDE PRIOR TO INSTALLATION OF ASPHALT. FILTER FABRIC MAY BE REQUIRED BETWEEN SUBGRADE AND BASE COURSE.
4. ROOT BARRIER SHALL BE REQUIRED.
5. MAXIMUM TRAIL SIDE SLOPE IS 3:1. GRADE WITH COMPACTED TOPSOIL BACKFILL AS REQUIRED. BOTTOM OF SIDESLOPE SHALL BE GRADED TO PREVENT ACCUMULATION OF RUN-OFF.
6. MINIMUM BRANCH CLEARANCE ABOVE TRAIL SURFACE IS 7 FEET. FOR EQUESTRIAN TRIALS MINIMUM BRANCH CLEARANCE FROM TRAIL SURFACE IS 10 FEET.
7. MINIMUM CROSS-SLOPE FOR TRAIL SURFACE IS 1%. MAXIMUM CROSS-SLOPE FOR TRAIL SURFACE IS 2%.
8. TRAIL SHALL HAVE THICKENED ASPHALT EDGES FOR EROSION PROTECTION: 6" (THICK) x 10" (WIDE) MINIMUM.
9. ASPHALT PAVEMENT SHALL BE HMA CL. 1/2" PG 64-22. THICKNESS TO BE SPECIFIED BY THE CITY ENGINEER. MINIMUM THICKNESS IS 2.5".
10. TOP COURSE SHALL BE PER WSDOT STANDARD SPECIFICATIONS. MINIMUM THICKNESS IS 2".
11. BASE COURSE SHALL BE PER WSDOT STANDARD SPECIFICATIONS. MINIMUM THICKNESS IS 6".



PEDESTRIAN AND BICYCLE PATH B

SEPARATED SHARED-USE PATH

DRAWN BY	IDS
DATE	1/31/2019
SCALE	NTS
DRAWING NUMBER	361

CHAPTER 4

PAVEMENT SURFACING

4.1 Streets

- A. Residential Streets, Pedestrian and Bikeways
- B. Requirements for Residential Streets on Poor Sub-grade
- C. Arterials and Commercial Access Streets
- D. Additional Information

4.2 Materials and Lay-Down Procedures

- A. Requirements

4.3 Pavement Markings, Markers and Pavement Tapers

- A. Types

4.4 Street Widening/ Adding Traveled Way to Existing Streets

- A. General Requirements

4.5 Monumentation

- A. Survey Monuments

4.6 Pervious Pavement

- A. Permitted Applications
- B. Essential Components
- C. Options for the Wearing Course

4.1 Streets

A. Residential Streets, Pedestrian and Bikeways

1. The minimum paved section, with alternative combinations of materials, for residential streets, shoulders, sidewalks and bikeways shall be as indicated in the Standard Details. These sections are acceptable only on visually good, well-drained, stable compacted sub-grade. Any proposed exception to these materials will be subject to soils strength testing, traffic loading analysis and subject to review and approval by the City Engineer as outlined below in Section 6.2.B Requirements for Residential Streets on Poor Sub-grade. All expenses for determining revised materials shall be at the Developer's own expense.
2. When a walkway or bikeway is incorporated into a street shoulder, the required shoulder section, if higher strength, shall govern. Sub-grade compaction for bikeways and paved walkways shall meet a minimum of 95 percent maximum density.

B. Requirements for Residential Streets on Poor Sub-grade

The minimum material thicknesses as illustrated in the Standard Details are not acceptable if there is any evidence of instability in the sub-grade. This includes free water, swamp conditions, fine-grained or organic soil, slides or uneven settlement. If there are any of these characteristics, the soil shall be sampled and tested sufficiently to establish a pavement design that will support the proposed construction. Any deficiencies, including an R-value of less than 55 or a California Bearing Ratio (CBR) of less than 20, shall be fully considered in the design. Remedial measures may include, but are not limited to, a stronger paved section, a strengthening of sub-grade by adding or substituting fractured aggregate, asphalt treated base, installing a geotextile fabric, more extensive drainage or a combination of such measures. Both the soils test report and the resulting pavement design will be subject to review and approval by the City Engineer.

C. Arterials and Commercial Access Streets

Any pavement for arterials and commercial access streets shall be designed using currently accepted methodology that considers the load bearing capacity of the soils and the traffic-carrying requirements of the street. Plans shall be accompanied by a pavement thickness design based on soil strength parameters reflecting actual field tests and traffic loading analyses. The analysis shall include the traffic volume and axle loading, the type and thickness of street materials and the recommended method of placement.

D. Additional Information

1. Please refer to Standard Details, Typical Street Sections 400-403.
2. For information on porous pavements, please refer to Section 4.8 Pervious Pavement in the Development Guidelines.

4.2 Materials and Lay-Down Procedures

A. Requirements

Materials and lay-down procedures shall be in accordance with WSDOT Standard Specifications and the following requirements:

1. Prior to placement of curbing or pavement section, a proof-rolle shall be performed and observed by the Construction Inspector to confirm the sub-grade is firm and unyielding.
2. Crushed surfacing top and base courses may be substituted for a structurally equivalent thickness of Asphalt Treated Base (ATB). The substitution ratio of crushed surfacing to ATB shall be 1.6:1. Where base or top courses cannot be placed without possible contamination, then these courses shall be substituted by ATB.
3. During surfacing activities, utility covers in streets shall be adjusted in accordance to Finish Grade.
4. ATB may be used over isolated areas of unstable sub-grade, providing the final lift of asphalt shall not be placed for a minimum of six months to allow time for the observation and repair of failures in the sub-grade and ATB.
5. Asphalt pavers shall be self-contained, power-propelled units. Truck mounted type pavers are not considered self-propelled. Truck mounted pavers shall only be used for paving of irregularly shaped or minor areas as approved by the City Engineer, or as follows:
 - a. Pavement widths less than eight feet; and
 - b. Pavement lengths less than 150 feet.
6. Hot mix asphalt (HMA) for the wearing course shall not be placed on any traveled way between October 1 and April 1, without written approval from the City Engineer. Please refer to WSDOT Construction Manual for further direction. Prior to placement of HMA, a tack coat shall be thoroughly and uniformly applied to all existing paved surfaces in accordance with Section 5-04.3(4) of the WSDOT Standard Specifications. Asphalt for prime coat shall not be applied when the ground temperature is lower than fifty degrees Fahrenheit, without written approval from the City Engineer.

When discharged from the mixing batch plant, the temperature of the HMA shall not exceed the maximum temperature recommended by the asphalt binder manufacturer. Documentation of recommended temperatures shall be submitted prior to placement.

A maximum water content of 2 percent in the mix, at discharge, will be allowed providing the water causes no problems with handling, stripping or flushing. If the water in the HMA causes any of these problems, the moisture content shall be reduced as directed by the Construction Inspector. The asphalt shall have a temperature of not less than 260 degrees Fahrenheit. For surface temperature limitations, see Section 5-04.3(6) of the WSDOT Standard Specifications. Each truckload shall be covered with a suitable tarpaulin while in transit and while waiting to be unloaded to prevent unnecessary heat loss.

7. Unfavorable Weather: Asphalt shall not be applied to wet material. Asphalt shall not be applied during rainfall or before any imminent storms that might damage the construction. The Inspector will have the discretion as to whether the surface and materials are dry enough to proceed with construction.

4.3 Pavement Markings, Markers, and Pavement Tapers

A. Types

Pavement markings, markers or striping shall be used to delineate channelization, lane endings, crosswalks and longitudinal lines to control or guide traffic, as illustrated in the Standard Details. Channelization plans or crosswalk locations shall be approved by the City Engineer.

1. Channelization shall be required when:
 - a. Through traffic is diverted around a lane or obstacle.
 - b. Connecting full width streets with different cross sections.
 - c. Extending an existing street with a new cross section different from the existing one.
2. For speeds 45 miles per hour (mph) and greater the channelization shall provide tapers equal in length to the posted speed limit times the distance in feet of diversion from the street centerline or the original alignment of travel, or the offset distance, as applicable. Channelization shall also be required to redirect traffic back to their original alignment. For speeds 40 mph or less, taper length shall equal the total of the speed squared times the width being moved divided by 60 ($L = (\text{width} \times \text{speed}^2)/60$).
3. Left turn channelization shall include a minimum of 150 feet of full width lane storage plus a reverse curve 90 feet in length for posted speeds up to 45 mph. The reverse curve shall be 120 feet in length for posted speeds greater than 45 mph. The reverse curve may be included within the taper distance. A deceleration taper as shown in the WSDOT Standard Plans may be used in place of a reverse curve. Standard left turn lanes shall be 12 feet wide. See Standard Detail, Two-Way Left Turn Lane Marking Details 423.

Additional storage may be required for long vehicles or anticipated left turn queues longer than the minimum storage.

4. Pavement markings for channelization shall be reflectorized hot (Type "A") applied plastic with the exception of any markings within the bike lane, which shall consist of paint. Extruded or sprayed markings shall be dressed with glass beads for initial reflectance. All materials shall have beads throughout the material to maintain reflectance while the material wears.
5. Where pavement widening less than 300 feet in length is abruptly ended and edge lines do not direct traffic to through lanes, Type 2e lane markers shall be installed at 10-foot centers near the end of the paved area at a 10:1 taper.
6. Crosswalks shall be installed at all intersections controlled by traffic signals and other areas approved by the City Engineer in accordance with the Standard Details.
7. All pavement markings shall be laid out with spray paint and approved by the City Engineer or designee before they are installed. Approval may require a three working

day advance notice to have field layout approved by the City Engineer or to make arrangements to meet the City Engineer on site during the installation.

8. Please refer to Standard Details for additional information.

4.4 Street Widening/Adding Traveled Way to Existing Streets

A. General Requirements

1. When an existing asphalt paved street is to be widened, the edge of pavement shall be saw-cut to provide a clean, vertical edge for joining to the new asphalt. After placement of the new asphalt section, the joint shall be sealed, and a pre-level course installed followed by a minimum one and one half-inch (1-1/2") overlay, full width throughout the widened area. All failures and cracking on road surfaces must be repaired prior to the overlay. Please refer to WSDOT 5-04 for additional guidance and details.
2. When an existing asphalt paved street is to be widened and the requirement to grind and overlay the existing portion is waived by the City Engineer, the widened portion shall be designed to optimize the change in cross-slope between the existing and new asphalt and to optimize the new curb grade.
3. When an existing shoulder is to become part of a proposed traveled way a pavement evaluation shall be performed. This evaluation shall analyze the structural capacity and determine any need for improvement. Designs based on these evaluations are subject to review and approval by the City Engineer. The responsibility for any shoulder material thickness improvement shall be considered part of the requirement for street widening. The shoulder shall be replaced in width as specified in Chapter 4 (Street Types and Geometrics).
4. Any widening of an existing street, either to add traveled way or paved shoulder shall have the same surfacing material as the existing street.
5. If the required grind and overlay extends to an existing ADA ramp, the ADA ramp shall be replaced to meet current standards.

4.5 Monumentation

A. Survey Monuments

1. Survey monuments shall be placed at all street intersections, boundary angle points, points of curves in streets and at such intermediate points as may be required by the City Engineer.
2. All existing survey monuments and appurtenances, which are disturbed, lost or destroyed during surveying or construction, shall be replaced by a land surveyor registered in the State of Washington at the expense of the responsible developer, builder or utility, in general accordance with RCW 58.09.130 and 58.04.015.
3. Plat monumentation shall comply with these standards on developments such as residential subdivisions, short plats, commercial site developments, binding site plans, or

any other construction that establish new roadways or reconstruct existing roadways. Monuments shall be set along the center of the right-of-way at the Point of Curvatures (PC's) and Point of Tangency (PT'S) of curves. When the Point of Intersection (PI) of the curve falls within the paved area of the road, a PI monument may be set in lieu of setting monuments at the PC and PT. Monument shall be located at center of each cul-de-sac.

4. All lot and block corners shall be set with an iron pipe or steel reinforcing bar at least 24 inches in length prior to submittal of the Final Plat Application. All lot corners shall be identified with the land surveyor's registration number.
5. Street monument cases, in conformance with the Standard Details, shall be installed within 60 days after the final course of surfacing has been placed.
6. Monument pins with cases shall be installed at these locations in accordance with the City's Standard Plan 460 (Monumentation A – Survey Control Monument).

4.6 Pervious Pavement

A. Permitted Applications

Permeable pavement is a range of sustainable materials and techniques which allows the stormwater to move through the surface of permeable pavements, base and sub-base to infiltrate into the ground. In addition to reducing runoff, this effectively traps suspended solids and filters pollutants from the water. Examples include roads, paths, lots that are subject to light vehicular traffic, such as car/parking lots, cycle-paths, service or emergency access lanes, road and airport shoulders, and residential sidewalks and driveways.

Although some porous paving materials appear nearly indistinguishable from nonporous materials, their environmental effects are qualitatively different. Whether pervious concrete, porous asphalt, paving stones or concrete or plastic-based pavers, all these pervious materials allow stormwater to percolate and infiltrate the surface areas, traditionally impervious to the soil below. The goal is to control stormwater at the source, reduce runoff, and improve water quality by filtering pollutants in the substrata layers.

B. Essential Components

1. Wearing Course: The wearing course is the surface layer of pervious pavement that allows water to percolate into the underlying rock layer and/or into the native soil. The wearing course may be pervious concrete, pervious asphalt, open-celled paving grids, or pervious pavers.
2. Leveling Course: This layer of bedding material is used to protect drain pipes and provides a uniform surface for paver systems. It must be included when required by the designer or recommended by the manufacturer. It generally consists of fine gravel.
3. Underdrain (optional): The underdrain is a slotted drainpipe installed just above the base of the facility. It conveys excess flows to the approved discharge point.
4. Reservoir course: This base layer is a layer of crushed rock that provides storage space for stormwater as it gradually infiltrates into the soil below. See the currently adopted

Low Impact Development Guidance Manual for additional information.

5. Native soil/Sub-grade: This is the native soil directly below the pervious pavement facility. It receives the infiltrating stormwater and provides support for the permeable pavement. The infiltration rate must be at least 0.3 inches per hour to use pervious pavement systems.
6. Observation Port (optional): An observation port installed in the furthest downslope area helps the owner see the water level and determine whether the water is soaking in as intended. Refer to currently adopted Department of Ecology Stormwater Management Manual for Western Washington for applicability.
7. Filter Fabric (optional): Filter fabric, also called nonwoven geotextile fabric, should be installed if the native soil is loose and finer than coarse sand to prevent the migration of fine soil particles from the native soil into the reservoir course, which can cause clogging. If used, geotextile fabric must be placed between the reservoir course and the sub grade. It must wrap underneath and along the sides of the reservoir course, and pass water at a rate greater than the infiltration rate of the existing sub grade.

C. Options for the Wearing Course

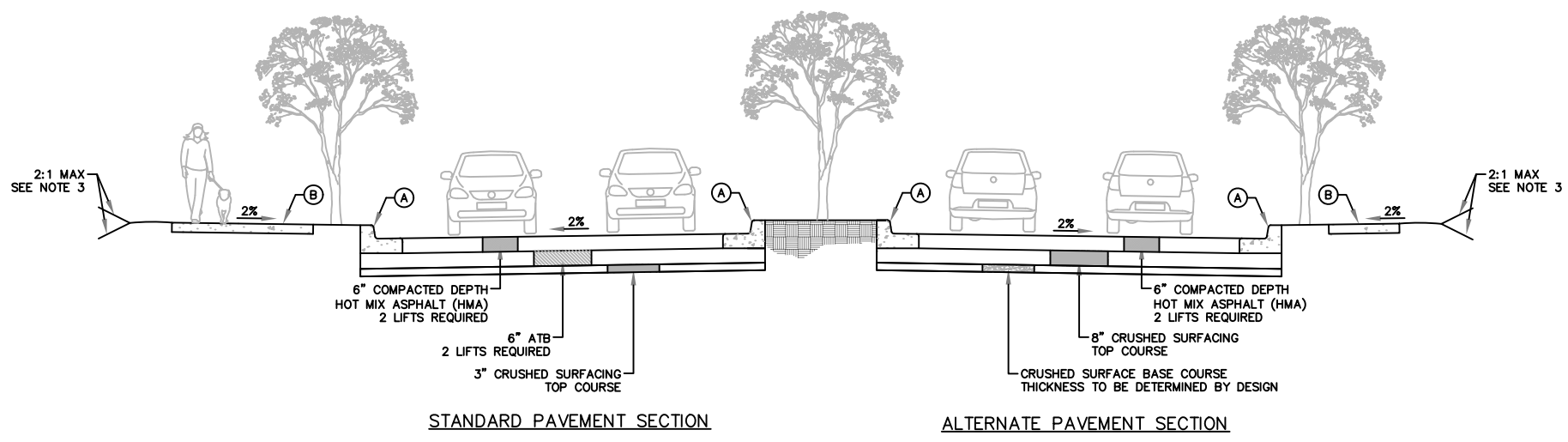
You can select one of five main types of pervious pavement surface material, also known as the wearing course:

1. Pervious asphalt: Pervious asphalt is an open-graded pavement with reduced fines and stable air pockets encased within the asphalt. This design allows water to drain to the base below. It is produced and mixed at an asphalt plant. Special care is needed to avoid over-consolidation of the asphalt and must be installed by an experienced pervious asphalt installer. Slopes must be less than 5% for pervious asphalt.
2. Pervious cement concrete: Pervious cement concrete is an open-graded pavement with reduced fines and stable air pockets encased within the concrete. This design allows water to drain to the base below. It has a rougher appearance than traditional cement concrete. It must be produced AND mixed at a concrete plant. Special care is needed for successful performance. Pervious cement concrete must be installed by a certified pervious cement concrete installer. Slopes must be less than 6% for pervious concrete.
3. Pervious Paver Systems: Pervious paver systems typically consist of manufactured interlocking pavers composed of concrete. Infiltration occurs through the gaps between the pavers that allow stormwater to penetrate quickly into the subsurface soil. The gaps are filled with a pervious material, usually small stone, unless the pavers themselves are pervious. Pavers must be installed per the manufacturer's specifications to qualify as a pervious pavement facility. Manufacturers typically recommend these systems only in low traffic volume areas. Slopes must be less than 10% for pervious paver systems.
4. Open-celled paving grid with vegetation: Open-celled paving grids consist of a rigid grid made of concrete or a durable plastic that is filled with a mix of sand, gravel and topsoil for planting vegetation. The cells can be planted with a variety of grasses or low-growing groundcovers. The support base and the grid walls prevent soil compaction

and reduce rutting and erosion by dispersing the weight of traffic. Vegetation in the grid openings provides habitat for beneficial microbes, nutrient cycling, pollutant removal through root uptake, and stormwater volume reduction through evaporation and transpiration. These systems are only recommended for use in low traffic volume areas. Slopes must be less than 10% for pervious paver systems.

5. Open-celled paving grid with gravel: This structure is similar to the open-celled grid with vegetation, but the openings are filled with a gravel mix to provide greater load bearing support for driveways or areas with longer parking durations. Clean gravel fill must meet the manufacturer's specifications. These systems are only recommended for use in low traffic volume areas. Slopes must be less than 10% for pervious paver systems.

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(A) CONCRETE CURB AND GUTTER,
SEE STD DETAIL 500

(B) CONCRETE SIDEWALK,
SEE STD DETAIL 540

NOTES:

1. PAVEMENT SECTIONS SHALL BE PLACED ON 12" MINIMUM COMPACTED SUBGRADE (95% MDD).
2. PAVEMENT SECTION DEPTHS NOTED, REFER TO COMPACTED DEPTH.
3. SLOPE EASEMENTS MAY BE REQUIRED FOR GRADING OUTSIDE DEDICATED RIGHT-OF-WAY.
4. PLANTER STRIP SHALL DRAIN TOWARD STREET AT 0% TO 10% CROSS-SLOPE.

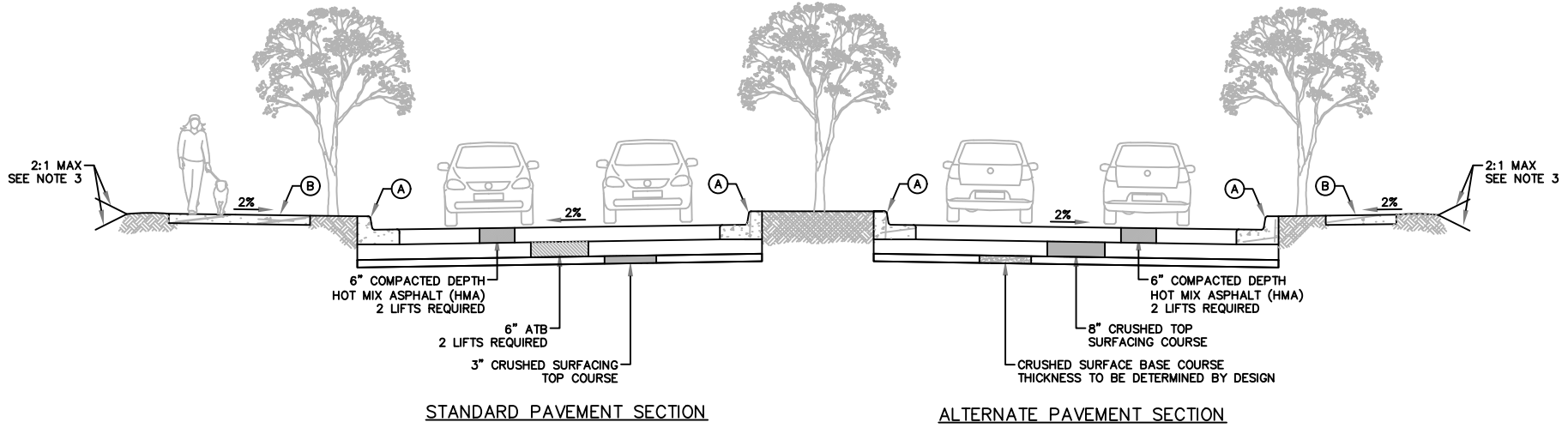


TYPICAL STREET SECTION A

PRINCIPAL ARTERIAL
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SCALE	NTS
DRAWING NUMBER	400

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(A) CONCRETE CURB AND GUTTER, SEE STD DETAIL 500

(B) CONCRETE SIDEWALK, SEE STD DETAIL 540

NOTES:

1. PAVEMENT SECTIONS SHALL BE PLACED ON 12" MINIMUM COMPACTED SUBGRADE (95% MDD).
2. PAVEMENT SECTION DEPTHS NOTED, REFER TO COMPACTED DEPTH.
3. SLOPE EASEMENTS MAY BE REQUIRED FOR GRADING OUTSIDE DEDICATED RIGHT-OF-WAY.
4. PLANTER STRIP SHALL DRAIN TOWARD STREET AT 0% TO 10% CROSS-SLOPE.
5. ADDITIONAL RIGHT-OF-WAY MAY BE REQUIRED FOR U-TURN LANE AT INTERSECTIONS.

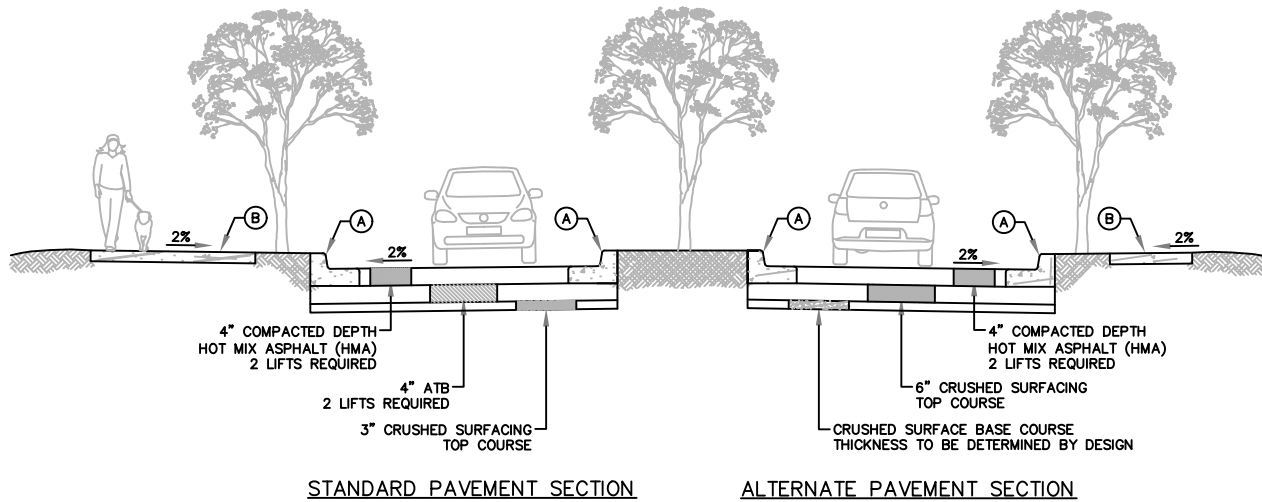


TYPICAL STREET SECTION B

MINOR ARTERIAL

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Ⓐ CONCRETE CURB AND GUTTER,
SEE STD DETAIL 500

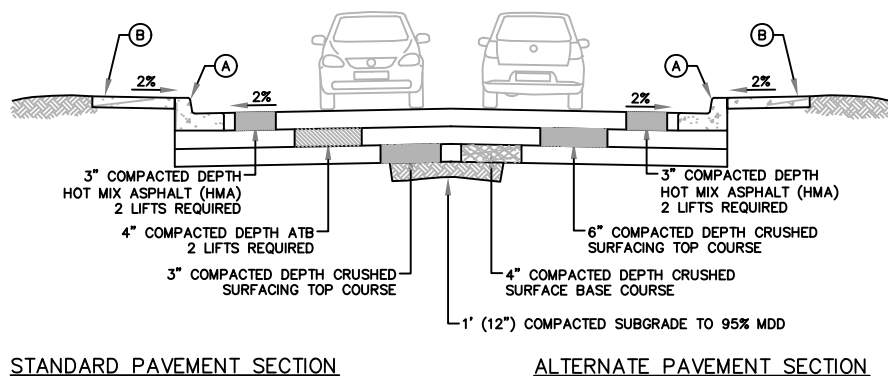
Ⓑ CONCRETE SIDEWALK,
SEE STD DETAIL 540

NOTES:

1. PAVEMENT SECTIONS SHALL BE PLACED OF 12" MINIMUM COMPACTED SUBGRADE (95% MDD).
2. PAVEMENT SECTION DEPTHS NOTED REFER TO COMPACTED DEPTH.
3. SLOPE EASEMENTS MAY BE REQUIRED FOR GRADING OUTSIDE DEDICATED RIGHT-OF-WAY.
4. PLANTER STRIP SHALL DRAIN TOWARD STREET AT 0% TO 10% CROSS-SLOPE.

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(A) CONCRETE CURB AND GUTTER,
SEE STD DETAIL 500

(B) CONCRETE SIDEWALK,
SEE STD DETAIL 540

NOTES:

1. PAVEMENT SECTIONS SHALL BE PLACED ON 12" MINIMUM COMPACTED SUBGRADE (95% MDD).
2. PAVEMENT SECTION DEPTHS NOTED REFER TO COMPACTED DEPTH.
3. SLOPE EASEMENTS MAY BE REQUIRED FOR GRADING OUTSIDE DEDICATED RIGHT-OF-WAY.
4. PLANTER STRIP SHALL DRAIN TOWARD STREET AT 0% TO 10% CROSS-SLOPE.

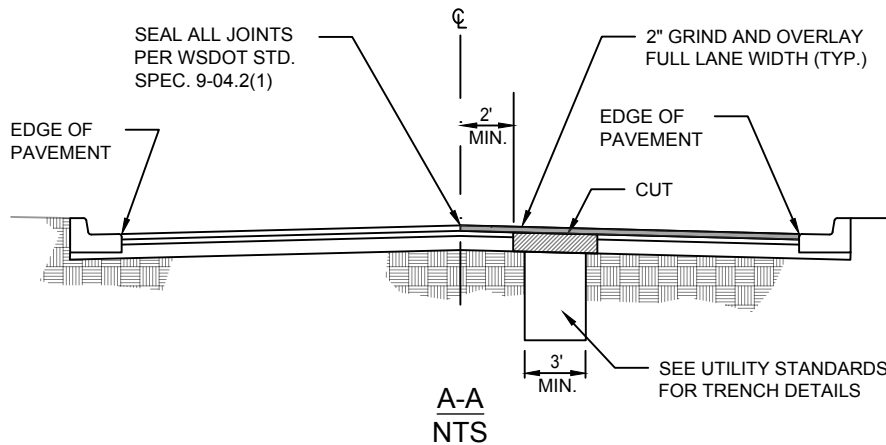
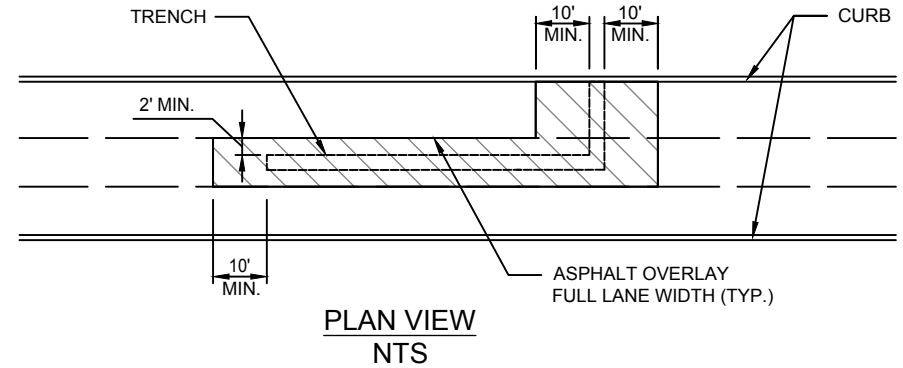
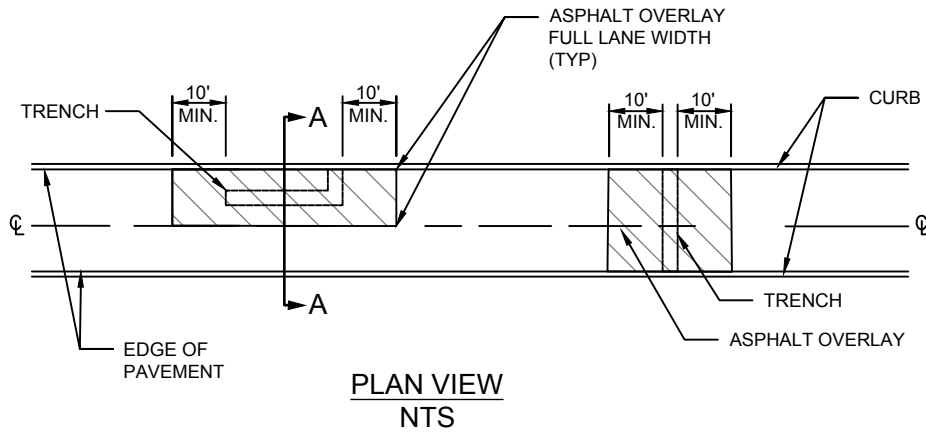


TYPICAL STREET SECTION D

LOCAL

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NOTES:

1. THIS STANDARD APPLIES TO ALL CUTS IN ASPHALT ROADWAY.
2. GRIND/OVERLAY WITHIN SIGNAL LOOP DETECTION ZONE MAY BE EXTENDED TO INCLUDE ADDITIONAL LANES AND/OR DETECTORS
3. OVERLAY AREA MAY BE EXTENDED AT THE DISCRETION OF THE TRANSPORTATION ENGINEER TO ENCOMPASS ADJACENT STREET CUTS OR PREVIOUS RESTORATIONS.
4. ADJUST ALL UTILITY CASTINGS TO FINISHED GRADE AFTER OVERLAY AND RESTORE CHANNELIZATION AND LOOP DETECTION

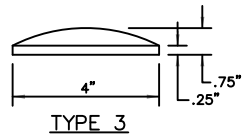
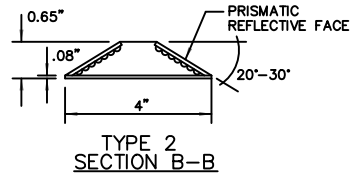
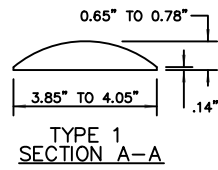
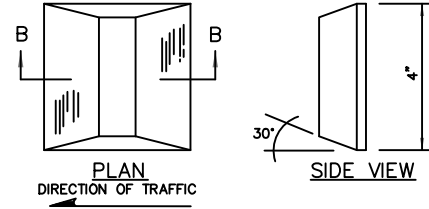
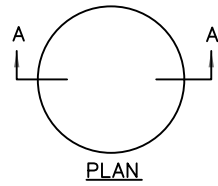


Est. 1890

TYPICAL STREET RESTORATION

ASPHALT OVERLAY FOR ROADWAY TRENCH RESTORATION

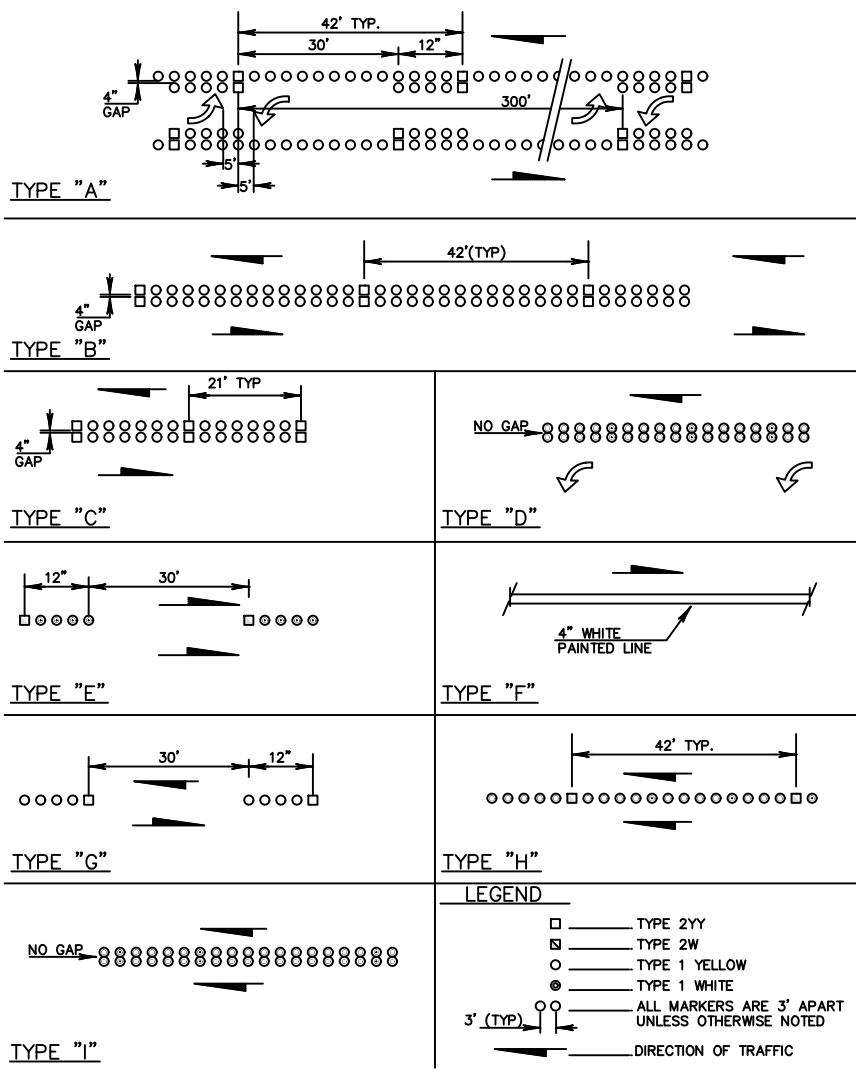
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NOTES

1. TYPE C PAVEMENT MARKERS TO BE USED ONLY UPON APPROVAL BY CITY ENGINEER.
2. NOT TO BE USED ON EDGELINES.

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SCALE	NTS
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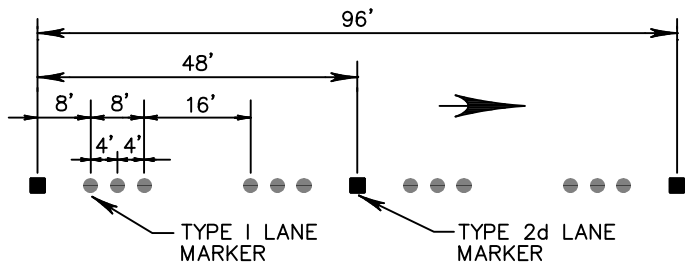


MARKINGS B

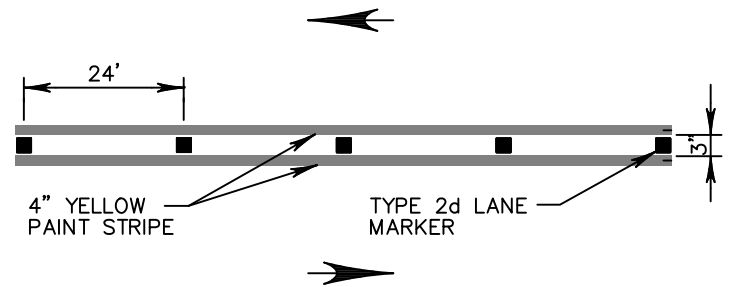
RAISED PAVEMENT LANE MARKING DETAILS

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SCALE	NTS
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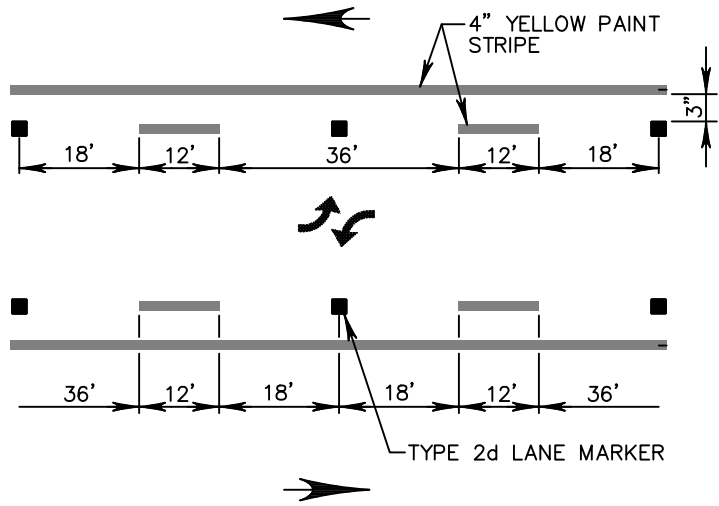
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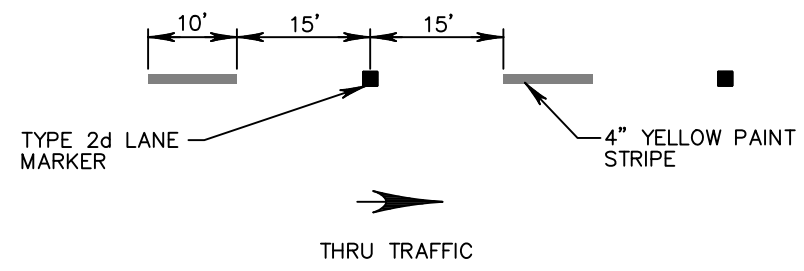
LANE LINE DETAIL



MEDIAN PATTERN



TWO-WAY LEFT TURN LANE



CENTER LANE SKIP PATTERN

NOTE
MATCH EXISTING PAVEMENT MARKING DIMENSIONS.

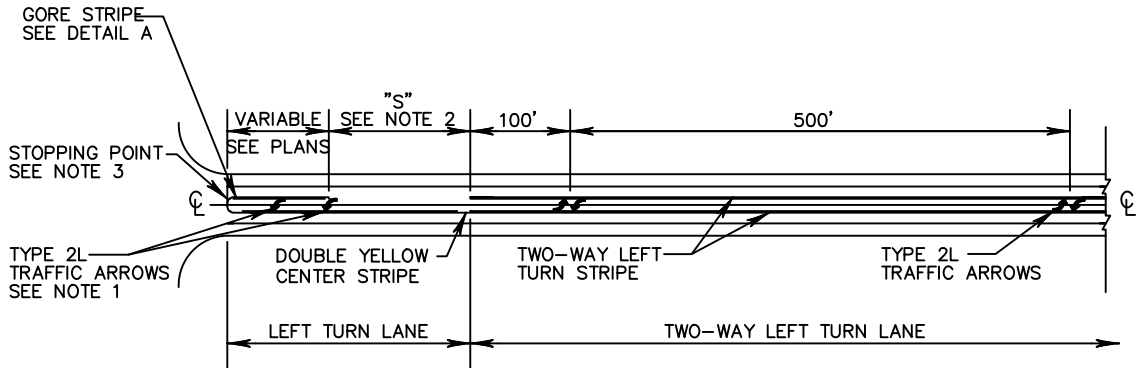


MARKINGS C

PAVEMENT MARKING DETAILS

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TWO-WAY LEFT TURN LANE

POSTED SPEED	TAPER RATE
55 MPH	55:1
50 MPH	50:1
45 MPH	45:1
40 MPH	40:1
35 MPH	35:1
30 MPH	30:1
25 MPH	25:1

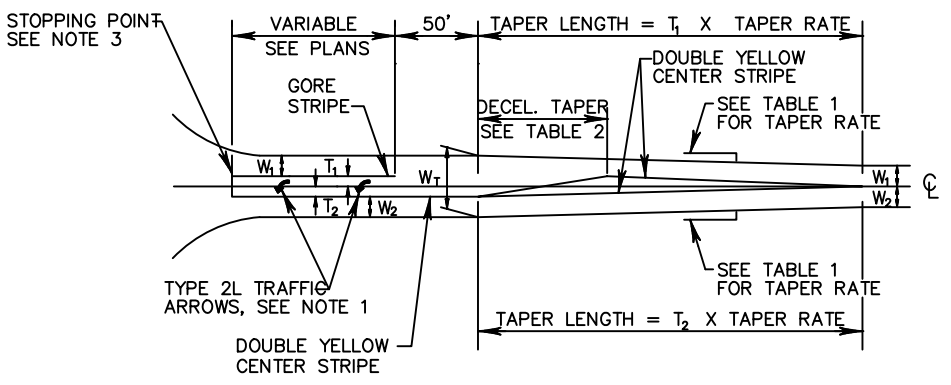
POSTED SPEED	DECEL. TAPER LENGTH
55 MPH	165'
50 MPH	150'
45 MPH	135'
40 MPH	120'
35 MPH	105'
30 MPH	90'
25 MPH	70'

LEGEND

- W_1 = APPROACHING THROUGH LANE
- W_2 = DEPARTING LANE
- T_1 = WIDTH OF LEFT TURN LANE ON APPROACH SIDE OF \mathcal{C}
- T_2 = WIDTH OF LEFT TURN LANE ON DEPARTURE SIDE OF \mathcal{C}
- W_1 = TOTAL WIDTH OF CHANNELIZATION ($W_1 + W_2 + T_1 + T_2$)

NOTES

1. FIRST TYPE 2L ARROW IS INSTALLED 50' BACK OF STOP BAR OR CROSSWALK. SECOND ARROW IS LOCATED 100' BACK, OR AT LEFT TURN POCKET.
2. "S" = 140' FOR POSTED SPEED < 50 MPH. "S" = 170' FOR POSTED SPEED > 50 MPH.
3. STOP BAR IS TO BE INSTALLED 4' BEHIND THE CROSSWALK (MARKED OR NOT) ONLY WHEN MAINLINE MOVEMENT IS CONTROLLED BY A STOP SIGN OR TRAFFIC SIGNAL.
4. RAISED PAVEMENT MARKERS SHALL BE INSTALLED ONLY WHEN SPECIFIED IN THE CONTRACT PLANS.
5. SEE RAISED PAVEMENT LANE MARKINGS DETAIL 621 FOR MARKER DESIGNATION.



LEFT TURN LANE

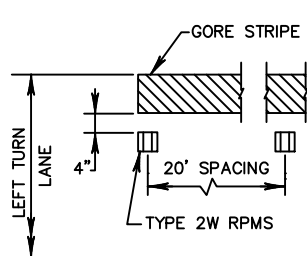


MARKINGS D

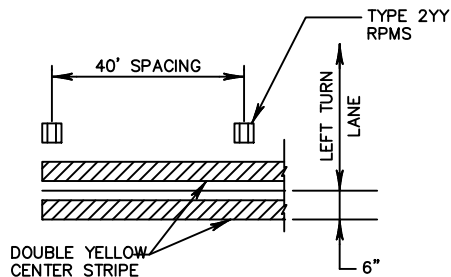
TWO-WAY LEFT TURN LANE MARKING DETAIL

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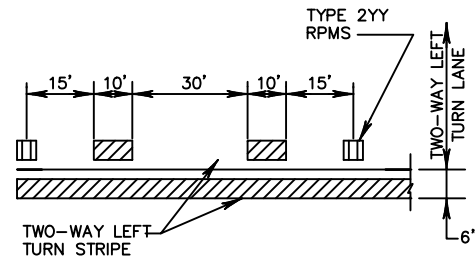
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DATE	1/31/2019
SCALE	NTS
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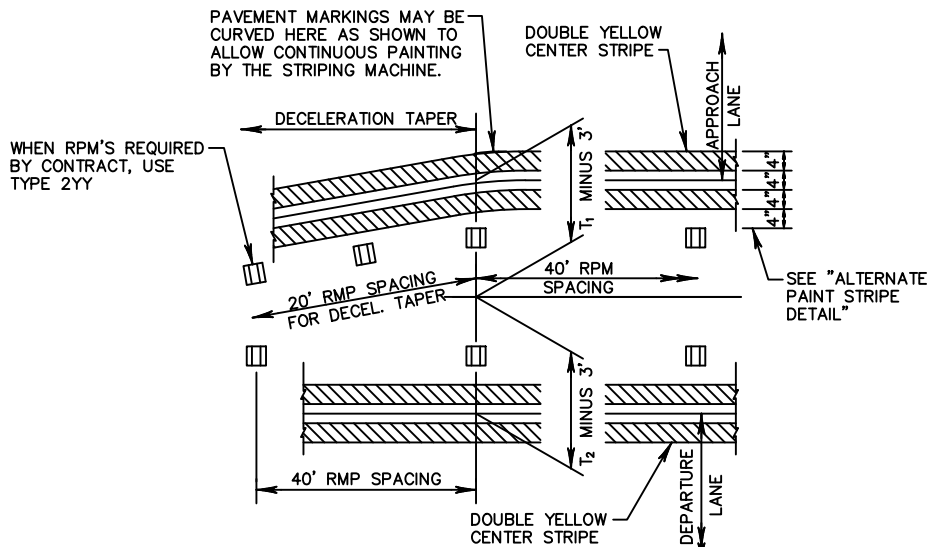
DETAIL A



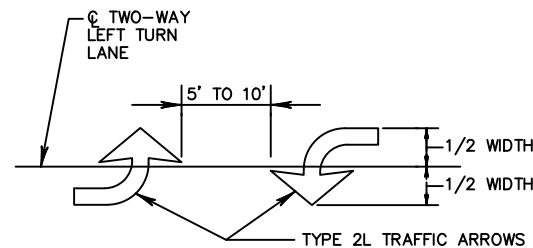
DETAIL B



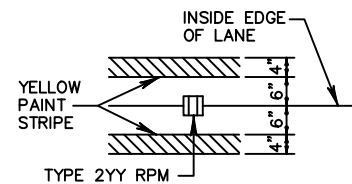
DETAIL C



DETAIL D



DETAIL E



ALTERNATE PAINT STRIPE DETAIL

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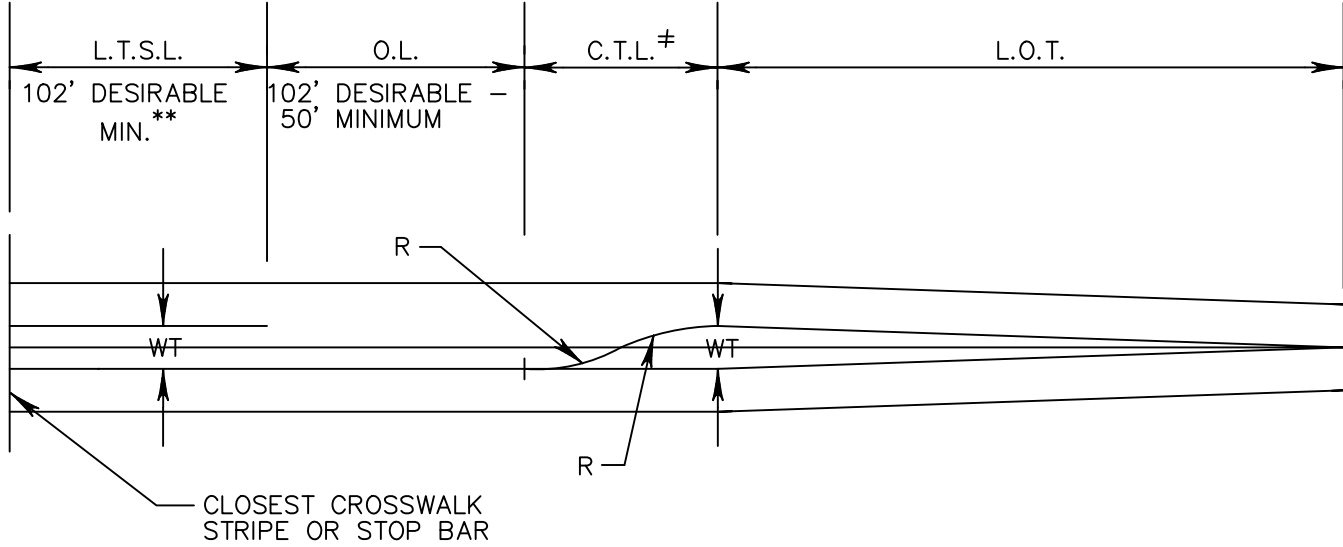


MARKINGS E

PAVEMENT MARKING TYPICAL DETAILS

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DRAWING NUMBER	424

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DETAIL NOTES:

- L.T.S.L. = LEFT TURN STORAGE LENGTH (FEET)
- O.L. = OPENING LENGTH (FEET)
- C.T.L. = CURVE TRANSITION LENGTH (FEET)
- L.O.T. = LENGTH OF TAPER (FEET)
- W.T. = WIDTH OF TURNING LANE (FEET)
- R = RADIUS OF TRANSITION CURVE (FEET)
- S.L. = SPEED LIMIT (M.P.H)

NOTE:
REFER TO STANDARD DETAILS 620 THRU 624 FOR ADDITIONAL INFORMATION ON LANE MARKINGS.

** MAY BE REDUCED WITH APPROVAL OF THE CITY ENGINEER

ADDITIONAL LEFT TURN STORAGE FOR TRUCKS AT UNSIGNALIZED INTERSECTIONS						
LEFT TURN STORAGE LENGTH REQ'D	% TRUCKS IN LEFT TURN MOVEMENT					
	10	20	30	40	50	
102'	24'	24'	51'	51'	51'	
150	24'	51'	51'	75'	75'	
201'	24'	51'	75'	99'	99'	
	STORAGE LENGTH TO BE ADDED TO LEFT TURN STORAGE LENGTHS					

L.T.S.L.	LENGTH BASED UPON EXPECTED QUEUE LENGTH	
O.L.	OPENING TO BE 102' UP TO 35 MPH, INCREASE 20' FOR EACH ADDITIONAL 5 MPH OF DESIGN SPEED	
S.L.	< 45 MPH	> 45 MPH
C.T.L. [‡]	84.0 FT (TYP.)	119.4 FT (TYP.)
R	150 FT	300 FT
L.O.T.	$\frac{W.T.}{120} \times (S.L.+5)^2$	$\frac{W.T.}{2} \times (S.L.+5)$
W.T.	12 FT (MIN.)	12 FT (MIN.)

[‡] base on W.T. = 12'

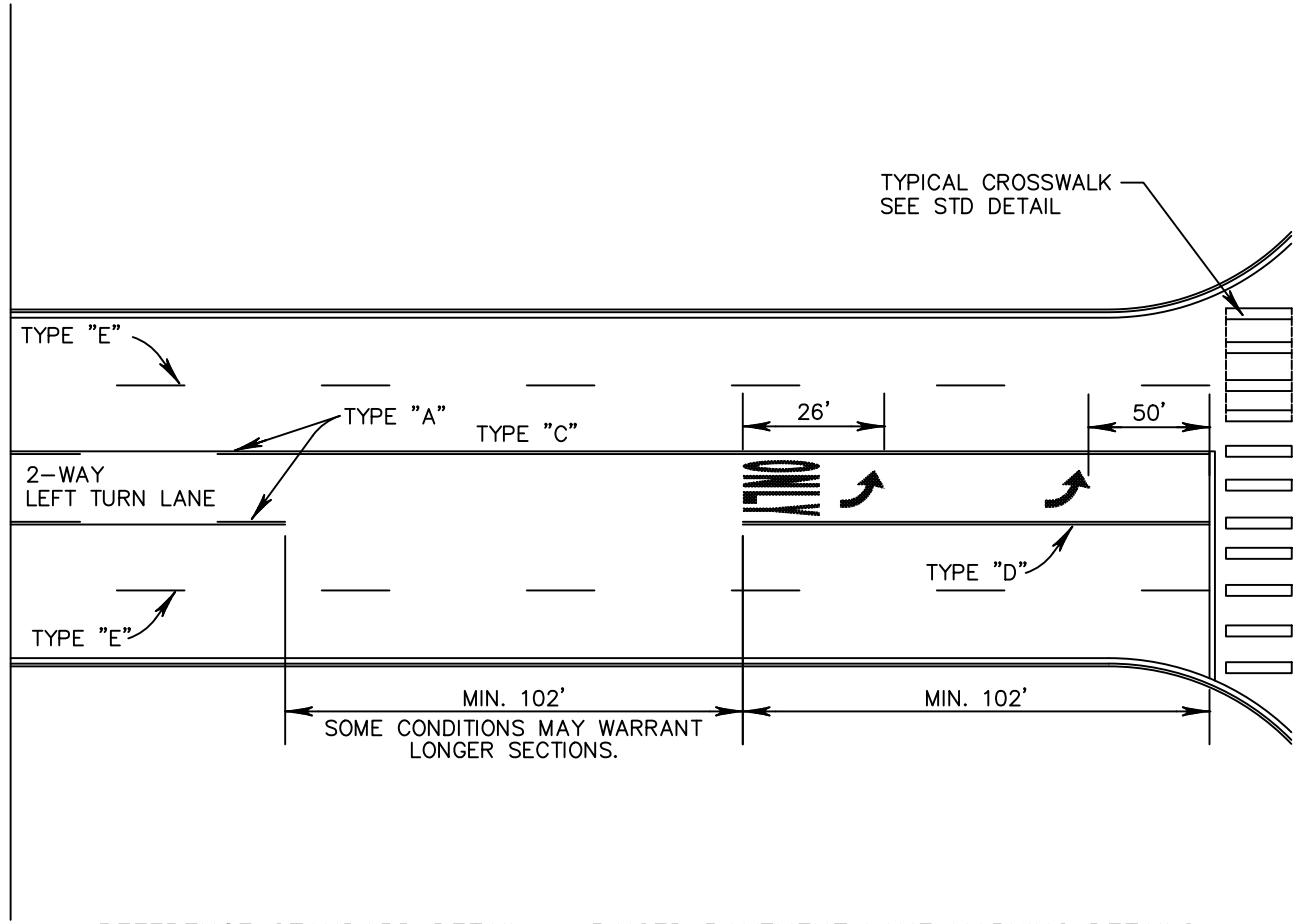


MARKINGS F

SYMMETRICAL LEFT TURN POCKET DETAIL

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DATE	1/30/2019
SCALE	NTS
DRAWING NUMBER	425

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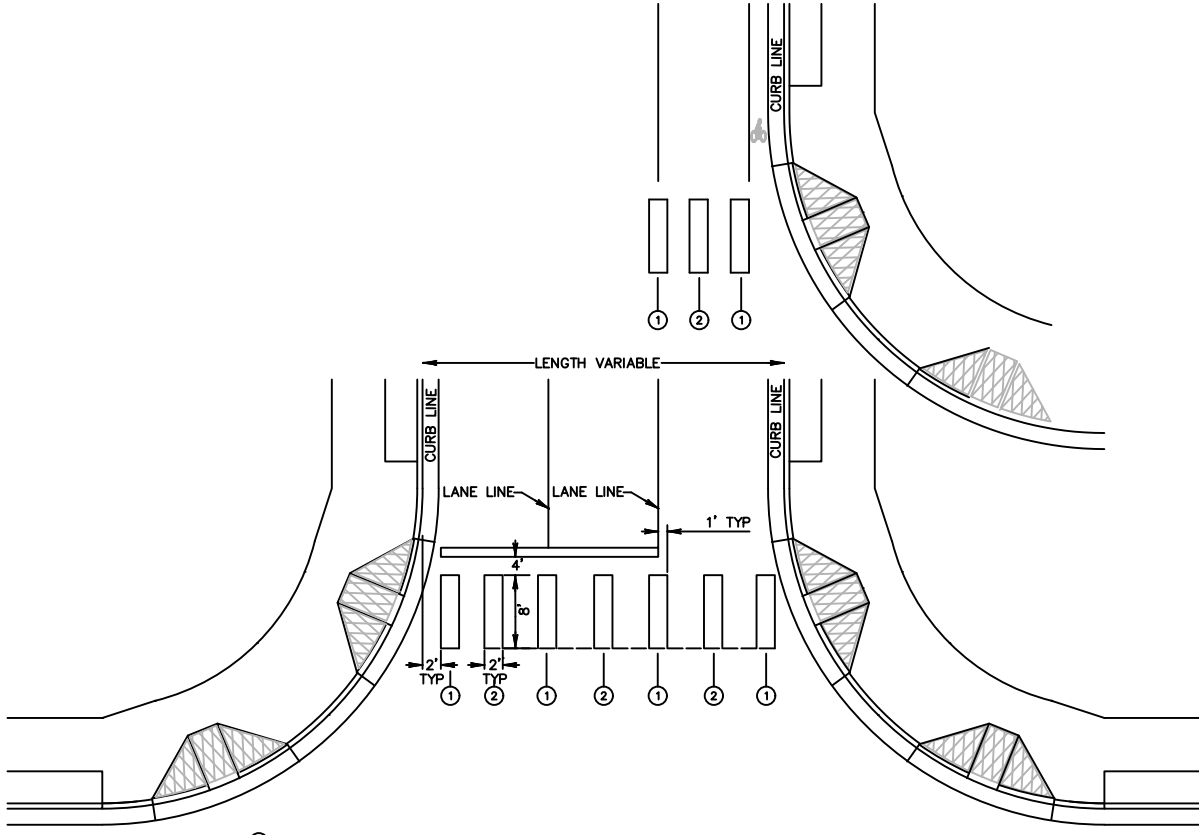
REFERENCE STANDARD DETAIL – RAISED PAVEMENT LANE MARKING DETAILS



MARKINGS G

TWO-WAY LEFT TURN TO LEFT TURN LANE

DRAWN BY	IDS
DATE	1/30/2019
SCALE	NTS
DRAWING NUMBER	426



- ① LANE LINE STRIP: THIS IS LOCATED IN THE LINE WITH EACH LANE LINE AND HALF THE STRIP ON EACH SIDE.
- ② MID LINE STRIP: THIS IS LOCATED MID WAY BETWEEN EACH LANE LINE STRIP

NOTES

DURA STRIPE MATERIALS SHALL BE USED UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.

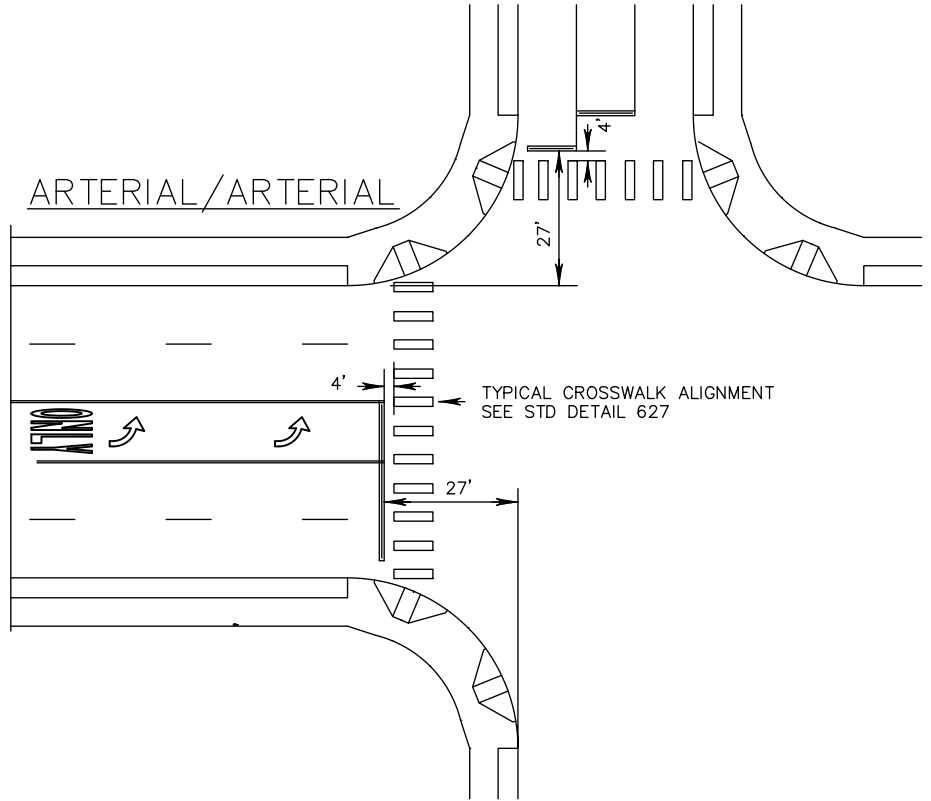
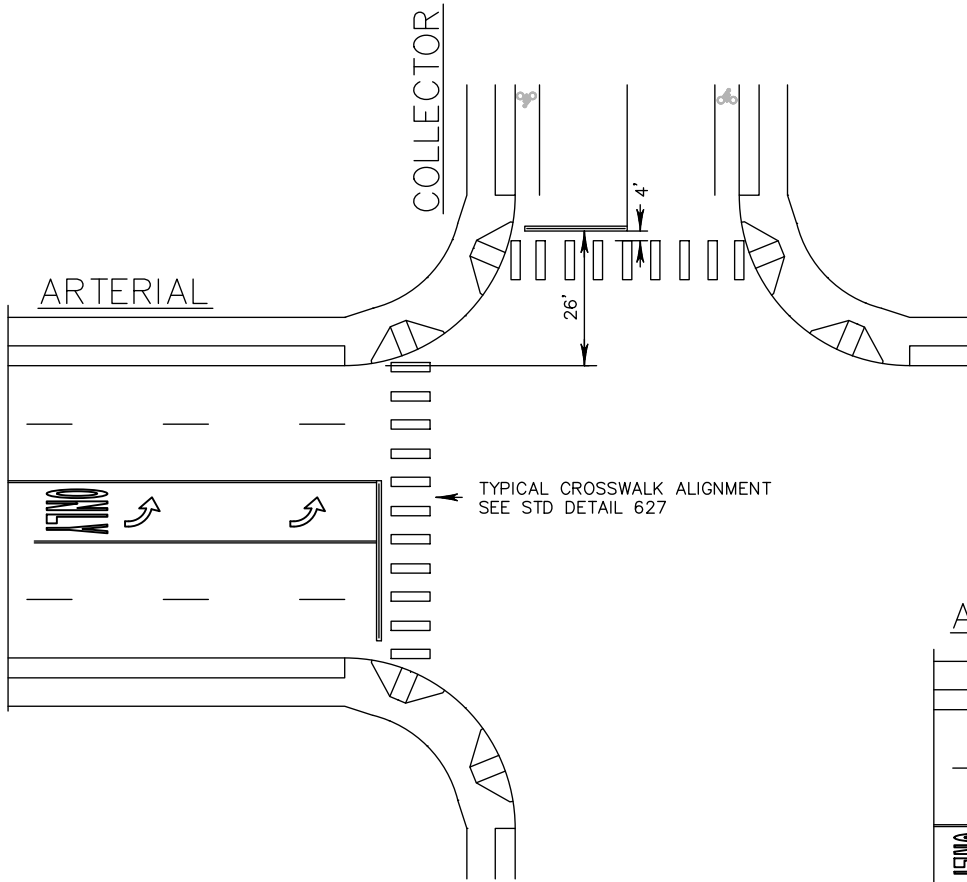
ALL NEW MID BLOCK CROSSWALKS SHALL BE LAYED OUT AS ABOVE AND PROVIDE SUPPLEMENTAL SIGNING CONSISTENT WITH N.U.T.C.D. AND AS DIRECTED BY THE CITY ENGINEER.



MARKINGS H

TYPICAL CROSSWALK STRIPING

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DATE	1/30/2019
SCALE	NTS
DRAWING NUMBER	427

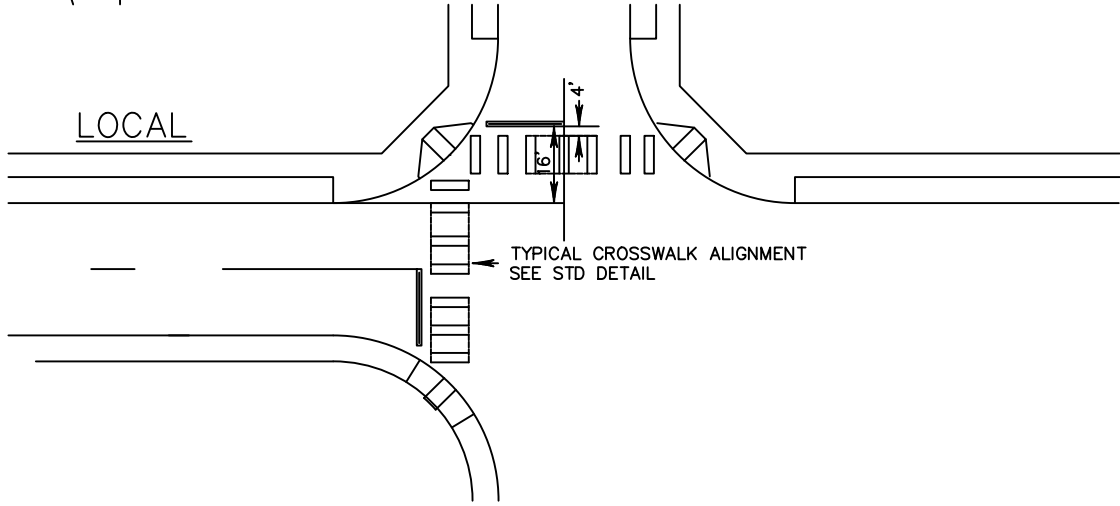
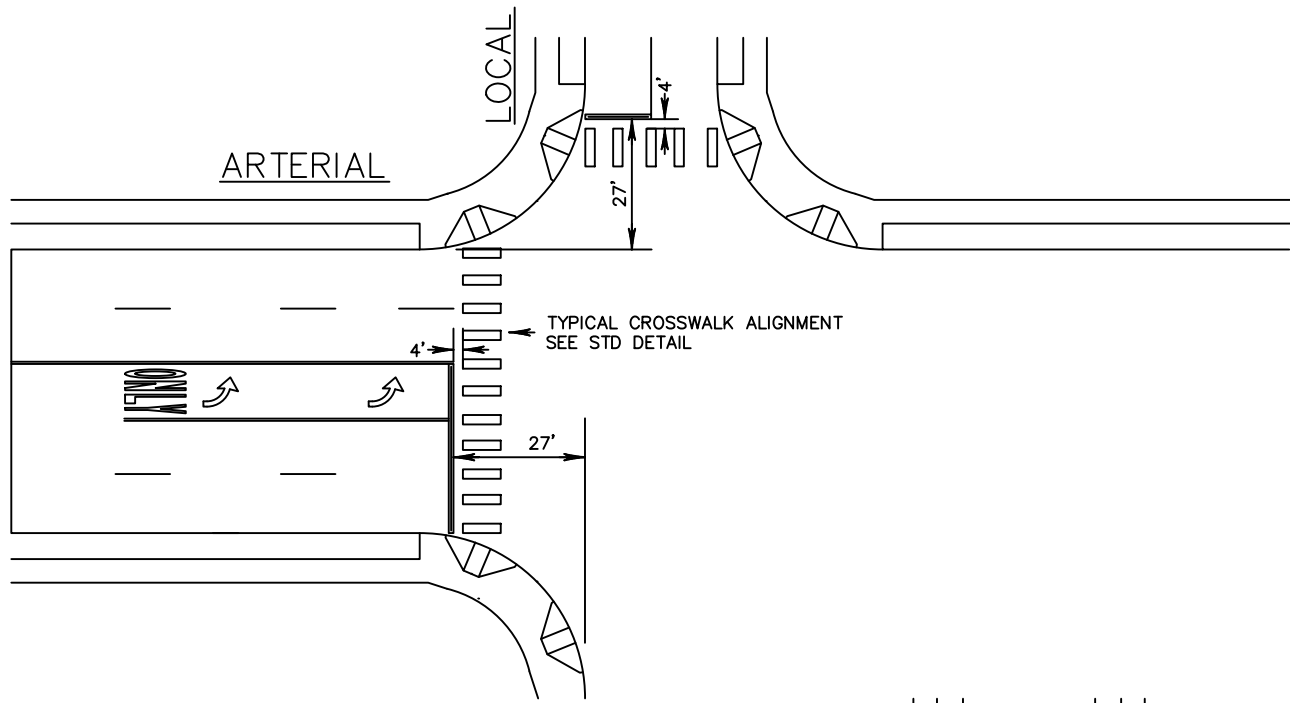


MARKINGS I

TYPICAL CROSSWALK ALIGNMENT - ARTERIAL/COLLECTOR

DRAWN BY	IDS
DATE	1/31/2019
SCALE	NTS
DRAWING NUMBER	428

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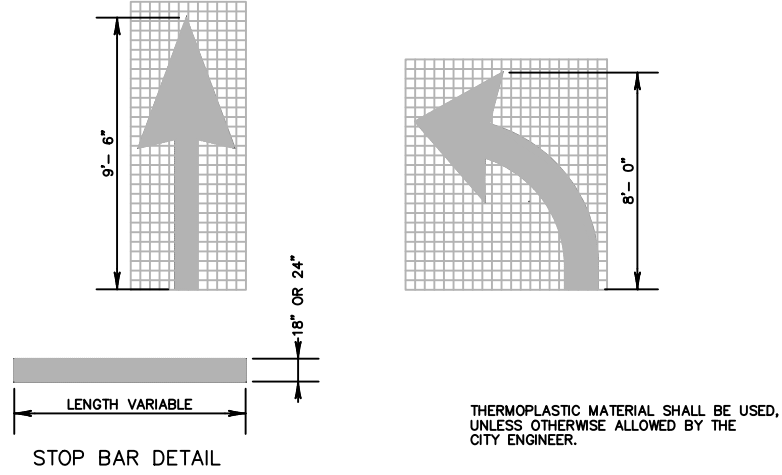
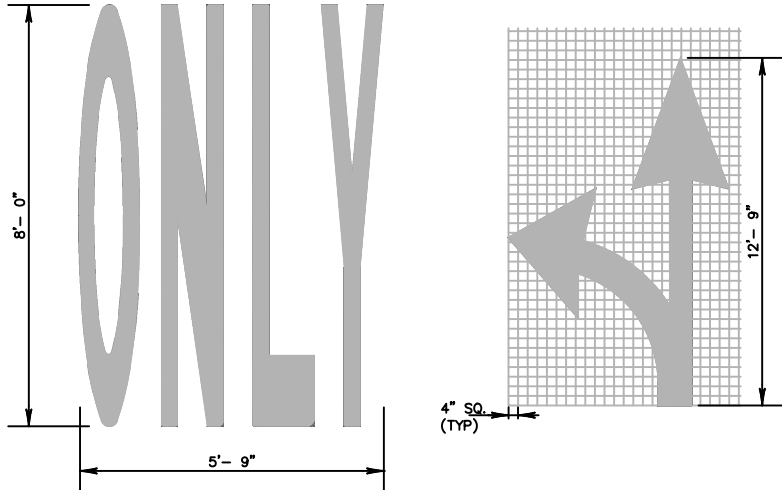


MARKINGS J

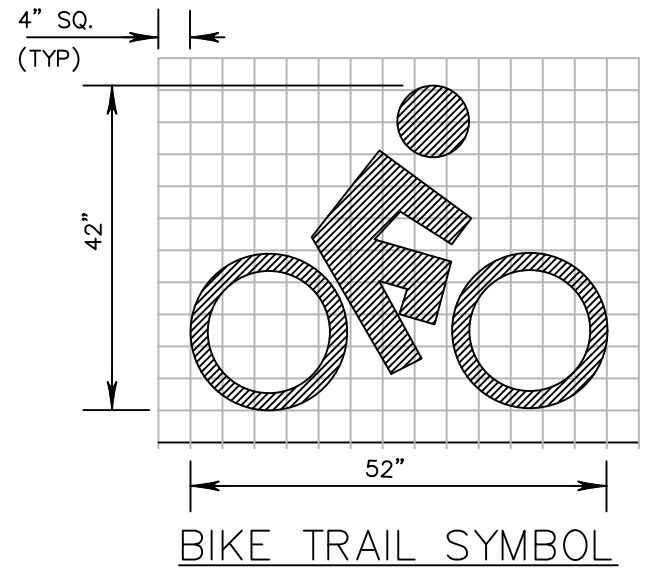
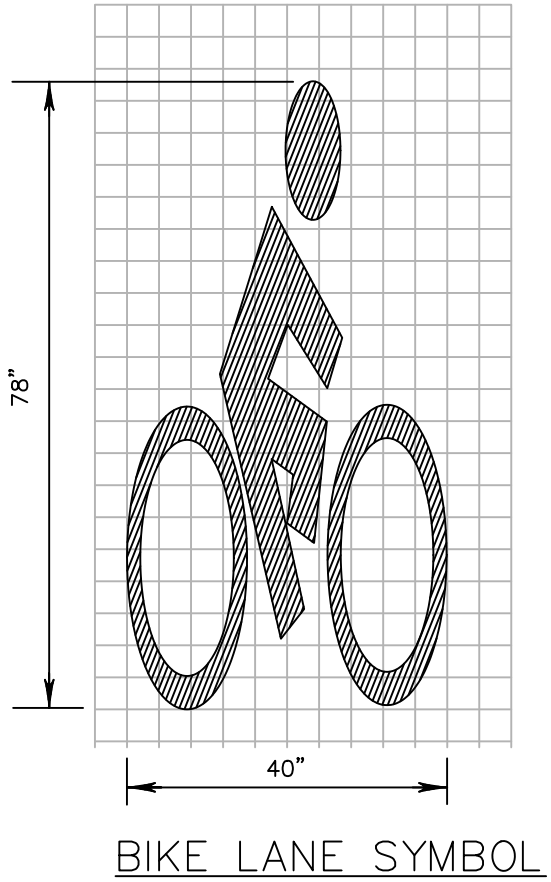
TYPICAL CROSSWALK ALIGNMENT - ARTERIAL/LOCAL

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SCALE	NTS
DRAWING NUMBER	429



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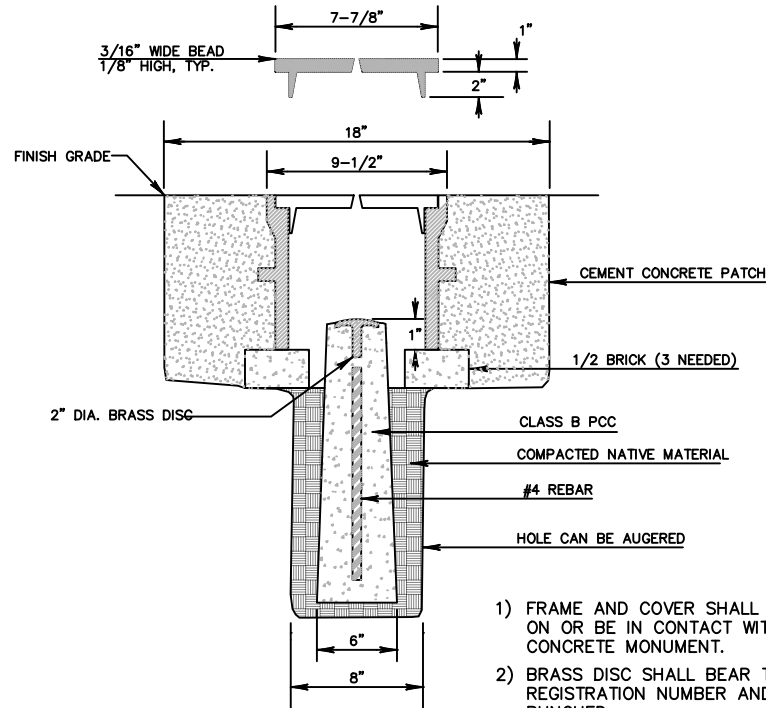
MARKINGS L

BIKE LANE SYMBOLS
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DATE	1/30/2019
SCALE	NTS
DRAWING NUMBER	431



LID PLAN



- 1) FRAME AND COVER SHALL NOT REST ON OR BE IN CONTACT WITH CONCRETE MONUMENT.
- 2) BRASS DISC SHALL BEAR THE LAND SURVEYORS REGISTRATION NUMBER AND BE CLEARLY PUNCHED
- 3) FRAME AND COVER:
SATHER MANUFACTURING COMPANY
No. 2022 W/CONCRETE MONUMENT OR APPROVED EQUAL.

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DATE	1/31/2019
SCALE	NTS
DRAWING NUMBER	460

Chapter 5

ROADSIDE FEATURES

5.1 Street Trees, Landscaping and Irrigation

- A. Street Trees and Landscaping
- B. Planting Strips
- C. Existing Trees and Landscaping
- D. New Trees

5.2 Mailboxes

- A. City Engineer
- B. Port Orchard Postmaster
- C. Owners or Residents
- D. Builders or Contractors
- E. Installation Methods

5.3 Street Illumination

- A. Requirements
- B. Ownership and Maintenance
- C. General Considerations
- D. Design Standards

5.4 Street Barricades

- A. Type I or Type II
- B. Type III Barricades

5.5 Bollards

- A. General

5.6 Guardrail/Embankment Heights

5.7 Off-Street Parking Spaces

5.8 On-Street Parking Required

5.9 Roadside Obstacles

- A. General

5.1 Overview

The City of Port Orchard places priority on the safety of our streets. We believe our streets should be livable and a positive expression of our communities' values. Beyond simply acting as streets for cars, streets fill a community need as public spaces. Our streets are places where people walk, shop, meet, and share life with social and recreational activities. In addition, beyond even these quality of life benefits, pedestrian-friendly streets have been increasingly linked to highly desirable social outcomes of economic growth improvements in air quality and increased physical fitness and health. For these reasons, we encourage the design of "livable" streets, or streets that seek to better integrate the needs of the community into the roadway's design. A real component of our streets is the fact that mobility is also a part of quality of life. In our community only a small number of the streets – arterials, are intended for higher volumes of traffic at higher speeds, while the great majority of the streets are for lower volumes and speeds. This small percentage of arterial streets is essential for our people to rely on to get to their jobs, schools, and shopping without unnecessary and dangerous delays. Safety problems can occur associated with landscaping located in the right-of-way. Drivers pulling out of side streets and driveways encounter landscaping that obstructs their view of oncoming bicyclists, pedestrians and traffic as well as traffic control devices. Roadside features that impede travel on these corridors can make travel more dangerous and can adversely affect the quality of life for all people.

5.2 Side Slopes

A. General

1. Side slopes shall generally be constructed no steeper than 3:1 on both fill slopes and cut slopes. Steeper slopes may be approved by the City Engineer upon showing that the steeper slopes, based on soils analyses, will be stable.
2. Side slopes shall be stabilized with grass sod or seeding or by other planting or surfacing materials acceptable to the City Engineer.

5.3 Street Signage

A. General

All traffic signs and installation shall conform to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD), as amended by the Washington State Transportation Commission per RCW 47.36.030. Street signs shall conform to Standard Detail 501 and all signs shall be located as shown on Figure 2A-2 of the MUTCD. The developer is responsible for purchase and initial installation of all traffic control devices including signage.

The MUTCD contains information on the intended use and placement of signs. It also contains information on the size of standard regulatory and warning signs. All traffic control signs shall be installed before a road is opened to vehicular use. The City Engineer shall approve all signs

for type, size, legend, reflective facing material, and mounting devices.

The city does not maintain private road name signs on private property.

5.4 Street Trees, Landscaping and Irrigation

B. Street Trees and Landscaping

Street trees and landscaping shall be incorporated into the design of street improvements as directed by classifications of streets. Such landscaping in the right-of-way shall be coordinated with off-street landscaping required on the developer's property under the provisions of Port Orchard Municipal Code 20.128.

C. Planting Strips

Planting strips are required along all classifications of streets. The design of planting strips must be approved by the City Engineer and must include a landscaping plan that addresses plant maintenance, utilities and traffic safety requirements.

D. Street Tree Selection and Placement

Street tree height and spacing shall not conflict unduly with overhead utilities, or root development with underground utilities.

New street trees shall conform to section 20.128 of Port Orchard Municipal Code.

5.5 Mailboxes

The responsibilities for location and installation of mailboxes in connection with the construction or reconstruction of City streets are as follows:

A. City Engineer

The City Engineer will:

1. Require street improvement plans, whether for construction by the City or by a private builder, to show clearly the designated location or relocation of mailboxes, whether single or in clusters.
2. Require with this information any necessary widening or reconfiguration of sidewalks with suitable knockouts or open strips for mailbox posts or pedestals.
3. Require these plans to bear a statement on the first sheet that "Mailbox Locations as Shown on These Plans Have Been Coordinated with the Post Office in Port Orchard, Washington." This will be a prerequisite to plan approval.
4. Require construction of mailbox locations in accordance with these plans, through usual inspection and enforcement procedures.
5. Ensure the mail boxes are not installed within five feet of a storm drain catch basin.
6. Mailboxes shall not create an obstruction to the pedestrian through movement on adjacent sidewalk.

B. Port Orchard Postmaster

Port Orchard Postmaster will:

1. Designate location and manner of grouping of mailboxes when so requested by the design agency. Note on the plans the type of mailbox delivery: CBU (Collection Box Unit), or Rural type box. NDCBU's, Neighborhood Delivery and Collection Box Units have been designated as obsolete delivery equipment by the US Postal Service.
2. Authenticate by stamp or signature when this information has been correctly incorporated into the plans.
3. Do all necessary coordination with owners or residents involved to secure agreement as to mailbox location and to instruct them regarding mailbox installation.
4. Install or relocate CBU's, if these are the type of box to be used in the neighborhood. Replace NDCBU's with new CBU's.

C. Owners or Residents

Owners or residents served by mailboxes, at time of original installation, will:

1. If using individual mailboxes, clustered or separate, install and thereafter maintain their own mailboxes as instructed by the post office.
2. If CBU delivery, rely on Post Office to provide and maintain the CBU's.

D. Builders or Contractors

Builders or their contractors shall:

1. Where there are existing mailboxes and no plans to replace them with CBU's: When it becomes necessary to remove or otherwise disturb existing mailboxes within the limits of any project, install the boxes temporarily in such a position that their function will not be impaired. After construction has been completed, reinstall boxes at original locations or at new approved locations, as indicated on the plans or as directed by the City Engineer. Use only existing posts or materials except that any damage caused by the builder or his contractor is to be repaired at the expense of the builder.
2. Where there are existing NDCBU's or plans to install new CBU's: Call on the Port Orchard Postmaster to install new CBU's and make the necessary installation.

E. Installation Methods

Installation methods are as follows:

1. Mailboxes in general, shall be set in accordance with the Standard Details. Boxes shall be clustered together when practical and when reasonably convenient to the houses served.
2. Materials used shall be crash worthy or shall break-away upon impact.
3. CBU's will be installed by the United States Postal Service in general accordance to their standard details.

5.6 Street Illumination

A. Requirements

1. Continuous illumination will be required for channelization accommodating additional lanes including the tapers. Illumination will also be required as identifiers where streets intersect arterials or for frequently used pedestrian areas on arterials.
2. Street Illumination shall require LED luminaires.
3. Street lighting systems design shall conform to the Illuminating Engineering Society of North American (IES) Standards Specification for Roadway Lighting as Outline in (RP-8-00). Puget Sound Energy (PSE) owns and maintains the street illumination system for the City of Port Orchard.
4. Plats and Short Plats, Commercial, Industrial or Institutional Property Development
 - a. Street lighting is required for all public streets. The street lighting design shall be reviewed and approved by the City Engineer prior to final plat approval. The cost of all street lighting shall be paid for by the developer.
 - b. The City will accept maintenance and power cost responsibility for the public street light system when a plat is fifty percent (50%) or more occupied. Until the plat is fifty percent (50%) occupied, the developer is responsible for the maintenance and energy charges for the street lighting system.
 - c. Street lighting is not required on private streets within a plat. However, a street lighting system is encouraged. The City does not install or maintain private street lighting systems. On private streets, all street light maintenance and power cost shall be paid by the developer, homeowner, or homeowners association.
5. Existing Residential Areas. If a resident or group of residents desires the installation of a new street light they must apply to the Public Works Director.
6. Commercial. Street lighting is required on all public street frontages. The developer is responsible for design, installation or relocation of new or existing lighting. Commercial development shall replace existing lighting systems on power poles with a new lighting system serviced by underground power if the system will not conflict with essential distribution lines.
7. City of Port Orchard is responsible for designating the street classification.
8. PSE or its consultant/contractor will design, engineer, provide, install, own and maintain the lighting system for the benefit of the City of Port Orchard.

B. Ownership and Maintenance

1. Puget Sound Energy (PSE) under franchise with the City (POMC 5.64) provides, installs, owns and maintains the street illumination system for the City. Maintenance of the completed lighting system is provided by Puget Sound Energy.
2. The property owner or homeowners association shall maintain private lighting systems.

C. General Considerations

1. Existing street light systems that extend along the frontage of a new development project, or within the limits of a roadway improvement project will not be generally required to be brought into conformance with these street lighting standards, unless the project is required to install full frontage improvements. If the City determines that existing street light systems should be brought into conformance with these requirements due to special circumstances the applicant will be notified of this requirement during the City's development review process.
2. When required, the applicant is responsible for the installation of streetlights and all accessories necessary to energize the street light system consistent with Standards.
3. For all new street light installations, the applicant shall coordinate jointly with Puget Sound Energy and the Public Works Department to prepare a street lighting plan for submittal to and approval by the City Engineer. The type of installation shall be as set forth in PSE Standard Specifications and these standards. The applicant can request that PSE design the street illumination system.
4. Street lighting plans shall be designed and submitted to the City Engineer for review and approval prior to construction. All lighting plans shall be prepared by a licensed engineer experienced with lighting design or by PSE. Lighting plans shall pursuant to PSE Standard Specifications and these standards.
5. The applicant shall coordinate with Puget Sound Energy for the availability and location of power sources for new light system
6. All public street light systems shall be accessible for public maintenance by a wheeled vehicle weighing twenty-thousand pounds (20,000 lbs.).
7. All street light installations including wiring, conduit, and power connections shall be located underground. Exception: existing residential areas with existing above ground utilities may have street lighting installed on the existing power poles. The applicant will be responsible for providing or obtaining necessary easements for underground power for street lighting systems designed and constructed as part of an approved development permit.
8. As-built drawings on 22-inch x 34-inch or 24-inch x 36-inch are required for all new or relocated underground street lighting systems prior to receiving a final occupancy permit. As-built drawings shall also be provided in electronic CAD format.
9. Street light circuitry will be provided with available voltage.
10. The exact location of the power source should be indicated. System continuity and extension should be considered.
11. Particular attention shall be given to locating luminaires near intersections, at all street ends and at pedestrian and/or equestrian crossings.

D. Design Standards

1. Illumination. Calculations should include luminaire spacing, illumination level, uniformity ratio, line losses, power source and other necessary details for the electrical and physical installation of the street lighting system.
2. Illumination Levels utilizing cut-off luminaires.

Street light illumination levels shall conform to the levels listed in the table below:

**Illumination Standards Average
Maintained Horizontal Illumination (Foot Candles)**

Road Class	Area Class	
	Residential	Industrial/Commercial
Private(Access)	0.4	N/A
Residential (Local Access)	0.6	0.9 To 1.2
Residential (Collector)	0.6	0.9 To 1.2
Arterial*	0.8	1.2 To 1.6
*Intersection lighting is required. Street lights shall be placed in accordance with the Standards listed below.		

Uniformity Ratio:

- 6:1 average to minimum for private (access)
- 6:1 average to minimum for residential (local access)
- 4:1 average to minimum for residential (collector)
- 3:1 average to minimum for arterial

Average illumination levels at intersections shall be 1.5 times the illumination required on the more highly illuminated street. Exception: Local residential streets intersecting other local residential streets shall not require 1.5 times the illumination at other intersections, provided that one luminaire is placed at the intersection.

At signalized intersections, all signal poles shall include a street light. Lighting levels at these locations may be higher than the criteria listed above.

3. Luminaire Requirements:
 - a. The following luminaires have been approved for use in the City of Port Orchard:
 - i. Arterials:
 - a. Fixtures: PSE Hunter Green (RAL6009) LED Cobra head. Wattage Based On Design.

- b. Arms: Ameron Mo-AE Elliptical Arm. Appropriate Arm Lengths Based On Design.
- c. Poles: Stresscrete 25' Mounting Height Green Octagonal Concrete.
- ii. Residential:
 - a. Fixtures: AAL Providence LED Color Corten Post Top Fixture Wattage Based On Design.
 - b. Poles: Stresscrete 13', 15' or 18' Mounting Height Round Tan & Burgundy Concrete. Based on Design & Location
- b. All luminaires shall be LED color temperature 4000k.
 - * Note: LED's will be used by the city as an alternative to reduce energy and maintenance cost.
- 4. Light Standards
 - a. Light standards shall be located on one side of the roadway only or shall be located opposite each other when placed along both sides of the roadway.
 - b. Staggered spacing will be allowed upon approval of the City Engineer where there is an established staggered pattern and it is necessary to continue this patter, or when site or safety conditions prevent locating luminaires on only one side of the roadway.
 - c. In areas where the street width differs from the City standard, or there are other factors influencing the location of the street lights, the City Engineer will provide input to the applicant on acceptable options.
 - d. Street light poles shall be direct buried as specified by PSE Line loss calculations shall show that no more than a 5 percent voltage drop occurs in any circuits. Branch circuits shall serve a minimum of four luminaires.

5. Conductors

Conductor size will be determined by the wattage and circuit lengths provided through the design. The minimum wire size for any illumination circuit shall be No. 6 Aluminum. No. 10 wire will be acceptable for the pole and bracket cable within the light standard only.

5.7 Street Barricades

Temporary and permanent barricades shall conform to the standards described in the City of Port Orchard currently adopted Manual on Uniform Traffic Control Devices (MUTCD) and the Standard Details.

A. Type I or Type II

Type I or Type II barricades may be used when traffic is maintained through the area being constructed or reconstructed.

B. Type III Barricades

1. Type III barricades may be used when streets and/or proposed future streets are closed to traffic. Type III barricades may extend completely across a street (as a fence). Where provision must be made for access of equipment and authorized vehicles, the Type III barricades may be provided with movable sections that can be closed when work is not in progress, or with indirect openings that will discourage public entry. Where job site access is provided through the Type III barricades, the developer/contractor shall assure proper closure at the end of each working day.
2. In general, Type III permanent barricades shall be installed to close arterials or other through streets hazardous to traffic. They shall also be used to close off lanes where tapers are not sufficiently delineated.
3. Type III barricades shall be used at the end of a local access street terminating abruptly without cul-de-sac bulb or on temporarily stubbed off streets. Each such barricade shall be used together with an end-of-street marker. For streets that will be extended in the future, a Type III barricade shall be placed at the end of the right of way with a sign stating, "STREET TO BE EXTENDED IN THE FUTURE."
4. Type III barricades may be required at other locations, as directed by the City Engineer.

5.8 Bollards

A. General

When necessary to deny motor vehicle access to an easement, tract, or trail, except for maintenance or emergency vehicles, the point of access shall be closed by a line of bollards.

1. This closure shall include one or more fixed bollards on each side of the traveled way and removable, locking bollards across the traveled way.
2. Spacing shall provide one bollard on the centerline of trail and other bollards spaced at a minimum of 50 inches on center on trails 10 feet wide or less measured from the center post in the center of the trail. Spacing shall be 60 inches on center on trails wider than 10 feet.
3. Bollard design shall be in accordance with the current Washington State Department of Transportation Standard Plans or other design acceptable to the City Engineer. No fire apparatus access streets shall be blocked in this manner without the concurrence of the Fire Marshall.

5.9 Guardrail/Embankment Heights

Guardrail installations shall conform to WSDOT Standard Plan C-1, Beam Guardrail Type 1 and C-2, Guardrail Placement. End anchors shall conform to WSDOT Standard Plan C-6, Beam Guardrail Anchor Type 1.

Evaluation of embankments for guardrail installations shall be in accordance with the WSDOT Design Manual.

5.10 Off-Street Parking Spaces

The number of off-street parking spaces required and specifications shall conform to Port Orchard Municipal Code, as updated. Please refer to POMC 20.124 Off-street parking design standards.

5.11 On-Street Parking Required

On-street parking should be incorporated into all designs of non-arterial streets, both residential and commercial land uses. Said parking should be located on both sides of the street (unless approved by the City Engineer) and the minimum stall width should be seven feet.

Where on-street parking is provided in Downtown Commercial zones, the area will be striped and the individual stalls marked. Intersections and alley connections to these streets shall be bulbed out the depth of the required parking at the intersection and alley points, in accordance with the Standard Details. Please refer to POMC 20.124 Parking Standards for general guidance.

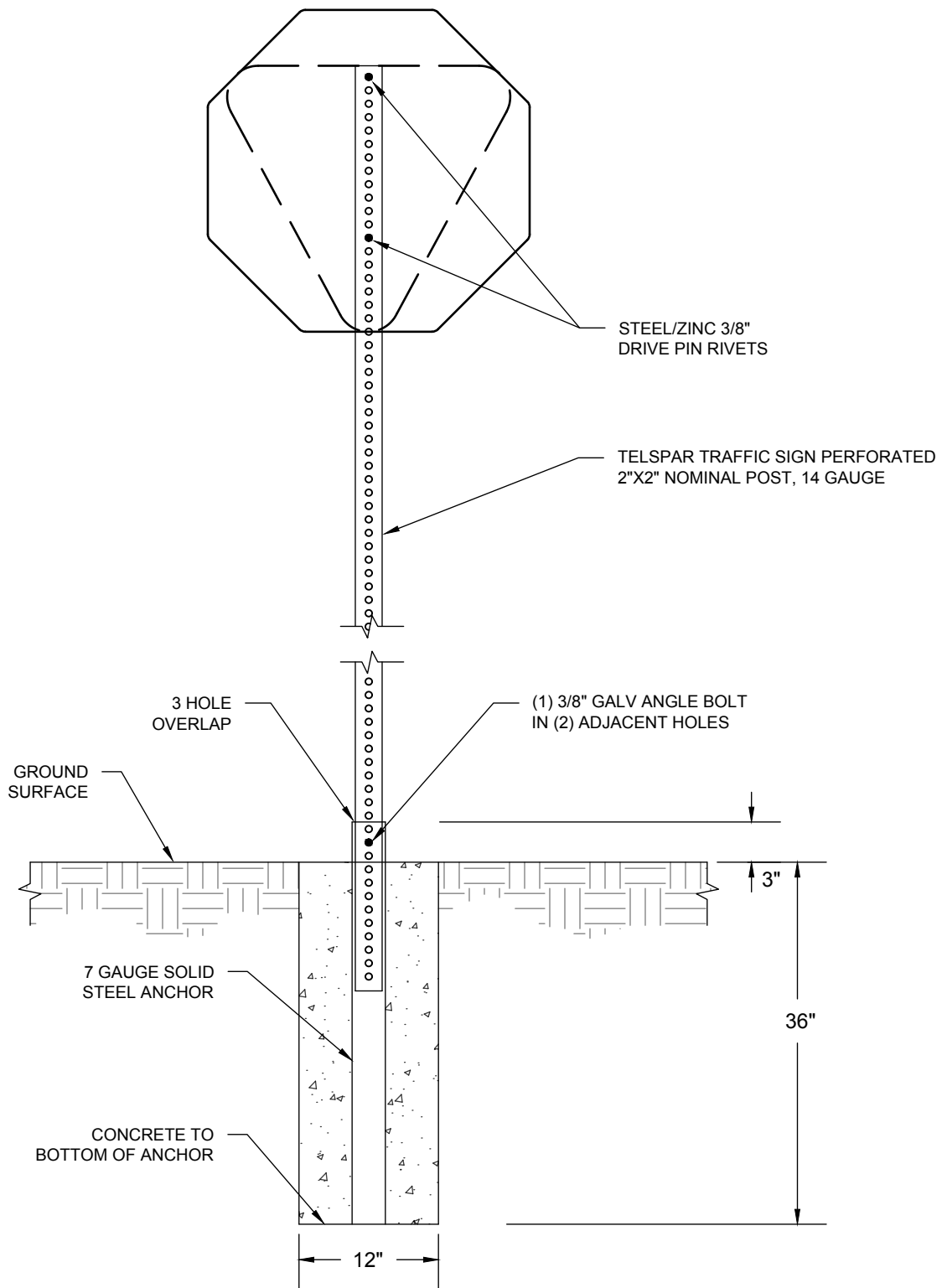
5.12 Roadside Obstacles

A. General

Non-yielding or non-breakaway structures, including retaining walls, rock facings and rockeries, which may be potential hazards to the traveling public, shall be placed with due regard to safety.

1. On streets with a shoulder or mountable curb, hazardous objects shall be placed as close to the right-of-way line as practical and a minimum of 10 feet from the edge of the traveled way or auxiliary lane.
2. On streets with a vertical curb section, hazardous objects shall be placed as far from the edge of the traveled way or auxiliary lane as practical.
3. Hazardous obstacles shall not be placed in a sidewalk or less than two feet from the face of the curb.
4. Placement of any utility structures shall be in accordance with requirements of the City

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NOTE:

INSTALL A NYLON WASHER WHEN SIGN FACE HAS TYPE III, IV, OR IX SHEETING

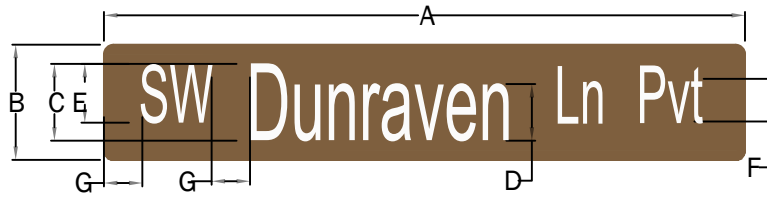


Est. 1890

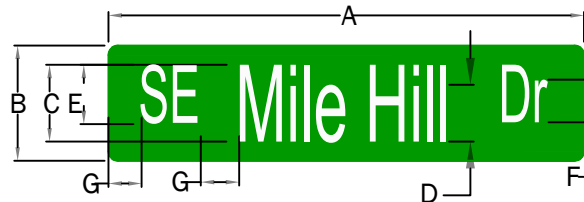
STREET SIGNS

STREET SIGN POST DETAIL

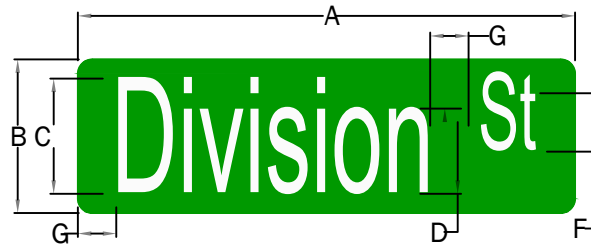
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DATE	2/21/2019
SCALE	NTS
DRAWING NUMBER	500



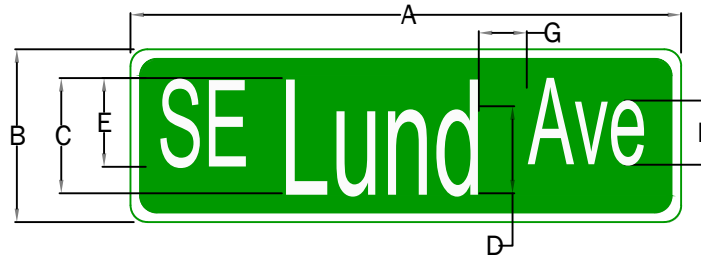
6-Inch Blade (Private Road)



6-Inch Blade



8-Inch Blade



Overhead Blade

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SCALE	NTS
DRAWING NUMBER	501A

	6-Inch Blade (Private)	6-Inch Blade	8-Inch Blade	12-Inch Blade	Overhead Blade
A	VARIES 48" MAX.	VARIES 48" MAX.	VARIES 48" MAX.	VARIES	VARIES
B	6"	6"	8"	12"	18"
C	4"	4"	6"	8"	12"
D	3"	3"	4.5"	6"	9"
E	3"	3"	3"	6"	9"
F	2.25"	2.25"	3"	4"	6.75"
G	2"	2"	2"	3"	5"

NOTES:

1. SIGN SHALL BE SUBMITTED AND APPROVED BY PUBLIC WORKS DIRECTOR OR DESIGNEE PRIOR TO FABRICATION.
2. SIGN SHALL BE MADE FROM 0.125" ALUMINUM AND HAVE AVERY OR 3M HIP (TYPE III/IV) SHEETING.
3. SIGNS SHALL HAVE STANDARD RADIUS CORNERS WITH NO HOLES.
4. SIGNS SHALL BE GREEN BACKGROUND WITH WHITE LETTERS FOR CITY OWNED STREETS.
5. SIGNS SHALL BE BROWN BACKGROUND WITH WHITE LETTERS AND MARKED "PVT" FOR PRIVATE STREETS.
6. SIGNS SHALL NOT HAVE A BORDER UNLESS THEY ARE AN OVERHEAD MOUNTED SIGN.
7. SIGNS SHALL BE DOUBLE SIDED.
8. LETTERING SHALL BE HIGHWAY SERIES C GOTHIC.
9. OVERHEAD MOUNTED SIGNS SHALL HAVE A 1-INCH WHITE BORDER WITH 2" MAX. SPACING TO TEXT FROM BORDER.
10. STREET NAMES SHALL HAVE AN UPPER CASE FIRST LETTER FOLLOWED BY LOWER CASE LETTERS.



STREET SIGN DETAIL

PAGE 2 OF 2
Page 111 of 402

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DATE	1/30/2019
SCALE	NTS
DRAWING NUMBER	501B

Chapter 6

Structures –Vaults and Walls

6.1 Vaults

6.2 Walls

- A. Terms
- B. General
- C. Retaining Walls
- D. Rockeries or Rock Walls
- E. Segmental Gravity Walls
- F. Requirements for Retaining Walls, Rockeries and Rock Walls Located Within a Public Right of Way

6.1 Vaults

Subsurface vaults are specialized underground structures designed for utility functions as places for meters and valves or as stormwater facilities.

Subsurface stormwater facilities shall conform to the pertinent City Building Code and criteria set forth in the currently adopted stormwater manual. Note that where the top of a vault is located within a fire lane, additional loading requirements to accommodate fire trucks will apply.

Plans for structures, such as vaults, require a separate review, approval, and building permit by the City of Port Orchard DCD prior to construction.

6.2 Walls

9 Terms

1. Rockery: "Rockery" means one or more courses of large rocks stacked near vertical in front of an exposed soil face to protect the soil face from erosion and sloughing.
2. Retained Wall: Retaining Wall is as defined in the International Building Code.
3. Segmental Gravity Wall: Segmental Gravity Walls are typically constructed of manufactured (Allen Block, Keystone, etc.) modular concrete or masonry units, stacked in a running bond pattern without mortar or reinforcement.

A. General

Design and construction of retaining walls and Segmental Gravity Walls shall conform to the currently adopted International Building Code. Rockeries shall be constructed in accordance with the "Rock Wall Construction Guidelines," prepared by the Associated Rockery Contractors. Segmental Gravity Walls shall be constructed of concrete masonry units (CMU's), manufactured in general accordance with the Northwest Concrete Masonry Association (NWCMA).

B.

1. If the rockery is 24-inches high or less, or stepped with no segment exceeding a height of 24-inches, and there is at least 24-inches of separation between segments, it may be located nearly anywhere on your property, subject to limitations established by the Land Use Code. If a rockery or any segment of a stepped rockery is over 24-inches, engineering is required. If the rockery Code, it must comply with the city's building code regulations permitting requirements, and the structural setback requirements for the property.
2. Rockeries shall be 12-feet or less in total height.
3. Rockeries shall not be used to retain fill.

4. Rockeries may not be used for any protection of cut or fill embankments within the public right of way or within the construction limits of said right of way. Engineered retaining walls may be used within the public right-of-way upon approval of the City Engineer and the proper permitting from both Building and Public Works has been secured.
5. Rockeries shall be constructed of sound, angular ledge rock that is resistant to weathering. The longest dimension of any individual rock should not exceed three times its shortest dimension.

C. Segmental Gravity Walls

1. Segmental Gravity Walls shall be constructed of concrete masonry units (CMU's), manufactured in general accordance with the Northwest Concrete Masonry Association (NWCMA).
2. If the segmental gravity wall is 24-inches high or less, or stepped with no segment exceeding a height of 24-inches, and there is at least 24-inches of separation between segments, it may be located nearly anywhere on your property, subject to limitations established by the Land Use Code. If a segmental gravity wall is over 24-inches, engineering is required. If the segmental gravity wall meets the definition of a retaining wall in the International Building Code, it must comply with the city's building code regulations permitting requirements, and the structural setback requirements for the property.

D. Requirements for Retaining Walls, Rockeries, and Segmental Gravity Walls Located within a Public Right of Way

1. Keyway. A keyway shall be constructed for all retaining walls, rockeries, and segmental gravity walls and shall be comprised of a shallow trench (12-inches minimum depth), extending the full length of the wall and as wide as the wall units and the drain rock layer. The competency of the keyway subgrade to support the rock wall shall be verified by the site Geotechnical Engineer or City Inspector. Areas of "soft" subgrade shall be over-excavated and replaced with compacted structural fill.
2. Underdrain. An underdrain shall be installed at the rear of the keyway, consisting of a four-inch minimum diameter perforated or slotted, smooth-walled rigid plastic drain pipe. It shall be bedded on and surrounded by free-draining, 2-inches to 4-inches crushed rock with 5% fines. The underdrain pipe should be installed with sufficient gradient to initiate flow to either one side, both sides or to a low point. Outfall shall be connected by an un-perforated tightline to a positive and permanent discharge.
3. First Course. The first course of rock or wall unit should be placed on firm, unyielding soil or onto a layer of compacted crushed rock. There should be full contact between the rock or wall unit and the soil or crushed rock surface. Due to the angular nature of rock, proper placement may require shaping of the ground surface or slamming or

dropping the rocks into place. During construction of rock facings or rockeries, the rocks should be placed so that there are no continuous joint planes in either the vertical or lateral direction. Wherever possible, each rock should bear on at least two rocks below.

4. Drainage. To provide some degree of drainage control behind the rock facing, retaining wall or rockery, and as a means of helping to prevent the potential loss of soil through the face of the wall, a drain rock filter shall be installed between the rear face of the wall and the soil face being protected. This drain rock filter should be a minimum of 12- inches thick and should be composed of two to four-inch sized quarry spalls, or equivalent material.
5. Sidewalk. When a sidewalk is to be built over a rock facing, retaining wall or rockery, the top of the facing shall be sealed and leveled with a cap constructed of Class 4000 cement concrete in accordance with Chapter 3 of these Standards, but with reduced water content resulting in slump of not over two inches.
6. Pedestrian Protection. For pedestrian protection, a black vinyl coated chain link fence or metal handrail shall be installed when the rock facing, retaining wall or rockery has an exposed wall height of three feet or greater. Rockfacings, retaining walls or rockeries constructed adjacent to property lines shall include a minimum 48- inch tall fence along the top of any portion of the wall with an exposed height of three feet or greater. Where applicable, fences should be placed on the property line.

CHAPTER 7

SURFACE WATER MANAGEMENT

7.1 General

- A. Design Standards
- B. Minimum Requirements

7.2 Hydrologic Design

- A. General
- B. Hydrologic Models
- C. Design Flows

7.3 Hydraulics Design

- A. General
- B. Conveyance
- C. Stormwater Flow Control Facilities

7.4 On-site Stormwater Management

- A. General
- B. Best Management Practices Selection
- C. Best Management Practices Infeasibility
- D. Best Management Practices Stormwater Benefits

7.5 Construction Stormwater Pollution Prevention

- A. General

7.6 Materials

- A. General
- B. Conveyance Systems
- C. Manholes, Catch basins, and Inlets
- D. Flow Control Facilities
- E. On-site Stormwater Management Systems

7.7 Methods of Construction

- A. General
- B. Conveyance Systems
- C. Manholes, Catch basins, and Inlets
- D. Flow Control Facilities
- E. Abandoning of Systems
- F. Cleaning and Testing

7.8 Operations and Maintenance

- A. General
- B. Cleaning of Permanent Retention/Detention Areas

7.9 Appendix A

7.1 General

A. Design Standards

All design, materials, and construction shall conform to the following list. Any design, materials, and methods not specifically referenced in these City standards and specifications shall comply with all applicable sections of the standards listed below. In the case of differences among the standards and specifications, the more stringent standards shall apply unless directed otherwise by the City Engineer. The City Engineer retains the authority to modify, revise, or deviate from the approved plans at his/her discretion. Approval of the plans does not warrant the accuracy of the plans.

1. The currently adopted Washington State Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW); and
2. The latest edition of “Standard Specifications for Road, Bridge, and Municipal Construction” and “Hydraulics Manual” prepared by the Washington State Chapter American Public Works Association (APWA) and the Washington State Department of Transportation (WSDOT) and subsequent revisions, and
3. Low Impact Development Technical Guidance Manual for Puget Sound (LID Technical Guidance Manual) by Puget Sound Partnership and WSU Extension Center, Puyallup, Washington, December 2012 (As referenced by the SWMMWW).

All storm water conveyance and retention/detention systems are the responsibility of the professional engineer retained by the developer and is subject to approval by the City Engineer.

B. Minimum Requirements

The Washington State Department of Ecology SWMMWW outlines the 9 Minimum Requirements that can apply to a development or redevelopment. Not all of the Minimum Requirements will apply to every development or redevelopment project depending on project type and size. Use the flowcharts in Figure I-2.41 and Figure I-2.42 in Volume I, Section 2.4 of the SWMMWW to determine which minimum requirements apply. The following is the list of the Minimum Requirements as outlined in the SWMMWW:

- Minimum Requirement #1 - Preparation of Stormwater Site Plans
- Minimum Requirement #2 - Construction Stormwater Pollution Prevention (SWPP)
- Minimum Requirement #3 - Source Control of Pollution
- Minimum Requirement #4 - Preservation of Natural Drainage Systems and Outfalls
- Minimum Requirement #5 - On-site Stormwater Management
- Minimum Requirement #6 - Runoff Treatment
- Minimum Requirement #7 - Flow Control
- Minimum Requirement #8 - Wetlands Protection
- Minimum Requirement #9 - Operation and Maintenance

7.2 Hydrologic Design

A. General

Hydrological analysis is used to size conveyance, on-site stormwater management, flow control, and water quality facilities to meet the Minimum Requirements set forth by the Washington State Department of Ecology SWMMWW. This chapter describes the models and methods of analysis required and allowed by the City of Port Orchard.

B. Hydrologic Models

Three types of models may be used for the use in sizing stormwater facilities: Rational Method, Ecology-approved continuous simulation models, and single-event hydrograph method. The table below outlines which models may be used for each computation:

Table 7.2.1 – Acceptable Runoff Models

Type of Computation	Allowed For	Rational Method	Single-Event Hydrograph Method	Ecology-Approved Continuous Simulation Method
Peak Flow Conveyance Sizing (Design Flow)	All Projects	<u>ACCEPTED</u> if no detention storage is considered	<u>ACCEPTED</u> if no detention storage is considered	<u>ACCEPTED</u> if the majority of the tributary area is detained. Use 15-minute time-step.
Water Quality Facility Sizing	Project requiring MR#6	<u>NOT ACCEPTED</u>	<u>ACCEPTED</u> for treatment facilities sized by volume from a 6-month, 24-hour storm	<u>ACCEPTED</u> . Use 15-minute time step.
Flow Control Facility Sizing	Project requiring MR#7	<u>NOT ACCEPTED</u>	<u>NOT ACCEPTED</u>	<u>ACCEPTED</u> . Use 15-minute time step.
Downstream Analysis	All Projects	<u>ACCEPTED</u> if no detention storage is considered. Use the 100-year, 24-hour rainfall event.	<u>ACCEPTED</u> if no detention storage is considered. Use the 100-year, 24-hour rainfall event.	<u>ACCEPTED</u> . Use 15-minute time-step.
On-site Stormwater Management	Projects requiring MR#5	<u>NOT ACCEPTED</u>	<u>NOT ACCEPTED</u>	<u>ACCEPTED</u> . Use 15-minute time-step.
Wetland Protection	Projects requiring MR#8	<u>NOT ACCEPTED</u>	<u>NOT ACCEPTED</u>	<u>ACCEPTED</u> . Use 15-minute time-step.

C. Design Flows

The land coverage used to calculate the design flow for each computation shall follow the requirements dictated in the adopted stormwater manuals (i.e. historic (forested), existing, or proposed). The following outlines the requirements for each computation design flow:

1. Conveyance:

For conveyance sizing using the rational method and single-event hydrograph method the design flow is based on the 100-year, 24-hour storm. The 50-year, 24-hour storm may be used if shown that the surcharge from the 100-year storm has a flow path away from buildings and critical structures.

For conveyance sizing using an Ecology-approved continuous simulation model the design flow is based on the 100-year return period using a 15-minute time-step.

2. MR#5 On-site Stormwater Management (LID):

For sizing On-site Stormwater Management Best Management Practices, the design flow is outlined in Volume I, Section 2.5.5 of the Washington State Department of Ecology Stormwater Manual for Western Washington.

3. MR#6 Water Quality:

For sizing water quality facilities, the design flow/volume is outlined in Volume I, Section 2.5.6 of the Washington State Department of Ecology Stormwater Manual for Western Washington.

4. MR#7 Flow Control:

For sizing flow control facilities, the design flow requirements are outlined in Volume I, Section 2.5.7 of the Washington State Department of Ecology Stormwater Manual for Western Washington.

5. MR#8 Wetland Protection:

For projects that trigger Minimum Requirement #8 – Wetland Protection the design flow/volume are outlined in Appendix I-D: Guidelines for Wetlands when Managing Stormwater of the Washington State Department of Ecology Stormwater Manual for Western Washington.

7.3 Hydraulic Design

A. General

Hydraulic analysis shall be used to size roof downspouts, footing drains, yard drains, underdrains, ditches, swales, stormwater conveyance systems, etc. to prevent stormwater runoff from damaging on-site, adjacent, and right-of-way properties.

B. Conveyance Systems

1. Outfalls and Discharge Locations

- a. Conveyance systems shall maintain natural drainage basins unless otherwise approved

by the City Engineer.

- b. Stormwater runoff from the project shall produce no significant adverse impact to downstream properties and shall discharge to the existing downstream drainage system at the approved location.
- c. All pipe outfalls shall require energy dissipation as outlined in Chapter 3, Section 4.7 of the WSDOT Hydraulics Manual.
- d. Concentrated flows discharging to an adjacent property which has no conveyance system shall not be allowed unless approved by the City Engineer.

2. Off-site Analysis

- a. The analysis shall include the evaluation of the downstream system to a minimum of ¼-mile and the upstream system to the extent impacted by backwater.
- b. A physical inspection of the upstream and downstream drainage system shall be completed.
- c. Any stormwater problems within the evaluation area shall be addressed, which includes but is not limited to existing flooding, predicted flooding, or erosion.

3. Design Requirements

- a. The required design flow for sizing conveyance systems is indicated in Section 9.2.C.1 of this document.
- b. No structures shall be surcharged in the 100-year storm event unless shown that a flow path is provided to not impact the building or critical structures. No structures shall be surcharged in the 50-year storm event.
- c. A backwater analysis shall be completed as indicated in Appendix A of this chapter.

4. Pipe Systems

a. Setbacks and Clearances

Horizontal:

Structures	10-feet
Dry Utilities (Power, Gas, Telecomm)	5-feet
Sanitary Sewer	5-feet
Water	10-feet

Vertical:

Dry Utilities (Power, Gas, Telecomm)	1-foot
Sanitary Sewer	1-foot
Water	2-feet

- b. The minimum cover for storm drain pipe shall be 2 feet. Where the minimum depth includes the roadway section, structural calculations for the appropriate H-loading shall be submitted along with the plans. All pipe specified where the cover is 2-feet or less shall be C900 pipe or ductile iron pipe of a class determined by the structural

- calculations.
- c. Storm drain pipe in the public right-of-way shall be a minimum of 12-inches in diameter; with the exception that 8-inch pipe may be used between inlets and catch basins in runs of 50 feet or less.
 - d. The minimum slope for a storm drains 12-inches and greater is 0.5%. If used, the minimum slope for an 8-inch pipe is 1.0%.
 - e. For private storm systems using 6-inch pipe or smaller the minimum slope is 2.0%.
 - f. Any storm drains with a 20% slope or greater shall require pipe anchors.
 - g. Changes of pipe size are allowed only at junctions. Pipes increasing in size shall match pipe centerlines at a minimum and match crowns when allowable.
5. Open Channel
- a. Open channels shall have a 5-foot setback from buildings and structures.
 - b. Constructed open channel systems shall be either vegetation-lined or rock-lined.
 - Vegetation-Lined are the most desirable open channel and shall be used with longitudinal slopes less than 6% and a maximum velocity of 5 fps.
 - Rock-Lined shall be used when slopes exceed 6% and the velocity exceeds 5 fps.
 - c. Conveyance design for open channel flow is outlined in Chapter 4 of the WSDOT Hydraulics Manual.
 - d. Refer to the SWMMWW for use of open channel systems to meet on-site stormwater management, water quality, and flow control requirements.
6. Culverts
- a. The minimum culvert size for driveways is 12-inches, and when minimum cover can be met an 18-pipe is required to minimize potential blockages.
 - b. Headwalls or anti-seep collars shall be provided on culverts where erosion of pipe bedding is possible, as determined by the City Engineer.
 - c. Energy dissipation is required on all culvert outfalls as outlined in Chapter 3, Section 4.7 of the WSDOT Hydraulics Manual.
 - d. Culverts shall be designed as outlined in Chapter 3 of the WSDOT Hydraulics Manual.
 - e. In fish-bearing waters, water-crossing structures must be provided for fish passage as required for Washington State Department of Fish and Wildlife Hydraulic Project Approval.
7. Manholes, Catch Basins, & Inlets
- a. All manholes, catch basins, and inlets shall be precast. If precast is not available, then a cast-in-place structure may be used as an alternative. A drawing stamped by the Engineer of Record is required to be submitted to the City prior to approval.
 - b. All manholes, catch basins, and inlets and covers shall be design for H-20 loading.

- c. Manholes, catch basins, and inlets shall not be located within the vehicle wheel path unless approved by the City Engineer.
- d. All manholes, catch basins, and inlets shall be set flush to grade.
- e. Spacing between structures shall not exceed 300-feet for pipe sizes less than 48-inches and shall not exceed 500-feet for pipe sizes 48-inches and greater.
- f. Maximum spacing between grates along a street shall be as follows:
 - 150 feet on surface grades less than 1%, and
 - 200 feet on surface grades less than 2%, and
 - 300 feet on surface grades over 3%;
 - A spacing greater than the maximums indicated may be approved based on a grate flow capacity as outlined in section 5-5 of the WSDOT Hydraulics Manual.
- g. Drainage structures in the curb flowline at a sump condition or locations prone to clogging shall require a through-curb/comboination grate.

C. Stormwater Flow Control Facilities

Stormwater flow control facilities shall be designed and constructed using criteria and methods set forth in Volume III, Section 3.2 of the adopted Stormwater Management Manual of Wester Washington in addition to the following information:

1. Ponds

- a. Ponds shall be designed per Volume III, Section 3.2.1 of the adopted Stormwater Management Manual of Wester Washington.
- b. Stormwater ponds may be used as interim sedimentation facilities if cleaned and restored to approved plan conditions following completion of all on-site construction.
- c. Provide debris barriers and trash racks on the pond outlet.
- d. The edge of a stormwater ponds shall have a 5-foot setback from the edge of a building without a basement and 10-feet from a building with a basement.
- e. The edge of the pond access road shall be within 5-feet of the control structure.

2. Subsurface Detention Pipes and Vaults

- a. Subsurface pipes and vaults shall be designed per Volume III, Section 3.2.2 & 3.2.3 of the adopted Stormwater Management Manual of Wester Washington.
- b. Subsurface pipes and vaults shall not be located underneath any structure (e.g. buildings, sheds, decks, carports, retaining walls, etc.) unless approved by the City Engineer.
- c. Subsurface pipes and vaults shall have a 10-foot setback from the edge of buildings and structures.
- d. When the design of underground systems does not take into account buoyancy

or hydrostatic pressure, footing drains shall be provided. Footing drains shall be backfilled to within two (2) feet of the top of the vault or pipe with Gravel Backfill for Drains conforming to Section 9-03.12(4) of the Standard Specifications. The gravel backfill shall be protected from contamination by soil fines with a permeable geotextile.

- e. Subsurface pipes and vaults shall conform to the pertinent Building Code and designed to meet appropriate loading requirements. Note that where the top of a vault or pipe is located within a fire lane, additional loading requirements will apply.
3. Infiltration Systems
- a. Infiltration systems shall be designed per Volume III, Section 3.3 of the adopted Stormwater Management Manual of Wester Washington.
 - b. Infiltration systems may be used for in conjuncture with a detention system to meet Minimum Requirement #7.
 - c. Design infiltration rate shall be calculated as outlined in Volume III, Section 3.3.4 Steps for the Design of Infiltration Facilities – Simplified Approach or Section 3.3.8 Steps for Designing Infiltration Facilities – Detailed Approach. Project size shall dictate which approach to take.
 - d. A Groundwater Mounding Analysis is required where the bottom of the infiltration system is within 10-feet of the seasonal high ground water elevation for projects infiltrating less than 1-acre of impervious area and within 15-feet for projects infiltrating more than 1-acre of impervious area. The seasonal high ground water elevation shall be provided by a licensed geotechnical engineer.
 - e. An overflow system is required for all infiltration systems design to meet City conveyance system requirements.
4. Chamber/Modular Systems
- a. Subsurface chamber and modular systems utilized for stormwater detention/infiltration shall be approved on a case-by-case basis by the City Engineer.

7.4 On-site Stormwater Management

A. General

The implementation of On-site Stormwater Management Best Management Practices (BMPs) within the project site offers an opportunity to reduce the size of traditional flow control and water quality facilities such as ponds and vaults. By utilizing the BMPs outlined in the SWMMWW the project can effectively reduce the impacts of development on the environment and can provide a more effective stormwater design.

B. Best Management Practices (BMPs) Selection

Use the flowchart in Figure I-2.5.1 in Volume I, Section 2.5.5 of the SWMMWW to determine

the project requirement for Minimum Requirement #5 – On-site Stormwater Management.

C. **Best Management Practices (BMPs) Infeasibility**

The Department of Ecology SWMMWW outlines the site requirements in order to implement stormwater BMPs to meet Minimum Requirements #5, #6, #7, and #8 when applicable. Infeasibility for each individual BMP can be found in Volume V, Section 5.3.1 of the SWMMWW.

D. **Best Management Practices (BMPs) Stormwater Benefits**

The implementation of on-site stormwater management BMPs can be used to either partially meet or fully meet Minimum Requirements #5, #6, #7, and #8 when applicable. Stormwater benefits and modelling information for each individual BMP can be found in Volume III, Appendix C of the SWMMWW.

7.5 Construction Stormwater Prevention Plan

A. **General**

Minimum Requirement #2 of the Washington State Department of Ecology Stormwater Management Manual of Western Washington outlines the requirements for the control of stormwater runoff from construction activities. In addition to the requirement presented in the SWMMWW the following standards outlines project requirements:

1. A Temporary Erosion and Sediment Control Plan shall be submitted to the City Engineer for approval. Control measures shall be in place prior to any clearing and/or grading activity. The site work contractor shall be responsible for maintaining all erosion and sedimentation control facilities.
2. The erosion and sedimentation control systems depicted on the plans are intended to be the minimum requirements to meet anticipated site conditions. The permittee should anticipate that more control measures may be necessary to insure complete siltation control on the site. It shall be the obligation and responsibility of the permittee to address any new conditions that may arise or be created by his activities and to provide additional facilities, over and above the minimum requirements shown, as may be needed to protect adjacent properties and the water quality of the receiving drainage system. The City Engineer may require additional measures.
3. Measures necessary to insure complete siltation control of the site are required at all times. It shall be the obligation and responsibility of the contractor to address any new conditions that may be created by his activities and to provide additional facilities, over and above any existing measures, as may be needed to protect adjacent properties and the water quality of the receiving drainage system. The City Engineer may also require additional measures.
4. Any dirt or mud tracked onto City streets by construction vehicles shall be cleaned up immediately. Dust control shall be maintained at all times.
5. During grading and utility installation, observed site conditions may result in the City Engineer making a determination that the applicant shall direct a geotechnical engineer

to complete detailed geotechnical investigations and provide the City Engineer with results and recommendations prior to completion of the work or issuance of subsequent approvals and permits.

6. The Department of Ecology requires project owners to obtain a Construction Stormwater General Permit for certain projects.
 - a. Initial guidance on this requirement can be found on the Department of Ecology Focus Sheet titled "Focus on Construction Stormwater General Permit" which is available at the City Public Works counter or online at:
www.ecy.wa.gov/biblio/0710044.html.
 - b. Permit application forms, also called a "Notice of Intent" or "NOI," are available at the City Public Works counter or online at:
www.ecy.wa.gov/biblio/ecy02085.html.
Construction site operators must apply for the permit 60 days prior to discharging stormwater.
7. On approximately September 15 of any construction year, the City Engineer may schedule a meeting with the developer to discuss winter-season site stabilization/closure requirements. All exposed soils shall be stabilized using (BMPs) defined by the Department of Ecology and Kitsap County Stormwater Management Manuals and as approved by the City Engineer.

7.6 Materials

A. General

Contractor shall provide Manufacturer's Certificate of Compliance in accordance with Section 1- 06.3 of the Standard Specifications when requested by the City for all pipe, fittings, precast concrete products, castings, and manufactured fill materials to be used in the project.

B. Conveyance Systems

1. Open Channels
 - a. Rock riprap for channel armoring shall conform to Section 9-13 of the Standard Specifications
 - b. Vegetation for open channel, including roadside ditches, shall conform to WSDOT Hydraulics Manual.
 - c. Soil, vegetation, mulch, and other materials for bioretention and other channel BMPs shall conform to the LID Technical Guidance Manual for Puget Sound.
2. Storm Drain Pipe and Culvert Materials
 - a. Only the pipe materials listed are approved for use in storm drain systems and culverts. Materials shall meet the noted sections of the Standard Specifications:
 - Reinforced Concrete Pipe (RCP), Cl. 3 (min.) 9-05.7(2)
 - Solid Wall PVC Pipe, SDR 35 (min.) 9-05.12(1)

- Profile Wall PVC Pipe 9-05.12(2)
 - Ductile Iron Pipe (DIP), Class 52 9-05.13
 - Corrugated Polyethylene Storm Sewer Pipe 9-05.20
 - High Density Polyethylene Pipe (HDPP) 9-05.23
 - Corrugated Polypropylene Pipe (double and triple wall) 9-05.24
- b. All joints shall be made with a bell/bell or bell and spigot coupling and shall conform to ASTM D3212, using elastomeric gaskets conforming to ASTM F477. All gaskets shall be factory installed on the pipe in accordance with the producer's recommendations.
3. Pipe Bedding
- a. For Reinforced Concrete Pipe (RCP), Corrugated Metal Pipe (CMP - which includes steel and aluminum), and Ductile Iron Pipe (DIP), bedding material shall be in accordance with Section 9- 03.12(3) - Gravel Backfill for Pipe Zone Bedding of the Standard Specifications.
 - b. For convenience, pipe bedding conforming to crushed surfacing top course material of Section 9- 03.9(3) - Crushed Surfacing of the Standard Specifications may also be used as bedding material for pipe.
 - c. In unpaved areas, the Contractor may request to use excavated material as pipe zone bedding and must demonstrate to the Engineer that the suitable excavated material conforms to Section 9- 03.12(3) - Gravel Backfill for Pipe Zone Bedding of the Standard Specifications, and proper compaction levels can be achieved.
 - d. For Polyvinyl Chloride (PVC) pipe, Corrugated Polyethylene (CPE) pipe, and other thermoplastic pipe, bedding material shall be imported material conforming to crushed surfacing top course material of Section 9-03.9(3) - Crushed Surfacing of the Standard Specifications.
 - e. In unpaved areas, the Contractor may request to use excavated material as pipe zone bedding and must demonstrate to the Engineer that the suitable excavated material conforms to Section 9- 03.12(3) - Gravel Backfill for Pipe Zone Bedding of the Standard Specifications, and proper compaction levels can be achieved.
4. Trench Backfill
- a. For transverse trenches (perpendicular to the roadway centerline) in paved areas, trench backfill conforming to Section 9-03.9(3) - Crushed Surfacing of the Standard Specifications shall be used as trench backfill for pipe.
 - b. For longitudinal trenches (trenches parallel to the centerline of the roadway) in paved areas, the top 8-feet of longitudinal trenches shall be backfilled with trench backfill conforming to Section 9-03.9(3) - Crushed Surfacing of the Standard Specifications and backfill material 8-feet and deeper below finished grade shall conform to Section 9-03.14(1) - Gravel Borrow of the Standard Specifications.
 - c. In unpaved areas, trench backfill material shall conform to Section 9-03.14(1) - Gravel Borrow of the Standard Specifications. The Contractor may request to use excavated

material as trench backfill and must demonstrate to the Engineer that the suitable excavated material conforms to Section 9-03.14(1) - Gravel Borrow of the Standard Specifications and proper compaction levels can be achieved.

d. Controlled Density Fill (CDF) may be used in lieu of trench backfill.

5. Private Conveyance Systems

Private conveyance systems shall comply with all criteria and standards for drainage systems in this document unless specifically exempted.

6. Outfalls

- a. Rock riprap for scour protection and energy dissipation shall conform to Section 9-13 of the Standard Specifications.
- b. Gabions for energy dissipators shall conform to Section 6-09.3(6) - Gabion Cribbing and Section 9-27.3 - Gabion Cribbing of the Standard Specifications.
- c. Precast concrete products for energy dissipators shall comply with Section 7-05.2 of the Standard Specifications.

7. Couplings

- a. Approved couplings for use on storm drainage mains with differing materials or diameters or non-approved materials shall be ductile iron mechanical couplings (equal to ROMAC).

8. Recycled Materials

- a. Recycled glass cullet and steel furnace slag shall not be used as backfill in, around, above or below any facility to be owned and operated by the City. Additionally, such recycled materials shall not be placed on any tract, property or easement for which the City has any ownership rights or maintenance responsibilities.
- b. Recycled concrete rubble shall not be used as bedding in the pipe zone, as trench backfill or as backfill above the projected neat-line trench above a pipe or structure.
- c. Recycled concrete rubble may be used except under the following conditions:
 - Below the original existing grade line of the project
 - On slopes exposed to precipitation or on unstable slopes
 - Within two (2) feet of the water table
 - Within 10 feet of a property line
 - Less than 100 feet from a water well or critical groundwater recharge area
 - Within any wetland or wetland buffer
 - Less than 100 feet from a stream, creek, river, pond or lake
 - Within 50 feet of Low Impact Development drainage BMP's; and
 - As backfill around any structure that has an underdrain system

9. Cement-Treated Soils

- a. Cement-treat soils shall not be used as backfill in, around, above or below any facility to be owned and operated by the City. Additionally, cement-treated soils shall not be

placed on any tract, property or easement for which the City has any ownership rights or maintenance responsibilities.

C. Manholes, Catch basins, and Inlets

8. Precast Concrete Products

- a. Precast concrete products for manholes, inlets, and catch basins shall comply with Section 7-05.2 of the Standard Specifications.
- b. For pre-cast concrete structures, the minimum design structural loading shall be H-20 loading and comply with ASTM C-857 and ASTM C-890.
- c. All precast concrete products need to be manufactured by an NPCA-certified plant.
- d. Vaults (risers, bases and lids) shall be constructed in accordance with ASTM C-858 and ASTM C-913.
- e. Reinforcing steel bars shall conform to ASTM A-615. Welded wire fabric shall conform to ASTM A-1064.
- f. Gasket material shall conform to ASTM C-443.
- g. End walls for water pipe penetrations shall be cast without knockouts.
- h. All riser, base and lid penetrations shall be core drilled or integrally cast.
- i. Vaults shall consist of:
 - a lid and integrally cast base and riser unit; or
 - individually cast base, riser and lid sections.
- j. All vaults shall be watertight and be free of any visible leaks.
- k. The repair of any leaks shall be in accordance with the vault manufacturer's written recommendations.
- l. A Manufacturer's Certification of Compliance with these requirements shall be provided for each type of product furnished for installation.

9. Metal Covers

- a. Castings
 - Metal castings for manhole rings, round covers, frames, grates, and rectangular covers shall conform to the Standard Details and Section 9-05.15 of the Standard Specifications as modified herein.
 - All catch basin grated covers in roadways shall be bolt-locking vaned ductile iron grates with cast iron frames, per these engineering standards or approved equal.
 - Manhole round covers and rectangular covers shall have the word "DRAIN" in block letters at least two (2) inches high, recessed so as to be flush with the surface.
 - Manhole Covers shall be Rexus or East Jordan Iron Works hinged manhole frame and cover.

- When bolt locking grates are required, the locking bolts shall be 5/8" - 11 NC stainless steel type 304 socket (allen) head bolts, 2 inches long or approved equal.
- Dipping, painting, welding, plugging or any repair of defects shall not be permitted in accordance with AASHTO M 306.
- b. Metal hatches and access covers shall be constructed with a non-slip treatment having a coefficient of friction of at least 0.6, as determined by DCOF AcuTest per ANSI A137.1-2012. Hatches and access covers located on slopes of 4% or greater shall have a coefficient of friction of at least 0.8, as determined by DCOF AcuTest per ANSI A137.1-2012.

10. Structure Backfill

- a. In paved areas and in areas within the right of way, the top 8-feet around structures shall be backfilled with structure backfill conforming to Section 9-03.9(3) - Crushed Surfacing of the Standard Specifications and backfill material 8-feet and deeper below finished grade shall conform to Section 9-03.14(1) - Gravel Borrow of the Standard Specifications.
- b. In unpaved areas outside of the right of way, structure backfill material shall conform to Section 9-03.14(1) - Gravel Borrow of the Standard Specifications. The Contractor may request to use excavated material as structure backfill and must demonstrate to the Engineer that the suitable excavated material conforms to Section 9-03.14(1) - Gravel Borrow of the Standard Specifications and proper compaction levels can be achieved.

11. Recycled Material

- a. HMA grindings, recycled glass cullet and steel furnace slag shall not be used as backfill in, around, above or below any facility to be owned and operated by the City. Additionally, such recycled materials shall not be placed on any tract, property or easement for which the City has any ownership rights or maintenance responsibilities.
- b. Recycled concrete rubble may not be used as backfill for structures.

12. Cement-Treated Soils

- a. Cement-treat soils shall not be used as backfill in, around, above or below any facility to be owned and operated by the City. Additionally, cement-treated soils shall not be placed on any tract, property or easement for which the City has any ownership rights or maintenance responsibilities.

D. Flow Control Facilities

13. General

All covers and grates on access structures to the flow control facility shall be bolt locking.

14. Control structures

- a. Precast concrete products for control structures shall comply with Section 7-05.2 of

- the Standard Specifications.
- b. Flow restrictors in detention control structures shall be fabricated from 0.060" aluminum pipe, PVC pipe (Profile Wall, Schedule 40 or SDR 35), CPE, or HDPP (SDR 32.5).
 - c. Pipe support materials shall match restrictor (if metal). For plastic materials, aluminum (3" W x 0.060" T) or stainless steel (3"W x 0.090"T) shall be used. Pipe supports shall be fastened to the structure wall with 5/8-inch stainless steel expansion bolts or lag and shield.
 - d. Orifice plates shall be fabricated from aluminum plate (0.125"), high density polyethylene (HDPE) sheeting (0.25"), or PVC sheeting (0.25"). Orifice plates shall be bolted to the flange on the flow restrictor with stainless steel hardware. Orifices may be fabricated by drilling the specified diameter hole in an end cap.
 - e. Protective screening for orifices less than one (1) inch in diameter shall be hot-dipped galvanized, 0.5" x 0.5" "hardware cloth" or polymer geo-grid with the approximate same size openings

15. Ponds

- a. Materials shall conform to Volume III, Section 3.2.1 of the SWMMWW.

16. Underground Detention Systems

- a. Underdrains and footing drains shall be a minimum of 6-inch diameter Polyvinyl chloride (PVC) pipe, SDR 35, with laser-cut slotted perforations
- b. Underdrains and footing drains shall be backfilled with material which conforms to Section 9- 03.12(4) - Gravel Backfill for Drains of the Standard Specifications.
- c. For Reinforced Concrete Pipe (RCP) and other rigid pipe, bedding material shall be in accordance with Section 9-03.12(3) - Gravel Backfill for Pipe Bedding of the Standard Specifications.
- d. For Corrugated Metal Pipe (CMP – which includes steel and aluminum) and other flexible pipe, bedding material shall conform to Section 9-03.16 - Bedding Material for Flexible Pipe per the Standard Specifications.
- e. Trench and structure backfill material shall conform to Section 9-03.14 - Gravel Borrow of the Standard Specifications.
- f. HMA grindings, recycled glass cullet and steel furnace slag shall not be used as backfill in, around, above or below any facility to be owned and operated by the City. Additionally, such recycled materials shall not be placed on any tract, property or easement for which the City has any ownership rights or maintenance responsibilities.
- g. Recycled concrete rubble shall not be used for backfilling for facilities.
- h. Detention Vaults:
 - Materials for cast-in-place concrete stormwater detention vaults shall be as

- approved by building code.
 - Precast products shall conform to Section C.1 of this Chapter.
 - Any metal structural components shall be protected from corrosion and have a low maintenance coating. The Developer shall submit proposed metal protective coatings with supporting documentation for review prior to drainage plan approval. Coatings shall have a 50-year design life.
 - For precast vaults, sealing between riser sections shall be accomplished by placing Portland cement mortar, compressible neoprene foam gaskets, asphaltic mastic material, or asphalt impregnated gasket materials between sections, as recommended by the manufacturer to produce a water-tight seal.
- i. Detention Pipe:
- Only the pipe materials listed are approved for use in stormwater detention facilities. Materials shall meet the following sections of the Standard Specifications and as modified herein:
 - Reinforced Concrete Pipe (RCP), Cl. 3 min. 9-05.7(2)
 - Corrugated Aluminum Culvert Pipe 9-05.5
 - Corrugated Steel Culvert Pipe, Treatment 1 9-05.4
 - Corrugated Steel Pipe Arch, Treatment 1 9-05.4
 - Aluminum Coated (Aluminized) Corrugated Iron 9-05.1(2)
 - Or Steel Drain Pipe Corrugated Polyethylene Pipe 9-05.20
 - Steel Reinforced Polyethylene 9-05.22
 - All corrugated metal pipe and pipe arch shall be furnished with annular ends, neoprene gaskets, and lap type couplings.
- j. Proprietary underground facilities shall be reviewed for compliance with relevant standards presented in this document.

E. On-site Stormwater Management BMPs

Materials for On-site Stormwater Management BMPs shall conform to the LID Technical Guidance Manual for Puget Sound.

7.7 Methods of Construction

A. General

1. All construction on City rights-of-way shall be done in accordance with the City's standards and the procedures and methods set forth in WSDOT Standard Specifications.
2. Prior to the final inspection, the Contractor shall clean the storm drain system and any off-site drainage systems affected by construction activities by a method approved by the City. Wastewater from such cleaning operations shall not be discharged to the storm drainage system or surface waters.

3. Contractor shall provide Manufacturer's Certificate of Compliance when requested by the City for all pipe, fittings, precast concrete products, castings, and manufactured fill materials to be used in the project.
4. Testing of the stormwater management facilities, by the Contractor, when required by the City, shall conform to the testing requirements for the particular component of the system as set forth in the Standard Specifications and issued permits.
5. Documentation for the newly installed stormwater management facilities required by these Standards, the Developer Extension Agreement, or issued permits shall be submitted and approved prior to construction acceptance.

B. Conveyance Systems

1. Methods of construction for storm drain pipelines and culverts shall conform to Section 7-04.3 - Construction Requirements of the Standard Specifications and the Department of Ecology Manual (for storm drainage systems).
2. Connection to Public Storm Systems:
 - a. When connecting existing metal storm pipe to new catch basins, the Contractor shall treat the newly exposed end of the pipe per Section 9-05.4(4) - Asphalt Coatings and Paved Inverts of the Standard Specifications.
 - b. Where new pipe is connected to existing, the Contractor shall verify the type of existing pipe and join in kind with new. If the existing pipe is of a nonapproved material or of dissimilar materials, the Contractor shall connect the new to the existing with an appropriate coupling device.
 - c. For profile wall PVC or CPE pipe, an insert-tee or saddle tee may be used. For new stormwater conveyance systems, roof/footing/yard drain pipes shall be connected with manufactured tee fittings.
 - d. When a connection is made without the benefit of a structure, a clean-out shall be provided upstream of each tee on the inletting private drainage system pipe.
 - e. If finished floor elevation is lower than adjacent street (top of curb) and a connection to public street drainage system is made, at minimum the property owner shall install a check valve.
3. The Installation of all non-linear plastic pipe, lot stubs and underdrains shall include a locator wire.
4. Trenches shall be excavated to the width, depth, and grade as set forth on the approved plans and as set forth in Standard Details herein. Material excavated that is unsuitable for backfill shall not be used for filling on or around surface water facilities.
5. Pipe bedding shall conform to Section 7-08.3(1)C - Bedding the Pipes of the Standard Specifications to provide uniform support along the entire pipe barrel, without load concentration at joint collars or bells.
6. Laying pipe shall be in accordance with Section 7-08.3(2)B - Pipe Laying of the Standard

Specifications.

7. Backfilling shall be accomplished in accordance with Section 2-09 - Structure Excavation of the Standard Specifications.
8. All backfill shall be mechanically compacted in accordance with Section 2-09.3(I)E - Backfilling - Compaction of the Standard Specifications with the following modifications:
 - a. Each layer in a paved area or within the right-of-way shall be compacted to 95% of the maximum dry density per Section 2-03.3(14)D - Compaction and Moisture Control Tests, of the Standard Specifications.
 - b. Each layer in an unpaved area shall be compacted to 90% of the maximum dry density per Section 2-03.3(14)D - Compaction and Moisture Control Tests, of the Standard Specifications.
9. The footing drainage system and the roof downspout system shall be separate pipe systems up to the on-site collection system.
10. Trench Excavation:
 - a. Trenches shall be excavated to the line and grade set forth on the approved plans and in accordance with the Standard Details. The trench width at the top of the pipe shall be 30 inches for pipe up to and including 12-inch inside diameter and the outside diameter of the pipe barrel plus 16 inches for pipe larger than 12-inch inside diameter. Where higher strength pipe or special bedding is required because of excess trench width, the Contractor shall furnish the necessary materials.
 - b. The trench shall be kept free from water until joining has been completed. Surface water shall be diverted so as not to enter the trench. The Contractor shall maintain sufficient pumping equipment on the job to ensure that these provisions are carried out. Unsuitable material below the depth of the bedding shall be removed and replaced with satisfactory foundation materials as determined by the Engineer.
 - c. Trenching operations shall not proceed more than 100 feet in advance of pipe laying except with approval of the City Engineer.
 - d. Providing sheeting, shoring, cribbing, cofferdams, and all aspects involved therein shall be the sole responsibility of the Contractor. Such trench/excavation protection shall comply with the requirements of Section 2-09 - Structure Excavation and Section 7-08.3(1)B - Shoring of the Standard Specifications, Chapter 49.17 RCW of the Washington Safety and Health Act, and Part N – Excavation, Trenching, and Shoring of Chapter 296-155 WAC.
 - e. When trenching operations take place in the public right-of-way, the pavement, and all other improvements, shall be restored as required by the Right-Of-Way Use Permit.

C. Manholes, Catch Basins, and Inlets

1. The construction of manholes, catch basins, and inlets shall conform to Section 7-05.3 - Construction Requirements of the Standard Specification.

2. All structure ladders, when used, shall be firmly attached using stainless steel hardware and extend to the bottom of the structure.
3. When connecting to a concrete structure, openings must be core-drilled unless an existing knockout is available. Connections shall be made with watertight rubber boots, sand collars, manhole adapters, or other approved watertight connectors except for : 1) concrete; 2) ductile iron; 3) corrugated metal pipe. For 1,2, and 3 above, connections shall be made with non-shrink Portland Cement Grout to make a watertight connection.
4. Backfilling shall be accomplished in accordance with Section 2-09 - Structure Excavation of the Standard Specifications with the following modifications:
 - a. In a paved area or within the right-of-way backfill shall be compacted to 95% of the maximum dry density per Section 2-03.3(14)D - Compaction and Moisture Control Tests, of the Standard Specifications.
 - b. In an unpaved area backfill shall be compacted to 90% of the maximum dry density per Section 2-03.3(14)D - Compaction and Moisture Control Tests, of the Standard Specifications.
5. Where shown on the approved plans or as directed by the City, existing manholes, catch basins and inlets shall be adjusted to conform to finished grade in accordance with Section 7-05.3(l) - Adjusting Manholes and Catch Basins to Grade of the Standard Specifications

D. Flow Control Facilities

1. Control structures shall follow construction practices set forth for manholes, catch basins, and inlets.
2. Ponds:
 - a. Fill placed around structures in the berm embankment shall be placed in four (4) inch maximum lifts and compacted to 95 percent of ASTM D- 1557.
 - b. Vegetation and landscaping shall conform to Section 8-02 - Roadside Planting of the Standard Specifications.
 - c. For City maintained facilities, all plant material shall be guaranteed for a period of one (1) year after acceptance. Defective materials shall be promptly replaced in like kind and size. The guarantee period may be extended for those defective materials which are replaced.
3. Subsurface Detention Systems:
 - a. Cast-in-Place and Precast concrete vaults shall conform to Section 6-02 - Concrete Structures of the Standard Specifications as modified herein and as directed by the Building Official
 - b. For precast vaults, sealing between sections shall be accomplished by placing Portland cement mortar, compressible neoprene foam gaskets, asphaltic mastic material, or asphalt impregnated gasket materials between sections, as

- recommended by the manufacturer to produce a water-tight seal.
- c. Pipes used for stormwater detention systems shall conform to the applicable sections of Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits of the Standard Specifications.
4. Infiltration Systems:
- a. Construction of infiltration systems for flow control and treatment shall conform to Volume III, Section 3.3 of the SWMMWW.
 - b. Excavation of infiltration systems shall be done with a backhoe or excavator working at "arms length" to avoid the compaction and disturbance of the completed infiltration surface.
 - c. The facility site shall be cordoned off so that construction traffic does not traverse the area
 - d. An inspection by the civil/geotechnical engineer of record, of the exposed soil shall be made after the infiltration system is excavated to confirm that suitable soils are present. A written copy of the inspection report shall be provided to the Public Works Inspector.
 - e. Infiltration systems for flow control shall not be utilized until construction is complete and disturbed areas have been stabilized, as determined by the City, to prevent sedimentation of the infiltration system. Temporary flow control facilities may be needed to utilize this option.

E. Abandoning Systems

1. Any property owner who plans to demolish or remove any structure connected to the public storm drainage system shall notify the City prior to the commencement of such work.
2. When a property is redeveloped, the property owner shall abandon storm drainage pipes that are no longer needed. In addition, the property owner shall abandon all unused provisional storm drainage pipes within the scope of the redevelopment project. The allowable methods of storm drainage pipe abandonment are as follows:
 - a. Cap the storm drainage pipe at the main.
 - b. Install a cured-in-place liner in the mainline to cover the lateral storm drainage pipe inlet and fill storm drainage pipe to be abandoned with controlled density fill.
 - c. Install a cured-in-place spot repair liner in the mainline to cover the lateral storm drainage pipe inlet and fill storm drainage pipe to be abandoned with controlled density fill. The spot repair liner shall extend minimum of one foot upstream and downstream of the edge of the storm drainage pipe opening.
 - d. Other trenchless technology proposed by the property owner, subject to City review and approval.
3. The Contractor shall completely fill the pipeline to be abandoned with sand, concrete, or

controlled density fill; or remove it.

4. Other trenchless technology proposed by the property owner, subject to City review and approval.
 - a. Removed completely according to Section 2-02 of the current Standard Specifications; or,
 - b. Abandoned according to Section 7-05.3 of the current Standard Specifications, provided no conflicts with new utilities or improvements arise.

F. System Cleaning and Testing

1. Cleaning and testing of storm systems shall conform to section 7-04.3(1) of the Standard Specifications.

7.8 Operations and Maintenance

A. General

The City shall maintain all stormwater drainage elements such as catch basins, oil water separators, and conveyance systems located within the public rights-of-way.

All private stormwater systems are required to have an Operations and Maintenance Manual per Department of Ecology's requirements. The manual must be submitted to the City for review prior to construction authorization. The development's owner association shall be responsible for maintaining on-site storm water facilities including, but not limited to, on-site retention/detention ponds, catch basins, oil-water separators and conveyance system(s).

B. Clearing of Permanent Retention/Detention Areas

Systems shall be cleared of all silt, sand and other material when infiltration rate becomes 60 percent of the initial. No vegetation shall be planted within the location of proposed infiltration systems.

7.9 Appendix A

A. Backwater Analysis Method

This method is used to analyze the capacity of both new and existing pipe systems to convey the required design flow (i.e. 50-year peak flow). Pipe system structures must be demonstrated to contain the headwater surface (hydraulic grade line) for the specified peak flow rate. Structures may overtop for the 100-year peak flow as allowed by Section 9.2.C.1. When this occurs, the additional flow over the ground surface is analyzed using the methods for open channels as described in this section.

This method is used to compute a simple backwater profile (hydraulic grade line) through a proposed or existing pipe system for the purposes of verifying adequate capacity. It incorporates a re-arranged form of Manning's equation expressed in terms of friction slope (slope of the energy grade line in ft/ft). The friction slope is used to determine the head loss in each pipe segment due to barrel friction, which can then be combined with other head losses to obtain water surface elevations at all structures along the pipe system.

The backwater analysis begins at the downstream end of the pipe system and is computed back through each pipe segment and structure upstream. The friction, entrance, and exit head losses computed for each pipe segment are added to that segment's tailwater elevation (the water surface elevation at the pipe's outlet) to obtain its outlet control headwater elevation. This elevation is then compared with the inlet control headwater elevation, computed assuming the pipe's inlet alone is controlling capacity using the methods for inlet control presented in the WSDOT Hydraulics Manual Section 3-3.4.2. The condition that creates the highest headwater elevation determines the pipe's capacity. The approach velocity head is then subtracted from the controlling headwater elevation, and the junction and bend head losses are added to compute the total headwater elevation, which is then used as the tailwater elevation for the upstream pipe segment. The following Backwater Calculation Sheet may be used to compile the head losses and headwater elevations for each pipe segment. The numbered columns on this sheet are described on the following page.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)		
Pipe Segment CB to CB	Q (cfs)	Length (ft)	Pipe Size	"n" Value	Outlet Elev (ft)	Inlet Elev (ft)	Barrel Area (sq. ft)	Barrel Vel (fps)	Barrel Vel Head (ft)	TW Elev (ft)	Friction Loss (ft)	Entry HGL Elev (ft)	Entry Head Loss (ft)	Exit Head Loss (ft)	Outlet Control Elev (ft)	Inlet Control Elev (ft)	Approach Head Loss (ft)	Bend Head Loss (ft)	Junction Head Loss (ft)	HW Elev (ft)	Upstream Rim Elev (ft)	Surcharged? (Y / N)		

Column (1) -	Design flow to be conveyed by pipe segment.
Column (2) -	Length of pipe segment.
Column (3) -	Pipe Size; indicate pipe diameter or span x rise.
Column (4) -	Manning's "n" value.
Column (5) -	Outlet Elevation of pipe segment.
Column (6) -	Inlet Elevation of pipe segment.
Column (7) -	Barrel Area; this is the full cross-sectional area of the pipe.
Column (8) -	Barrel Velocity; this is the full velocity in the pipe as determined by: $V = Q/A$ or $\text{Col.}(8) = \text{Col.}(1) / \text{Col.}(7)$
Column (9) -	Barrel Velocity Head = $V^2/2g$ or $(\text{Col.}(8))^2/2g$, where $g = 32.2 \text{ ft/sec}^2$ (acceleration due to gravity)
Column (10) -	Tailwater (TW) Elevation; this is the water surface elevation at the outlet of the pipe segment. If the pipe's outlet is not submerged by the TW and the TW depth is less than $(D+dc)/2$, set TW equal to $(D+dc)/2$ to keep the analysis simple and still obtain reasonable results (D = pipe barrel height and dc = critical depth, both in feet. See Section 4-4 of the Hydraulics Manual for determination of dc).
Column (11) -	Friction Loss = $S_f \times L$ [or $S_f \times \text{Col.}(2)$], where S_f is the friction slope or head loss per linear foot of pipe as determined by Manning's equation expressed in the form: $S_f = (nV)^2/2.22R^{1.33}$
Column (12) -	Hydraulic Grade Line (HGL) Elevation just inside the entrance of the pipe barrel; this is determined by adding the friction loss to the TW elevation: $\text{Col.}(12) = \text{Col.}(11) + \text{Col.}(10)$ If this elevation falls below the pipe's inlet crown, it no longer represents the true HGL when computed in this manner. The true HGL will fall somewhere between the pipe's crown and either normal flow depth or critical flow depth, whichever is greater. To keep the analysis simple and still obtain reasonable results (i.e., erring on the conservative side), set the HGL elevation equal to the crown elevation.
Column (13) -	Entrance Head Loss = $K_e \times V^2/2g$ [or $K_e \times \text{Col.}(9)$] where K_e = Entrance Loss Coefficient (from Section 6-6.3 of the Hydraulics Manual). This is the head lost due to flow contractions at the pipe entrance.
Column (14) -	Exit Head Loss = $1.0 \times V^2/2g$ or $1.0 \times \text{Col.}(9)$. This is the velocity head lost or transferred downstream.
Column (15) -	Outlet Control Elevation = $\text{Col.}(12) + \text{Col.}(13) + \text{Col.}(14)$ This is the maximum headwater elevation assuming the pipe's barrel and inlet/outlet characteristics are controlling capacity. It does not include structure losses or approach velocity considerations.
Column (16) -	Inlet Control Elevation (see Section 3-3.4.2 of the Hydraulics Manual for computation of inlet control on culverts); this is the maximum headwater elevation assuming the pipe's inlet is controlling capacity. It does not include structure losses or approach velocity considerations.
Column (17) -	Approach Velocity Head; this is the amount of head/energy being supplied by the discharge from an upstream pipe or channel section, which serves to reduce the headwater elevation. If the discharge is from a pipe, the approach velocity head is equal to the barrel velocity head computed for the upstream pipe. If the upstream pipe outlet is significantly higher in elevation (as in a drop manhole) or lower in elevation such that its discharge energy would be dissipated, an approach velocity head of zero should be assumed.
Column (18) -	Bend Head Loss = $K_b \times V^2/2g$ [or $K_b \times \text{Col.}(17)$] where K_b = Bend Loss Coefficient (from Section 6-6.3 of the Hydraulics Manual). This is the loss of head/energy required to change direction of flow in an access structure.
Column (19) -	Junction Head Loss. This is the loss in head/energy that results from the turbulence created when two or more streams are merged into one within the access structure. Section 6-6.4 of the Hydraulics Manual may be used to determine this loss.
Column (20) -	Headwater (HW) Elevation; this is determined by combining the energy heads in Columns 17, 18, and 19 with the highest control elevation in either Column 15 or 16, as follows: $\text{Col.}(20) = \text{Col.}(15 \text{ or } 16) - \text{Col.}(17) + \text{Col.}(18) + \text{Col.}(19)$
Column (21) -	Rim elevation of upstream manhole or catch basin.
Column (22) -	Check to see if the upstream structure is being surcharged [$\text{Col.}(20) > \text{Col.}(21)$]



Chapter 8

DESIGN STANDARDS FOR WATER EXTENSIONS

8.1 Design Standards

- A. General
- B. Plans
- C. Mechanical (Water)
- D. Cross-Connection Control Regulations

8.2 Standard Specifications for Construction

- A. General
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8.1 Design Standards

A. General

All extensions to the water system must conform to the design standards of the City and shall meet the requirements of the latest Kitsap County Fire Protection Ordinances and International Fire Codes. In addition, plans and specifications for system extensions must be approved in accordance with the requirements of the State Department of Health.

The water system must provide adequate domestic and fire flow supply for the fire protection requirements. If fire flow is required, the plan must be approved by the South Kitsap Fire & Rescue Fire Marshall.

In all cases where public road right of way will be used for mains or other improvements, or where water facilities are proposed to be installed in easements, the City Engineer must approve the plan. All easements for water facilities must be on an approved form and the City must be listed as the "Grantee." The legal description and attached map showing the location and size of the easement must be approved by the City Engineer prior to recording.

In all cases where a County road right of way will be used for mains or other improvements, the County Road Department must also approve the plan in addition to the City.

The system must be capable of future expansion and must be constructed of permanent materials.

Project Datum: The site survey shall use North American Vertical Datum 88 (NAVD 88). Design submittals including water plan and profile and well pump station elevations shall be based on NAVD 88.

B. Plans

1. General

The developer shall submit plans and specifications in accordance with individual permit requirements. City standards are adequate to serve as the technical specifications for the project, however the Applicant may propose deviations from the Standards. The City may also require additional specifications if project conditions warrant. Plans and specifications for all projects must be prepared and stamped by a professional engineer registered in the state of Washington, with the exception of extensions for single family residences. After the review, the developer shall submit copies of the final version of the plans in accordance with permit requirements.

2. Criteria for Plans

The plans shall be prepared in accordance with criteria listed in Chapter 1 – Land Development with the addition of the following:

- a. Profiles: Water line profiles shall be provided when the water lines are to be installed over un-graded terrain. In general, the City will not require profiles of water lines to

be installed in streets or other graded terrain where specified depth of cover will be adequate to determine the location of the line in the ground. Elevations shall be shown on the plans which are adequate to determine the pressure differential in the lines due to change in elevation and for placement of pressure reducing valves if required. Clearances between sewer lines and water mains shall be shown at all sewer line crossings.

3. Plan Revisions

4. The City shall be informed of all plan revisions which affect the design of the water system prior to implementation. The City reserves the right to withdraw approval if in the opinion of the City the changes will cause the design of the extension to be below the City's standards.

Facility Placement
All water mains and other facilities, unless a private system, shall be installed in public rights-of-way or in recorded utility easements dedicated to the City. The developer or his engineer shall check with the City prior to beginning of design of the extension to determine if there is a preferred main location.

5. Public Rights of Way

All locations of City facilities within the City right-of-way must be approved by the City Engineer. Utilities located in the road right-of-way must comply with franchise requirements outlined in ordinances passed by the City Council authorizing such use of the road and right-of-way. Where no ordinance applies, water mains shall be installed to be compatible with the existing water system, the terrain, geology, and the location of other utilities.

Where the water line is installed in a public right of way, it shall not be located under curbs or sidewalks. Deviations from approved locations must receive prior written approval by the City Engineer, be documented, and be accompanied by accurate record drawings.

6. Easements

Utility easements will be a minimum of 15 feet in width and piping will be installed no closer than five feet from the easement's edge. Water line constructed deeper than 7.5-feet below finished ground surface shall require an easement width greater than 15 feet to encompass a 1:1 slope from the bottom of the pipe.

7. Private Roads

If it is necessary to install a water main within a private road, the easement shall be the width of the traveled surface plus one foot on either side.

8. Water and Sewer Line Separation Distances

Transmission and distribution water piping shall be separated at least ten feet horizontally from waste disposal piping, drain fields, and/or sanitary sewer gravity or force mains. The bottom of the water main shall be 18 inches above the top of the

sewer component. All parallel and crossing installations of water and sewer lines shall be in accordance with provisions of WAC 248-96 (septic systems) and the “Recommended Standards for Water Works” - Ten State Standards. Where local conditions prevent such horizontal and/or vertical separation, closer spacing is permissible where design and construction meet the special requirements of the Department of Ecology criteria for Sewage Works Design.

When a water line crosses a sanitary sewer or force main, it shall be specified that the water main be installed a minimum of two feet above the sewer line with joints a minimum of five feet from the sewer line on each side. Controlled density fill shall be placed over the sewer line.

9. Main Layout and Sizing

The City shall be consulted as to the size of the water main.

In general, the minimum size water main which will be allowed to serve developments is 8 inch inside diameter, unless otherwise approved by the City. Looped six-inch diameter mains will be allowed within a development if no fire hydrants are connected to the main. Where dead end mains are allowed in cul-de-sacs, they may be 4-inch diameter from the last fire hydrant to the remaining residences, if approved by the City Engineer.

In general, dead end water mains are not permitted. Wherever possible, all water line extensions shall form a looped system. Mains must be extended to the far side of a property to be served. For commercial and residential developments on corner lots, the mains must be extended to the far side of both sides of property fronting roads. Commercial developments which are required to upgrade city roads will be required to upgrade the water main in the road to the size indicated in the City’s Water System Plan.

It is the intent of these requirements to ensure that the water pipe sizing will supply the required domestic and fire protection flows while maintaining adequate system pressure under existing and future demand conditions. The City may, at its discretion, require the developer to pay for the City or its Consultant to conduct an analysis and run the hydraulic model developed specifically for the City’s water system. The purpose of this analysis is to confirm the actual flow rate that is available and the size of needed system improvements to provide water service.

10. Fire Hydrants

Water line extensions shall include fire hydrants if required by City Standards and Specifications, or if not, be designed to permit placement of fire hydrants in accordance with South Kitsap Fire and Rescue (SKF&R) standards, unless a modification is authorized by the Fire Marshall. Fire hydrants shall be placed at street intersections wherever possible, and located to minimize damage due to traffic. Fire hydrants installed in residential areas shall have a maximum spacing of 600 feet measured along the street frontage. Hydrants located at intersections shall be installed at the curb return. All others

shall be located on property lines between lots. Fire hydrants in commercial, industrial and multifamily areas shall have a maximum spacing of 300 feet and shall be placed not more than 150 feet or less than 50 feet from a building. Variation from hydrant spacing standards will be allowed when it can be demonstrated that alternate spacing will better serve the site layout. The SKF&R may require additional hydrants.

11. Water Pressure Requirements

Water systems shall be designed to maintain a minimum residual pressure of 30 psi at meter outlets under maximum demand flow conditions, excluding fire demand. Unless specifically approved otherwise by the City, water systems shall be hydraulically designed to provide a maximum pressure no greater than 100 psi, with a desired range of 40-90 psi. In

cases where a booster pump station will be required, a bladder tank will be installed. For water systems requiring fire flow capability, the design shall be adequate to maintain, under fire flow conditions, positive pressure throughout the system and a 20-psi residual pressure in mains supplying fire hydrants in use as per WAC 246-290 requirements. The City may require the engineer to submit a hydraulic analysis showing the required flows and pressures can be met. The City may, at its discretion, require that the City's hydraulic model be used and run by the City or City's Consultant. Developer shall pay for costs to accomplish this analysis.

12. Pipe Cover

The depth of trenching, installation of pipes, and backfill shall be such as to give a minimum cover of 36 inches over the top of the pipe. This standard applies to transmission, distribution, and service piping. Backfill and compaction will be in accordance with applicable construction standards identified below. Materials capable of damaging the pipe or its coating shall be removed from the backfill material.

13. Isolation Valves

Valves shall be installed at all crosses and tees. The number of valves at each intersection shall at a minimum equal the number of connecting pipes less one. Lengths of pipe between valves should not exceed 500 feet in school, commercial, or multi-family areas, and 800 feet in other residential service areas. Valves shall be located on tees and crosses at street intersections, or at other locations as determined by the City. If it is necessary to install valves between street intersections, they shall be located on property lines between lots and on fire hydrant tees wherever possible.

14. Air and Air-vacuum Relief Valves

In order to minimize problems associated with air entrainment, air or combined air-vacuum relief valves shall be installed at points of high elevation throughout each system. To prevent freezing, the vault lid and vault cavity will be insulated as directed by the City.

These valves shall be installed as per standard specifications and detail drawings.

15. Blow-off Valves

A blow-off valve assembly shall be installed on all permanent dead-end runs and at designated points of low elevation within the distribution system. The blow-off valves shall be installed on public rights-of-way except where a written access and construction easement is provided to the City. In no case shall the location be such that there is a possibility of back-siphoning into the distribution system.

16. Fire Protection Systems on Private Property

A double detector check valve installation shall be required on all fire protection systems to private property. The detector check shall be approved for the type of use by Washington

State Department of Health. An OS&Y valve shall be installed on the inlet side along with a 1-inch by-pass. The by-pass shall include a water meter and double check valve assembly.

The property owner is responsible for the fire line from the City main to the fire suppression system.

17. Record Plans for the City

Any deviations from originally approved plans and specifications shall be in accordance with Section 8.1.B.2 Plan Revisions. Upon completion of the project, the following will be provided to the City:

- a. Electronic Auto CADD files (2013 compatible version),
- b. a digital format such as "pdf" of the record plans on CD (2 copies).

Record drawings must show all new water facilities and related appurtenances which, at a minimum, shall include the locations of all mains, fire mains, valves, hydrants, back flow assemblies, and fittings, giving sizes and types of each. Record drawings for new sewer improvements shall include all mains, manholes, clean-outs and similar appurtenances. The drawings shall show the exact location of water/sewer mains including distances of mains from property lines. The applicant shall make every reasonable effort to assist the City in acquiring all necessary information for record drawings.

C. Mechanical (Water)

1. General

This division covers that work necessary for furnishing and installing mechanical appurtenances and accessories as described in these specifications and as shown on the plans.

All pipe, valves, meters, hydrants, fittings, and special material shall be new, undamaged, and designated for use in potable water systems. All material suppliers shall be bonded sufficiently for the value of material supplied. Material used on water projects shall comply with AWWA Standards, and each project's detailed plans and specifications.

The developer's Contractor shall furnish all materials necessary for the installation of the water system facilities including but not limited to meter boxes and service connection materials.

2. Submittals

Submittal information shall be provided to the City for the following items:

- a. Ductile Iron Pipe
- b. Ductile Iron Fittings
- c. Stainless Steel Pipe and Fittings
- d. Poly Pipe and Fittings
- e. PVC Pipe and Fittings
- f. Isolation Valves
- g. Control Valves
- h. Fire Hydrants
- i. Double Check Valves
- j. Other Mechanical Components

3. Pipe and Fittings

Provide piping, plumbing, fittings and appurtenances necessary to make all piping systems complete, tested, and ready for operation as specified herein and as shown on the plans. All pipe sizes, as shown on the drawings, and as specified herein, are in reference to "nominal" diameter, unless otherwise indicated. All pipe shall meet the City's standard specifications. One type of pipe shall be used throughout entire projects, except as necessary to match existing piping, or as otherwise specified in writing by the City Engineer. Where relocation of, or replacement of, existing piping is necessary during construction, materials used shall be subject to the written approval of the City Engineer.

4. Ductile Iron Pipe

Ductile iron pipe shall be thickness Class 52 and shall conform to standards of ANSI Standard A21.51 (AWWA C-151).

All pipe shall be restrained joint pipe= and shall be ductile iron manufactured in accordance with requirements of ANSI A21.51 (AWWA C-151). Push on joints or mechanical joints shall be in accordance with ANSI 21.11 (AWWA C-111). Pipe shall be Tyton Joint Pipe or approved equal. Gaskets shall be Field Lok or approved equal. Pipe thickness shall be designed in accordance with ANSI A21.50 (AWWA C-150). Standard thickness cement -mortar lining shall be in accordance with ANSI A21.4 (AWWA C-104).

Where Mega-Lug joints are required, they shall be Mega-Lug Series 1100, as manufactured by EBAA Iron, or approved equal. Mega-Lugs shall be used on all mechanical joints.

When requested, furnish certification from manufacturer of pipe and gasket being supplied that all of the specified inspections and tests have been made and the results comply with requirements of this standard.

5. Ductile Iron Fittings

All fittings shall be ductile iron where possible. Steel fittings will not be accepted. Ductile iron fittings shall be short body, cement lined, and have a minimum working pressure of 250 psi. Metal thickness and manufacturing processes shall conform to applicable portions of ANSI Standards A21.20, A21.11, B16.2, and B16.4. Standard cement lining shall be in accordance with ANSI Standard A21.4 (AWWA C-104). Mechanical joint (MJ), ductile iron, compact fittings 3 inches through 24 inches shall be in accordance with AWWA C-153.

Ductile iron flange (FL) fittings shall be in accordance with AWWA C-110, with bolt pattern to match adjacent pipe and 250 psi pressure rating. Gasket material for flanges shall be neoprene, bunan, chlorinated butyl, or cloth inserted rubber. Gaskets shall be full face ring type.

6. Type of ends shall be specified as mechanical joint (MJ), restrained joint (RJ), plain end (PE), or flanged (FL). Mega-Lugs shall be used on all mechanical joints. Polyvinyl Chloride (PVC) Pipe

PVC pipe in excess of 2 inches will not be used for new installations. Larger size PVC piping may be used to replace small sections of existing PVC piping in emergencies only. PVC pipe shall conform to the requirements of AWWA C-900 specifications. PVC pipe for distribution pipelines shall be pressure class 200. The pipe shall bear the seal of the National Sanitation Foundation for potable water pipe. All pipe shall be listed by the Underwriters Laboratories, Inc.

PVC pipe shall be made from Class 12454-A or Class 12454-B virgin compounds, as defined in ASTM D1784. Joints shall conform to ASTM D3139 using a restrained rubber gasket conforming to ASTM 3477. Solvent welded pipe joints will not be permitted.

PVC pipe shall be Johns Manville, or approved equivalent.

7. Galvanized Iron Pipe (GI)

Galvanized iron pipe shall conform to the latest revision of ASTM A-120 or A53; Grade A, Schedule 40, seamless pipe that has been manufactured in the United States. Pipe shall be hot-dip galvanized. Pipe fittings shall be galvanized and threaded.

8. Flexible Couplings

Flexible couplings shall be as manufactured by Smith Blair or Romac, or equal; MJ sleeve couplings shall be as manufactured by Griffen or U.S. Pipe or equal.

9. Bolts in Piping

Bolts shall be zinc or chrome plated cast iron. Stainless steel bolts are not allowed.

10. Valves and Appurtenances Valves noted on the plans or in other parts of the specifications shall meet the requirements herein. Valves shall be designed for the intended service. Prior to placement in the trench, valves shall be fully opened and closed to check the action and a record made of the number of turns required to fully open or close the valve. For valves 16 inches or larger, a member of the water utility shall be present to check the action and record the number of turns. The inside of all valves shall then be thoroughly cleaned and the valve installed.

Install valves in strict accordance with manufacturer's instructions and as shown on the plans. Buried valves shall have all operators or valve box installed so that wrenches or operators perform freely and without binding or other interference. Bed and backfill buried valves according to the requirements of the pipe to which they are attached. Provide concrete supports for operators where required, as shown on the plans.

- a. Resilient Seat Gate Valves: All gate valves for water lines 2" and larger shall be of the resilient, wedge-type, non-rising stem and shall meet or exceed the performance requirements of AWWA C-509 and be suitable for installation with the type and class of pipe being installed. The wedge shall be fully encapsulated with vulcanized SBR rubber. Valves to be equipped with mechanical joints or flange ends of Class 125 in accordance with ANSI B16.1 unless otherwise specified. Valve opening direction shall be counter-clockwise. Provide fusion epoxy coating and 2 inch operating nut. Gate valves shall be Dresser, Kennedy, or approved equivalent.
- b. Butterfly Valves: Butterfly valves shall be approved for use only where special applications are required. Butterfly valves shall meet or exceed all AWWA C-504 specifications and shall be Class 150-B valves with short body which are suitable for direct bury. When they are installed, they shall have a position indicator which clearly shows the position of the disc. All butterfly valves shall be installed with the operator nut located toward the center line of the street. All valves shall be equipped with an underground manual operator with AWWA 2-inch square nut, shall open with a counterclockwise rotation, and have mechanical joint or flanged ends of Class 125 in accordance with ANSI B16.1 unless otherwise specified. All butterfly valves shall be Dresser, Pratt, or approved equivalent.
- c. Check Valves: Check valves, three inches or larger, shall be iron body, iron disc, bronze-mounted, swing type, clearway, quiet closing, lever and spring valves with flanged ends. All valves shall comply with AWWA C-508 specifications.

Check valves, smaller than three inches, shall be bronze body, bronze-mounted, swing type with flanged or threaded ends depending upon installation.

Check valves shall be Dresser, Mueller, or approved equivalent.
- d. Pressure Reducing Valves: Pressure reducing valves shall be diaphragm actuated, single seat, hydraulically operated valves with a single operating chamber sealed by a synthetic rubber diaphragm. Control of the valve shall be from a single direct acting

hydraulic pilot valve that is controlled by hydraulic pressure acting on a spring acted diaphragm. The main valve shall have a single removable seat and a resilient disc. The stem shall be guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. No external packing glands are permitted, and there shall be no pistons operating the main valve or any pilot controls. The pilot control shall be a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve, designed to permit flow when controlled pressure is less than the spring setting. The control system shall include a fixed orifice. The diaphragm shall be set to open at any pressure below its preset set point and to close at any pressure above an adjustable dead band, to maintain downstream pressure within 2.5 psi of the pressure set point. Downstream pressure control shall not be based on changing upstream pressures. The valve shall be rated for 250 psi working pressure.

A bypass line of suitable size with isolation valves and pressure reducer will be installed in parallel to the main Pressure Reducing Valve (PRV) to manage low flows and assure continuity of service in event of main PRV failure.

Pressure reducing valves shall be Cla-Val model 90-01 or approved equivalent.

11. Tapping Sleeve and Valve

Provide restrained mechanical joint with flanged outlet tapping sleeve with a minimum 150 psi rating. The sleeve shall be grade 18-8 type 304 stainless steel and SBR rubber gasket, Romac Style SST, Ford Style FAST, or approved equal.

The valve shall be 200 psi pressure rated, resilient seated, non-rising stem, AWWA C-509, with flanged by mechanical joint connection. The valve shall have a cast or ductile iron body with AWWA C-550 epoxy coating. The valves shall be M&H style 3751-NRS, or approved equal.

12. Fire Hydrant Assembly

Fire hydrants shall conform to AWWA Standard C-502 for post-type, dry-barrel, self-draining hydrants suitable for at least a 54-inch depth. Each hydrant shall have a six-inch inlet, a minimum valve opening of 5-1/4 inches, two 2-1/2 inch hose connections, and a 4- 1/2 inch pumper port with a 5 inch Storz pumper connection. All ports shall have National Standard Threads or other connection devices consistent with local fire protection authority requirements. All valves and caps shall open counterclockwise and have a 1-1/2-inch flat point pentagon operation and cap nuts. Hydrants shall be break-away traffic models.

The configuration of the fire hydrant assembly shall be as shown on Standard Detail 881. The assembly shall have a cast iron tee (with mechanical joint connections to the main) a flanged tee, a six-inch flanged by mechanical joint gate valve with valve box, and a six-inch ductile iron pipe extension. All mechanical joints shall be secured with mega-lugs. Push on pipe joints shall be secured with field lock gaskets. Shackle rods to connect the hydrant to the auxiliary valve at the main are not permitted.

Provide a minimum of seven cubic feet of washed gravel surrounding the 90 degree

bend below the hydrant. Gravel shall be 1-1/2 inch minus and be retained on 1/4 inch mesh for drain.

Hydrants added to existing systems will be installed by wet tap.

The hydrant shall have at least an 18 inch clearance between the ground and the lower port, and a 36 inch unobstructed radius around it for operation of a hydrant wrench. The steamer/pumper port shall face the street or the most likely direction of emergency approach.

Hydrants shall be coated with two coats of yellow Rustoleum paint or equal in accordance with coating manufacturer's recommendations.

Fire hydrants shall be Clow Medallion, M&H 129S.

13. Blow off Valve Assembly

Two-inch blow off assemblies shall be provided in accordance with Standard Detail 880 at locations shown on the plans or prescribed by the City.

14. Miscellaneous Mechanical

- a. Air and Air/Vacuum Release Valves: Provide air and air/vacuum release valve's body and cover fabricated from cast iron. Provide internal parts, including float, seat, needle, linkage, level pins, retaining rings, and screws, fabricated from either stainless steel or bronze. Air release valve shall have 2 inch inlet, 3/32 inch orifice, and shall be designed for operating service to 150 pounds per square inch (psi). Air and air-vacuum relief valve assembly materials shall conform to Standard Detail 883.

Air release valve shall be equal to APCO Model No. 55. Air and air-vacuum relief valves shall be APCO Model #142 or #143C for one-inch, or #144 or #145C for two-inch, or approved equivalent.

- b. Gate Valves: Gate valves 2 inches and smaller for steel pipe shall be Crane No. 1320 or equal, with 250 psi pressure rating having non-rising stem, screwed bonnet, solid wedge disc, bronze construction and threaded ends.

Install valves and fittings in accordance with manufacturer's recommendations and the plans. Verify alignment and adjustments after installation.

- c. Valve Boxes: All valve boxes shall be two-piece cast iron, and equipped with a suitable extension for a 36-inch to 65-inch trench depth. Top sections and lids will be designed for installation in vehicular areas. Lids will be labeled "WATER", and lid tabs will point in the direction of the water main. The valve boxes shall have a design loading meeting

AASHTO H-20. All valves and valve boxes will be set plumb with the valve box centered on the valve. Valve box installation shall comply with Standard Detail 884.

Cast iron valve boxes shall be Olympic Foundry, Rich Box No. 920 or approved equivalent and must be compatible with the City's system.

- d. Valve Marker Posts: A fiberglass valve marker post shall be furnished and installed with each single or closely grouped combination of valves. Marker posts shall be located as directed by the City. Size of valve and distance (to the nearest foot) shall be stenciled on the face of the post with a 1 1/2-inch black painted figure.

Valve marker posts shall be blue in color, 4 inches wide (flat), 72 inches high and beveled top. Carsonite Curve-Flex marker or approved equal.
- e. Hydrant Guard Posts: Guard posts are not required.
- f. Warning Tape: Locator tape WILL NOT be used as an alternative to wire but will be used in addition to the wire. Continuous metallic tape, brightly colored, 2 inch minimum width, imprinted in 1 inch letters with "Caution Buried Water Line" shall be repeated at not less than 4 foot intervals. Install warning tape above water line approximately 18 in. below the finished grade.
- g. Locating Wire: All pipe shall be laid with one piece of 10-gauge or thicker insulated copper wire. The locating wire shall be situated immediately adjacent to the pipe and connected to all valves. Locating wire shall also connect to all service lines and meters.

15. Backflow Prevention

Backflow prevention devices including Double Check Valves and Reduced Pressure Backflow Assemblies shall be installed according to detailed installation plans prepared by the engineer or the Contractor and approved by the City Engineer. Installation shall comply with standards of Accepted Procedure and Practice in Cross Connection Control, AWWA, and Pacific Northwest Section. All backflow assemblies shall be approved on the latest approved list of the Washington State Department of Health.

16. Service Connections

Water service installations shall comply with the City's Standard Detail 860 and 861. The location and type of corporation stop, meter setters, and locating wire on all individual services must be as indicated on Standard Details 860 and 861. In addition, if pressure reducing valves are required for individual service connections where static pressure at the meter exceeds 80 psi, they normally will be installed after the meter. Meter sets and yokes will be specified by the City.

- a. Service Saddle: Ductile iron body, stainless steel straps, nuts, and bolts, Buna N or SBR O-ring gasket, with iron pipe tap. Saddles 1½ inches and larger shall be double strap. Saddles shall be Romac 101S or 202S, Smith Blair 311, or approved equal.
- b. Corporation Stops: Corporation stops for one-inch to two-inch service saddles shall be bronze body, male iron pipe threaded inlet, pack joint (compression) outlet, Mueller H- 10013, Ford FB1100, or approved equivalent conforming to AWWA C-800. Direct taps for services are not allowed.
- c. Polyethylene Pipe (Blue Poly): Polyethylene pipe for service connections shall conform to AWWA C-901, PE 3406, SDR 9, copper tubing size. Pipe shall have a cell

classification meeting ASTM D3350 and a pressure rating of 160 psi. Joints shall be pack joint with stainless steel insert stiffener.

- d. Meter Setter: Meter sets shall be installed using a meter yoke equipped with a locking angle meter valve and an angle check valve. Meter yoke inlets and outlets shall have male iron pipe size threads.
- e. Meter yoke assemblies shall be Mueller H-1434-2 or H-1422, Ford VH 72-12W with valve, or approved equal. If meters need to be raised, Mueller H-14118 Meter Relocater, or approved equivalent shall be used.

17. Meter Boxes

18. SIGMA-Raven HDPE Meter Box Model RMB 1324-SW or RMB 1730-SW and HDPE Lid with touch-read, and meter reader door per standard detail, or approved equal. Individual Pressure Reducing Valves

Where static water pressure exceeds 80 psi, pressure reducing valves shall normally be installed after the meter as directed by the City. Individual service pressure reducing valves shall be of bronze body construction with a renewable stainless steel seat, stainless steel integral strainer, and temperature resistant diaphragm. Pressure reducing valves 2-inches and smaller for individual water service lines shall be Wilkins 600 Series or equal.

19. Pipe and Fittings Installation

- a. General: Use materials and installation methods in accordance with Uniform Plumbing Code, latest edition, and local codes and regulations which are applicable. Install ductile iron water mains in accordance with AWWA C600-93 and manufacturer's recommendations. Use types and sizes of pipes as specified herein and/or as shown on the approved plans. Where sizes of small pipe are omitted from the plans and not mentioned in the specifications, use sizes corresponding to code requirements, and as required by equipment and plumbing fixtures and appurtenances. In any event, properly size any undesignated pipe sizes for functions to be performed.
- b. Materials Delivery: Pipe and appurtenances shall be handled in such a manner as to ensure delivery to the trench in a sound, undamaged condition. Particular care shall be taken not to injure the pipe, pipe coating, or lining. Before installation, the pipe and appurtenances shall be cleaned of foreign material and inspected for defects. Valves shall be cleaned of all foreign material and operated before installation to ensure proper functioning.

Pipe shall not be strung out along a trench or shoulder of a road in a manner which causes a safety hazard to the public.

Rubber gaskets shall be stored in a cool, dark place to prevent damage from the direct rays of the sun.

- c. Alignment: Pipe shall be laid to specified grade and alignment as staked in the field. Alignment deviation shall not exceed 0.5 feet. Replacement of stakes lost or destroyed shall be made at the Developer's expense and in accordance with Agreement Plans, including modifications specified by the City. All construction staking shall be provided by the Contractor.
- d. Grade: Prior to installation of the water line all roadways shall be graded to the finished rough grade. The water line shall be installed three (3) feet below finished grade. Any modification of the main or appurtenances required to adjust to grade changes will be at the expense of the Contractor.
- e. Installation: Carefully lay pipe and support at proper lines and grades. Follow piping runs shown on the plans as closely as possible, except for minor adjustment to avoid architectural and structural features. Make minor relocations, if required, in a manner acceptable to the City.

Pipe passing through or under concrete or rock walls or slabs shall be placed in casing. Keep openings in pipes closed during progress of work.
- f. Polyethylene Encasement: Where shown on the plans, the Contractor shall lay ductile iron pipe with a polyethylene encasement. Pipe and polyethylene encasement shall be installed in accordance with AWWA C105.
- g. Thrust Blocking: All valves, tees, and bends shall be restrained as indicated in Section C.4 and C.5 of this chapter. Thrust block is not required unless specified by the City Engineer.. Only concrete thrust blocking is acceptable for installation of water system facilities. Concrete blocking shall be commercial concrete mix, poured in place against undisturbed soil. All concrete blocking shall have a minimum compressive strength of 3,000 psi. Thrust blocking shall comply with the provisions of Standard Detail 803. All fittings which may come in contact with poured thrust blocks shall be wrapped with 8 mil thick plastic sheet. Form thrust blocking so that bolts, joints, gaskets, and flanges of adjacent joints are clear of concrete and so that bolts and joints can be dismantled without removing concrete.

The City does not use thrust blocks for fire hydrants. Each fire hydrant shall be secured with mega lugs and tie backs per the standard detail.
- h. Sanitation Requirements: Extreme care should be used in checking and cleaning all pipe and fittings of dirt, debris and foreign matter during installation. All material shall be kept clean. Plugs shall be used to seal installed water mains when they are to be left for any period of time, including lunch breaks, coffee break, overnight, etc. Material contaminated by petroleum products or questionable chemicals will be rejected. No trench water shall be allowed to enter installed water mains.
- i. During construction, new water mains must be separated from the existing system (eg. with a gate valve). All new water mains require satisfactory flushing, disinfection, and bacteriological sampling. The final testing shall be performed in the presence

of a City inspector.

- j. Only City personnel are permitted to operate valves on the potable water side of a system and at wet taps. The City will fine the Contractor for system tampering if unauthorized personnel operate water system valves per *Port Orchard Municipal Code 13.04.170 Violation*.

20. Water Main Inspection and Testing

Furnish all required personnel and equipment and make all tests required to demonstrate the integrity of finished installation to approval of the City and all agencies having jurisdiction.

- a. **Water Main Cleaning:** Prior to testing, the inside of each completed pipeline shall be thoroughly cleaned of all dirt, loose scale, sand and other foreign material. Cleaning shall be accomplished by flushing with a minimum velocity of 2.5 feet per second.

The Contractor shall install temporary strainers, temporarily disconnect equipment and take other appropriate measures to protect equipment while cleaning. Cleaning shall be completed after any repairs.

Flushing shall allow four complete exchanges of water at flushing velocity.

- b. **Water Main Disinfection and Flushing:** After preliminary purging of the system, chlorinate entire potable water system in accordance with AWWA C-651-92 and any subsequent modifications thereof for flushing and disinfecting water mains, current adopted WSDOT Standard Specifications Section 7-09.3(24), and in accordance with all other pertinent rules and regulations. Upon completion of sterilizing, thoroughly flush entire potable water system at a minimum velocity of 2.5 feet per second, allowing four complete exchanges of contents. Discharge of disinfection water into a storm drain, drainage ditch or natural channel is prohibited without thoroughly neutralizing the

chlorine residual (0.1 parts per million or less) remaining in the water and volumetrically and velocity controlled to prevent re-suspension of sediments in the stormwater system.

After final flushing and before the water pipe is connected to or hydrostatically tested, the Contractor shall request that the City arrange to have a sample or samples collected for bacteriological testing. At least one sample will be collected from each branch of the pipe. A City Inspector must be present when samples for bacteriological testing are taken. The City will supply bottles and submit them for testing to a Washington State certified laboratory. Copies of test results shall be retained by the City. A copy of the test results will be delivered to the Contractor for review. The water pipe will not be charged for hydrostatic testing prior to satisfactory bacteriological testing results.

If test results are not satisfactory, lines shall again be disinfected, flushed, and tested until two consecutive, satisfactory series of samples are obtained. If the new water pipes are exposed to contaminants or pressure drop after acceptance of a successful bacteriological test the Contractor shall be required to repeat the disinfection process at the City's discretion and the Contractor's expense.

- c. Hydrostatic Pressure Testing: All water mains and appurtenances shall be tested under a hydrostatic pressure equal to 250 psi for 1-hour. Water service lines will be visually inspected for leakage. All pumps, gauges, plugs, saddles, corporation stops, backflow prevention devices, miscellaneous hose and piping, and other equipment shown on the construction plans and that are necessary for performing the test shall be furnished and operated by the Contractor. The pipeline trench shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and sufficiently cured to reach design strength before testing. Where permanent blocking is not required, the Contractor shall furnish and install temporary blocking and remove it after testing.

The mains shall be filled with water and allowed to stand under pressure for a minimum of 24 hours to allow the escape of air and/or allow the lining of the pipe to absorb water. The City will furnish the water necessary to fill the pipelines for testing purposes at a time of day when excess quantities of water are available for normal system operation.

Gauges used in the test may be required to be certified for accuracy at a laboratory chosen by the City.

Any visible leakage detected shall be corrected to the satisfaction of the City regardless of the allowable leakage specified. Should the test section fail to meet the pressure test successfully as specified in the Agreement, the Contractor shall, at his own expense, locate and repair the defects and then retest the pipeline. After the test has been completed, each valve shall be tested by closing each in turn and relieving the pressure beyond. This test of the valves will be acceptable if there is no immediate loss of pressure on the gauge when the pressure comes against the valve being checked. The Contractor shall verify that the pressure differential across the valve does not exceed the rated working pressure of the valve. All tests shall be made with the hydrant auxiliary valve open and pressure against the hydrant valve.

Prior to calling out the City to witness the pressure test, the Contractor shall have all equipment completely set up and ready for operation and shall have successfully performed the test to assure that the pipe is in satisfactory condition.

Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants.

The test shall be accomplished by pumping the main up to the required pressure, stopping the pump for fifteen minutes and then pumping the main up to the

test pressure again. During the test, the section being tested shall be observed to detect any visible leakage. A clean container shall be used for holding water for pumping pressure on the main being tested. This makeup water shall be sterilized by the addition of chlorine to a concentration of 50 mg/l.

Acceptability of the test will be determined in accordance with the current adopted WSDOT Standard Specification Section 7-09.3(23). There shall not be an appreciable or abrupt drop in pressure during the 1-hour test period.

21. Construction Acceptance

Construction Acceptance by the City will not occur until all new mains have been satisfactorily inspected and tested, and all punch list items have been satisfactorily corrected.

22. Generator

Water well, water pump stations, and other appurtenances which require power at all times shall have a generator installed. The generator should have the quiet package enclosure with either Cummins power or be Kohler with John Deere power. The City shall approve the generator prior to installation.

D. Cross-Connection Control Regulations

The City established regulation of cross connections in Port Orchard Municipal Code 13.04.100. No cross connections shall be created, installed, used or maintained within the service boundaries served by City of Port Orchard except in accordance with WAC 246-290-490.

W.A.C. 246-290-490 and the latest adopted edition of the Cross Connection Control Manual as published by the Pacific Northwest Section-AWWA, shall be used to determine installation requirements.

8.2 Standard Specifications for Construction

A. General

This document outlines the general and specific construction requirements for water systems operated and maintained by or for the City of Port Orchard (City). All references to the City Engineer shall mean the City Engineer or his/her authorized representative.

1. Standard Specifications

In general, all construction activities and material specifications shall conform to the latest City adopted edition of:

- a. City's Design Standards for Water Extensions.
- b. Applicable City of Port Orchard rules, regulations, ordinances and standards.
- c. "Standard Specifications for Road, Bridge, and Municipal Construction", Washington State Department of Transportation/American Public Work

Association, (WSDOT/APWA), latest edition (Standard Specifications).

- d. Standards of the American Water Works Association, latest revision.
- e. Rules and regulations of the State Board of Health regarding the Health aspects of Public Water Systems, WAC 246-290, latest revision.
- f. Recommendations of the manufacturer of materials or equipment.

2. Permits and Licenses

The applicant/Contractor shall acquire the required permits for construction within public rights of way. The Developer and/or his engineer shall provide and complete all necessary forms and submit to the County/City/State agencies with the applicable fees.

All construction shall conform to the requirements of the respective permits.

3. Pre-Construction Conference

The City will schedule a pre-construction conference with the applicant, Contractor, and affected County/City/State agencies prior to start of construction. The Contractor shall submit the following to the City at the pre-construction conference:

- a. Material submittals
- b. Safety and traffic control plan, if needed
- c. Copies of all necessary city, county, and state permits necessary for the conduct of the work. No work will be allowed to proceed without a copy of the necessary permits being provided to the City.
- d. Evidence of insurance with the City named as additional insured in accordance with the Developer Extension Policies. An endorsement to the insured's policy will be considered as evidence of insurance.

4. Submittal and Shop Drawings

In accordance with the City's Technical and Standard Specifications, applicants or their Contractor shall submit a list of all brands, sizes, types, grades, and standard materials to be used. The City may reject certain brands and will provide approval, disapproval, and/or comment by letter.

- a. Submittal data for each item shall contain sufficient information on each item to determine if it is in compliance with the Agreement requirements. Items that are installed in the work that have not been approved through the submittal process shall be removed and an approved product shall be furnished, all at the Developer's expense. Shop drawing review will be limited to general design requirements only, and shall not relieve the Developer from responsibility for errors or omissions, or responsibility for consequences due to deviations from the Agreement documents. No changes may be made in any submittal after it has been reviewed except with written notice and approval from the City Engineer prior to implementation. Shop drawings shall be submitted on 8½" x 11", 11" x 17", or 22" x 34" sheets and shall

contain the following information:

- i. Project Name
 - ii. Prime Developer and Applicable Subcontractor
 - iii. City's Name
- b. Submittals that do not comply with these requirements may be returned to the Developer for re-submittal. Acceptable submittals will be reviewed as promptly as possible, and transmitted to the Developer not later than 10 working days after receipt by the City Engineer. Revise and submit as necessary.

Submittals shall contain the following information for all items:

- i. Equipment drawings, dimensions, and weights (pump stations only).
- ii. Catalog information.
- iii. Manufacturer's specifications.
- iv. Special handling instructions (pump stations and pumps only).
- v. Maintenance requirements (pump stations and pumps only).
- vi. Wiring and control diagrams (pump stations and pumps only).

Specific submittal requirements are listed in each section of these specifications.

5. Substitutions

- a. The approved Developer Extension Agreement, construction plans, and City technical and standard specifications shall be followed. No deviations will be allowed without request for change and approval in writing from the City Engineer or designee. The City reserves the right to order changes, which conform to the City's standard specifications; in the event conditions or circumstances are discovered during construction, which indicate changes are prudent. The applicant shall be notified in writing of any changes. Such changes will be mutually accepted.
- b. Deviations from standard locations and/or approved plans must be documented, receive prior written approval by the City Engineer, and be accompanied by accurate record drawings.

6. Site Control

- a. The Contractor shall be responsible for surveying and staking and will stake out the locations of the permanent easements, temporary easements, rights-of way, and all major facilities shown on the Plans and permits.
- b. Replace all damaged survey monuments in accordance with RCW 332-120.

7. Waste Material Control

- a. Adhere to all requirements of federal, state, and local statutes and regulations dealing with pollution. Permit no public nuisances.

- b. Use only dump sites that are approved by the regulatory agency having jurisdiction and present proof of approval upon request. Obtain any and all permits required by regulatory agencies.
 - c. At all times, keep the construction area clean and orderly and upon completion of the work, restore all work or equipment storage areas to their original condition. Remove all miscellaneous unused material resulting from the work and dispose of it in a manner satisfactory to the City.
 - d. The Contractor shall follow all requirements and guidelines of the Puget Sound Air Pollution Control Agency and other associated agencies.
 - e. Use water sprinkling, temporary enclosures, or other methods to limit dust and dirt from rising and scattering in the air. Surface water runoff that is contaminated with site debris, silt, or other material that adversely affects water quality shall be collected and cleaned prior to discharge.
 - f. Do not use water to control dust when it may create hazardous or objectionable conditions such as ice formation, flooding, or pollution.
8. Spill Response
- The Contractor shall prepare a spill response plan for the site and provide a copy to the City Engineer. The Contractor shall maintain a current copy of the approved spill response plan on site at all times and provide any updates to the City Engineer as they occur. All necessary materials and equipment necessary to respond to spills shall be kept readily available on site.
9. Erosion Control
- The Contractor shall prepare an erosion control plan for approval by the regulatory agency. The Contractor shall maintain a copy of the approved erosion control plan on site at all times.
10. Construction Notification
- Contractors shall notify the City Engineer, a minimum of 48 hours in advance of construction, to facilitate project coordination and notification of affected property owners.
11. Construction Shutdowns
- a. Construction under this Agreement may involve replacement or modification of the existing water system, which must continue to provide service to all buildings and homes during construction. Connections and service changes must be programmed to provide the least possible interruptions of service.
 - b. A Water Main Shutdown Agreement must be completed by the Contractor if a connection to an existing system involves turning off the water. The Contractor shall notify the City Engineer at least five (5) days in advance of any required shutdowns so that affected customers may be notified. City personnel will notify

properties affected by the shutoff.

- c. Prior to any shutdown, all traffic control, materials, fittings, supports, equipment, and tools shall be on the site and all necessary labor scheduled prior to starting any connection work. In general, shutdowns shall not exceed four hours in duration unless specifically authorized by the City Engineer.
- d. The Contractor may be required to install and maintain temporary water to all houses and other buildings affected by frequent service disruptions caused by construction activities. Installation and maintenance of temporary facilities will be at the Contractor's expense. All temporary piping and connections shall be approved by the City Engineer and disinfected as specified herein before being put into service.
- e. All work under this Agreement shall be conducted in a manner that will minimize shutdowns, open roadways, or traffic obstructions caused by construction. Shutdowns causing damage to adjacent public and private property shall be the sole responsibility of the Contractor.
- f. Planned utility service shutdowns shall be accomplished during periods of minimum use. In some cases, this will require night or weekend work. In such instances, the Developer/Contractor will be required to pay overtime inspection fees.
- g. Coordinate all work so that service will be restored in the minimum possible time, and cooperate with the City in reducing shutdowns of the utility system to a minimum.
- h. No utility interruption will be permitted without the prior approval of the City. Any unauthorized tampering with the water system is subject to fines.

12. Connection to Existing Systems

- a. Connections to existing water mains shall not be made without first completing the necessary arrangements with the City. Work shall not be started until all traffic control, materials, equipment, and labor necessary to properly complete the work are assembled on the site. Once work is started on a connection, it shall proceed continuously, without interruption, and as rapidly as possible until complete. No shut-off of mains will be permitted overnight, over weekends, or during weeks with holidays.
- b. Contractors shall acquaint themselves with all aspects of existing systems prior to starting construction on new mains. Pertinent information concerning existing systems may be obtained from City personnel and may be verified from City records. Contractors shall locate existing water mains and service lines prior to beginning work so they may be properly protected and maintained in service during construction.
- c. Taps or new extension connections from existing mains must be made in the presence of designated City personnel. No taps or connections are to be made

without designated City personnel being present.

- d. Only City personnel are permitted to operate valves on the certified, potable waterside of a line, including emergencies unless personnel safety is threatened. Exposing a potable water line during construction without the City Engineer's concurrence will result in a penalty being imposed.

13. Work on Non-City Rights-of-Way

- a. Work on a state highway, county road, street or any other right-of-way not owned by the City, shall conform to the requirements of the authority having jurisdiction over such right-of-way. Contractors are responsible for notifying the proper authorities and acquiring permits before beginning work on a right-of-way. Contractors will ascertain restoration requirements and determine that schedules of operations proposed are satisfactory to applicable authorities. Work will not be permitted to proceed without evidence of having obtained the required permits.
- b. When city streets, SR 160 or SR 166 within City Limits, are involved, the Contractor must coordinate all trenching and restoration activities with the City Engineer and WSDOT. Open cuts must be approved by the City Engineer.
- c. When county roads are involved, the Contractor must coordinate all trenching and restoration activities with the Kitsap County Department of Public Works and the City. Open cuts must be approved by the Kitsap County Department of Public Works.

14. Traffic Maintenance

Contractors shall conduct work so as to interfere as little as possible with public travel. Required traffic control shall be in place prior to commencement of work. Access for firefighting equipment shall be provided at all times, and Contractors shall keep the local fire protection authorities informed of the location of construction operations and fire lanes. Contractors shall also notify the authorities in charge of any municipal, private, or school transportation system at least 48 hours in advance of road closures that will force a change in the regular routing of the transportation system. Contractors shall also provide and maintain suitable detour routes for the system. Road closures will not be allowed without written permission from the City Engineer, except verbal permission may be used in an emergency. Work which involves State, County road or City Streets rights of way shall be restricted to the hours between 8:00 AM and 4:00 PM and no work shall be allowed in such right of way on Saturdays, Sundays or Holidays unless authorized by the City Engineer.

15. Safety

Contractors will be solely and completely responsible for conditions at job sites, including safety of all persons and property during the performance of work. This requirement will apply continuously and not be limited to normal working hours.

16. Inspection Requirements

- a. Unless previously authorized by the City Engineer, work on water mains shall not proceed without a City Inspector being present. The City may refuse acceptance of any water mains installed without a City inspection. To permit scheduling an inspector, the City Engineer must receive a hard copy of the construction schedule at least two full working days before construction activities covered by the schedule begin. The City must be kept advised of changes to the construction schedule. When significant breaks in construction occur, the Contractor must give two working days notice before resuming work. The inspector shall have authority to reject defective material and to suspend any work that is not conducted in accordance with the City's Technical Standards and Specifications.
- b. All mains shall be inspected by the City Inspector before closure of any excavation. Inspectors will have access to work sites as necessary to keep the City informed of the progress of the work and the manner in which it is being done, to keep records, to act as liaison between the Contractor and the City Engineer, and to report any deviations from Plans or Specifications. Failure of the Inspector to call the attention of a Contractor to faulty work or deviations from the Plans or Specifications shall not constitute acceptance of said work.
- c. Any personal assistance, which an Inspector may give a Contractor, will not be understood as the basis of any assumption of responsibility in any manner, financial or otherwise, by the Inspector, the Engineer, or the City.
- d. The presence or absence of an Inspector on any job will be at the sole discretion of the City Engineer. Such presence or absence of an Inspector will not relieve a Contractor of responsibility to deliver the construction results specified in the Agreement documents.
- e. City Inspectors will not be authorized to issue instructions or to approve or accept any portion of the work, which is contrary to the Plans and Specifications. Approvals, acceptances, or instructions, when given, must be in writing and signed by the City Engineer or his/her designated representative. Inspectors will have authority to reject defective material. The failure of an Inspector to reject defective material or any work which deviates from the Agreement documents will not constitute acceptance of such work.
- f. Kitsap County may have an inspector on site when working on County rights-of-way.

17. Overtime and Holiday Work

Should a Contractor elect to work more than eight hours per day, or more than five days per week or on holidays during the course of a project, all costs of resulting City overtime/holiday engineering and inspection will be charged to the Contractor at 2.5 times the normal rates.

18. As-Constructed and Warranty Records

- a. Prior to final acceptance of the work by the City, the Developer shall deliver a complete set of acceptable as-constructed records to the City Engineer. Drawings shall be made on clean, unmarked prints of the project, and the final submittal shall include the following:
 - i. Electronic Auto CADD files, version 2013 compatible;
 - ii. a digital format such as "pdf" or "tif" of the record plans on CD (2 Copies)
- b. The Developer shall provide as-constructed information on all items and work shown on the plans showing details of the finished product including dimensions, locations, outlines, and changes. The information must be in sufficient detail to allow City personnel to locate, maintain, and operate the finished product and its various components.

B. Site Work

1. General

This division covers the work that is necessary for providing materials and performing all site work as called for on the approved plans.

2. General Construction Procedures

a. Standards

Construction procedures shall be in full accordance with the City's Standard Specifications for Water Main Construction and the most recent edition of the American Water Works Association (AWWA) Standards.

Certain other referenced standards used in this specification are from the latest editions of:

- i. DOE Washington State Department of Ecology
- ii. IBC International Building Code
- iii. UPC Uniform Plumbing Code
- iv. IMC International Mechanical Code
- v. NEC National Electrical Code
- vi. AWWA American Water Works Association
- vii. ANSI American National Standards Institute
- viii. ASA American Standards Association
- ix. ASTM American Society for Testing and Materials

b. Contractor

All main extensions shall be installed by a Contractor approved by the City.

3. Submittals

Submittal information shall be provided to the City for the following items:

- a. Erosion and Sedimentation Control Plan
 - b. Erosion Control Fence Fabric
 - c. Dewatering Plan
 - d. Shoring Plan and Calculations
 - e. Dump Site Permits
 - f. General Fill
 - g. Structural Fill
 - h. Pipe Bedding
 - i. Trench Backfill
 - j. Gravel Base Course
 - k. Crushed Surfacing
 - l. Paving
 - m. Compaction Test Results
 - n. Hydro-seed
4. Erosion and Sedimentation Control
- a. All erosion/sedimentation control systems including fencing, earth berms, grasses, straw, mulch, culverts, drain pipe, outfalls and other items required for this project, are the responsibility of the Developer and fall under the jurisdiction of Kitsap County or the City of Port Orchard (depending on the location of the extension).
 - b. All erosion/sedimentation control (ESC) systems specified in the approved erosion control plan must be installed prior to commencing any work that could result in off-site storm water or material flows. Erosion/sedimentation controls must remain in place throughout the duration of the construction activities.
 - c. The Contractor shall add additional ESC facilities or processes as necessary to ensure that erosion and sedimentation problems do not occur. The Contractor shall inspect the ESC facilities daily and maintain the systems as necessary to prevent off-site drainage.
5. Dewatering
- a. The Developer is to determine the scope, type, size, quantity, method of installation, operation, and removal of the dewatering system necessary to keep all excavations de-watered to an elevation below the base of the excavation. The system shall also be sufficient to stabilize the soils in the excavation and the surrounding areas, and to prevent flotation of partially completed structures.
 - b. The Contractor shall control groundwater and surface water to prevent the softening

of the bottom of excavations, or formation of quick conditions or boils during excavation. Ground water shall be lowered to 3 feet below the base of the excavation at all times. Determination of unsuitable soil conditions for supporting the improvements shall be determined by the City Engineer. When the dewatering system does not meet the specified requirements, and as a consequence there is a loosening or disturbance of the foundation soils, instability for the slopes, or damage to the foundation or structures occur, the Developer shall at its own expense repair said disturbance. This shall include

supplying all materials, labor, and equipment, and performing all work required for the restoration of foundation soil, slopes, or structure to the satisfaction of the City Engineer.

- c. It is solely the Developer's and the Contractor's responsibility to meet all regulatory requirements governing the disposal of dewatering flows and to prevent damage to adjacent property. Disposal of these waters into existing City sewer mains or trunk lines is strictly prohibited. Drainage of water through the pipeline under construction is also prohibited.
- d. All dewatering wells installed by the Contractor shall be removed and backfilled in accordance with applicable Federal and State regulations.

6. Construction Access

The Contractor shall provide temporary site access for City personnel and shall maintain vehicular site access at all times.

7. Clearing and Grubbing

Clearing and grubbing shall be performed by the Contractor to remove and dispose of unwanted debris, vegetative matter, and other items noted on the construction drawings within the construction limits. This shall conform to Section 2-01 of the WSDOT Standard Specifications.

8. Excavation

- a. The Contractor shall excavate as necessary to construct the improvements shown on the construction drawings. Excavation includes utility excavation, structural excavation, and grading excavation.
- b. Grading excavation shall be to the finished rough grade of the roadway or easement and shall be completed prior to utility excavation. Grade staking, when required, will be done by the developer's/owner's engineer, or surveyor, prior to installation of the mains.
- c. Utility excavation shall be performed to the depths necessary to complete the construction work shown. Utility excavation shall be performed in accordance with the WSDOT Standard Specifications, Section 2-09, with a minimum cover of 36 inches.

- d. The base of the excavation shall be examined by the City Engineer to determine if it is suitable for backfilling. The City Engineer will evaluate the stability of the base of excavation by determining if all significant organic soils or other unsuitable materials have been removed. The Contractor per direction of the City Engineer shall perform excavation required by the City that is beyond the depth shown at their expense.
 - e. All excavated material shall be removed from the site unless approved as backfill material by the City Engineer. Weather conditions may make previously excavated material unsuitable for backfill requiring the material to be removed from the project site. Approval of material as backfill will be made just prior to placement of material as backfill.
 - f. If the trench soil is unsuitable for trench backfill, as determined by the Inspector, the Contractor shall remove and dispose of unsuitable material and backfill the trench with approved backfill. The Contractor will keep the City Engineer informed of the disposal site of all unusable material removed from the project. New or refuse material must not be dumped on neighboring properties.
 - g. Excavation within City right of way areas shall be in accordance with the City of Port Orchard Public Works Right of Way Permit.
9. Shoring
- Where shoring, sheet piling, sheeting, bracing, lagging, or other supports are necessary to prevent cave-ins or damage to existing structures, it shall be the responsibility of the Contractor to design, furnish, place, maintain, and remove supports in accordance with applicable laws, codes, and safety requirements including Chapter 296-155 of WAC, A Safety Standards for Construction Work, Part N, Excavation, Trenching, and Shoring. Design, planning, installation, and removal of sheeting, shoring, piling, lagging, and bracing shall be accomplished in such a manner as to maintain the undisturbed state of soil below and adjacent to excavation. Failure to maintain shoring in accordance with the submitted shoring plan will result in shut down of the job by the City Engineer until required shoring is in place.
10. Hazardous Content of Fill Material
- All imported fill material shall be free of hydrocarbons (e.g., gasoline, diesel oil, etc.), pesticides, herbicides, and other hazardous volatile organic compounds (VOCs) and synthetic organic chemicals (SOCs). If required, the Contractor shall provide certification to the City Engineer that the fill is free of these chemicals.
11. General Fill
- a. All fill required for the project that is not specifically defined as another type shall be "General Fill".
 - b. General fill shall be free of organics, debris, and other deleterious materials. General

fill shall conform to Section 9-03.10 "Aggregate for Gravel Base" of the WSDOT Standard Specifications. The moisture content of the material and weather conditions at the time of placement will be used to determine the suitability of native materials for backfill as general fill. All general fill shall be compacted in uniform layers not to exceed 8 inches in loose thickness and compacted to at least 95 percent maximum dry density based on the ASTM D-1557 test procedure.

12. Structural Fill

- a. All fill placed below and against building components, building structures, vaults, manholes, handholds, slabs, sidewalks, and drives shall be "Structural Fill".
- b. Structural fill shall be free of organics, debris, and other deleterious and conform to Section 9-03.12 (2), "Gravel Backfill for Walls" of the WSDOT Standard Specifications. The City Engineer shall determine if native on-site materials are suitable for use as structural fill. The moisture content of the material and weather conditions at the time of placement will be used to determine the suitability of native materials for backfill as structural fill. Structural fill shall bear on a firm base and be placed in uniform layers not exceeding 8 inches in loose thickness. The backfill area must be free of standing water and the sub-grade soils must be stable. Each layer of structural fill shall be compacted to at least 95 percent of its maximum dry density based on the ASTM D-1557 test procedure.

13. Pipe Bedding

- a. All fill placed below and around buried utilities shall be "Pipe Bedding". Pipe bedding shall be placed when the trench base is deemed unsuitable by the City Engineer.
- b. Bedding material shall surround the pipe and conduits to the limits shown on the construction drawings and provide uniform support along the entire length without allowing concentrated loading at joints or bells. Bedding material shall conform to Section 9-03.12(3) of the WSDOT Standard Specifications. All bedding material shall bear on firm sub-grade and be compacted to at least 95 percent of maximum dry density based on the ASTM D-1557 test procedure.

14. Trench Backfill

- a. Unless the trench is backfilled with Control Density Fill, all fill material placed above the pipe bedding in a trench shall be "Trench Backfill."
- b. Trench backfill shall be placed and compacted above the pipe bedding to finish grade elevations in un-restored areas or to sub-grade elevations in restored areas. Trench backfill shall consist of a well-graded sand or sand and gravel mixture conforming to Section 9-03.12 (2),"Gravel Backfill for Walls" of the WSDOT Standard Specifications and have less than 5 percent passing the U.S. No. 200 sieve based on the fraction passing the 3/4 inch sieve. Trench backfill shall bear on a firm base and be constructed in uniform layers not exceeding 8 inches in thickness. Each lift shall

be compacted in uniform layers not to exceed 8 inches in loose thickness and compacted to at least 95 percent maximum dry density based on the ASTM D-1557 test procedure. The City Engineer shall determine if native on-site materials are suitable for use as trench backfill.

- c. Finished backfill shall leave all existing drainage ditches, culverts, and other appurtenances in a useable condition equal to or better than their original condition.

15. Gravel Base Course

- a. All fill placed under paving and next to native material shall be "Gravel Base Course".
- b. Aggregate for gravel base course shall conform to Section 9-03.10 of the WSDOT Standard Specifications.

16. Gravel Top Course

- a. All fill placed under paving and next to paving material shall be "Gravel Top Course" or crushed surfacing.
- b. Aggregate for gravel top course shall conform to Section 9-03.09(3) of the WSDOT Standard Specifications.

17. Paving

- a. Cement concrete pavement, sidewalks, and curb shall be Class B concrete (3,000 psi) as specified in the concrete section of these specifications. Construction shall comply with Section 5-05 of the WSDOT Standard Specifications.
- b. Asphalt concrete pavement shall comply with Section 5-04 of the WSDOT Standard Specifications and the utility permit for the work. Finish, place, spread, and compact Class B asphalt concrete pavement to the thickness shown on the construction drawings or specified in the utility permit. The minimum compacted thickness of asphalt concrete pavement shall be 2-inches.
- c. All paving shall be inspected and approved by the agency issuing the utility permit.

18. Compaction Testing

- a. The Contractor shall arrange, at his own expense, for in place density testing to be performed at intervals not less than every 500 linear feet of pipe run and where required by the City Engineer. At a minimum, density tests shall be performed at 50% of the trench depth and at the surface of the trench. Other depths of the trench may be required by the City Engineer.
- b. The Contractor shall excavate to the depths required to perform the tests and shall provide sheeting, shoring, and bracing of the trench as necessary. Backfill, in all sections where density requirements are not satisfied, shall be removed from the trench, re- compacted, and re-tested until conforming to specifications.
- c. A certified independent testing laboratory acceptable to the City Engineer shall

perform density testing. All test results shall be submitted directly to the City Engineer.

- d. The City shall have the right, but not the obligation, to perform such additional density testing, as the City Engineer deems necessary. If the tests show that the density requirements are not satisfied, the Contractor shall reimburse the City for all costs for the tests, and shall remove the unsatisfactory backfill from the trench and re-compact and retest it until conformance with the specifications is obtained.
- e. All compaction shall meet the approval of the agency issuing the utility permit.

19. Surface Restoration

- a. Roads, driveways, shoulders, landscaping and all other areas removed, broken, caved-in, settled, or otherwise damaged as a result of construction work, shall be repaired and/or resurfaced to match the existing surface or landscaped areas.
- b. Existing shoulders and gravel surfaces shall be restored with like, crushed rock surfacing. Existing lawns shall be restored with sod after proper backfilling and settling. Existing landscaping, fences, mailboxes, ornamentation, etc. shall be restored as close to original conditions as possible. Private driveways, walks, and other surfaced areas shall be repaired, patched, or resurfaced as required to match the original surface condition.
- c. Contractors shall furnish and install new asphalt surface at all locations where the existing asphalt surface or asphalt driveway has been removed or damaged by construction work. Trenches shall be backfilled with select granular material approved by the City Engineer. It shall be mechanically tamped to 95 percent compaction in six- inch lifts. The top four inches shall consist of two inches of crushed surfacing top course and two inches compacted depth of asphaltic concrete, Class B.

C. Concrete

1. General

This division covers that work necessary for furnishing and installing all concrete as described in these specifications and shown on the plans.

2. Submittals

Submittal information shall be provided to the City Engineer for the following items:

- a. Concrete design and admixtures
- b. Special placement procedures for hot or cold weather
- c. Schedule of surface finishes
- d. Control Density Fill design mix

Concrete performance mixes shall be submitted to the City Engineer for approval a minimum of two weeks prior to placing any concrete. The performance mix shall include the amounts of cement, fine and coarse aggregate, water and admixtures, as well as the water cement ratio, slump, concrete yield and substantiation strength data in accordance with ACI 318-95, Chapter 5. The use of a performance mix requires batch plant inspection, the cost of which shall be paid by the Contractor. Review of mix submittals by the City

indicates only that information presented conforms generally to Agreement documents. Contractor or supplier maintains full responsibility for special performance.

3. Control Density Fill (CDF)

- a. At least 10 days before placing CDF, the Contractor shall submit a mix design for the material to be used. The mix design shall include trial laboratory and testing data with cylinder breaks performed at 7, 14, and 21 days. The mix design shall be approved by the agency issuing the utility permit.
- b. CDF shall be proportioned to be a non-segregating, free flowing, self-consolidating, low shrink slurry.
- c. The Contractor and its supplier shall determine the materials and proportions used to meet the requirements of these Specifications. The mix design shall be prepared for the range of aggregate gradations that are expected to be used.
- d. The unconfined compressive strength at 28 days shall be 200 psi (+50 psi) as per ASTM D4832.
- e. Contain CDF in trench sections using bulkheads or fill materials to confine the flow of material. Take appropriate precautions to prevent pipe displacement and/or flotation.
- f. CDF shall be placed in lifts not exceeding 6 feet in height, with a time interval of not less than 1 hour between lifts.
- g. Provide steel plates to span trenches and prevent traffic contact if necessary. No traffic or construction equipment shall be allowed on CDF for at least 24 hours after placement or until the material is hard enough to prevent rutting or damage. Work shall not proceed unless plates are on the jobsite.

4. Concrete Materials

- a. Concrete shall be mixed, conveyed, and proportioned in accordance with IBC section 1905. The performance mix shall include the amount of cement, fine and coarse aggregate, water, and admixtures as well as water cement ratio, slump, concrete yield, and sustaining strength data in accordance with these specifications, the minimum requirements of the current adopted International Building Code, Section 1905, and the requirements of ACI 318-99.
- b. Materials shall conform to the following standards:

- i. Cement: ASTM C-105
 - ii. Coarse Aggregate: ASTM C-33
 - iii. Fine Aggregate: ASTM C-33
 - iv. Admixtures: ASTM C-494
 - v. Air entraining Admixtures: ASTM-260
 - vi. Water used in concrete shall be potable.
 - vii. Fly ash may be substituted for up to 15% of the required cement.
5. Thrust Blocking, Driveways, and Sidewalks
- a. Cement: ASTM C-105
 - b. Coarse Aggregate ASTM C-33
 - c. Fine Aggregate: ASTM C-33
 - d. Admixtures: ASTM C-494
 - e. 28-day strength: 3,000 psi minimum
 - f. Cement content: 5.5 sacks/CY minimum
 - g. Water/Cement ratio: 6 gals/95 lb sack maximum
 - h. Fine aggregate ratio: 45% max by weight
 - i. Coarse aggregate limits: 7/8 inch maximum
 - j. Entrained air ratio: 3% minimum to 5% maximum
 - k. Slump: 4 inches maximum

Conform to Standard Details for General Blocking, Vertical Blocks, and Deadman Blocking. All fittings to be blocked shall be wrapped with 8-mil polyethylene plastic. Concrete blocking shall be properly formed with plywood or other acceptable forming materials and shall not be poured around joints. The forms shall be stripped prior to backfilling. All blocking must be inspected by the City Inspector prior to backfill.

The City does not use thrust blocks for fire hydrants. Each fire hydrant shall be secured with mega lugs and tie backs per the standard detail. For mains crossing other pipes, the City will require additional restraints.

D. Special Construction (Pipeline Casings)

1. General

This division covers the boring and jacking of pipeline casings and the installation of carrier pipe.

2. Submittals

Submit the following for review:

- a. Casing pipe drawings, details, and thickness calculations
 - b. Carrier pipe placement method and equipment
 - c. Utility crossing permits
3. Quality Assurance
- The boring contractor shall have regularly engaged in work of this nature for at least 5 years.
4. Other Utilities
- No other utilities are allowed to be placed inside the casing without the prior express written consent of the City Engineer and a satisfactory hold harmless Agreement.
5. Casing Pipe
- a. Provide welded steel pipe of the minimum diameter and thickness approved by the City Engineer. The casing ID shall be at least four inches larger than the carrier bell OD. Provide pipe of sufficient wall thickness and axial strength to withstand the forces encountered during the jacking operation, but in no case less than 3/8 inch. The casing shall be designed to withstand all imposed loads plus a corrosion allowance of 1/4 inch.
 - b. Fabricate the pipe in conformance with ASTM A 252, Grade 2 except the hydrostatic test is waived. Provide tapped grout holes at the top of the casing at reasonable intervals. Install plugs in the tapped holes.
6. Joints
- Weld sections of casing pipe with a continuous circumferential weld. Provide stress transfer across the joints capable of resisting the jacking forces involved.
7. Casing End Seals
- Seals shall be 1/4-inch (minimum) thickness, pull on style end seals fabricated from EPDM synthetic rubber with stainless steel bands and clamps. End seals shall be as manufactured by PSI Industries or approved equal.
8. Carrier Pipe Skids
- Provide custom engineered skids/isolators to isolate the carrier pipe from the casing. The insulator shall consist of a PVC insulating liner (90 mil minimum thickness), 12-inch wide, 12-gauge (minimum) steel bands with steel risers and glass reinforced plastic or ultra-high molecular weight runners. The skids shall be designed to properly support the pipe filled with water. The runners shall be designed so that the carrier pipe joints clear the casing by two inches. The ferrous components of the insulator and steel bands shall be shop coated with a minimum of 10 mills PVC heat fusion coating. All miscellaneous hardware including stud bolts, washers, and nuts shall be 316 stainless steel. Skids shall center the pipe in the casing. Provide skids as manufactured by PSI

Industries, Cascade Manufacturing Co., or approved equal. The minimum number of required skids is 3 per pipe length for the entire length of the casing.

9. Sand

Unless specifically required by the City Engineer, sand shall not be used in a casing for filling between the casing and carrier pipe. In those instances where the City Engineer does require sand, it shall be clean and 90-100 percent will pass the No. 4 sieve. Not more than 5 percent will pass the No. 200 sieve. Sand shall be free from clay and organic material.

10. Casing Excavation and Installation

Prior to installing the casing, thoroughly investigate the locations of existing utilities. The Contractor shall pothole the casing location to verify that there are no interferences.

Equip the leading section of casing pipe with a jacking head securely anchored to prevent any wobble or variation in alignment during jacking operation. Make every effort to avoid loss of ground outside the jacking head. If excessive ground loss occurs, stop excavation and fill void with grout.

The casing shall be installed in such a manner that it is not damaged or deflected to reduce its true circular diameter.

11. Tolerances

A maximum horizontal and vertical tolerance of three inches per 100 linear feet of jacked casing is permitted.

12. Grouting

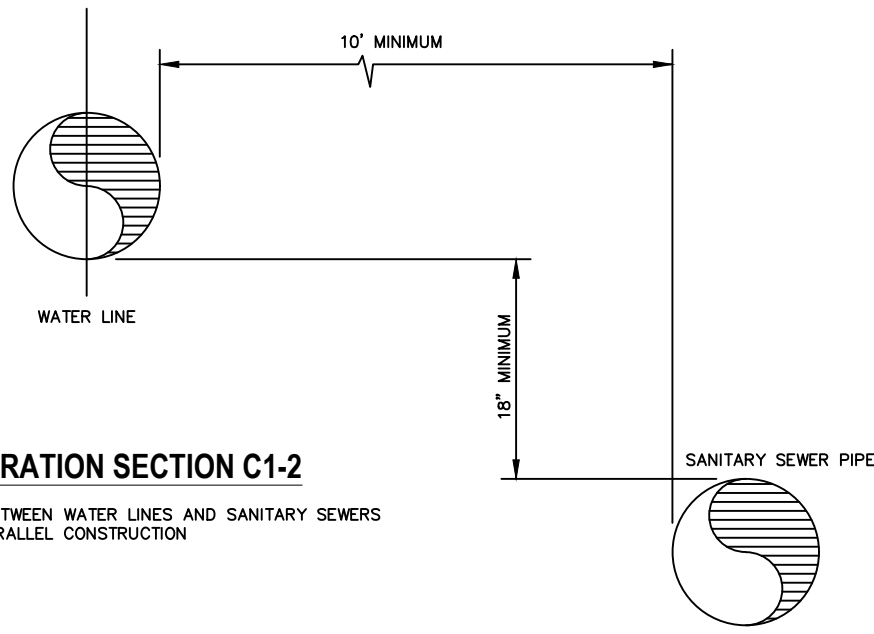
After jacking is completed, fill voids by pumping grout through grout holes in the casing at any locations of ground loss and elsewhere where voids are suspected. Plug grout holes after grouting. Take care to avoid over-pumping grout and disturbing the improvements the casing was jacked under.

13. Carrier Pipe

- a. All pipe installed in casing shall have restrained joints.
- b. Protect pipe as necessary during installation to insure against damage. Install the carrier pipe with the skids located not more than two feet from each end of the pipe joints. The skids shall be adequate in number to hold the pipe to grade, and not less than two skids shall be installed on each section of pipe. Provide skids within 6 inches of each end of the casing.
- c. After installation and testing of the carrier piping, carefully fill the remaining space in the casing with pneumatically placed sand unless directed by the City Engineer to leave the casing unfilled. Take care to avoid floating the carrier pipe.
- d. Install casing end seals and secure in place with stainless steel bands. Make seals watertight.

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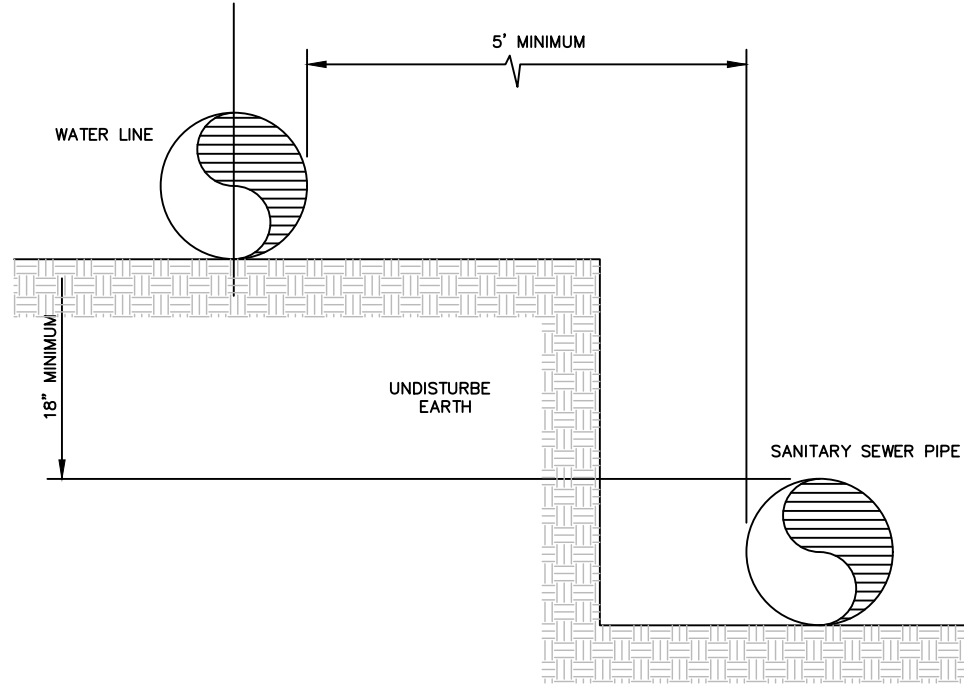
SYMMETRICAL ABOUT CENTER LINE OF WATER MAIN



UTILITY SEPARATION SECTION C1-2

REQUIRED SEPARATION BETWEEN WATER LINES AND SANITARY SEWERS
PARALLEL CONSTRUCTION

SYMMETRICAL ABOUT CENTER LINE OF WATER MAIN



UTILITY SEPARATION SECTION C1-3

REQUIRED SEPARATION BETWEEN WATER LINES AND SANITARY SEWERS
UNUSUAL CONDITIONS PARALLEL CONSTRUCTION



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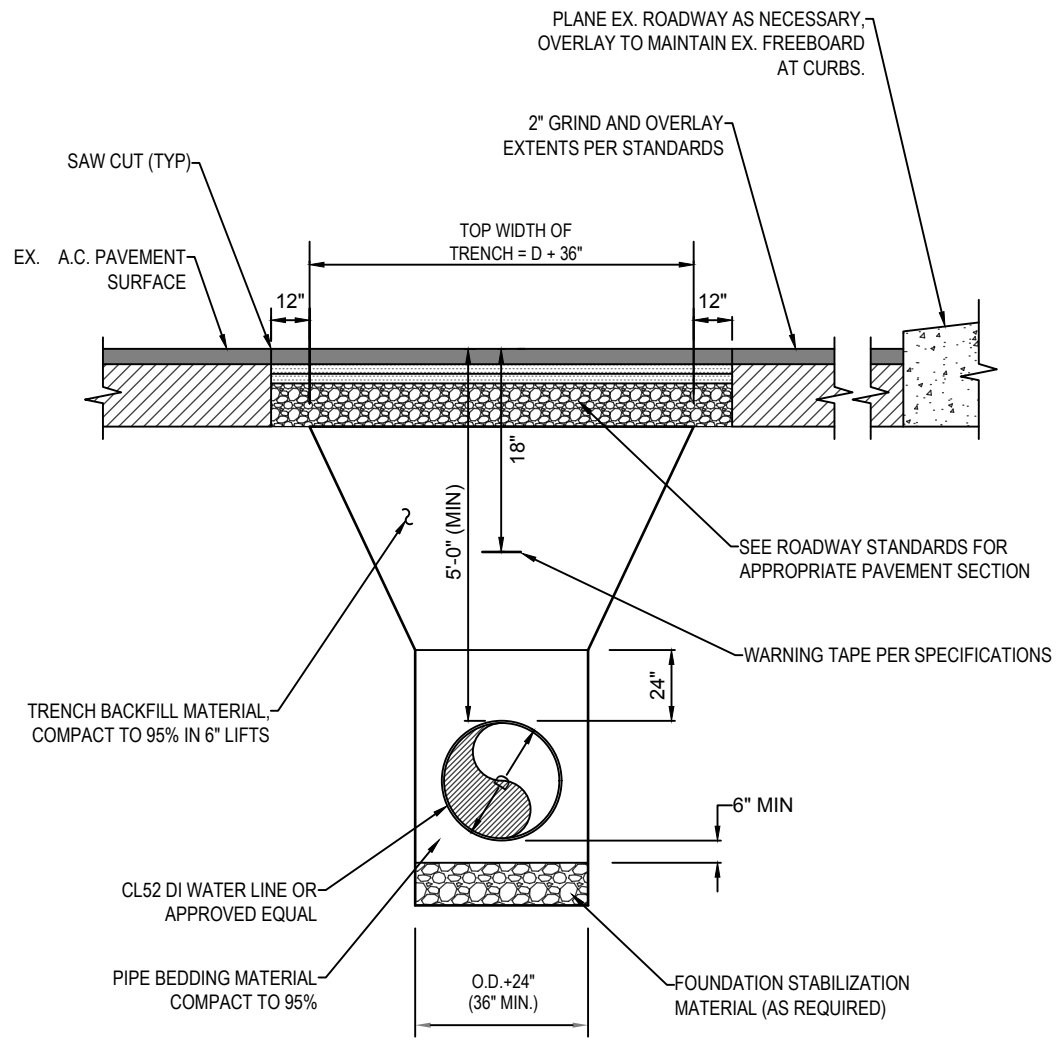
RESTORATION, TAPS, AND BLOCKING A

SEPARATION STANDARDS

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DATE	1/30/2019
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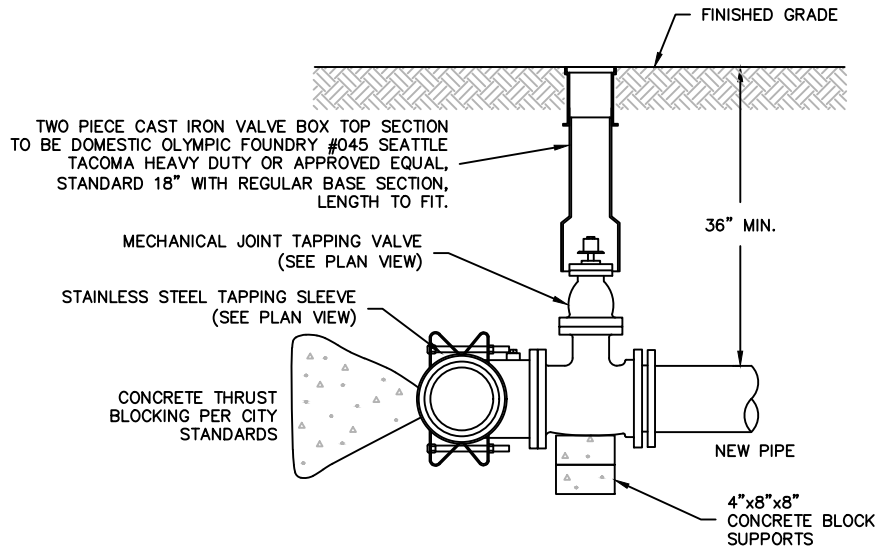
- NOTES:**
- 1) BED THE ENTIRE WIDTH OF THE TRENCH PAVEMENT
 - 2) RESTORATION SHALL BE PER THE APPROPRIATE SECTION IN CHAPTER 6 (PAVEMENT SURFACING).
 - 3) INSTALL TRACER WIRE PER SPECIFICATIONS



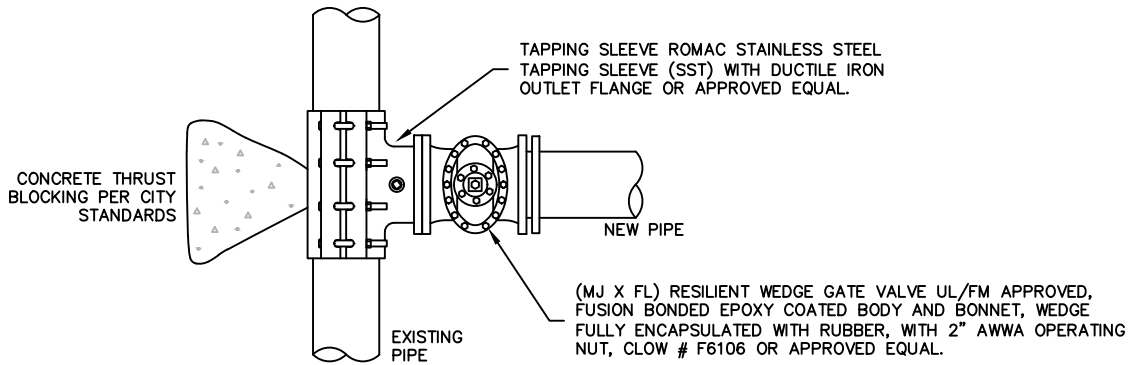
RESTORATION, TAPS, AND BLOCKING B

WATER MAIN TRENCH
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DATE	1/31/2019
SCALE	NTS
DRAWING NUMBER	801



ELEVATION



PLAN

NOTES:

1. PRIOR TO BORING:
 - A. TAPPING SLEEVE AND VALVE SHALL BE PRESSURE TESTED AT 200 PSI FOR A PERIOD OF 15 MINUTES. PRESSURE LOSS DURING TESTING SHALL NOT EXCEED 5 PSI.
 - B. TAPPING SLEEVE AND VALVE SHALL BE STERILIZED PER SPECIFICATIONS
2. PRIOR TO FINAL CONNECTION OF TAPPING VALVE TO NEW PIPING, THE NEW PIPING SHALL BE PRESSURE TESTED AND STERILIZED PER SPECIFICATIONS



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RESTORATION, TAPS, AND BLOCKING C

WET TAP

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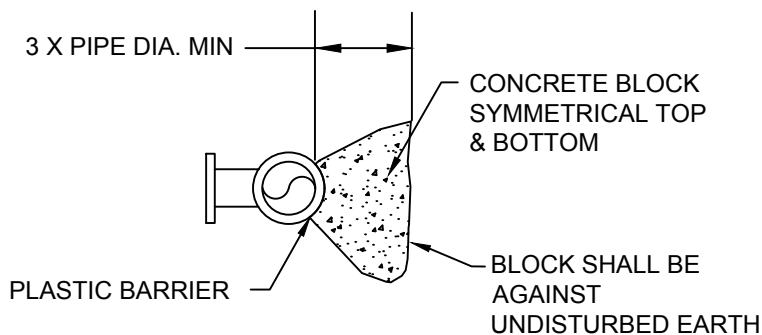
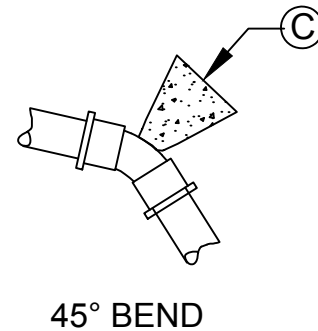
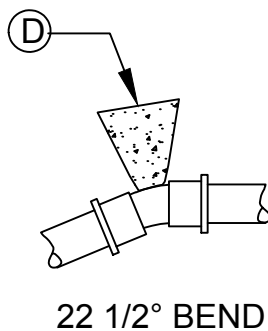
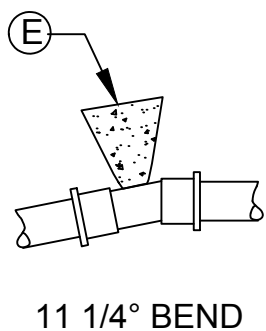
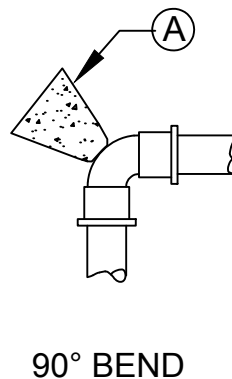
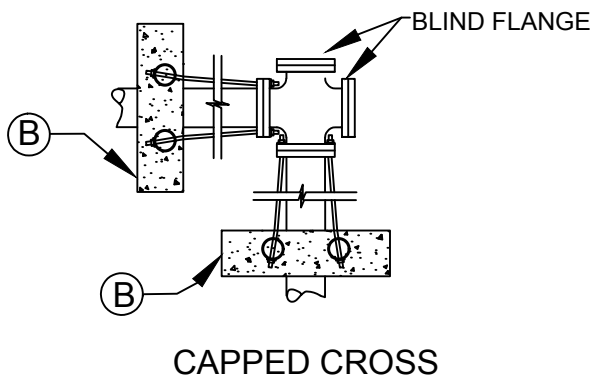
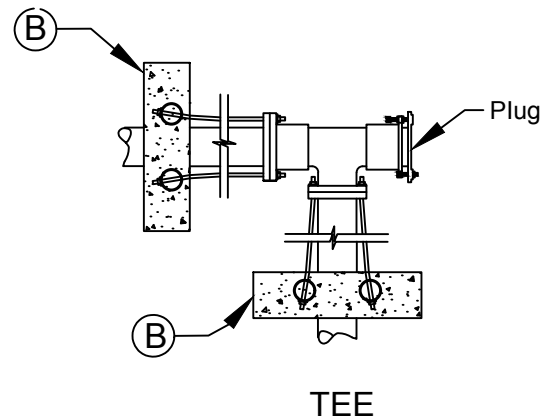
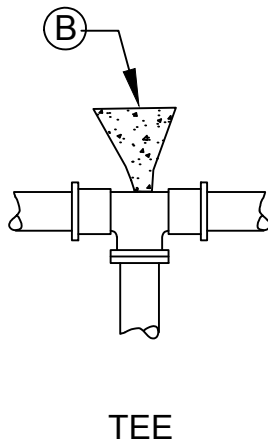
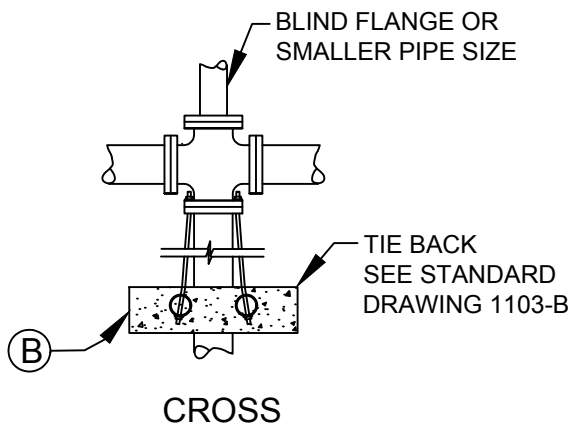


TABLE A - THRUST BLOCK

PIPE SIZE	(A) SQ. FT.	(B) SQ. FT.	(C) SQ. FT.	(D) SQ. FT.	(E) SQ. FT.
4"	3	2	2	1	1
6"	6	5	4	2	1
8"	11	8	6	3	2
12"	22	16	12	6	3
16"	38	27	21	10	6
18"	48	34	26	14	7
24"	84	59	45	23	13

MIN. BEARING AREA AGAINST UNDISTURBED SOIL

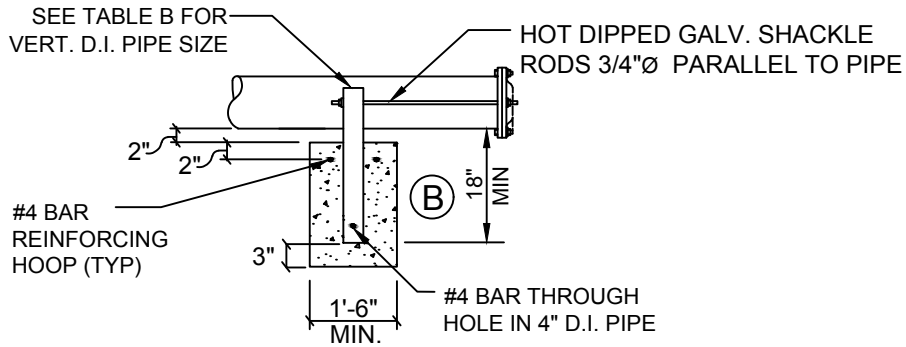
SEE DRAWING 1103-B FOR ADDITIONAL NOTES



RESTORATION, TAPS, AND BLOCKING

THRUST BLOCKING AND TIE BACKS

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DATE	1/15/2019
SCALE	NTS
DRAWING NUMBER	803-A



TIE BACK BLOCK DETAIL

TABLE B - TIE BACK

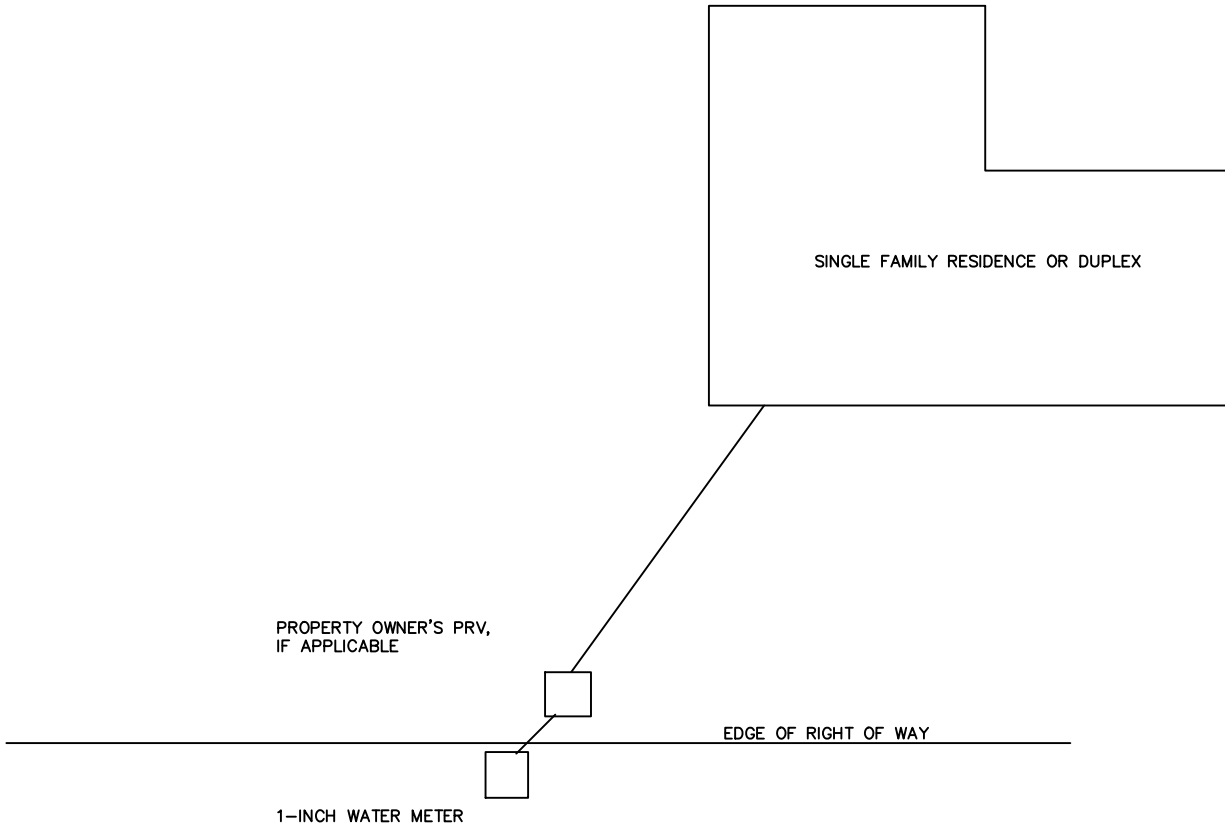
WATER MAIN PIPE	AMOUNT OF 3/4" GALV. SHACKLE RODS	SIZE OF VERT. PIPE IN CONC.	AMOUNT OF #4 REINFORCING BAR HOOPS
4"	2	4"	1
6"	2	4"	1
8"	2	4"	1
12"	4	4"	2
16"	6	6"	3
18"	6	6"	3
24"	6	6"	3

NOTES:

1. BEARING AREA OF CONCRETE THRUST BLOCK IS BASED ON 225 PSI PRESSURE AND SAFE SOIL BEARING LOAD OF 2000 PSF.
2. THE SAFE SOIL BEARING LOAD SHALL BE ADJUSTED TO MEASURED SOIL BEARING LOADS IN THE FIELD.
3. AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES AND SOIL CONDITIONS.
4. CONCRETE BLOCKING SHALL BE CAST IN PLACE AND HAVE A MINIMUM OF 1/4 SQUARE FOOT BEARING AGAINST THE FITTING.
5. THE BLOCK SHALL BEAR AGAINST THE FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP AND DISMANTLING OF JOINT
6. THE CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.
7. USE 2" THICK STYROFOAM TO FORM THE CONCRETE BLOCKING. PLASTIC SHALL BE INSTALLED BETWEEN ALL CONCRETE BLOCKING AND FITTINGS.

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DATE	1/15/2019
SCALE	NTS
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NOTES:

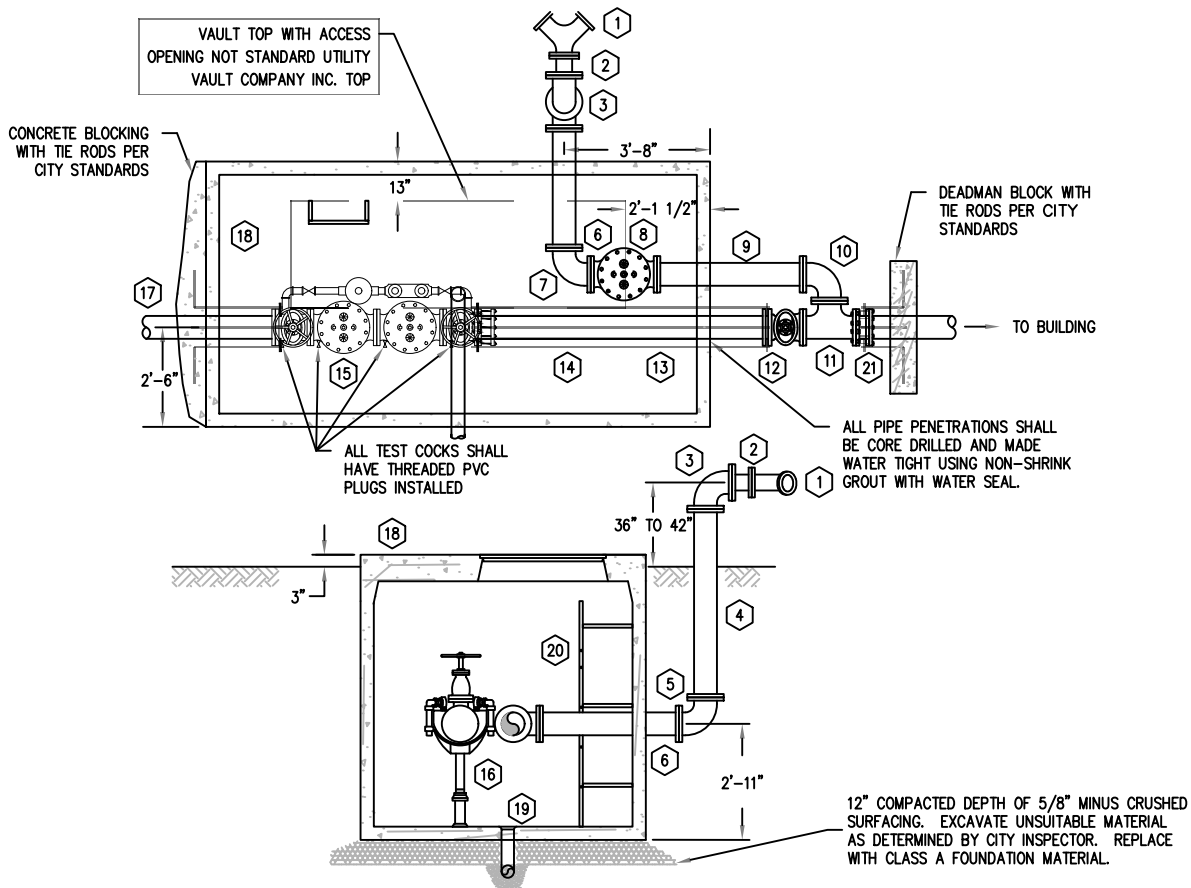
IF A RESIDENTIAL FIRE SPRINKLER SYSTEM IS USED:

1. THE WATER METER WILL BE AT LEAST A 1-INCH METER
2. THE SPRINKLER SYSTEM WILL BE PRIVATELY OWNED AND MAINTAINED.
3. THE SPRINKLER SYSTEM WILL BE CONNECTED TO THE OWNER'S SERVICE LINE AND WILL BE A FLOW-THROUGH SYSTEM.



FIRE SUPPRESSION A
RESIDENTIAL FIRE SPRINKLER METERING
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DRAWN BY	IDS
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DRAWING NUMBER	820



1. 4"x2 1/2" FIRE DEPARTMENT DOUBLE CONNECTION FOR STAND PIPE WITH BREAKABLE CAST IRON HOSE CAPS.
2. 4" ADAPTER (FLxSCREWED)
3. 4" OR 6" 90° BEND (FL)
4. 4" OR 6" PIPE (FLxFL), LENGTH TO FIT
5. 4" OR 6" 90° BEND (FL)
6. 4" OR 6" PIPE (FLxFL), 3'-0" LONG
7. 4" OR 6" 90° BEND (FL)
8. 4" OR 6" SWING TYPE GRAVITY OPERATED CHECK VALVE(FL)
9. 4" OR 6" PIPE (FLxFL), 3'-8" LONG
10. 4" ASSEMBLY: 4" SHORT RADIUS 90° BEND (FL), 6" AND 8" ASSEMBLY: 6" SHORT RADIUS 90° BEND (FL), 10" ASSEMBLY: 8"x6" REDUCING 90° BEND (FL)
11. 4" ASSEMBLY, 4" TEE (FL)
6" ASSEMBLY, 6" TEE (FL)
8" ASSEMBLY, 8"x8"x6" TEE (FL)
10" ASSEMBLY, 10"x10"x8" TEE (FL)
12. 4", 6", 8", OR 10" RESILIENT WEDGE GATE VALVE (FLxMJ) WITH INDICATOR POST. INDICATOR POST VALVE SAME SIZE AS DOUBLE CHECK VALVE.
13. 4", 6", 8", OR 10" DI CLASS 52 NIPPLE PIPE, CEMENT LINED, LENGTH TO FIT, WITH TIE RODS PER CITY STANDARD.
14. 4", 6", 8", OR 10" FLANGED COUPLING ADAPTER
15. DETECTOR DOUBLE CHECK VALVE ASSEMBLY. EACH ASSEMBLY SHALL INCLUDE TWO RESILIENT WEDGE GATE VALVES AND TEST COCKS, BY-PASS ASSEMBLY, AND BE APPROVED CROSS-CONNECTION CONTROL ASSEMBLIES PER THE LATEST D.O.H. APPROVED LIST.
16. ADJUSTABLE PIPE SUPPORT UNDER CHECK VALVES STANDON MOD. #S92 OR APPROVED EQUAL (THREE REQUIRED).
17. 4", 6", 8", OR 10" (FLxPE) PIPE WITH COLLAR 18" FROM PLAIN END (PE):
4" - 5'-6" LONG 6" - 4'-6" LONG
8" - 3'-6" LONG 10" - 3'-0" LONG
18. PRECAST CONCRETE VAULT WITH LOCKING STEEL COVERS. COVER EQUAL TO LW PRODUCTS COMPANY TYPE "HD." UTILITY VAULT CO. #612-LA OR APPROVED EQUAL.
19. 6" MIN. DRAIN WITH SCREEN TO DAYLIGHT OR STORM DRAIN SYSTEM. PROVIDE RODENT PROOF SCREEN AT DAYLIGHT.
20. FREE STANDING GALVANIZED STEEL LADDER ATTACH TO FLOOR AND VAULT WALL.
21. 4", 6", 8", OR 10" FLANGED COUPLING ADAPTER

LEGEND



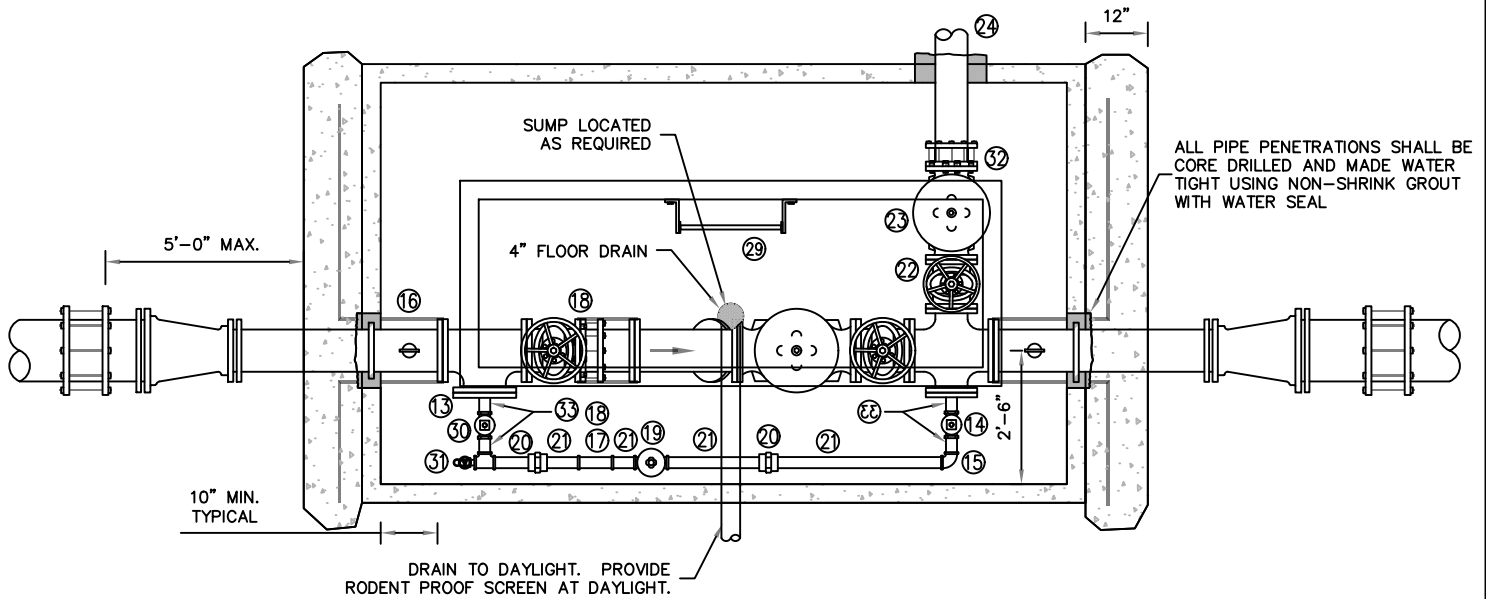
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FIRE SUPPRESSION B

FIRE SERVICE CONNECTION - EXTERNAL DDCV/PIV/FDC

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DRAWING NUMBER	821



PLAN

- ① 12" CAST IRON COUPLING ROCKWELL 431 WITH LONG LENGTH SLEEVE OR APPROVED EQUAL.
- ② 12" DI PIPE, LENGTH TO FIT.
- ③ 12" TO 8" DI REDUCER (MxMJ).
- ④ 8" DI SPOOL WITH COLLAR (PExFL), LENGTH TO FIT.
- ⑤ 8" DI TEE (FL x FL x FL).
- ⑥ ADJUSTABLE PIPE SUPPORT STANDON MODEL S92 OR APPROVED EQUAL.
- ⑦ 8" RESILIENT SEAT GATE VALVE (FLxFL) WITH HAND WHEEL.
- ⑧ 8" FLANGE COUPLING ADAPTER ROCKWELL 913 WITH ANCHOR STUDS OR APPROVED EQUAL.
- ⑨ 8" STRAINER (FLxFL) MUESSCO NO. 751 OR APPROVED EQUAL.
- ⑩ 2" BRONZE CORPORATION STOP (IPTxFIPT) FORD FB 1700-7 OR APPROVED EQUAL.
- ⑪ 8" PRESSURE REDUCING VALVE (FLxFL), CLA-VAL 90G-01ABCS OR APPROVED EQUAL WITH TEST COCKS, COPPER TUBING TRIM, EPOXY LINING, AND VALVE POSITION INDICATOR.
- ⑫ 8" TO 6" BRANCH REDUCING CROSS (FLxFLxFLxFL).
- ⑬ 8" DI BLIND FLANGE WITH 3" IPS TAP (TYPICAL).
- ⑭ 3" R.S. GATE VALVE WITH HAND WHEEL (SxS).
- ⑮ 3" BRASS 90° BEND (SxS).
- ⑯ PRESSURE GAUGE (0 TO 200 PSI) WITH BALL VALVE AND BRASS FITTINGS. TAP PIPE FOR CONNECTION, CENTER BETWEEN FLANGE AND VAULT WALL.
- ⑰ 3" STRAINER (FLxFL) WITH 1/8" PERFORATIONS BRASS SCREEN MUESSCO NO. 751 OR APPROVED EQUAL. TWO 3" BLIND FLANGES WITH 3" FIPT THREAD.
- ⑱ 3/4" BRONZE CORPORATION STOP (IPTxFIPT) FORD FB1700-3 OR APPROVED EQUAL.
- ⑲ 3" PRESSURE REDUCING VALVE (SxS), CLA-VAL 90G-01ABS WITH TEST COCKS AND VALVE POSITION INDICATOR OR APPROVED EQUAL.
- ⑳ 3" BRASS UNION.
- ㉑ 3" BRASS THREADED PIPE, LENGTH TO FIT (TYPICAL).
- ㉒ RESILIENT SEAT GATE VALVE (FLxFL) WITH HAND WHEEL (CITY TO SIZE FOR EACH PROJECT).

SIZING TABLE

Main Line	Main PRV	Bypass Line	Pressure Relief	Utility Vault	Locking Steel Covers
* 12"	8"	3"	Sized for Project	712-LA	LW PRODUCTS TYPE "HD"
10"	8"	3"		712-LA	LW PRODUCTS TYPE "HD"
8"	6"	2"		612-LA	LW PRODUCTS TYPE "HD"
6"	4"	2"		5106-LA	LW PRODUCTS TYPE "HD"

* Size shown in this figure.

NOTES

- 1. PAINT INTERIOR WALLS WITH TWO COATS OYSTER WHITE, FACTORY APPLIED.
- 2. SUBMIT FOR APPROVAL ALL SUPPLIER CUT SHEETS ON ALL MATERIALS TO BE USED.
- 3. TWO COATS VAN DEX WATERPROOFING OR APPROVED EQUAL TO BE APPLIED ON OUTSIDE SURFACES OF VAULT.
- 4. ALL BRASS OR COPPER GALVANIZED CONNECTIONS SHALL HAVE DIELECTRIC BUSHINGS.
- ㉓ PRESSURE RELIEF VALVE (FL) CLA-VAL 50G-01 WITH TEST COCKS AND VALVE POSITION INDICATOR OR APPROVED EQUAL. (CITY TO SIZE FOR EACH PROJECT).
- ㉔ DI PIPE. (CITY TO SIZE FOR EACH PROJECT).
- ㉕ 8" DI SPOOL (FLxPE) APPROX. 9" LONG.
- ㉖ PRECAST UTILITY VAULT - SEE SIZING TABLE OR APPROVED EQUAL. ALL JOINTS TO BE INSTALLED USING NON-SHRINK GROUT AND TESTED TO ACHIEVE WATER TIGHTNESS.
- ㉗ 4" FLOOR DRAIN WITH SCREEN AND 4" SCHEDULE 40 PVC PIPE.
- ㉘ 4" SCHEDULE 40 PVC 45° BEND (2 each).
- ㉙ FREE STANDING GALVANIZED STEEL LADDER ATTACH TO FLOOR AND SIDE OF HATCH.
- ㉚ 3" BRASS TEE (SxS) WITH 3" x 3/4" BUSHING AND 3/4" BALL VALVE.
- ㉛ HOSE BIB WITH VACUUM BREAKER.
- ㉜ FLANGE COUPLING ADAPTER (SIZE PER DISCHARGE PIPING).
- ㉝ 3" BRASS THREADED PIPE, 3" LONG.



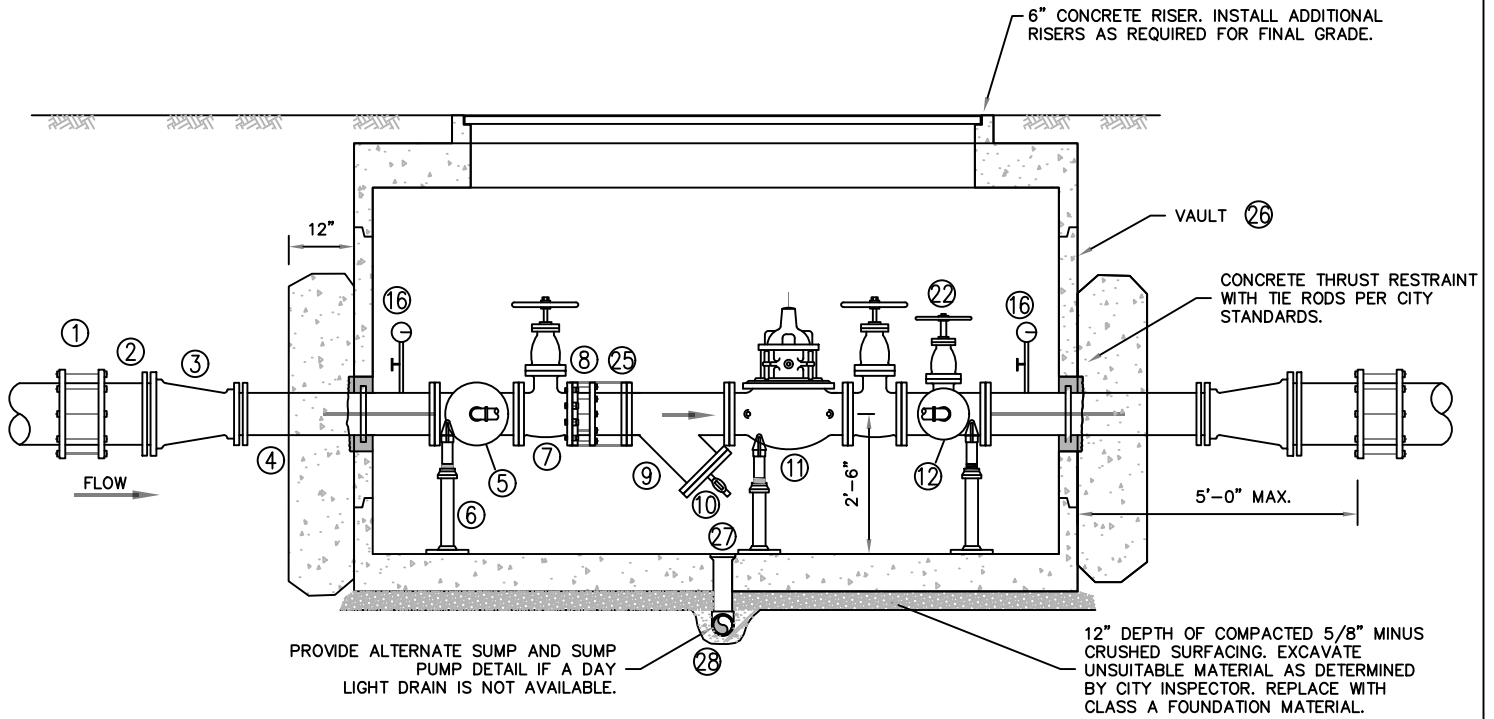
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PRESSURE REDUCTION A

PRESSURE REDUCING STATION (PLAN)

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DATE	1/30/2019
SCALE	NTS
DRAWING NUMBER	840A

BALL VALVES SHALL BE TWO PIECE
BRASS RED-WHITE BALL VALVE
#5044F OR APPROVED EQUAL.



ELEVATION

- ① 12" CAST IRON COUPLING ROCKWELL 431 WITH LONG LENGTH SLEEVE OR APPROVED EQUAL.
- ② 12" DI PIPE, LENGTH TO FIT.
- ③ 12" TO 8" DI REDUCER (MxMxM).
- ④ 8" DI SPOOL WITH COLLAR (PexFL), LENGTH TO FIT.
- ⑤ 8" DI TEE (FL x FL x FL).
- ⑥ ADJUSTABLE PIPE SUPPORT STANDON MODEL S92 OR APPROVED EQUAL.
- ⑦ 8" RESILIENT SEAT GATE VALVE (FLxFL) WITH HAND WHEEL.
- ⑧ 8" FLANGE COUPLING ADAPTER ROCKWELL 913 WITH ANCHOR STUDS OR APPROVED EQUAL.
- ⑨ 8" STRAINER (FLxFL) MUESSCO NO. 751 OR APPROVED EQUAL.
- ⑩ 2" BRONZE CORPORATION STOP (IPTxFIPT) FORD FB 1700-7 OR APPROVED EQUAL.
- ⑪ 8" PRESSURE REDUCING VALVE (FLxFL), CLA-VAL 90G-01ABS OR APPROVED EQUAL WITH TEST COCKS, COPPER TUBING TRIM, EPOXY LINING, AND VALVE POSITION INDICATOR.
- ⑫ 8" TO 6" BRANCH REDUCING CROSS (FLxFLxFLxFL).
- ⑬ 8" DI BLIND FLANGE WITH 3" IPS TAP (TYPICAL).
- ⑭ 3" R.S. GATE VALVE WITH HAND WHEEL (SxS).
- ⑮ 3" BRASS 90° BEND (SxS).
- ⑯ PRESSURE GAUGE (0 TO 200 PSI) WITH BALL VALVE AND BRASS FITTINGS. TAP PIPE FOR CONNECTION, CENTER BETWEEN FLANGE AND VAULT WALL.
- ⑰ 3" STRAINER (FLxFL) WITH 1/8" PERFORATIONS BRASS SCREEN MUESSCO NO. 751 OR APPROVED EQUAL, TWO 3" BLIND FLANGES WITH 3" FIPT THREAD.

- ⑱ 3/4" BRONZE CORPORATION STOP (IPTxFIPT) FORD FB1700-3 OR APPROVED EQUAL.
- ⑲ 3" PRESSURE REDUCING VALVE (SxS), CLA-VAL 90G-01ABS WITH TEST COCKS AND VALVE POSITION INDICATOR OR APPROVED EQUAL.
- ⑳ 3" BRASS UNION.
- ㉑ 3" BRASS THREADED PIPE, LENGTH TO FIT (TYPICAL).
- ㉒ RESILIENT SEAT GATE VALVE (FLxFL) WITH HAND WHEEL (CITY TO SIZE FOR EACH PROJECT).
- ㉓ PRESSURE RELIEF VALVE (FL) CLA-VAL 50G-01 WITH TEST COCKS AND VALVE POSITION INDICATOR OR APPROVED EQUAL. (CITY TO SIZE FOR EACH PROJECT).
- ㉔ DI PIPE. (CITY TO SIZE FOR EACH PROJECT).
- ㉕ 8" DI SPOOL (FLxPE) APPROX. 9" LONG.
- ㉖ PRECAST UTILITY VAULT - SEE SIZING TABLE, OR APPROVED EQUAL. ALL JOINTS TO BE INSTALLED USING NON-SHRINK GROUT AND TESTED TO ACHIEVE WATER TIGHTNESS.
- ㉗ 4" FLOOR DRAIN WITH SCREEN AND 4" SCHEDULE 40 PVC PIPE.
- ㉘ 4" SCHEDULE 40 PVC 45° BEND (2 each).
- ㉙ FREE STANDING GALVANIZED STEEL LADDER ATTACH TO FLOOR AND SIDE OF HATCH.
- ㉚ 3" BRASS TEE (SxS) WITH 3" x 3/4" BUSHING AND 3/4" BALL VALVE.
- ㉛ HOSE BIB WITH VACUUM BREAKER.
- ㉜ FLANGE COUPLING ADAPTER (SIZE PER DISCHARGE PIPING).
- ㉝ 3" BRASS THREADED PIPE, 3" LONG.

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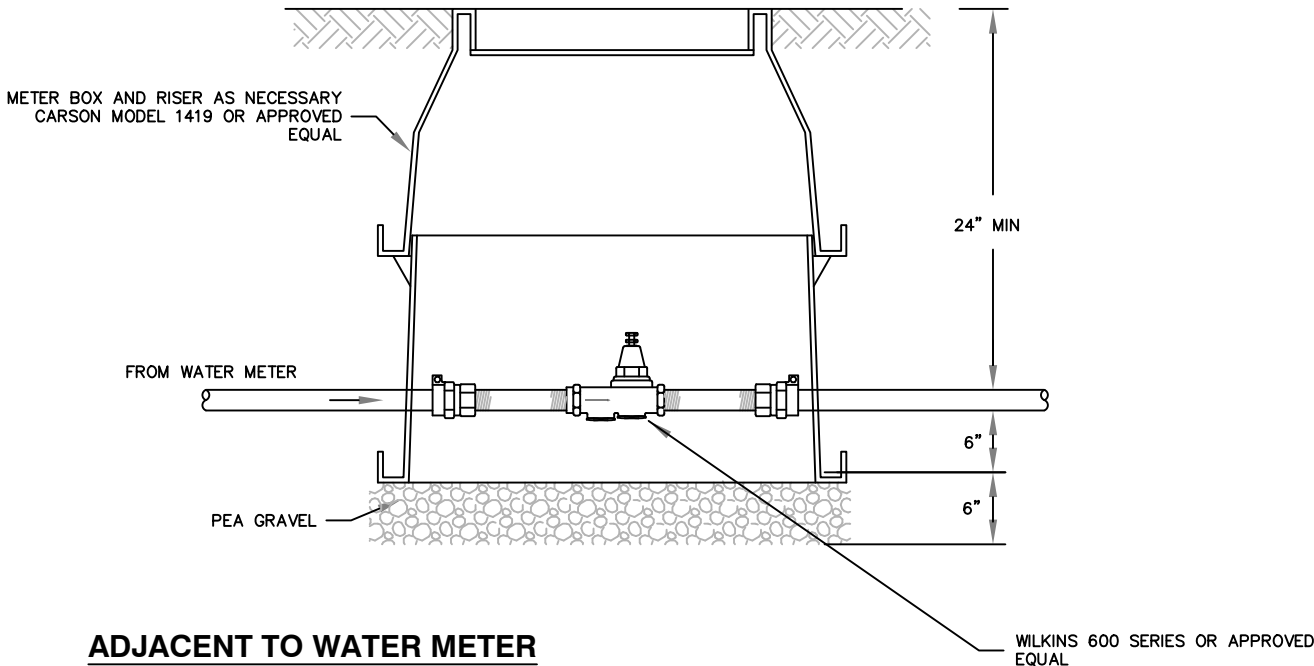
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PRESSURE REDUCTION A

PRESSURE REDUCING STATION (ELEVATION)

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SCALE	NTS
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ADJACENT TO WATER METER

WILKINS 600 SERIES OR APPROVED EQUAL

INSTALLATION

THE PRESSURE REDUCING VALVE SHALL BE LOCATED ON THE CUSTOMER'S PROPERTY "DOWNSTREAM" OF THE METER BOX. THE FUNCTION OF A PRESSURE REDUCING VALVE IS TO REDUCE HIGH-WATER PRESSURES IN THE SERVICE CONNECTION TO AN ACCEPTABLE RANGE OF 50 TO 75 PSI. INSTALLATION OF A PRESSURE REDUCING VALVE IS REQUIRED WHERE THE SERVICE CONNECTION PRESSURE EXCEEDS 80 PSI IN ACCORDANCE TO THE UNIFORM PLUMBING CODE.

THE CUSTOMER IS RESPONSIBLE FOR INSTALLATION AND MAINTENANCE

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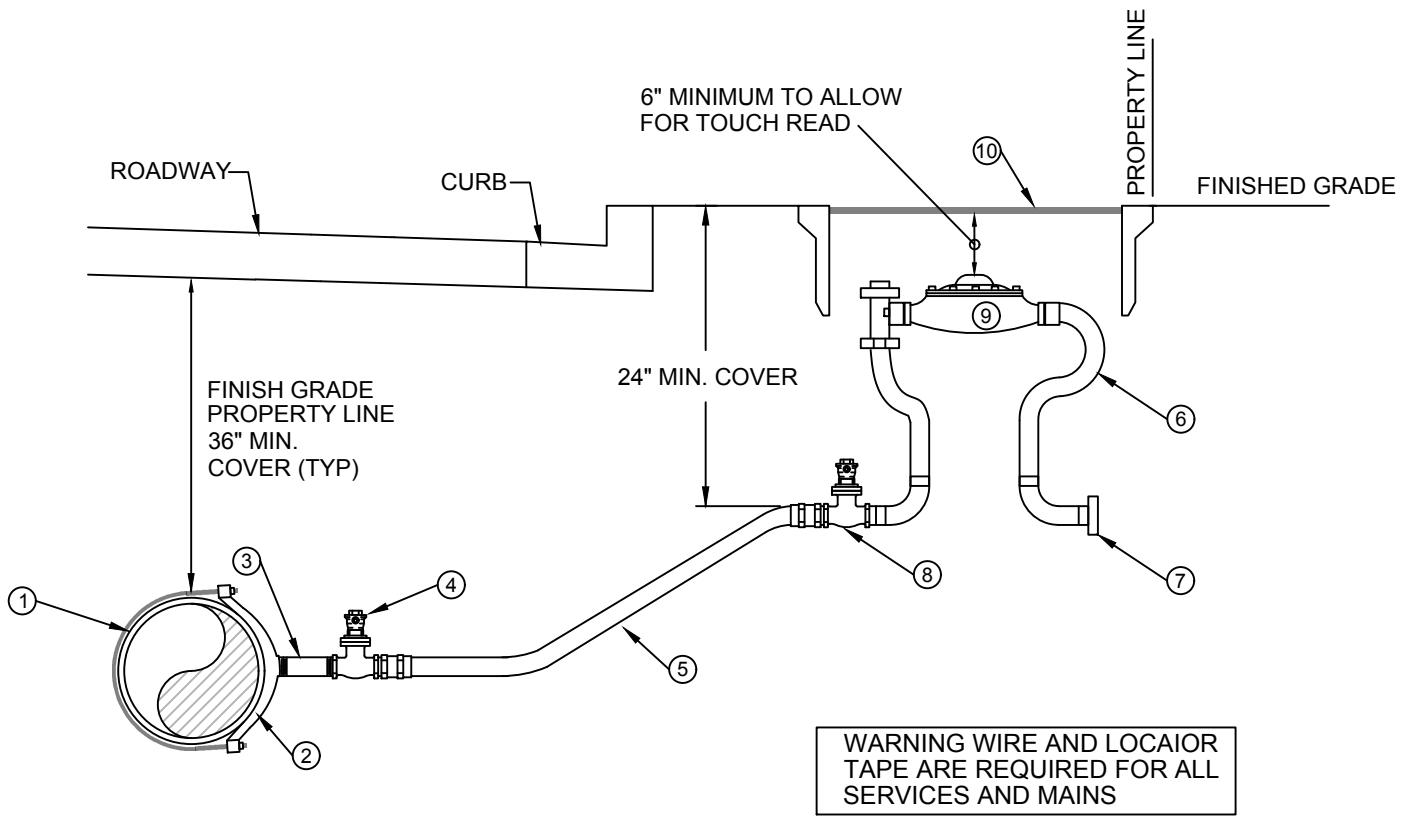
PRESSURE REDUCTION B

SERVICE PRESSURE REDUCING VALVE

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NOTES:

1. EXISTING WATER MAIN
2. 1" (IP THREAD) SINGLE STRAP SADDLE ROMAC STYLE 101S OR APPROVED EQUAL
3. 1" BRASS NIPPLE, 3" LONG
4. CORP. STOP, FORD FB1100 OR APPROVED EQUAL
5. 1" POLYETHYLENE PIPE, MAINTAIN 36" COVER FROM WATER MAIN TO WITHIN 48" OF METER BOX
6. 1" METER SETTER MUELLER 1434 OR APPROVED EQUAL HORIZONTAL IN, HORIZONTAL OUT. M.I.P. THREAD ENDS.
7. SCHEDULE 40 1" PVC THREADED PLUG. REMOVED WHEN CONNECTION MADE TO CUSTOMER LINE
8. BRASS CURB STOP, FORD B41-444-NL OR EQUAL.
9. WATER METER - TO BE SUPPLIED BY THE CITY
10. METER BOX SHALL BE SIGMA RAVEN HDPE METER BOX MODEL 1324-SW. PROVIDE HDPE LID WITH TOUCH READ AND METER READER LID. PLACE BACK OF METER BOX FLUSH WITH PROPERTY LINE.



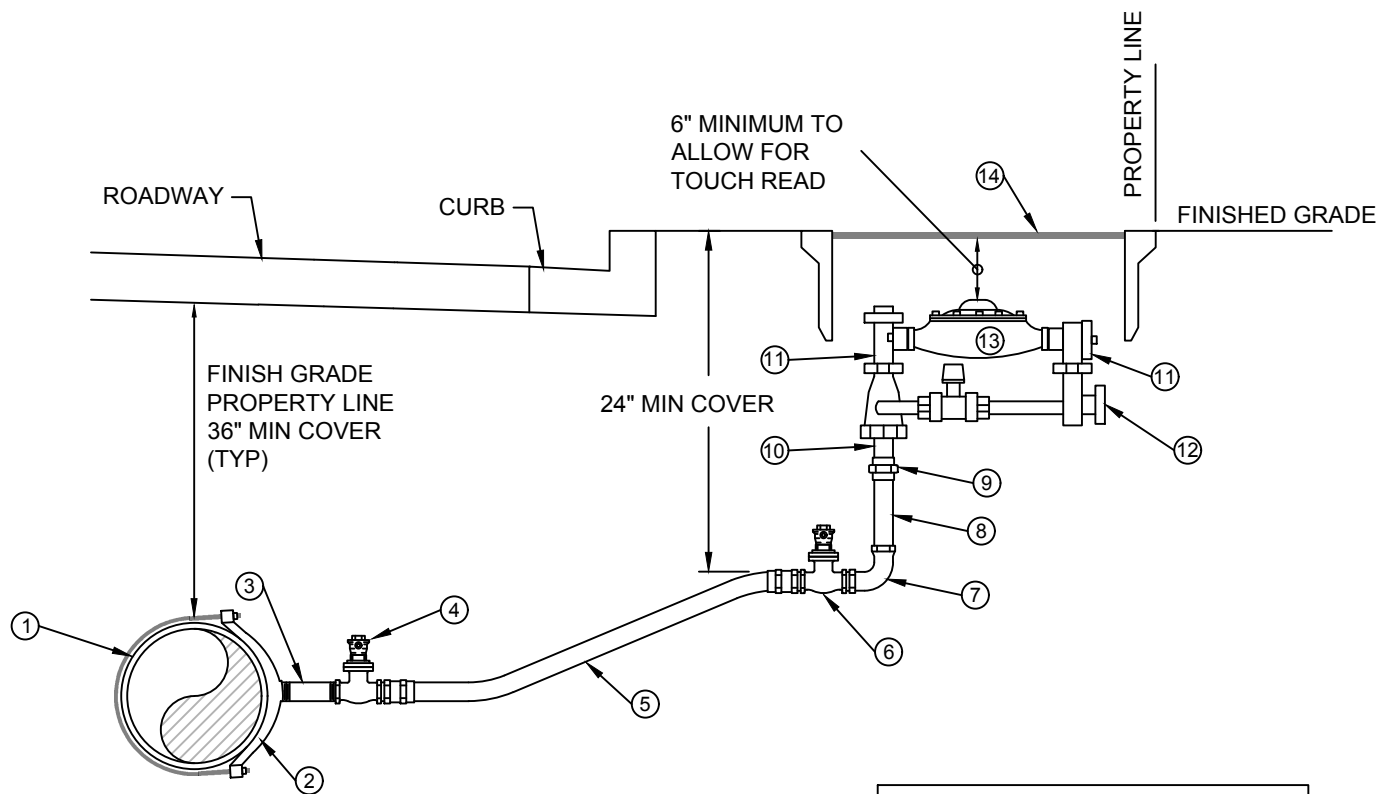
SERVICES A

5/8, 3/4, OR 1-INCH WATER SERVICE

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WARNING WIRE AND LOCATOR TAPE ARE REQUIRED FOR ALL SERVICES AND MAINS

NOTES:

1. EXISTING WATER MAIN
2. 2" (IP THREAD) DOUBLE STRAP SADDLE ROMAC STYLE 202S OR APPROVED EQUAL
3. 2" BRASS NIPPLE, 3" LONG
4. CORP. STOP, FORD FB1100 OR APPROVED EQUAL
5. 2" POLYETHYLENE PIPE, MAINTAIN 36" COVER FROM WATER MAIN TO WITHIN 48" OF METER BOX
6. 2" BRASS CURB STOP, FORD B41-777-NL OR EQUAL
7. 2" BRASS STREET ELL
8. 2" BRASS NIPPLE, 6" LONG
9. 2" BRASS UNION
10. 2" BRASS NIPPLE, 3" LONG
11. 2" METER SETTER WITH HIGH BYPASS MUELLER SERIES 1429 OR APPROVED EQUAL. VERTICAL IN, HORIZONTAL. OUT. FLANGED BALL VALVE WITH LOCK WINGS, CHECK VALVE AND BY-PASS.
12. SCHEDULE 40 2" PVC THREADED PLUG. REMOVED WHEN CONNECTION MADE TO CUSTOMER LINE
13. WATER METER - TO BE SUPPLIED BY THE CITY
14. METER BOX SHALL BE SIGMA RAVEN HDPE METER BOX MODEL 1730-SW. PROVIDE HDPE LID WITH TOUCH READ AND METER READER LID. PLACE BACK OF METER BOX FLUSH WITH PROPERTY LINE.

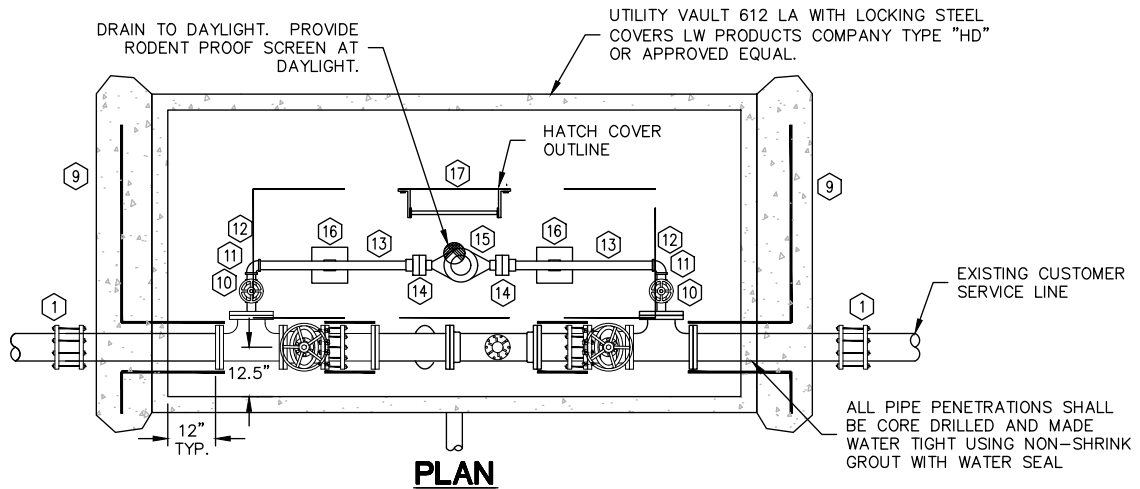


SERVICES B

1-1/2 OR 2-INCH WATER SERVICE

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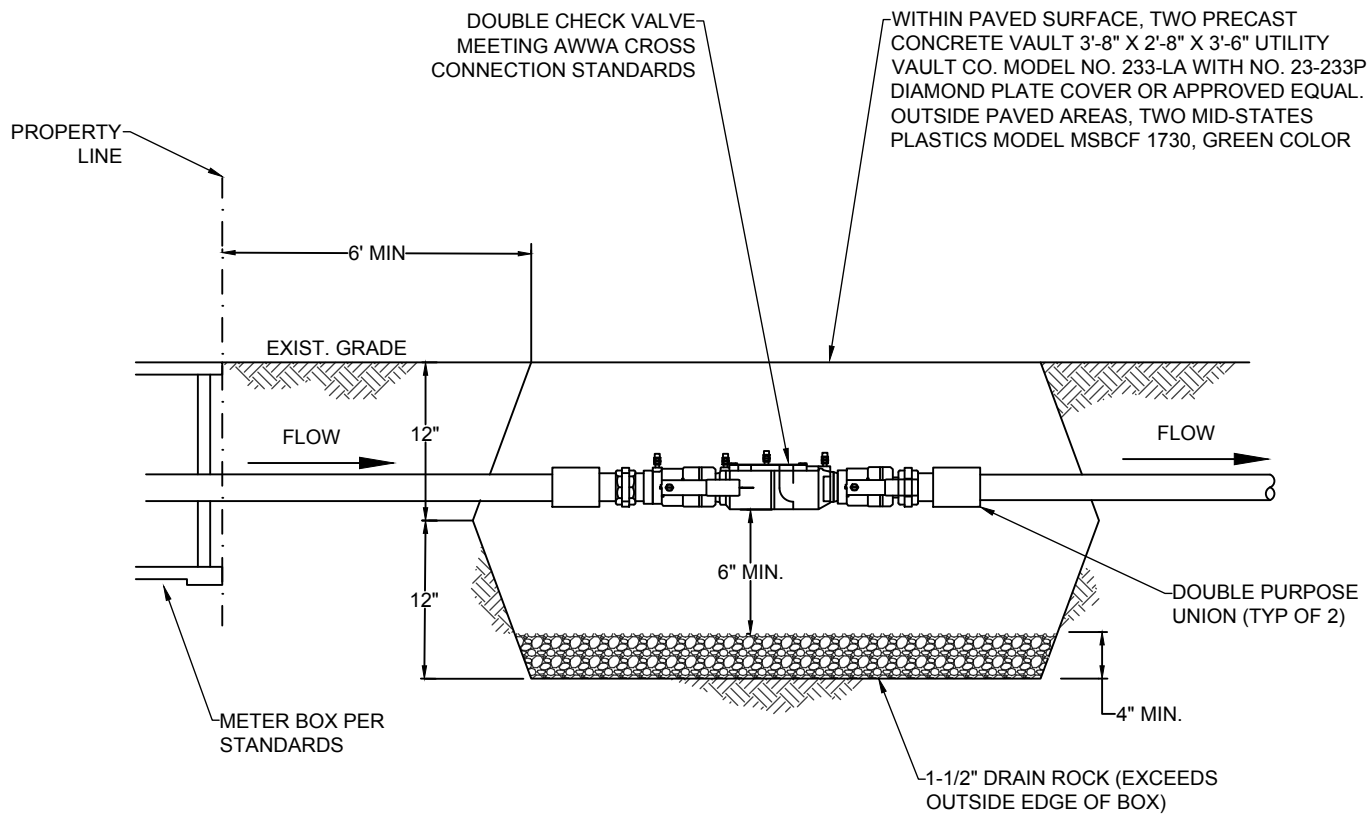
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- ① LONG BODY SLEEVE
- ② DI SPOOL (FLxPE), 3'-0" LONG
- ③ DI TEE (FLxFLxFL) WITH BLIND FLANGE WITH 2" IPT TAP
- ④ RESILIENT SEAT GATE VALVE (FLxFL) WITH HAND WHEEL
- ⑤ FCA
- ⑥ 6" DI SPOOL (FLxPE), 0'-9" LONG
4" DI SPOOL (FLxPE), 1'-6" LONG
3" DI SPOOL (FLxPE), 1'-11" LONG
- ⑦ STRAINER (FLxFL)
- ⑧ COMPOUND METER W/TOUCH READ (FLxFL), CITY TO PROVIDE
- ⑨ CONCRETE THRUST RESTRAINT WITH TIE RODS PER CITY STANDARDS
- ⑩ 2" THREADED BRASS NIPPLES (3" LONG)
- ⑪ 2" RESILIENT SEAT GATE VALVE THREADED WITH HAND WHEEL
- ⑫ 2" BRASS ST ELL
- ⑬ 2" THREADED BRASS PIPE, LENGTH TO FIT
- ⑭ 2" FLANGE METER COUPLINGS
- ⑮ 2" BYPASS METER W/TOUCH READ, CITY TO PROVIDE
- ⑯ ADJUSTABLE PIPE SUPPORT STANDON #S92 OR APPROVED EQUAL
- ⑰ FREE STANDING GALVANIZED STEEL LADDER, ATTACH TO FLOOR AND SIDE OF HATCH.
- ⑱ 4" FLOOR DRAIN W/ SCREEN
4" SCHEDULE 40 PVC PIPE

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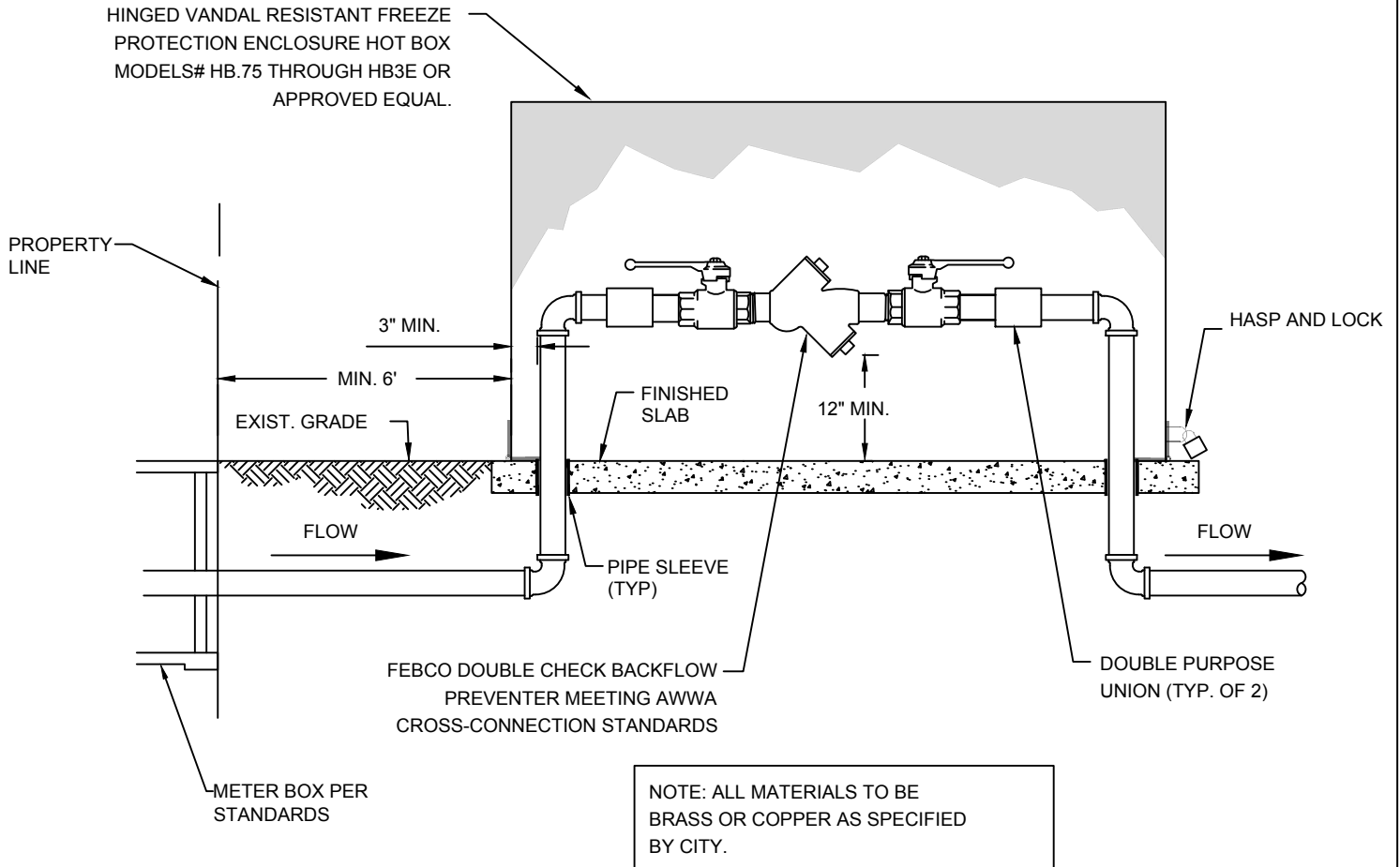
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SERVICES E
DOUBLE CHECK BACKFLOW ASSEMBLY
(BELOW GROUND)
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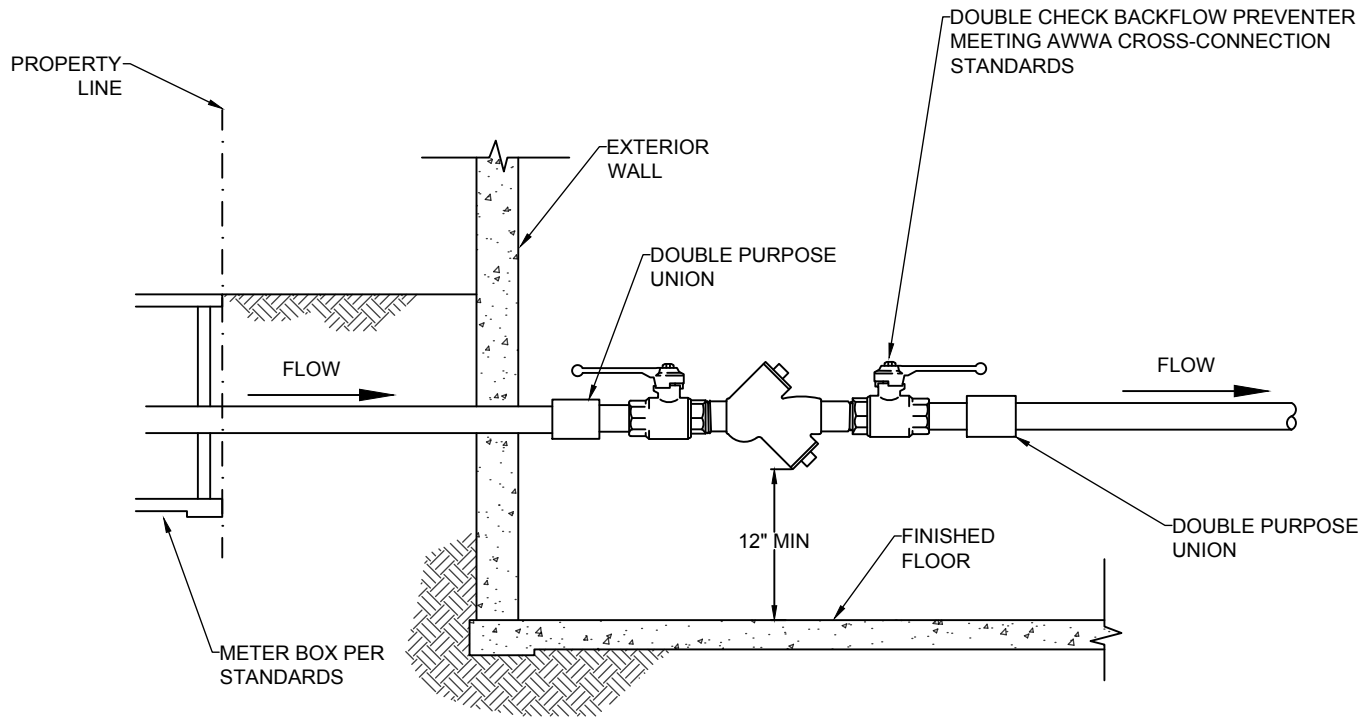
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SCALE	NTS
DRAWING NUMBER	864



SERVICES F
DOUBLE CHECK BACKFLOW ASSEMBLY
(ABOVE GROUND)
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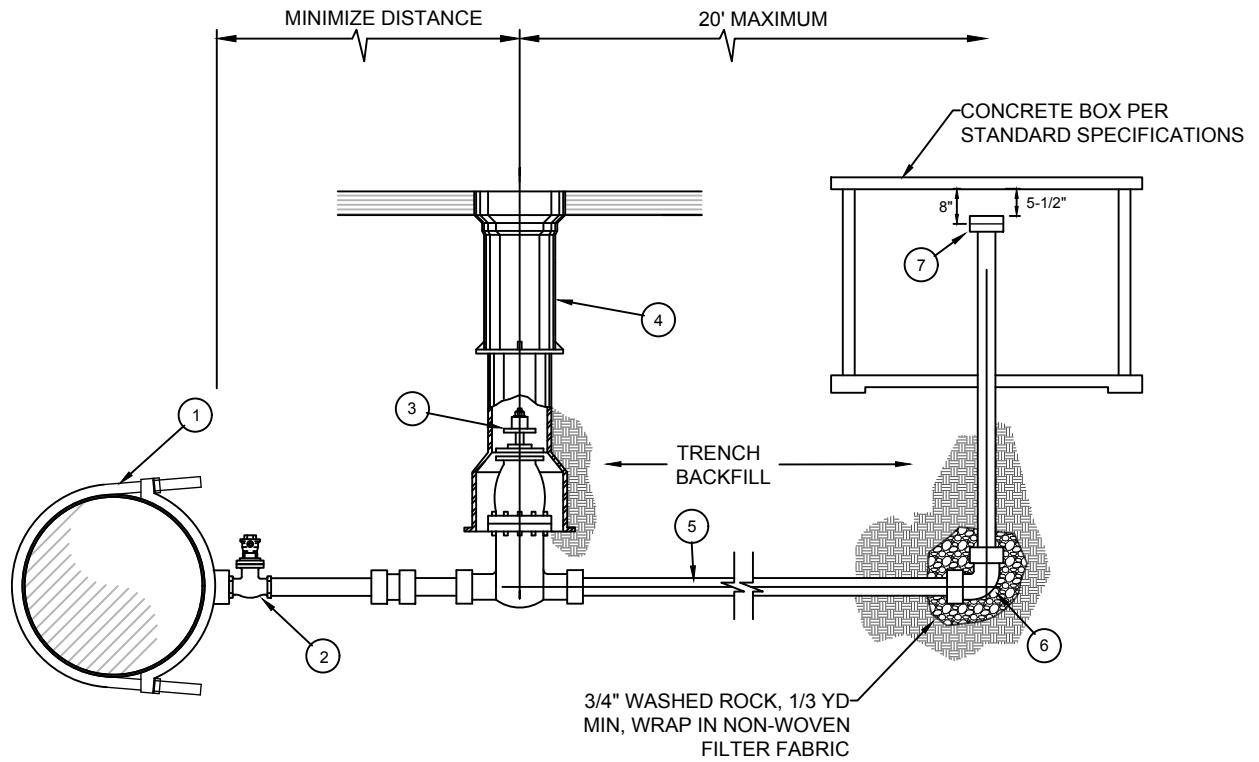
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SERVICES G

DOUBLE CHECK BACKFLOW ASSEMBLY
(IN BASEMENT)

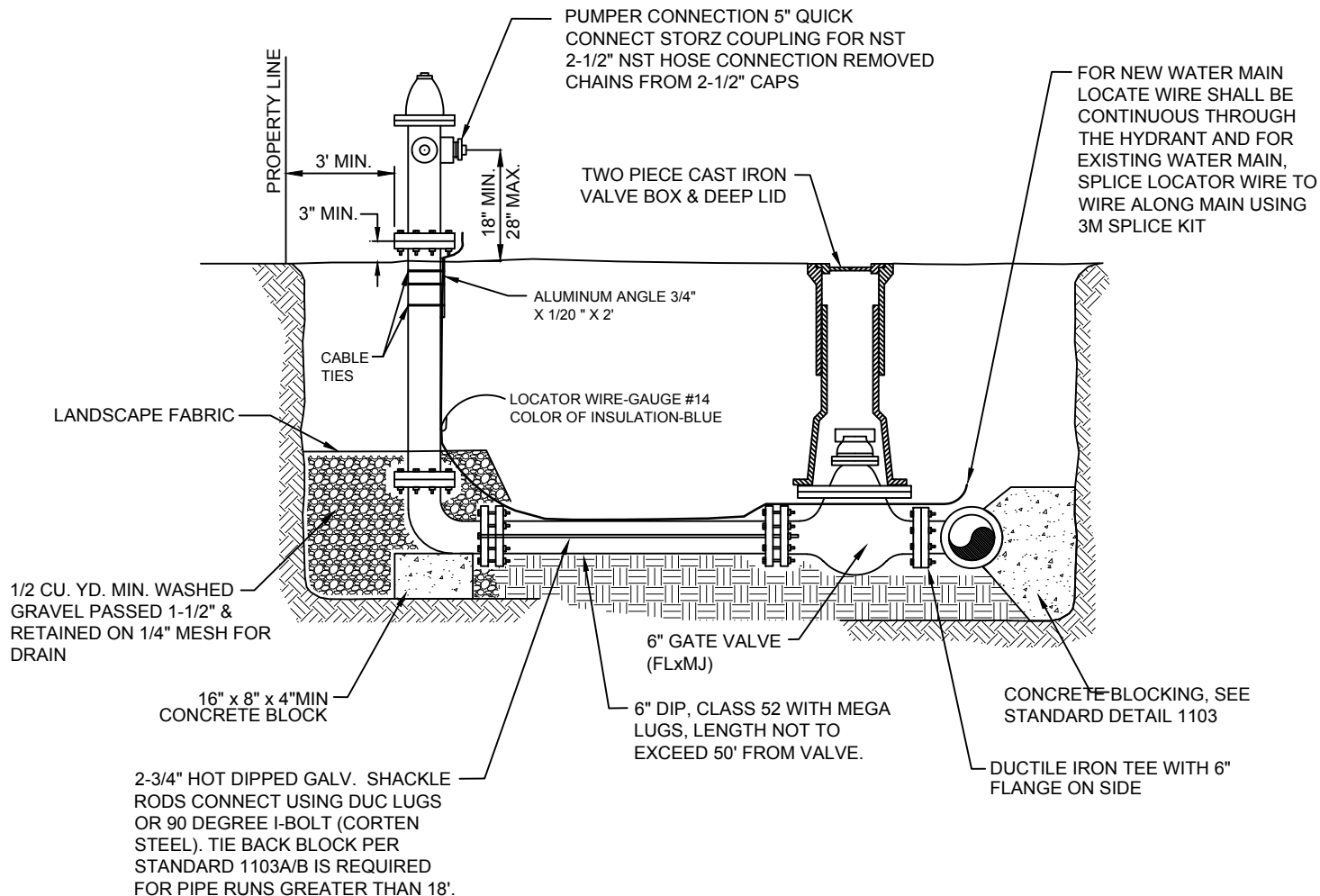
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NO.	ITEM
1	2" DOUBLE STRAP SADDLE, ROMAC 202 OR APPROVED EQUAL
2	2" CORP. STOP, FORD FB1100 OR APPROVED EQUAL
3	2" GATE VALVE, THREADED, NON-RISING STEM WITH SQUARE NUT
4	VALVE BOX
5	2" GALVANIZED IRON PIPE
6	2"-90° GALVANIZED IRON ELBOW W/ 1/8" DRAIN HOLE
7	2" GALVANIZED IRON COUPLING (FIPx FIP) W/ PVC PLUG

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NOTES:

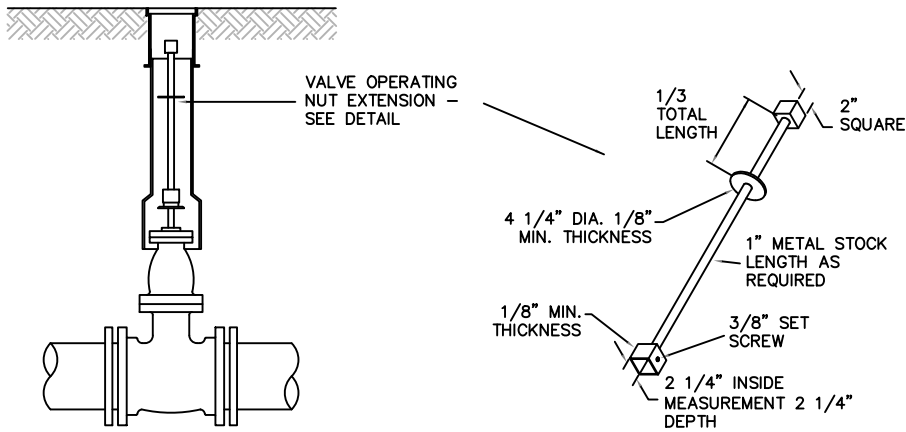
1. MAIN VALVE OPENING SHALL BE 5-1/4" IN DIAMETER EQUAL TO M&H 929. 6" MECHANICAL JOINT INLET. 1-1/2" PENTAGON OPERATING NUT. THE CITY WILL PAINT THE HYDRANT.
2. LOCATOR WIRE TO BE PROTECTED WITH ANGLE ALUMINUM (3/4" X 1/20" X 2' LONG) STRAP TO THE HYDRANT BURY WITH CABLE TIES (36" LENGTH, 175 LB TENSILE, COLOR BLACK, MANUFACTURED BY 3M). LOCATION SHALL BE BELOW THE LOWER FLANGE OF THE HYDRANT BELOW THE PUMPER PORT. LOCATE WIRE SHALL HAVE 6" SLACK FOR CONNECTING TO LOCATING DEVICE.
3. IF THE PIPE BETWEEN THE VALVE AND THE HYDRANT IS MORE ONE FULL STICK OF DUCTILE IRON PIPE, THEN A TIE BACK THRUST SHALL BE INSTALLED AND FIELD-LOK GASKETS AND MEGA LUGS SHALL BE USED.



SYSTEM APPURTENANCES B

FIRE HYDRANT ASSEMBLY

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VALVE OPERATING
NUT EXTENSION -
SEE DETAIL

1/3
TOTAL
LENGTH

2" SQUARE

4 1/4" DIA. 1/8"
MIN. THICKNESS

1" METAL STOCK
LENGTH AS
REQUIRED

1/8" MIN.
THICKNESS

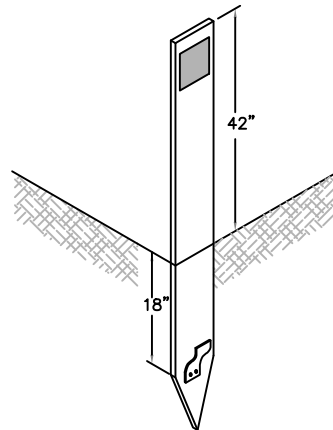
3/8" SET
SCREW

2 1/4" INSIDE
MEASUREMENT 2 1/4"
DEPTH

EXTENSIONS ARE REQUIRED WHEN THE VALVE NUT IS MORE THAN THREE (3) FEET BELOW FINISHED GRADE. EXTENSIONS ARE TO BE A MINIMUM OF ONE (1) FOOT LONG, ONLY ONE EXTENSION PER VALVE. ALL EXTENSIONS ARE TO MADE OF STEEL SIZED AS NOTED, AND PAINTED WITH TWO COATS OF CARBON ELASTIC (ATCO NO. 2221) OR APPROVED EQUAL.

VALVE OPERATING NUT EXTENSION

VALVE MARKER POST



PROVIDE A VALVE MARKER POST FOR EACH VALVE. THE FIBERGLASS VALVE MARKER POST SHALL BE BLUE IN COLOR, 4" WIDE (FLAT), 72" LONG AND FURNISHED WITH A 2"x2" HIGH-INTENSITY WHITE REFLECTOR (250 CANDLEPOWER) AND A FLEXIBLE ANCHOR BARB.

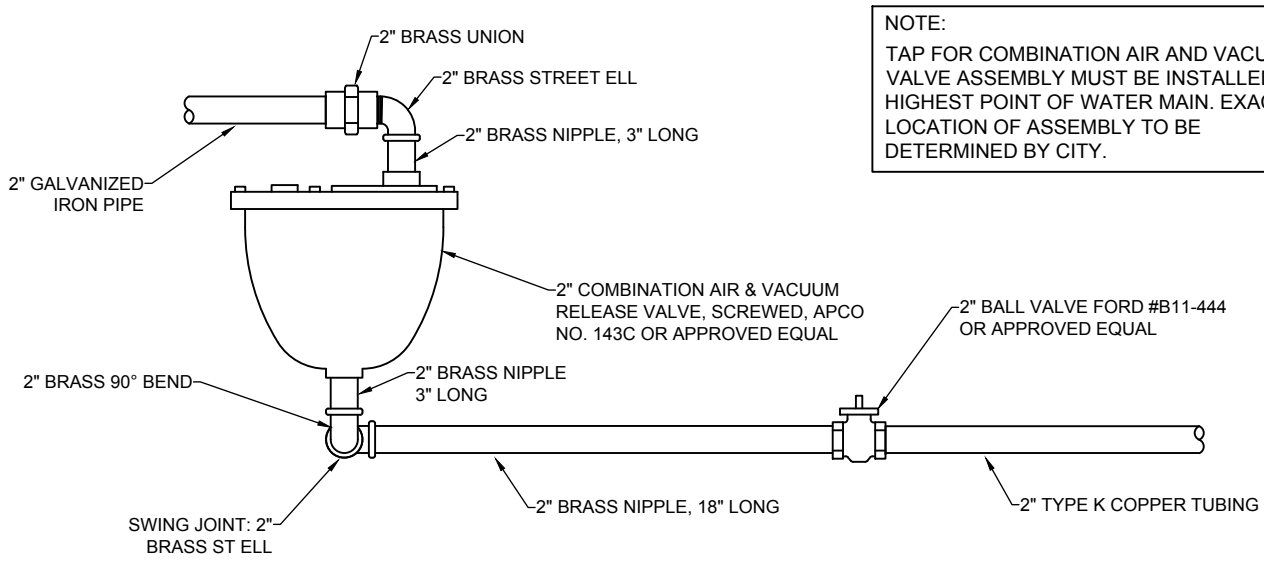
THE VALVE MARKER POST SHALL BE A CARSONITE CURV-FLEX MARKER OR APPROVED EQUAL.

THE POST SHALL BE SITUATED IN A SAFE, REASONABLY CONSPICUOUS LOCATION, AND AT A RIGHT ANGLE TO THE ROADWAY FROM THE VALVE.

THE DISTANCE FROM THE MARKER TO THE VALVE SHALL BE WRITTEN ON THE BACK OF THE MARKER IN 1-1/2" HIGH BLACK LETTERS.

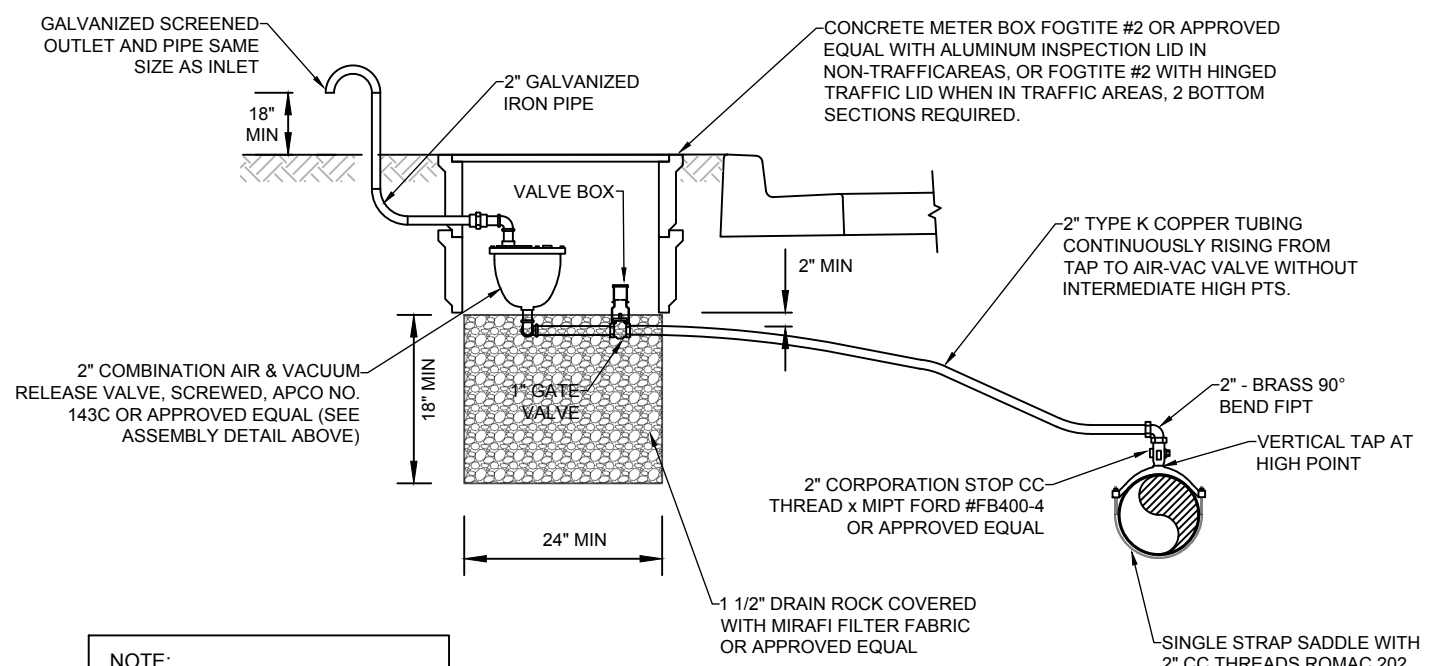
VALVE MARKER

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NOTE:
TAP FOR COMBINATION AIR AND VACUUM VALVE ASSEMBLY MUST BE INSTALLED AT HIGHEST POINT OF WATER MAIN. EXACT LOCATION OF ASSEMBLY TO BE DETERMINED BY CITY.

VALVE ASSEMBLY DETAIL



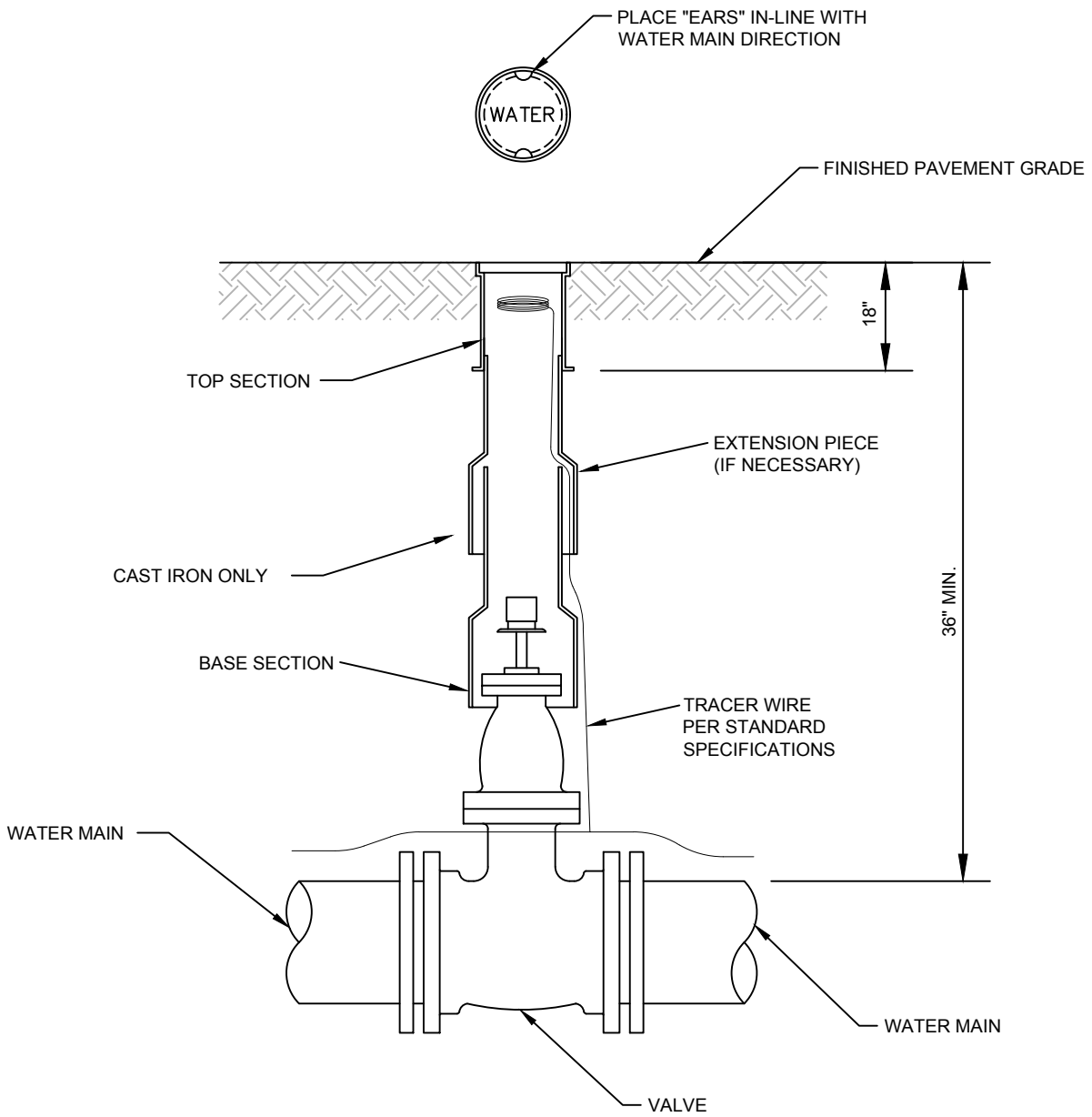
NOTE:
ALL FITTINGS SHALL BE BRASS.
ALL PIPE SHALL BE COPPER,
UNLESS OTHERWISE SHOWN.



SYSTEM APPURTENANCES D
AIR-VAC ASSEMBLY
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SYSTEM APPURTENANCES

VALVE BOX

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Chapter 9

DESIGN STANDARDS FOR SANITARY SEWER EXTENSIONS

9.1 Design Standards

- A. General
- B. Plans
- C. Sewer Piping and Fittings
- D. Sewer Pipe and Fittings Installation
- E. Test Equipment
- F. Individual Grinder Pump Equipment
- G. Pretreatment Systems
- H. Generators
- I. Pump Stations

9.2 Standard Specifications for Construction

- A. General
- B. Site Work
- C. Concrete
- D. Special Construction (Pipeline Casings)

9.1 Design Standards

A. General

All extensions to the sewer system must conform to the design standards of the City. In addition, plans and specifications for system extensions must be approved in accordance with the requirements of the State Department of Ecology.

In all cases where public road right of way will be used for mains or other improvements, or where sewer facilities are proposed to be installed in easements, the City Engineer must approve the plan. All easements for sewer facilities must be on an approved form and the City must be listed as the "Grantee." The legal description and attached map showing the location and size of the easement must be approved by the City Engineer prior to recording.

In all cases where a County road right of way will be used for mains or other improvements, the County Road Department must also approve the plan in addition to the City.

The system must be capable of future expansion and must be constructed of permanent materials.

Project Datum: The site survey shall use North American Vertical Datum 88 (NAVD 88). Design submittals including sewer plan and profile and pump station elevations shall be based on NAVD 88.

B. Plans

1. General

The developer shall submit plans and specifications in accordance with individual permit requirements. City standards are adequate to serve as the technical specifications for the project, however the Applicant may propose deviations from the Standards. The City may also require additional specifications if project conditions warrant. Plans and specifications for all projects must be prepared and stamped by a professional engineer registered in the state of Washington, with the exception of side sewer extensions for single-family residences. After the review, the developer shall submit copies of the final version of the plans in accordance with permit requirements.

2. Criteria for Plans

The plans shall be prepared in accordance with criteria listed in Chapter 2 – Land Development with the addition of the following:

- a. Profiles: Sewer line profiles shall be shown and indicate both length and slope of pipe. Sanitary sewer line profiles shall be provided for all sanitary sewer lines. Clearances between storm lines and sanitary sewer mains shall be shown at all crossings.

3. Plan Revisions

The City shall be informed of all plan revisions, which affect the design of the sanitary sewer and/or sewer system prior to installation in the field. The City reserves the right to withdraw

approval if in the opinion of the City the changes will cause the design of the extension to be below the City's standards.

4. Facility Placement

All sewer mains and other facilities, unless a private system, shall be installed in public rights-of-way or in recorded utility easements dedicated to the City. The developer or his engineer shall check with the City prior to beginning the design of the extension to determine if there is a preferred main location.

5. Public Rights of Way

All locations of City facilities within the City right-of-way must be approved by the City Engineer. Utilities located in the road right-of-way must comply with franchise requirements outlined in ordinances passed by the City Council authorizing such use of the road and right-of-way. Where no ordinance applies, sewer mains shall be installed to be compatible with the existing sanitary sewer system, the terrain, geology, and the location of other utilities.

Where the sewer line is installed in a public right of way, it shall not be located under curbs or sidewalks. Deviations from standard locations must be documented, receive prior written approval by the City Engineer, and be accompanied by accurate record drawings.

6. Easements

Utility easements will be a minimum of 15 feet in width and piping will be installed no closer than five feet from the easement's edge. Sewer line constructed deeper than 7.5-feet below finished ground surface shall require an easement width greater than 15 feet to encompass a 1:1 slope from the bottom of the pipe.

7. Private Roads

If it is necessary to install a sewer main within a private road, the easement shall be the width of the traveled surface plus one foot on either side.

8. Water and Sewer Line Separation Distances

Transmission and distribution water piping shall be separated at least ten feet horizontally from waste disposal piping, drain fields, and/or sanitary sewer gravity or force mains. The bottom of the water main shall be 18 inches above the top of the sewer component. All parallel and crossing installations of sanitary sewer and water lines shall be in accordance with provisions of WAC 248-96 (septic systems) and the "Recommended Standards for Sanitary Sewer Works" - Ten State Standards. Where local conditions prevent such horizontal and/or vertical separation, closer spacing is permissible where design and construction meet the special requirements of the Department of Ecology criteria for Sewage Works Design.

When a water line crosses a sanitary sewer or force main, it shall be specified that the water main be installed a minimum of two feet above the sewer line with joints a minimum of five feet from the sewer line on each side. Controlled density fill shall be placed over the sewer line.

9. Submittals

Submittal information shall be provided to the City for the following items:

- a. Provide manufacturer's certification and test results, as applicable, for all materials in this specification.
- b. Submit a certificate of calibration for the laser used for grade control prior to the start of construction. The manufacturer, vendor, or service and repair shop shall issue the certificate. The issuer must be authorized by the manufacturer as qualified to calibrate the laser light device. The certificate shall be issued no more than 60 days prior to start of construction.
- c. Color video of new sewer.
- d. Manhole Coating products and applicator certification.

10. Manholes and Cleanout Materials

- a. Minimum Design Criteria
 - i. Design loadings for manholes shall be designed for a soil unit weight of 150 lb/CF and a live load complying with AASHTO HS 20.
 - ii. The minimum allowable manhole diameter is 48 inches. Provide larger diameter manholes where required by the City Engineer.
 - iii. The minimum diameter of force main terminal manholes shall be 54 inches or larger if required by the City Engineer.
 - iv. The minimum allowable manhole depth is 7 feet from the cover to the top of the manhole channeling unless specifically approved by the City Engineer.
 - v. Flow entering a manhole shall not turn more than 90° before exiting the manhole.
- b. Manholes: Provide manholes conforming to ASTM C478. Portland Cement shall be ASTM C150 Type II or Type IV. Precast bases may be separate or integral with the riser section.

All manholes shall be installed with a GU Manhole Base Liner, or equal, with plastic invert and nonskid landing area embedded in concrete and O-ring gaskets for the sewer connection or approved equal. The liner shall have a 5 mm minimum thickness. The depth of the main through channel shall be equal to or larger than the diameter of the largest pipe. Provide riser heights of not less than one foot. Provide riser sections, which have a preformed opening of a minimum size to accommodate the pipe to be inserted. Heights of base sections shall be such that openings for pipes are not located at joints.

- c. Grade Adjustment: Provide concrete grade rings meeting the requirements of ASTM C478. HDPE grade adjustment rings shall be used to adjust minor variations in grade or slope that concrete grade rings cannot accomplish. HDPE grade adjustment rings shall be Ladtech or approved equal. Grade adjustment rings shall be limited to a maximum height of 12 inches. In no case shall the "neck-length" (grade rings plus the manhole frame) exceed 18 inches. Interior and exterior of all grade rings shall be

- sealed with mortar.
- d. Joints: Provide sewage and grease resistant confined rubber gaskets conforming to ASTM C 443. In addition, all joints shall be grout/sealed on all interior surfaces with mortar.
 - e. Manhole Steps: Provide manholes with steps that meet the following specifications.
 - i. Installed by the manufacturer conforming to ASTM D4101 polypropylene encased steel manhole steps with non-slip surface. Steel reinforcing shall be ½-inch minimum diameter ASTM A615, Grade 60.
 - ii. Knurled ¾-inch diameter 316 stainless steel steps. There shall be a 2-inch hook on the embedment end.
 - f. Frames and Covers
 - i. Manhole frames and covers shall be ductile iron and shall have the word "SEWER" in 3-inch raised letters. Provide Rexus or East Jordan Iron Works hinged manhole frame and lid. .
 - ii. In non-pedestrian areas cleanouts shall be brought to finished grade and provided with PVC weld-on fittings that form a female threaded opening and a male threaded plug to be used to seal the cleanout. A fiberglass cleanout box shall be brought to finish grade as shown on Standard Detail 960.
 - iii. In sidewalk or vehicle areas, the cleanouts shall be constructed in the same manner as described above but also will be finished at road or walkway grade and furnished with a traffic rated frame and cover from Olympic Foundry or approved equal.
 - iv. In off-road conditions, the manhole frame and cover shall have a two-foot square concrete collar.
 - g. System A Epoxy Coating: When specified, use hydrogen sulfide/sulfuric acid resistant coating, Tnemec Series 120 Vinester Lining, Aquata Poxy by Raven, Raven 405 or System A epoxy coating approved equal for manhole and wall protection. This will be required in high hydrogen sulfide environments.
 - h. Pipe Connections to Manholes: PVC pipe connections to manholes and other structures shall be approved by the City Engineer. Provide one of the following methods for the connection.
 - i. For NEW manhole bases that require liners, fiberglass (FRP) manhole base by GU Industries or approved equal with sewage and grease resistant O-ring gasket conforming to ASTM C443.
 - ii. For NEW and EXISTING manhole bases, sanitary sewer-proof elastomeric boots such as Kor-N Seal I-Wedge Korband by National Pollution Control Systems Inc. or approved equal.
 - i. Pipe and Fittings for Drop Connections: The type of pipe and fittings for drop connections shall be specified by the City Engineer. When ductile iron pipe is used

for a drop connection, the fittings shall be the mechanical joint type, except where flanged fittings are shown on Standard Drawings 1225-1227.

11. Manhole Installation: If material in the bottom of the trench is unsuitable for supporting the manhole, excavate below the base and install foundation stabilization material accepted by an approved geotechnical engineer and the City to obtain a suitable foundation.
 - a. Install gravel base material under manhole base and compact to comply with the WSDOT Standard Specifications.
 - b. Carefully inspect pre-cast manhole sections to be joined. Sections with chips or cracks in the tongue or groove shall not be used. Clean ends of sections of all foreign material. Provide all special tools, appliances, and lubricants for the jointing assembly. Joints shall be made in strict accordance with the manufacturer's recommendations.
 - c. Install grade rings in conformance with Standard Detail 922. Lay grade rings in mortar with sides plumb and top level. Seal joints with mortar. Grade rings shall be sanitary sewer-tight.
 - d. Construct manhole inverts in conformance with detail shown on Standard Detail 922, with smooth transitions to ensure an unobstructed flow through the manhole. Remove all sharp edges or rough sections which tend to obstruct flow. Channeling shall be to the springline of the sewer or above. Benches shall be sloped from the manhole wall toward the channel to prevent the accumulation of solids.
 - e. Completed manhole shall be straight, plumb, and the joints shall be watertight. All interior joints shall be coated with a fast setting, quick drying mortar prior to backfill.
 - f. The City Engineer will require additional manhole coatings in situations that indicate potential for infiltration or inflow.
12. Corrosion Resistant Manholes: Provide corrosion resistant manholes at force main terminations, as well as two manholes downstream and one manhole upstream. Provide additional corrosion resistant manholes in areas with steep slopes downstream from force main discharges where directed by the City Engineer. Apply all coatings in strict accordance with the coating manufacturer's instructions.

Manholes shall be a GU Liner System integrally cast in the concrete structure. The manhole system shall include a GU Manhole Base Liner, GU Barrel Liner, GU Lined Cone, convertible collar, and all associated appurtenances for a GU manhole system. An equivalent manhole lining may be approved by the City Engineer upon review.

13. Existing manholes to be coated
 - a. High-pressure blast existing manhole surfaces to be coated. Remove all grease, laitance, and deleterious materials from the concrete surfaces. Seal off the flow line as required to maintain flows while keeping debris out of the sewer. Dry the manhole surfaces to meet the coating manufacturer's requirements. Apply coating in strict conformance with the coating manufacturer's requirements.

- b. If in the sole opinion of the City Engineer, the existing manhole surfaces are unsuitable for service as corrosion resistant manholes, replace the manhole with new corrosion resistant manholes at no cost to the City.

14. Future Manhole Stubouts

- a. Install stubouts from manholes for future sewer connections as required by the City Engineer. Maximum length shall be 1½ feet outside the manhole wall.
- b. Match the crowns of the pipelines. Provide compacted pipe bedding material around the stubout as specified herein.
- c. Install semi-permanent plugs in the end on stubouts with gasketed joints similar to sewer pipe being used. Plugs shall be capable of withstanding all internal or external pressures without leakage. All plugs to be braced to prevent blowout. If used, inflatable plugs must be chained to the manhole step in-case of blowout.

15. Connection to Existing Manholes

- a. Submit proposed connection method to the City Engineer for approval prior to beginning work.
- b. Maintain flows through the manhole during construction without interruption using an approved method.
- c. Excavate completely around existing manholes to avoid unbalanced loading of the manhole. Repair all damage to manhole. Verify all existing invert elevations prior to constructing new line.
- d. Connections to existing manholes shall be core drilled. Report any discrepancies to the City Engineer. Re-channel the existing manhole base.

C. Sewer Piping and Fittings

1. Minimum Design Criteria

The minimum sewer main size shall be 8-inch diameter. The minimum side sewer (the sewer pipe between the main and the property line) size shall be 6-inch diameter.

Sewer extensions shall incorporate adequate capacity to provide for the future expansion of the system in conformity with the City's comprehensive planning or future needs as determined by the City Engineer.

It is the policy of the City that the Developer extend any sanitary sewer main improvements to the most distant end of abutting and interior rights-of-way or easements unless it is determined by the City, according to its rules and policies, that extension of the sanitary sewer main will not be necessary. Developers owning corner property shall extend the sanitary sewer system to the far ends of both corners of the property unless it is determined by the City, in its sole discretion, extension of the system is not necessary. The sanitary sewer system shall be extended to the far end of the development at depths, whenever possible, which enable the City to provide gravity service to upstream properties.

- a. Sewer Line Depth

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- i. All lines shall be at a sufficient depth to drain basements. A minimum of 5-feet of cover over the crown of the sewer is required, unless specifically exempted by the City Engineer.
 - ii. The sewer shall be designed to provide gravity service to upstream properties whenever possible as determined by the City Engineer.
 - b. Separation between utilities
 - i. Sanitary sewer: Comply with Department of Ecology criteria.
 - ii. Storm Sewer: Provide a minimum of 3 feet horizontal clearance. Provide a minimum of 1-foot vertical clearance.
 - iii. Underground Power, Gas, Telephone, and Cable: Provide a minimum of 3-foot horizontal clearance. Provide a minimum of 1-foot vertical clearance.
 - iv. Power, Telephone, Light, and Signal Poles: Provide a minimum of 7.5-foot horizontal clearance.
 - c. Sewer grade
 - i. Provide no additional drop on straight runs through manholes other than the pipe slope.
 - ii. Provide an additional 0.10 foot drop for 90° turns through a manhole.
 - iii. Comply with Ecology minimum slope requirements.
 2. PVC Pipe and Fittings (PVC pipe, 4-inch and larger)
 - a. Pipe and fittings shall meet the requirements of ASTM Specification D3034 for 4"-15" SDR 35 and F679 for 18"-27." The pipe shall be colored green for in-ground identification as sewer pipe.
 - b. Pipe shall be suitable for use as a gravity sewer conduit. Provisions must be made for contraction and expansion at each joint with a rubber ring. The bell shall consist of an integral wall section with a solid cross-section rubber ring, factory assembled, securely locked in place to prevent displacement during assembly.
 - c. All fittings and accessories shall be as manufactured by the pipe supplier or approved equal and have bell and/or spigot configurations compatible with that of the pipe.
 - d. Provide factory molded wye fittings with elastomeric gasketed bell end joints. Tapped and solvent welded fittings or fittings strapped to the main sewer are not acceptable. Side sewers shall be connected to the main by means of a wye. A gasketed cap or plug shall be furnished with each wye. The plug or cap shall be banded or otherwise secured to withstand the test pressures to which it will be subjected without leakage.
 3. High Density Polyethylene (HDPE) Pressure Pipe
 - a. High density polyethylene plastic pipe suitable for use as a pressure conduit shall conform to the following specifications and standards:

- i. Base Resin: Conform to all requirements of ASTM D 1248, Type III, Class C, Category 5, Grade P34, with a PPI rating of PE 3408.
 - ii. Cell classification: 345434C per ASTM D 3350.
 - iii. Environmental Stress Crack Resistance: No cracks after 5000 hours as determined by ASTM D 1693, Condition C.
 - iv. Rating: Long-term hydrostatic strength of 1,600 psi and hydrostatic design stress of 800 psi as determined by ASTM D 2837.
 - v. Working Pressure Rating: 160 psi, SDR 11.
 - b. Pipe shall be butt-fused and internal weld seams removed.
4. Ductile Iron Pipe and Fittings
- a. Ductile Iron Pipe shall not be used for a pressure sewer system.
 - b. Pipe shall be centrifugally cast ductile iron, conforming to AWWA C151. Minimum thickness class shall be as determined in accordance with AWWA C150 but in no case less than Class 52.
 - c. Fittings shall be cast iron or ductile iron conforming to the requirements of AWWA C110 or AWWA C153 and rated for not less than 250 psi working pressure.
 - d. Joints shall be push-on or mechanical joint conforming to AWWA C111. Bolts for mechanical joints shall be ductile iron or Corten tee head bolts.
 - e. Gaskets for mechanical or push-on joints shall be sewage and grease resistant rubber (nitrile or neoprene), conforming to AWWA C111.
 - f. Provide one of the following lining systems for corrosion resistance:
 - i. 40 mil DFT nominal ceramic epoxy lining.
 - ii. 40 mil DFT nominal polyurethane lining.
 - iii. 30 mil DFT electrostatically applied fusion bonded polymer alloy coating.
 - g. Provide U.S. Pipe or Pacific States pipe and fittings, or approved equal.
5. Corrosion Protection for Ductile Iron Pipe and Fittings
- a. Conduct a soil corrosion survey in accordance with AWWA C105 Appendix A where ductile iron pipe is to be used. In areas where the soil is found to be corrosive, the pipe and fittings shall be encased in polyethylene material. The polyethylene material shall be as specified in AWWA C105 and have a minimum nominal thickness of 0.008 inch. Minus tolerance shall not exceed 10 percent of the normal thickness. Material shall be tubes for straight pipe and flat sheets for fittings.
 - b. Additional special corrosion protection of the pipe may be required for construction near saltwater or in other locations for the specific construction conditions encountered. Provide protection as required by the City Engineer.
6. Trace Wire: Copper wire, No. 10 is the City standard Install on all force mains and side

sewers between mains and cleanouts at property line. Use waterproof splices where necessary.

7. Warning Tape: Use polyethylene film underground warning tape with a metal core. The tape shall be green with black and white lettering: "CAUTION SEWER LINE BURIED BELOW"

D. Sewer Pipe and Fittings Installation

1. Connection to City Sewers

- a. All sewer extensions shall connect to the City's system at a manhole or approved location by the City Engineer. Provide a manhole if one is not located at the connection point.
- b. Apartment complexes shall connect to the City's sewer at a manhole. A side sewer service connection to the City's sewer is not allowed. The sewer main connection from the apartment complex shall be a minimum of 8-inch diameter. Side sewers from separate buildings shall join the main at manholes to facilitate grease removal. No more than two side sewers shall connect to a manhole.
- c. Side sewers serving commercial/industrial buildings or facilities which have the potential of discharging grease, oil, and/or chemicals to the sewer shall connect to the sewer at a manhole. This includes restaurants, service stations and garages, car washes, photo labs, processing facilities, and any other facility as required by the City.

2. Dewatering

The Developer is to determine the scope, type, size, quantity, method of installation, operation, and removal of the dewatering system necessary to keep all excavations dewatered to an elevation below the base of the excavation. The system shall also be sufficient to stabilize the soils in the excavation and the surrounding areas, and to prevent flotation of partially completed structures.

The Contractor shall control groundwater and surface water to prevent the softening of the bottom of excavations, or formation of quick conditions or boils during excavation. Ground water shall be lowered to 3 feet below the base of the excavation at all times. Determination of unsuitable soil conditions for supporting the improvements shall be reviewed by the Contractor's site engineer and approved or denied by the City Engineer. When the dewatering system does not meet the specified requirements, and as a consequence there is a loosening or disturbance of the foundation soils, instability for the slopes, or damage to the foundation or structures occur, the Developer shall at its own expense repair said disturbance. This shall include supplying all materials, labor, and equipment, and performing all work required for the restoration of foundation soil, slopes, or structure to the satisfaction of the City Engineer.

It is solely the Developer's and the Contractor's responsibility to meet all regulatory requirements governing the disposal of dewatering flows and to prevent damage to adjacent property. Disposal of these waters into existing City sewer mains or trunk lines is strictly prohibited. Drainage of water through the pipeline under construction is also

prohibited.

All dewatering wells installed by the Contractor shall be removed and backfilled in accordance with applicable Federal and State regulations.

3. Bedding

- a. Place and compact bedding in accordance with the specifications. Grade the pipe bedding by hand to the line and grade to which the pipe is to be laid, with proper allowance of the pipe thickness. Remove hard spots that would prevent a uniform thickness of bedding. Before laying each section of the pipe, check the grade with a straight edge and correct any irregularities found. The trench bottom shall form a continuous and uniform bearing and support for the pipe at every point between bell holes. Excavate bell holes at each joint to assure uniform support and permit proper assembly of the joint.
- b. Sand and other material that cannot be easily compacted shall not be used for bedding.

4. Line and Grade

- a. Allowable deviation from design line and grade shall be $\frac{1}{2}$ inch for line and $\frac{1}{4}$ inch for grade.
- b. Allowable variation in the invert elevation between adjoining ends of pipe, due to non-concentricity of bell and spigot shall not exceed $\frac{1}{64}$ th inch per inch of pipe diameter.
- c. Measure for grade at the pipe invert, not the top of the pipe.
- d. Establish line and grade for pipe by the use of lasers or other suitable method so that the specified tolerances are not exceeded.

5. Laying and Joining Pipe and Fittings

- a. Pipe laying shall proceed upgrade with spigot ends pointing downgrade.
- b. Inspect all pipe and fittings prior to lowering into the trench to ensure no cracked, broken, or otherwise defective materials are being used. PVC pipe with deep scratches shall not be installed. Clean the ends of the pipe to be joined, the inside of the joint, and the gasket immediately before joining the pipe. Assemble the joint in accordance with the instructions and recommendations of the manufacturer of the type of joint used.
- c. After the joint has been made, check pipe for alignment and grade. The trench bottom shall form a uniform and continuous bearing and support for the pipe at every point between joints. Place enough pipe bedding material to secure the pipe from movement before the next joint is installed.
- d. When pipe is laid within a movable trench shield, take all necessary precautions to prevent pipe joints from pulling apart when moving the shield ahead.
- e. Take the necessary precautions to prevent excavated or other foreign material from

- getting into the pipe during the laying operation. When laying operations are not in progress, at the close of the day's work, or whenever workers are absent from the job, close and block the open end of the last laid section of pipe to prevent entry of foreign material, or creep of the gasket joints.
- f. Take precautions necessary to prevent the "uplift" or floating of the line prior to completion of the backfilling operation.
6. Cutting and Dressing Pipe
 - a. When cutting or machining of the pipe is necessary, use only tools and methods recommended by the pipe manufacturer.
 - b. Ductile iron pipe shall be cut with milling type cutter, rolling cutter, or abrasive saw cutter. Do not flame cut.
 - c. Cut all pipe without damaging the pipe or lining, and so as to leave a smooth end at right angles to the axis of the pipe.
 - d. Dress cut ends of pipe by beveling, or as recommended by the pipe manufacturer. Remove sharp edges or projections that may damage the gasket.
 7. Side Sewer Service Connections
 - a. Connect side sewer service connections to the City's existing main by means of a rigid ROMAC fitting or approved equal. Residential side sewers shall not connect to a manhole without written approval from the City Engineer.
 - b. Connect side sewer service to new mains with a wye fitting. Tees are not allowed for side sewer connections.
 - c. Side sewer service connections shall extend to the street or alley right-of-way line as directed by the City Engineer and as shown on the Drawings.
 - d. Provide a minimum 2-foot-wide compacted pipe base under wyes installed in trenches.
 - e. Side sewer service connections in the right-of-way shall be 6 inch diameter or larger.
 - f. Install a two-way cleanout on each side sewer at the property line, as shown in Standard Detail 960. After final grading, the cleanout cap shall be brought to grade and adequately protected for its location.
 - g. Install 4-inch diameter cleanouts within five feet of building foundation wall. A removable watertight cap shall be placed at the top of the cleanout, which shall extend above finished grade.
 - h. Pipe and fittings shall be of one type of material throughout.
 - i. No more than two residential structures shall be connected to the same sidesewer.
 8. Side Sewer Depth and Slope
 - a. Construct side sewers to a minimum invert depth of five feet below the floor being served or five feet below the ground surface at the property line or the easement

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- line.
 - b. Comply with minimum clearance requirements for sanitary sewer line crossings.
 - c. The minimum slope is 2 percent.
9. Location Markers
- a. Place a new 2" diameter, Schedule 40 PVC service connection marker and a magnetic tape marker at the end of the side sewer service stub.
 - b. Markers shall extend from the bottom of the trench to 12 inches above the ground surface.
 - c. Stencil the word "sewer" in two-inch high letters and the depth of the side sewer invert below ground.
 - d. In traveled areas, cut marker flush with the ground surface.
10. Inspections
- a. Do not backfill any side sewers or building laterals until the City Inspector has visually inspected and approved the installation.
 - b. If any work is covered up without the City's approval or consent, it must be uncovered for examination at the Developer's expense.
11. Sewer Main Cleaning and Testing
- Tests on the completed installation shall be made as specified below.
- a. Scheduling
 - i. All tests must be observed by the City. Notify the City of the proposed test date at least 2 days prior to the test.
 - ii. Testing of sections of the constructed sanitary sewer for acceptance will not be performed until all service connections, manholes, and backfill of the section are completed.
 - b. Cleaning and Flushing

All gravity sewer pipe shall be cleaned and flushed after backfilling and compaction in accordance with Section 7-17.3(2) A of the WSDOT Standard Specifications. The pipe shall be cleaned and flushed by passing an inflatable rubber ball through the completed section or using a flush truck. Any obstruction such as cemented grout or debris found in the completed section shall be removed. Do not allow flushed water and debris into the existing collection system.
 - c. Low-Pressure Air Test

All gravity sewers, including all connected side sewers, shall be tested in accordance with the provisions of Section 7 17.3(2)F of the WSDOT Standard Specifications to verify watertight connections. No other test procedures will be allowed except by written approval of the City Engineer.

d. Hydrostatic Testing

All gravity sewers, including all side sewers, shall be hydrostatically tested when low-pressure air testing cannot be used and only with written approval of the City Engineer. The Contractor shall furnish all equipment for testing. Seal off the downstream end of the line and fill with water to a minimum head of 4 feet in a stand pipe at the high end. A period of at least one hour will be allowed for absorption time before making the test. A suitable meter or method of measuring the quantity of water used is necessary. The allowable water loss for sanitary sewers shall not exceed 0.158 gallons per hour per 100 feet of pipe per inch of diameter of pipe under a minimum test head of 4 feet above the top of the pipe at the upper end.

12. Pressure Testing HDPE Pipe Outside the Trench

If specified by the Engineer, pressure testing may be conducted prior to pipe installation. After the pipe has been joined, fill it with water, carefully bleed off any trapped air. Subject the pipe to a hydrostatic test pressure that is 1.5 times the system design pressure for a maximum of 3 hours. During this time, add water periodically to maintain the test pressure; this compensates for the initial stretching of the pipe. The line pressure tightness is determined by visual observation; therefore, it is not necessary to measure the make-up water. Examine every fused joint, any leakage must be repaired and then retested.

NOTE: It shall be the responsibility of the contractor to ensure that appropriate safety precautions are observed during hydrostatic testing above ground.

13. Pressure-testing Sewer Pipe in the Trench (force main)

- a. Fill the pipeline with water after it has been laid; bleed off any trapped air. Subject the lowest element in the system to a test pressure that is 1.5 times the design pressure, and check for any leakage. When, in the opinion of the Engineer, local conditions require that the trenches be backfilled immediately after the pipe has been laid, apply the pressure test after backfilling has been completed but not sooner than a time which will allow sufficient curing of any concrete that may have been used. Typical minimum concrete curing times are 36 hours for early strengths and 7 days for normal strengths.
- b. The test procedures consist of two steps; the initial expansion and the test phase. When test pressure is applied to a water filled pipe, the pipe expands. During the initial expansion of the pipe under test, sufficient make-up water must be added to the system at hourly intervals for 3 hours to maintain the test pressure. After about 4 hours, initial expansion should be complete and the actual test can start.
- c. When the test is to begin, the pipe is full of water and is subjected to a constant test pressure of 1.5 times the system design pressure. The test phase should not exceed 3 hours, after which time any water deficiency must be replaced and measured. Add and measure the amount of make-up water required to return to the test pressure and compare this to the maximum allowance in the table below.
- d. An alternate leakage test consists of maintaining the test pressure (described above)

over a period of 4 hours and then dropping the pressure by 1.0 psi (0.69 MPa). If the pressure then remains within 5% of the target value for 1 hour, this indicates there is no leakage in the system.

NOTE: Under no circumstances shall the total time under test exceed 8 hours at 1.5 times the system pressure rating. If the test is not complete within this time limit (due to leakage, equipment failure, etc.), the test section shall be permitted to “relax” for 8 hours prior to the next test sequence.

- i. Air testing is not recommended. Additional safety precautions may be required. (Reference procedure is from PPI Technical Report TR-31 by the Plastic Pipe Institute.)

ALLOWANCE FOR EXPANSION UNDER TEST PRESSURE							
NOMINAL PIPE SIZE"	U.S. GALS/100 FT. OF PIPE			NOMINAL PIPE SIZE	U.S. GALS/100 FT. OF PIPE		
	1 HOUR	2 HOURS	3 HOURS		1 HOUR	2 HOURS	3 HOURS
2"	0.08	0.12	0.15	20"	2.80	5.50	8.00
3"	0.10	0.15	0.25	22"	3.50	7.00	10.50
4"	0.13	0.25	0.40	24"	4.50	8.90	13.30
5"	0.21	0.41	0.63	28"	5.50	11.10	16.80
6"	0.30	0.60	0.90	30"	6.20	12.60	19.10
8"	0.50	1.00	1.50	32"	7.00	14.30	21.50
10"	0.75	1.30	2.10	36"	9.00	18.00	27.00
12"	1.10	2.30	3.40	42"	12.00	24.00	36.00
14"	1.40	2.80	4.20	48"	15.00	27.00	43.00
16"	1.70	3.30	5.00	54"	18.00	30.00	50.00
18"	2.20	4.30	6.50	–	–	–	–

14. Video Televising and Taping

- a. The Developer shall hire a reputable firm skilled in conducting television inspection of sewers and shall perform work in conformance with WSDOT Standard Specification 7-17.3(2)H.
- b. Conduct television inspection of all pipelines laid that are 8-inches in diameter or greater. At the City’s discretion, Developer may be required to televise 4” and/or 6” diameter pipe as well. Television inspection shall occur after backfilling, compaction, and deflection testing of the sewer.
- c. Television inspection of the sewer shall be done with a CCTV color camera recorded in digital format. A pivot head camera shall be used to record all side sewer laterals. DVD format may be allowed with approval of the City Engineer.
- d. A copy of the inspection video results from all televising operations shall be provided to the City (digital format is preferred).
- e. Any defects discovered shall be repaired by the Developer prior to issuance of final acceptance.

15. Deflection Test of PVC Pipe

All PVC gravity sewer pipe shall be tested for deflection at least 30 days after completion of trench backfill and compaction in accordance with the requirements of section 7-17.3(2) G of the WSDOT Standard Specifications.

16. Infiltration Tests

When the natural groundwater table is above the crown of the higher end of the test section, the maximum allowable limit for infiltration shall be four tenths (0.16) gallons per hour per inch of internal diameter per 100 feet of length, with no allowance for external hydrostatic head.

E. Test Equipment

1. Any arrangement of testing equipment that will provide observable and accurate measurements of either air or water leakage under the specified conditions will be permitted. Gauges, air piping manifolds, valves, and graduated containers shall be located aboveground.
2. Air testing apparatus shall be equipped with a pressure release device such as a rupture disc or a pressure relief valve designed to relieve pressure in the pipe under test at 6 psi.

F. Individual Grinder Pump Equipment

1. General
 - a. This division covers that work necessary for furnishing and installing grinder pumps, discharge piping and appurtenances to comply with these specifications and the City's standard details.
 - b. The Developer shall furnish and install a complete factory-built and tested grinder pump station, it shall be a Liberty Pumps or e-One with level controls, and shall be suitably mounted in a basin constructed of high density polyethylene or fiberglass, and all necessary internal wiring and controls.

2. Submittals

Submittal information shall be provided to the City for the following items:

- a. Submit shop drawings containing catalog cuts, design of modifications required in this section, complete electrical schematics, and motor data.
- b. Submit details of field jointing of access ways.
- c. Provide a recorded easement for the grinder pump facilities on each property prior to acceptance.

3. Warranty

Provide the Developer's standard two-year installation warranty.

4. Design Criteria

- a. Provide a minimum of one grinder pump for each lot served.

- b. Each grinder pump shall serve no more than 1 house and a mother-in-law apartment located on the same lot.
 - c. No more than one duplex shall be served by a simplex grinder pump station. A triplex shall be served by a duplex grinder pump station or two simplex grinder pump stations.
 - d. Comply with Washington State Labor & Industries requirements regarding intrinsically safe electrical equipment.
5. Grinder Pump and Appurtenances
- a. Developer shall furnish a Barnes PHPP 2 HP Submersible grinder pump station.
 - b. Pressure sewer mains shall be HDPE pipe, and shall conform to AWWA C-900. Joints shall be made up as recommended by the pipe manufacturer for pressure pipe, shall be class 160 minimum. HDPE pipe for force mains or special conditions shall be in accordance with the Department of Ecology's "Criteria for Sewage Works Design'.
6. Valves Associated with Grinder Pumps
- a. Plug valves shall be cast iron body, welded nickel or adjustable stainless steel seat, Buna-N coated plug and Buna-N packing. Valves shall be full port opening with drip tight shutoff and mechanical joint or flanged ends.
 - b. Valve operator shall be a 2-inch square nut with AASHTO H-20 traffic rated cast iron valve box. Worm gear operated for valves 6 inches and larger.
 - c. Valves shall be coated. Coat interior metal surfaces and exterior surfaces with 12 mils minimum fusion epoxy per AWWA 550 or 20 mils coal tar epoxy.
 - d. Ball valves shall be bronze body, Teflon seat, stainless steel ball and stem with flanged or threaded ends. Provide ball valves with operating handle and drip-tight shutoff.
 - e. Ball check valves shall be Schedule 80 PVC with Teflon seats and EPDM O-ring gaskets. Valve shall be rated at 150 psi @75° F. Provide double union type valve with threaded or socket ends.
 - f. Valve box shall be a concrete meter box, equivalent to Fogtite No. 2, or fiberglass meter box rated for H-20 loading. Valve box lid shall have "SEWER" label.
7. Grinder Pump Installation
- a. The Developer shall be responsible for removing ground water to provide a firm, dry subgrade for the structure, and shall guard against flotation or other damage resulting from general water or flooding. The grinder pump station shall not be set into the excavation until the installation procedures and excavation have been reviewed and approved by the City Inspector.
 - b. The pump station is supplied with a standard 4-inch inlet grommet for inlet piping. Developer shall not insert inlet piping beyond the factory-provided "stop." The basin

- may not be dropped, rolled or laid on its side for any reason.
- c. Installation shall be accomplished so that 1-inch to 3-inch of access way, below the bottom of the lid, extends above the finished grade line. The finished grade shall slope away from the unit. The diameter of the hole must be large enough to allow for the concrete anchor.
 - d. A 6-inch minimum layer of naturally rounded aggregate, clean and free flowing, with particle size of not less than 1/8 inch or more than 3/4 inch shall be used as bedding material under each unit. A concrete anti-flotation collar, as detailed on the drawings, and sized according to the manufacturer's instructions, shall be required and shall be pre-cast to the grinder pump or poured in place. The grinder pump station with its precast anti-flotation collar shall have a minimum of four lifting eyes for loading and unloading purposes. The unit shall be leveled, and filled with sanitary sewer, to the bottom of the inlet, to help prevent the unit from shifting while the concrete is being poured. The concrete must be manually vibrated to ensure there are no voids. If it is necessary to pour the concrete to a level higher than the inlet piping, an 8-inch sleeve is required over the inlet prior to the concrete being poured.
 - e. Backfill of clean native earth, free of rocks, roots, and foreign objects shall be thoroughly compacted in lifts not exceeding 12 inches to a final Proctor Density of not less than 90% on private property and 95% in the public ROW. Improper backfilling may result in damaged access ways.
 - f. The electrical control panel shall be installed and wired to the grinder pump station by the Developer using the factory supplied length of 6 conductor, 12 gauge TC type cable as shown on the standard drawings. Type TC cable shall be installed in PVC Schedule 40 continuous conduit and burial depth shall comply with local code requirements.
 - g. Polyethylene pressure pipe joints shall be flanged, thermal fusion butt welds or made using weld-on compression couplings. Joints in 1¼" and 2" pipe shall be made only at pump basins, valves, fittings and changes in pipe diameter. For pipes larger than 2" in diameter, joints between pipe sections shall be thermal fusion butt welded. All flanges and fittings shall be thermal fusion butt welded to the pipe. Operators of fusion welding equipment shall be trained by the pipe manufacturer, who shall certify that operators are qualified.
 - h. Install warning tape in the trench approximately 18" below finished grade, directly above the pipe.
 - i. Install trace wire with all polyethylene pressure or force main and grinder pump discharge piping.
 - j. Trace wire shall be a minimum of 10 gauge.

8. Startup and Field Testing

All testing and startup operations will be done by City personnel only. Provide City with 24-



hour request for inspection and startup testing.

G. Pretreatment Systems

1. General

- a. Pretreatment systems may be required to reduce, eliminate or alter the nature of a pollutant’s properties prior to discharging to the public sewer collection system. Pretreatment systems include grease interceptors, oil/water separators and other units to treat metals, solvents, excessive BOD or TSS and other constituents.
- b. The City reserves the right to evaluate a waste stream prior to connection and require pretreatment.

2. Grease Interceptors

- a. Any business involved in the process, preparation, sale, or packaging of human or animal food requires that an exterior (outside) grease interceptor be installed, on a separate side sewer main. This separate side sewer shall be connected directly, and only to, the food handling areas in the building, with no sanitary connections permitted upstream of the grease interceptor.
- b. Comply with the latest versions of the Uniform Plumbing Code and the International Building Code for exterior grease interceptors. The design capacity of the grease interceptor shall be determined by the following formula (from Appendix H, Uniform Plumbing Code):

$$\text{Interceptor Size} = (\# \text{ Meals @ Peak Hour})^1 \times (\text{Waste Flow})^2 \times (\text{Retention Time})^3 \times (\text{Storage Factor})^4$$

¹Meals Served at Peak Hour

²Waste Flow Rate

Single Service kitchen.....2 gallon flow

Food Waste Disposer.....1 gallon flow

³Retention Times

Commercial Kitchen Waste..... 2.5 hours

Single service kitchen 1.5 hours

⁴Storage Factors

Fully Equipped Kitchen

8-hour operation 1

6-hour operation..... 2

24-hour operation..... 3

Single Service Kitchen.....1.5

Precast concrete grease interceptors shall be designed for a soil dead load of 150 lb/cf

and an AASHTO H-20 live load as manufactured by Utility Vault or equal.

3. Oil/Water Separators

- a. Oil/water separator design and sizing shall conform to the Department of Ecology's Best Management Practices (BMP) for Stormwater Treatment. The separator shall be an American Petroleum Institute (API) or Coalescing Plate Interceptor (CPI).
- b. Oil/water separators shall be designed for a soil dead load of 150 lb/cf and an AASHTO HS 20 live load.
- c. Provide a forebay to collect floatables and large settleable solids with a surface area not less than 20 SF per 10,000 SF of area draining into the separator.

4. Grease Interceptor & Oil/Water Separator Installation

- a. The building sanitary side sewer shall be connected to the service lateral at least four feet downstream from the interceptor, providing the slope of the lateral is 2 percent or more. For laterals with a slope of less than 2 percent, the connection point shall be a minimum of eight feet downstream from the separator, or directly connected to the City main.
- b. Grease interceptors or oil/water separators may be installed in either planter or vehicle areas. In vehicular areas the unit shall be constructed as to provide H-20 load capabilities. In all cases the installation site shall provide and ensure ease of access, maintenance, and visual inspection and will be provided with a hinged locking hatch.
- c. Install a manhole where the grease interceptor or oil/water separator discharges into the City's sanitary sewer for monitoring purposes or at an upstream location approved by the City. If physical conditions preclude the installation of a monitoring manhole on the City main, Developer may install, with prior City approval, an Inspection Chamber as manufactured by Pacific North Marketing Ltd., Abbotsford, British Columbia or approved equal.
- d. Provide a cleanout/inspection tee between the building and the grease interceptor. Locate tee 3 to 5 feet from the building in an accessible location for maintenance equipment.
- e. Install in strict conformance with the manufacturer's instructions. Install unit on a 6-inch layer of compacted gravel base. Grade the base material to provide uniform bearing.

H. Generators

Sewer pump stations and other appurtenances which require power at all times shall have a backup generator and automatic transfer switch (ATS) installed. A manual transfer switch (MTS) shall be installed in the feed line between the generator and the ATS so that a portable generator can be connected should the onsite generator fail or be down for maintenance. The MTS shall have 600 VAC rated, 400 amp Series E cam lock connectors installed or have a j-box with 600 VAC rated, 400 amp Series E cam lock connectors installed and landed on the "Portable Generator" side MTS lugs. The onsite generator feed shall be landed on the "Onsite Generator" lugs in the MTS and the MTS "load lugs" shall be

connected to the ATS. Generator shall have the quiet package enclosure. The generator/engine combination shall be Cat Diesel power, Cummins Diesel power or Kohler with John Deere Diesel engine. The generator shall be sized so that it can provide the startup current for any pump with the other pump or pumps already running at the full load nameplate motor current. (Note: startup current can be up to three times the nameplate full load current for the pump) (Example: two pumps rated at 30 amps full load current at 480 volts 3 phase. With one pump running at 30 amps full load current the generator shall be capable of supplying an additional 90 amps or a total of 120 amps plus the current required to operate the controls so that it is not overloaded or stressed when the second pump starts) or (Good for three pumps at a three pump station) Generator fuel tanks shall be double walled with internal tank leak detection and sized for a minimum of 20 hours of run time before refueling is needed based on anticipated generator loading.

I. Pump Stations

1. General

Except where otherwise indicated, the following sections are intended to be consistent with the latest edition of Ecology's "Criteria of Sewage Works Design."

Except where provided otherwise, Submersible Sewerage Pump Station (SSPS) construction details, workmanship, and materials shall be in accordance with the latest edition of "Standard Specifications for Road, Bridge, and Municipal Construction" prepared by the Washington State Chapter of the American Public Works Association.

The SSPS's operational components shall be located at an elevation that is not subjected to the 100-year frequency storm flood, an associated wave action, or shall be otherwise adequately protected as certified by a professional engineer registered in the State of Washington.

Final acceptance of the completed SSPS shall include approval of all construction and testing by the City Inspector, providing the City Engineer with three (3) copies of the SSPS facility's Operation and Maintenance Manual and providing the following spare parts:

- 2 each – all gaskets and O-rings
- 2 each – all bearings
- 1 each – mechanical seal
- 2 each – oil seals inboard
- 2 each – oil seals
outboard 1 each – SCADA
Modem

All SSPS shall be provided with either 277/480 volts AC, 3 phase power with a 480 to 120/240 volt AC stepdown transformer either on site or as part of the pump station control panel designed to provide power for onsite lighting, GFI receptacles and onsite crane if one is installed in addition to the control panel or 120/208 volts AC, 3 phase power based on the voltage requirements of the selected station pumps. No 120/230 or

120/240 volt AC, 3 phase power will be allowed. All SSPS's shall have surge protection provided for the pump control cabinet power.

Provide one (1) additional pump for a duplex submersible system and two (2) additional pumps for a triplex submersible system. Provide one set of spare parts for each pump of the same model. The set of spare parts shall be as recommended by the manufacturer. The spare parts shall be packed in a hinged wooden box with hasp and clearly labeled for contents.

2. Site Work

The driving area into the SSPS and the area within the SSPS contained within the fencing shall be paved with asphalt and shall support vehicles with a gross vehicle weight of 50,000 pounds.

All SSPS sites shall have at a minimum, two 120 volt 4 foot LED wet location rated light fixtures on each underside of the roof to light up the equipment mounted on both sides controlled by a single light switch mounted to a roof support post at a height of 46 inches to top above finished grade. In addition, a 12-foot-tall pole having a 120 volt LED fixture head with photo cell control shall be installed to light up the wet well area for night time maintenance/repair. Light pole shall be installed so that it does not interfere with pump installation/removal. Location shall be approved by the City. A light switch shall be mounted to the pole to turn the light off if needed for maintenance. (Note: light pole shall be positioned to provide minimum impact on any residences near the SSPS.)

At minimum, a 6-foot chain link fence with locking 16 foot wide double swing access gate and locking single access swing gate shall be provided around the SSPS.

Landscaping shall be on the outside of the fence to screen the site. Any planting shall be low maintenance and approved by the City's Planning Department.

A ¾ inch non-freeze post hydrant shall be provided on site with approved backflow prevention assembly, utilizing copper pipe rigidly supported and having a Hotbox with a 20 amp, 120 VAC GFI receptacle and self-regulating heat trace for freeze protection.

3. Pump Station

The design capacity of a SSPS shall be computed on the basis of the total area and projected population that can be served by the SSPS (based on the most current zoning projections.) Method of calculation shall be consistent with Criteria for Sewage Works Design.

SSPS design shall include provisions for operating and maintaining the facilities without needing to comply with confined space entry requirements.

All SSPS sites shall have a two-sided peaked roof structure over the station control cabinet and main electrical equipment. No single slanted roofs will be allowed. The roof shall be supported by a minimum of two 4-inch or 6-inch square steel posts engineered to support the weight of attached equipment and roof structure. The support posts shall accommodate the attachment of strut for mounting control and power equipment to. The sides of the roof shall extend a minimum of two foot past the sides of any mounted equipment and two and half feet beyond the face of the deepest piece of equipment or control cabinet.

SSPS Pumps shall be Vaughn Chopper model to handle the increasing number of flushable wipes and other materials that are finding their way into the sewer system. At minimum, provide one (1) additional pump for a duplex submersible system and two (2) additional pumps for a triplex submersible system. The pumps shall be sized for actual flow conditions and must each be capable of handling the expected maximum peak sewage flow.

Where three (3) or more pump units are provided, they shall have the capacity that with any one unit out of service, the remaining units will have capacity to handle the maximum peak sewage flow.

Submersible pumps shall be readily removable and replaceable without dewatering the wet well or requiring personnel to enter the wet well. Other pump units at the same stations shall continue to be operable while one pump is serviced. Pump unit lifting devices shall be included in the design and shall be fabricated from Grade 316 Stainless Steel.

Pumps shall be capable of passing spheres of at least 3-inches in diameter. Pump suction and discharge openings shall be at least 4-inches in diameter.

Emergency on-site generators (provided with built-in diagnostics) are required at all SSPS facilities. Emergency power equipment shall be provided to ensure continuous operability for a minimum of 48 hours. See Section 9.4.H.

The design of the submersible SSPS shall provide for a "lead pump" cycle time of no more than six cycles per hour during peak wet weather flow design conditions, and no less than one cycle per hour during minimum dry weather flow design conditions.

4. Piping and Control Facilities

Electrical control equipment shall be housed above ground level, in an enclosed structure. The cabinet door should face away from prevailing winds if possible. Lighting in the control cabinet shall be LED.

Motor controller cabinet shall be mounted in an outer weather-tight enclosure.

Each control panel shall have a “Hand-Off-Auto” selector switch to select the modes of operation for each pump. Hand-Off-Auto selection for each pump shall be able to be selected at the Master SCADA Station as well so any pump can be run from the Master SCADA Station. Each control panel shall have standalone backup UPS with means for UPS fail alarm. Any UPS shall provide a sine wave not square wave output whether on AC power or providing power from its backup batteries. Any UPS shall be approved by the City. No backplate or rail mounted UPS is allowed.

Allen Bradley CompactLogix Series PLC’s will be the only PLC allowed in Sewer Lift Station Control Panels. Control Panel shall have an Ethernet/IP network to connect components within the control panel together such as the CompactLogix PLC, front panel HMI display unit and the VFD drives. The Ethernet/IP switch installed to connect the various components shall have a minimum of 2 free Ethernet ports available for future devices/equipment. The VFD’s specified shall have the Ethernet/IP port option in them. The front panel HMI display will have an Ethernet/IP and serial port if available, if it doesn’t have both available then the Ethernet/IP port will be the option required. The Control panel will have a 15A GFI receptacle and an Ethernet/IP port on the front panel to connect a laptop to for maintenance, troubleshooting and programming of PLC and other components connected to the Ethernet/IP network. The control cabinet front panel shall also have a foldup locking table big enough to hold a standard size laptop. Ethernet/IP address assignments for each component connected to the control panel Ethernet/IP network will be requested from the City Public Works Department.

For each pump there shall be:

- Combination circuit breaker/overload unit providing overload protection. Each shall be capable of being locked in the Off position with a padlock for maintenance.
- Short circuit protection.
- Reset and disconnect for all phases.
- Across the line magnetic contactor.
- Variable Frequency Drives (VFD) are required for all pumps. (VFD’s shall be Allen Bradley Powerflex 753 or 755 Series or Schneider Electric Altivar 61 Drives for 10 horsepower and larger pumps. Allen Bradley Powerflex 523 or 525 AC drives shall be used for pumps under 10 horsepower. All drives shall have a heavy duty rating. All VFD’s will have Ethernet/IP port option. Eaton VFD’s may be used as an alternative drive with City’s approval. For 10 horsepower or less pumps a Soft start may be used as an alternative to a VFD if a specified flow rate is not needed with the City’s approval. Control power shall be 120 VAC or 24 VDC only, Analog signals shall be optically isolated 24 volt 4-20 milliamp.
- Overload relay to be precalibrated to match motor characteristics.
- Thermal overtemp relay and thermal overtemp reset pushbutton, each factory sealed to insure trip setting is tamperproof.
- Elapse time meter that will count the time from when the pump starts until the pump has stopped. The time shall count in hours and tenth of an hour. Pump

cycles shall also be counted. Both pump hours and cycles will be displayed on the local control panel HMI display and at the Master SCADA Station.

Variable frequency, variable-speed drive units for the pumps shall be arranged to control the pumps such that the pumping rate will exceed the in-flow rate by 10 gallons per minute.

Variable frequency, variable speed drive wet well level indicator shall be provided by a level transducer capable of providing a continuous level signal throughout the full depth of the wet well. The transducer shall be calibrated to show levels from the bottom to the top of the wet well in feet with tenths of a foot between actual foot measurements. Wet well levels shall not be based on grade elevations.

Level sensors shall be a submersible transducer with high-level and low-level float backup.

An alarm system shall be provided for all pumping stations. Alarm system activation shall be required for high water, low water, power failure, phase loss, pump failure, internal fuel tank leak, generator running, generator failure, ATS in emergency, Loss of Communication (with Master SCADA station), control panel and wet well intrusion. (Intrusion alarm shall have a 60 second delay before alarming.) All alarms shall be displayed locally at control panel and be transmitted to the Master SCADA station.

All SSPS's shall be connected to the City's Sewer SCADA, with one (1) spare modem provided as mentioned above. The City's sole source vendor (TSI) will be required to perform all integration and SCADA programming.

If wet well ventilation is required, the ventilation may be either continuous or intermittent. Continuous ventilation systems shall provide at least 12 complete air changes per hour. Intermittent ventilation systems shall provide at least 30 complete air changes per hour.

Odor control requirements, if any, shall be evaluated by the design engineer, but will be determined by the City Engineer on a case by case basis.

Odor control equipment shall be enclosed in an above grade structure within the pump station site.

A device suitable to the City and approved by the City Engineer shall be provided for measuring sewer station discharge flow. Flow rate shall be measured and displayed in gallons per minute (GPM). There shall also be a display for total gallons pumped (totalizer for each station). Flow rate and total flow shall be displayed on the local control panel HMI display and transmitted to the Master SCADA Station for display.

All control valves and check valves on the discharge line for each pump shall be placed in

an adjacent accessible location outside the wet well in separate vault and be protected from weather and vandalism.

Control valves and piping shall be designed to prevent backflow through the inactive piping, and to allow isolation and removal of inactive valves or equipment for repair, maintenance or replacement without having to shut down the entire station. All pump discharge lines shall “Y” together not “T” together and shall be approved by the City to prevent hampering discharge flow of any pump if all pumps are running.

The City Engineer may require additional or specialty valves such as air cushion swing check valves, ball check valves, electric check valves, rotary ball valves, and surge relief valves, as needed for special conditions.

5. General – Materials

The developer shall submit information from the material manufacturer or fabricator showing that the materials meet the requirements of the design and pertinent specifications. The developer shall provide submittals to the City Engineer on all materials to be used.

6. Site Work - Materials

Foundation Material shall meet the requirements of Section 9-30-17, Class B, of the Standard Specifications for Road, Bridge, and Municipal Construction.

Bedding for Rigid Pipe: unless approved otherwise for special cases, bedding material for rigid pipes shall conform to Standard Specifications for Road, Bridge, and Municipal Construction Standard Section 9-03.15.

Bedding for Flexible Pipe: unless approved otherwise for special cases, bedding material for flexible pipes shall conform to Standard Specifications for Road, Bridge, and Municipal Construction Section 9-03.16.

Crushed Surfacing Top Course: imported crushed surfacing top course shall meet the requirements of Section 9-03.9(3) of the Standard Specifications for Road, Bridge, and Municipal Construction.

Bank Run Gravel for Trench Backfill: bank run gravel for trench backfill shall conform to Section 9-03.19 of the Standard Specifications for Road, Bridge, and Municipal Construction.

Control Density Fill: control density fill material (CDF) shall be composed of Portland cement, aggregate, fly ash, and water and shall conform to the following requirements:

Portland Cement; ASTM C 150, Types I or II.

Aggregate; sand with or without fine gravel, maximum size 1 inch. Aggregate shall be free of foreign material, roots, clay balls, trash, debris, and organics and shall have less than 15% finer than the No. 200 sieve. Material passing the No. 40 sieve shall be non-plastic.

Water (potable)

Fly ash; Class F ASTM C 618, unless otherwise approved.

Admixture; as necessary to develop flowability without segregation.

CDF shall be proportioned to be a flowable, nonsegregating, self-consolidating, low shrink slurry with an unconfined compressive strength as specified below. The mix design shall be prepared for a range of aggregate gradations that are expected to be used. The Developer and its supplier shall determine the materials and proportions used to meet the requirements of these Specifications. The CDF mix for each strength class shall meet the flowability, pumpability, and set time requirements for each design application.

No CDF shall be placed until the City Engineer has approved the mix design. The City Engineer's approval of the mix design will be understood to indicate conditional acceptance. Final acceptance will be based on tests conducted on field installations for conformance with these Specifications.

With the City Engineer's approval, the Developer may be allowed the option of processing the native sands for CDF aggregate. If the Developer elects to use onsite sands for producing CDF, Developer shall make its own determination as to the quantity of suitable sands and amount of processing required and shall bear all costs associated with using native materials.

Class 100 CDF shall have an unconfined compressive strength at 28 days of 100 psi, per ASTM D 4832, (+50 psi, -2- psi). Maximum density 125 pcf.

Class 300 CDF shall have an unconfined compressive strength at 28 days of 300 psi, per ASTM D 4832, (+100 psi, -50 psi). Maximum density 125 pcf.

Class 1000 CDF shall have an unconfined compressive strength at 28 days of 1,000 psi, per ASTM D 4832, (+100 psi, -50 psi). Maximum density pcf.

Concrete thrust blocks for pressure force mains shall be Class B concrete poured in place, per City Standard Details.

7. Pump Station

Wet well shall be of precast or cast in place reinforced concrete covered with a coating resistant to damage from sewer gases as specified in "Criteria for Sewage Works Design, Section C2-2.1.3", fiberglass or stainless steel construction at the discretion of the City. Any wet well construction material shall be approved by the City Engineer. The wet well floor shall be sloped to the pump suction to minimize grit accumulation. The wet well shall be water tight.

Motors shall be explosion proof and designed for 208/480 volts (480 volt, 3-phase motors are preferred), 3 phase and single phase protection. Motor shall be nonoverloading at all points of pump curve. Motors shall be specified which allow unsubmerged operation for extended periods of time without overheating.

Wear rings shall be provided for both the impeller and the suction of each pump. Wear rings shall be removable.

All bearings shall be rated in accordance with USASI B3.11 for a continuous (24 hours/day) duty life of not less than 50,000 hours at the worst condition of service.

The pump shaft shall be sealed against leakage by a double mechanical seal installed in a bronze seal housing constructed in two sections with registered fit.

Pump shafts shall be stainless steel ANSI 431.

All metal parts in wet well shall be aluminum or stainless steel. Metal outside the wet well shall be aluminum, stainless steel or hot dipped galvanized following fabrication.

Hatches shall be rectangular aluminum, Bilco style or approved equal. Hatches shall work with the pump rails in the wet well to provide unobstructed removal of pumps. Hatches shall have hasp type locking mechanism.

All underground vaults shall be a minimum of 2-inches above finished asphalt grade and paved/tack sealed at vault edge.

8. Piping and Control Facilities

Pump control panel for submersible pump station with no control room shall be a NEMA 4 enclosure mounted on a pedestal above ground and shall have a metal roof supported by its own structural base. Panel door shall face away from prevailing winds to minimize water entering the enclosure and shall be a minimum of 10 feet from the fence to minimize vandalism. There shall be a heater strip to prevent condensation accumulation in the enclosure. All other components of the pump station shall be below ground.

All electrical and control cabinets shall have intrusion alarms on doors with a sixty (60) second delay.

There shall be an outer watertight enclosure to house the motor controller cabinet. Enclosure shall have inside lighting.

All wire shall be stranded copper, and all conduits shall be rigid galvanized conduit. All rigid galvanized conduit shall be wrapped with 10 mil anticorrosion tape any place it passes thru concrete for a minimum of 6 inches above and 6 inches below the concrete.

All components within the pump station system, including both internally and face-mounted instrumentation and devices, shall be clearly identified with phenolic name plates of black background with white letter.

Valve vaults shall be precast or cast in place concrete with drains.

Polyvinyl chloride (PVC) pressure sanitary sewer pipes shall meet the requirements of AWWA C900, Class 200, DR14. PVC pipe shall have the same outside dimensions as ductile iron pipe.

Joints for PVC pressure pipe shall be push-on type meeting the requirements of ASTM D 3139 using a restrained rubber gasket conforming to ASTM F 477. Solvent welded pipe joints are not permitted.

Pressure pipe transition couplings, reducing couplings, transition-reducing couplings, and flexible couplings shall be compression type, constructed with ductile iron sleeves and ductile iron followers. Bolts and nuts shall be ductile iron. Factory finish shall be the standard of the manufacturer. Couplings shall be Romac, Smith-Blair or approved equal.

Check valves 2 inches or larger, unless otherwise approved by the City Engineer, shall be iron body, brass trimmed, swing type, balanced, external spring loaded, with a clear opening equal to or greater than the connecting pipe. The spring and lever shall be with extra heavy duty stainless-steel shaft and keys.

Isolation valves shall be eccentric plug resilient seat epoxy coated gate valves with full opening ports and shall have synthetic rubber coated, valve plugs with stainless steel seats and driptight shutoff with pressure in either direction.

Eccentric plug valves 6 inches and smaller shall be lever operated. Larger valves shall have totally enclosed worm gear operates with handwheel, operating nut, or chainwheel as required.

Air release valves shall be for sewage and designed to prevent clogging due to solids in the fluid. The float and ball shall be constructed of stainless steel and attached to a stainless steel lever mechanism with an external shaft. Buna-N, or approved equal, seat shall be attached to the lever mechanism for drop-tight closure.

All new pump stations requiring chlorine odor control shall use hypochlorite odor control systems.

Non-freeze post hydrants shall be Zurn, Model Z-1385 (3/4-inch), or approved equal.

9. General - Installation

The Developer shall complete the proposed sanitary sewer construction in accordance with the approved construction drawings, details, specifications, state requirements, and local regulatory requirements. The Developer shall implement the runoff and erosion control plan that was approved by the City Engineer.

The Developer shall provide all materials, labor, and equipment necessary to shore trenches to protect the work, existing property, utilities, pavement, etc., and to provide safe work conditions in the trench. The Developer may elect to any combination of shoring and overbreak, tunneling, boring, sliding trench shield, or other method of accomplishing the work consistent with applicable local, state and federal safety codes.

The Developer shall furnish, install, and operate all necessary equipment to keep excavation above the foundation level free from water during construction, and shall dewater dispose of the water so as not to cause injury to public or private property or nuisance to the public. Sufficient pumping equipment in good working condition shall be available at all times for emergencies, including power outage, and shall have available at all times competent workers for the operation of the pumping equipment.

All existing sewer lines shall be kept in service at all times. Provision shall be made for disposal of sewage flow if any existing sewers are damaged. Damage to existing sewers shall be repaired by the Developer to a condition equal to or better than their condition prior to the damage. Water accumulating during construction shall be removed from the new sewers but shall not be permitted to enter the existing system. The Developer shall be responsible for flushing out and cleaning any existing sewers, into which gravel, rocks, or other debris has entered as a result of the work, and shall repair lift stations or other facilities damaged by the work at the Developer's expense.

The physical connection to any existing manhole or sewer shall not be made until authorized by the City Engineer. Such authorization will not be given until all upstream lines have been completely cleaned and tested.

Excavation for a precast concrete wet well shall be sufficient to leave 1 foot clearance between the wet well outer surface and the earth bank. Excavation for a cast in place concrete wet well shall allow enough space for form work.

The wet well shall be set in place or formed on a prepared foundation material with a minimum thickness of 6 inches, or thicker as per the design engineer. Before the wet well is set in place or formed, the foundation material shall be carefully leveled and

compacted to a minimum of 95% compaction to provide full bearing for the entire base section.

Backfill with bank run gravel for trench backfill material shall be placed in loose lifts of 10 inches maximum thickness and compacted to at least the percentage of the maximum dry density as shown on the approved plans (as determined by ASTM D 1557).

For cast in place and precast concrete wet wells, pipes, castings, or conduits shall be placed in the forms before pouring concrete wherever possible. Alternatively, knock-out panels or sleeves shall be designed into the structure. If an unanticipated wall penetration is required, a core drill installation will be acceptable on an exception basis.

PVC pipe connections to the wet well shall be made with a rubber gasketed coupling or sand collar which can be mortared directly into the manhole to provide a watertight seal. Ductile iron pipes shall be mortared directly to the wet well wall, or installed with modular mechanical seal assemblies with stainless steel bolts and nuts, as required to provide a water tight seal.

Bedding of the class or classes of pipes shown on the plans shall be installed in accordance with the City Standards. Bedding shall provide a uniform support along the entire pipe barrel, without load concentration at joint collars or bells. Bedding disturbed by pipe movement or by removal of shoring or movement of the trench shield or box shall be reconsolidated prior to backfill.

Bedding shall be placed in more than one lift, the first lift is to provide at least 4 inches of bedding under any portion of the pipe and shall be placed before the pipe is installed, and shall be spread smoothly so that the pipe is uniformly supported along the barrel. Subsequent lifts of the not more than 6 inches thickness shall be installed to a depth of 6 inches over the crown of the pipe. Each lift shall be compacted to 90% of maximum density as determined by ASTM D 1557. Densities shall be determined by the sand-cone method, ASTM D 1556 or by nuclear methods, ASTM D 2922.

Concrete thrust blocks for pressure mains shall be placed at bends, tees, dead ends, and crosses. Concrete thrust blocks shall bear against solid undisturbed earth at the sides and bottom of the trench.

Pipe zone backfill for rigid pipe shall be imported crushed surface top course or control density fill. However, pipe zone backfill material where depth of trench (pipe invert to finish grade) exceeds 24 feet deep shall be CDF.

Pipe zone backfill for flexible pipe shall be the same as the bedding material.

Upon completion of work, the Developer shall remove all shoring unless indicated otherwise on the approved plans or as directed by the City Engineer. Damages resulting

from improper shoring or failure to shore shall be the sole responsibility of the Developer.

All electrical and controls shall be furnished and installed in accordance with the applicable Federal, State and local codes and standards including but not limited to the following:

- National Electrical Code (NEC)
- Occupational Safety & Health Act (OSHA)
- National Electrical Safety Code (NESC)
- National Electrical Manufacturers Association (NEMA)
- Underwriters Laboratory (UL)
- Insulated Power Conductor Engineering Association (IPCEA)
- American National Standards Institute (ANSI)
- Institute of Electrical & Electronic Engineers (IEEE)

10. General - Testing

The completed pump station shall be given an operational test of all equipment for leaks in all piping and seals, and for correct operation of the automatic control system and all auxiliary equipment. Developer shall conduct preliminary tests and be assured that the section to be tested is in an acceptable condition before requesting the City Inspector to witness the test.

The pump suction and discharge shall be coupled to a reservoir, and the pumps shall recirculate water for at least one hour under simulation service conditions.

The hydrostatic pressure test method is required for force mains and fittings.

If any sanitary sewer installation fails to meet the requirements of the test method used, the Developer shall repair or replace all defective materials or workmanship at no expense to the City.

Final testing for City acceptance is required after backfill has been completed and all other utilities have been installed.

Only after final testing and acceptance by the City Engineer is the pump station allowed to pump sanitary sewage into the City System.

11. Hydrostatic Pressure Test

All force mains shall be tested in sections of convenient length to a hydrostatic pressure of 150 PSI in excess of operating pressure but in no case less than 200 PSI.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Developer shall furnish

and install temporary blocking and remove it after testing.

A positive displacement pump shall be furnished by the Developer for the testing. Feed for the pump shall be from a container wherein the actual amount of “makeup” water can be measured.

The pipe section to be tested shall be filled with water and allowed to stand under pressure to allow venting of air at all high points and the lining of the pipe to absorb water.

The test shall be accomplished by pumping pipe section up the required pressure, stopping the pump for 60 minutes, and then pumping the main up to the test pressure again.

The quantity of water lost from the main shall not exceed the number of gallons per hour as determined by the formula:

$$L = NDSP = 7400$$

L = Allowable leakage, gallons/hour

N = Number of joints in the length of pipeline tested

D = Nominal diameter of the pipe in inches

P = Average test pressure during the leakage test, PSI

9.2 Standard Specifications for Construction

A. General

This document outlines the general and specific construction requirements for sanitary sewer systems operated and maintained by or for the City of Port Orchard (City). All references to the City shall mean the City Engineer or his/her authorized representative.

1. Standard Specifications

In general, all construction activities and material specifications shall conform to the latest City adopted edition of:

- a. City's Design Standards for Sewer Extensions.
- b. Applicable City of Port Orchard rules, regulations, ordinances, and standards. “Standard Specifications for Road, Bridge, and Municipal Construction,” Washington State Department of Transportation/American Public Work Association, (WSDOT/APWA), latest edition (Standard Specifications).
- c. Standards of the American Sanitary Sewer Works Association, latest revision.
- d. Rules and regulations of the State Board of Health regarding the health aspects of Public Sanitary Sewer Systems, WAC 246-290, latest revision.
- e. Recommendations of the manufacturer of materials or equipment.

2. Permits and Licenses

The applicant/contractor shall acquire the required permits for construction within public rights of way. The Developer and/or his engineer shall provide and complete all necessary forms and submit to the County/City/State agencies with the applicable fees.

All construction shall conform to the requirements of the right of way permits.

3. Pre-Construction Conference

The City will schedule a pre-construction conference with the applicant, Contractor, and affected County/City/State agencies prior to start of construction. The contractor shall submit the following to the City at the pre-construction conference:

- a. Material submittals
- b. Safety and traffic control plan, if needed
- c. Copies of all necessary city, county, and state permits necessary for the conduct of the work. No work will be allowed to proceed without the necessary permits.
- d. Evidence of insurance with the City named as additional insured in accordance with the Developer Extension Policies. An endorsement to the insured's policy will be considered as evidence of insurance.

4. Submittal and Shop Drawings

In accordance with the City's Technical and Standard Specifications, applicants or their contractor shall submit a list of all brands, sizes, types, grades, and standard materials to be used. The City may reject certain brands and will provide approval, disapproval, and/or comment by letter.

- a. Submittal data for each item shall contain sufficient information on each item to determine if it is in compliance with the Agreement requirements. Items that are installed in the work that have not been approved through the submittal process shall be removed and an approved product shall be furnished, all at the Developer's expense. Shop drawing review will be limited to general design requirements only, and shall not relieve the Developer from responsibility for errors or omissions, or responsibility for consequences due to deviations from the Agreement documents. No changes may be made in any submittal after it has been reviewed except with written notice and approval from the City Engineer prior to implementation. Shop drawings shall be submitted on 8½" x 11," 11" x 17," or 22" x 34" sheets and shall contain the following information:
 - i. Project Name
 - ii. Prime Developer and Applicable Subcontractor.
 - iii. City's Name.
- b. Submittals that do not comply with these requirements may be returned to the Developer for re-submittal. Acceptable submittals will be reviewed as promptly as

- possible, and transmitted to the Developer not later than 10 working days after receipt by the City Engineer. Revise and submit as necessary.
- c. Submittals shall contain the following information for all items:
 - i. Equipment drawings, dimensions, and weights (lift stations only).
 - ii. Catalog information.
 - iii. Manufacturer's specifications.
 - iv. Special handling instructions (lift stations and pumps only).
 - v. Maintenance requirements (lift stations and pumps only).
 - vi. Wiring and control diagrams (lift stations and pumps only).
 - d. Specific submittal requirements are listed in each section of these specifications.

5. Substitutions

The approved Developer Extension Contract, construction plans, and City technical and standard specifications shall be followed. No deviations will be allowed without request for change and approval in writing from the City Engineer or designee. The City reserves the right to order changes, which conform to the City's standard specifications; in the event conditions or circumstances are discovered during construction, which indicate changes are prudent. The applicant shall be notified in writing of any changes. Such changes will be mutually accepted.

Deviations from standard locations and/or approved plans must be documented, receive prior written approval by the City Engineer, and be accompanied by accurate record drawings.

6. Site Control

- a. The Contractor shall be responsible for surveying and staking and will stake out the locations of the permanent easements, temporary easements, rights-of way, and all major facilities shown on the Plans and permits.
- b. Replace all damaged survey monuments in accordance with RCW 332-120.

7. Waste Material Control

- a. Adhere to all requirements of federal, state, and local statutes and regulations dealing with pollution. Permit no public nuisances.
- b. Use only dump sites that are approved by the regulatory agency having jurisdiction and present proof of approval upon request. Obtain any and all permits required by regulatory agencies.
- c. At all times, keep the construction area clean and orderly and upon completion of the work, restore all work or equipment storage areas to their original condition. Remove all miscellaneous unused material resulting from the work and dispose of it in a manner satisfactory to the City.

- d. The Contractor shall follow all requirements and guidelines of the Puget Sound Air Pollution Control Agency and other associated agencies.
- e. Use water sprinkling, temporary enclosures, or other methods to limit dust and dirt from rising and scattering in the air. Surface water runoff that is contaminated with site debris, silt, or other material that adversely affects water quality shall be collected and cleaned prior to discharge.
- f. Do not use water to control dust when it may create hazardous or objectionable conditions such as ice formation, flooding, or pollution.

8. Spill Response

The contractor shall prepare a spill response plan for the site and provide a copy to the City Engineer. The contractor shall maintain a current copy of the approved spill response plan on site at all times and provide the any updates to the City Engineer as they occur. All necessary materials and equipment necessary to respond to spills shall be kept readily available on site.

9. Erosion Control

The contractor shall prepare an erosion control plan for approval by the regulatory agency. The contractor shall maintain a copy of the approved erosion control plan on site at all times.

10. Construction Notification

Contractors shall notify the City Engineer a minimum of 48 hours in advance of construction, to facilitate project coordination and notification of affected property owners.

11. Construction Shutdowns

- a. Construction under this Agreement may involve replacement or modification of the existing sewer system, which must continue to provide service to all buildings and homes during construction. Connections and service changes must be programmed to provide the least possible interruptions of service.
- b. A Sanitary Sewer Shutdown Agreement must be completed by the Contractor if a connection to an existing system involves temporary suspension of the sanitary sewer service. The contractor shall notify the City Engineer at least five (5) days in advance of any required shutdowns so that affected customers may be notified. City personnel will notify properties affected by the shutoff.
- c. Prior to any shutdown, all traffic control, materials, fittings, supports, equipment, and tools shall be on the site and all necessary labor scheduled prior to starting any connection work. In general, shutdowns shall not exceed four hours in duration unless specifically authorized by the City Engineer.
- d. The Contractor may be required to install and maintain temporary water and/or sewer mains and service connections to all houses and other buildings affected by frequent service disruptions caused by construction activities. Installation and maintenance of temporary facilities will be at the Contractor's expense. All

temporary piping and connections shall be approved by the City Engineer and disinfected as specified herein before being put into service.

- e. All work under this Agreement shall be conducted in a manner that will minimize shutdowns, open roadways, or traffic obstructions caused by construction. Shutdowns causing damage to adjacent public and private property shall be the sole responsibility of the Contractor.
- f. Planned utility service shutdowns shall be accomplished during periods of minimum use. In some cases this will require night or weekend work. In such instances, the Developer/Contractor will be required to pay overtime inspection fees.
- g. Coordinate all work so that service will be restored in the minimum possible time, and cooperate with the City in reducing shutdowns of the utility system to a minimum.
- h. No utility interruption will be permitted without the prior approval of the City. Any unauthorized tampering with the sanitary sewer system is subject to fines.

12. Connection to Existing Systems

- a. Connections to existing sewer mains shall not be made without first completing the necessary arrangements with the City. Work shall not be started until all traffic control, materials, equipment, and labor necessary to properly complete the work are assembled on the site. Once work is started on a connection, it shall proceed continuously, without interruption, and as rapidly as possible until complete. No shut-off of mains will be permitted overnight, over weekends, or during weeks with holidays.
- b. Contractors shall acquaint themselves with all aspects of existing systems prior to starting construction on new mains. Pertinent information concerning existing systems may be obtained from City personnel and may be verified from City records. Contractors shall locate existing sewer mains and service lines prior to beginning work so they may be properly protected and maintained in service during construction.
- c. Taps or new extension connections from existing mains must be made in the presence of designated City personnel. No taps or connections are to be made without designated City personnel being present.
- d. Only City personnel are permitted to operate valves on the certified potable water side of a line, including emergencies, unless personnel safety is threatened. Exposing a potable water line during construction without the City Engineer's concurrence will result in a penalty being imposed.

13. Work on Non-City Rights-of-Way

- a. Work on a state highway, county road, street or any other right-of-way not owned by the City, shall conform to the requirements of the authority having jurisdiction over such right-of-way. Contractors are responsible for notifying the proper authorities and acquiring permits before beginning work on a right-of-way. Contractors will

ascertain restoration requirements and determine that schedules of operations proposed are satisfactory to applicable authorities. Work will not be permitted to proceed without evidence of having obtained the required permits.

- b. When city streets, SR 160 or SR 166 within City Limits, are involved, the Contractor must coordinate all trenching and restoration activities with the City Engineer and WSDOT. Open cuts must be approved by the City Engineer.
- c. When county roads are involved, the Contractor must coordinate all trenching and restoration activities with the Kitsap County Department of Public Works and the City. Open cuts must be approved by the Kitsap County Department of Public Works.

14. Traffic Maintenance

Contractors shall conduct work so as to interfere as little as possible with public travel. Required traffic control shall be in place prior to commencement of work. Access for firefighting equipment shall be provided at all times, and Contractors shall keep the local fire protection authorities informed of the location of construction operations and fire lanes. Contractors shall also notify the authorities in charge of any municipal, private, or school transportation system at least 48 hours in advance of road closures that will force a change in the regular routing of the transportation system. Contractors shall also provide and maintain suitable detour routes for the system. Road closures will not be allowed without written permission from the City Engineer, except verbal permission may be used in an emergency. Work which involves State, County road or City streets rights of way shall be restricted to the hours between 8:00 AM and 4:00 PM, and no work shall be allowed in such right-of-way on Saturdays, Sundays, or holidays unless authorized by the City Engineer.

15. Safety

Contractors will be solely and completely responsible for conditions at job sites, including safety of all persons and property during the performance of work. This requirement will apply continuously and not be limited to normal working hours.

16. Inspection Requirements

- a. Unless previously authorized by the City Engineer, work on sewer mains shall not proceed without a City Inspector being present. The City may refuse acceptance of any sewer mains installed without a City inspection. To permit scheduling an inspector, the City Engineer must receive a hard copy of the construction schedule at least two full working days before construction activities covered by the schedule begin. The City must be kept advised of changes to the construction schedule. When significant breaks in construction occur, the Contractor must give two working days notice before resuming work. The inspector shall have authority to reject defective material and to suspend any work that is not conducted in accordance with the City's Technical Standards and Specifications.
- b. All mains shall be inspected by the City Inspector before closure of any excavation. Inspectors will have access to work sites as necessary to keep the City informed of

- the progress of the work and the manner in which it is being done, to keep records, to act as liaison between the Contractor and the City Engineer, and to report any deviations from Plans or Specifications. Failure of the Inspector to call the attention of a Contractor to faulty work or deviations from the Plans or Specifications shall not constitute acceptance of said work.
- c. Any personal assistance, which an Inspector may give a Contractor, will not be understood as the basis of any assumption of responsibility in any manner, financial or otherwise, by the Inspector, the Engineer, or the City.
 - d. The presence or absence of an Inspector on any job will be at the sole discretion of the City Engineer. Such presence or absence of an Inspector will not relieve a Contractor of responsibility to deliver the construction results specified in the Agreement documents.
 - e. City Inspectors will not be authorized to issue instructions or to approve or accept any portion of the work which is contrary to the Plans and Specifications. Approvals, acceptances, or instructions, when given, must be in writing and signed by the City Engineer or his/her designated representative. Inspectors will have authority to reject defective material. The failure of an Inspector to reject defective material or any work which deviates from the Agreement documents will not constitute acceptance of such work.
 - f. Kitsap County may have an inspector on site when working on County rights-of-way.

17. Overtime and Holiday Work

Should a Contractor elect to work more than eight hours per day, or more than five days per week or on holidays during the course of a project, all costs of resulting City overtime/holiday engineering and inspection will be charged to the Contractor at 2.5 times the normal rates.

18. As-Constructed and Warranty Records

- a. Prior to final acceptance of the work by the City, the Developer shall deliver a complete set of acceptable as-constructed records to the City Engineer. Drawings shall be made on clean, unmarked prints of the project, and the final submittal shall include the following:
 - i. Electronic AutoCADD files, version 2009 or earlier;
 - ii. a digital format such as "pdf" or "tif" of the record plans on CD (2 Copies)
- b. The Developer shall provide as-constructed information on all items and work shown on the plans showing details of the finished product including dimensions, locations, outlines, and changes. The information must be in sufficient detail to allow City personnel to locate, maintain, and operate the finished product and its various components.

B. Site Work

1. General

This division covers the work that is necessary for providing materials and performing all site work as called for on the approved plans.

2. General Construction Procedures

a. Standards

Construction procedures shall be in full accordance with the City's Standard Specifications for Sanitary Sewer Main Construction and the most recent edition of Washington State Department of Ecology's Criteria for Sewage Works Design.

Certain other referenced standards used in this specification are from the latest editions of:

- i. DOE Washington State Department of Ecology
- ii. IBC International Building Code
- iii. UPC Uniform Plumbing Code
- iv. IMC International Mechanical Code
- v. NEC National Electrical Code
- vi. AWWA American Sanitary sewer Works Association
- vii. ANSI American National Standards Institute
- viii. ASA American Standards Association
- ix. ASTM American Society for Testing and Materials

b. Contractor

All main extensions shall be installed by a Contractor approved by the City.

3. Submittals

Submittal information shall be provided to the City for the following items:

- a. Erosion and Sedimentation Control Plan
- b. Erosion Control Fence Fabric
- c. Dewatering Plan
- d. Shoring Plan and Calculations
- e. Dump Site Permits
- f. General Fill
- g. Structural Fill
- h. Pipe Bedding
- i. Trench Backfill
- j. Gravel Base Course
- k. Crushed Surfacing

-
- I. Paving
 - m. Compaction Test Results
 - n. Hydro-seed
4. Erosion and Sedimentation Control
 - a. All erosion/sedimentation control systems including fencing, earth berms, grasses, straw, mulch, culverts, drain pipe, outfalls and other items required for this project, are the responsibility of the Developer and fall under the jurisdiction of Kitsap County or the City of Port Orchard (depending on the location of the extension).
 - b. All erosion/sedimentation control (ESC) systems specified in the approved erosion control plan must be installed prior to commencing any work that could result in off-site storm water or material flows. Erosion/sedimentation controls must remain in place throughout the duration of the construction activities.
 - c. The Contractor shall add additional ESC facilities or processes as necessary to ensure that erosion and sedimentation problems do not occur. The Contractor shall inspect the ESC facilities daily and maintain the systems as necessary to prevent off-site drainage.
 5. Dewatering
 - a. The Developer is to determine the scope, type, size, quantity, method of installation, operation, and removal of the dewatering system necessary to keep all excavations dewatered to an elevation below the base of the excavation. The system shall also be sufficient to stabilize the soils in the excavation and the surrounding areas, and to prevent flotation of partially completed structures.
 - b. The Contractor shall control groundwater and surface water to prevent the softening of the bottom of excavations, or formation of quick conditions or boils during excavation. Groundwater shall be lowered to 3 feet below the base of the excavation at all times. Determination of unsuitable soil conditions for supporting the improvements shall be reviewed by the Contractor's site engineer and approved or denied by the City Engineer. When the dewatering system does not meet the specified requirements, and as a consequence there is a loosening or disturbance of the foundation soils, instability for the slopes, or damage to the foundation or structures occur, the Developer shall at its own expense repair said disturbance. This shall include supplying all materials, labor, and equipment, and perform all work required for the restoration of foundation soil, slopes, or structure to the satisfaction of the City Engineer.
 - c. It is solely the Developer's and the Contractor's responsibility to meet all regulatory requirements governing the disposal of dewatering flows and to prevent damage to adjacent property. Disposal of these waters into existing City sewer mains or trunk lines is strictly prohibited. Drainage of water through the pipeline under construction is also prohibited.
 - d. All dewatering wells installed by the Contractor shall be removed and backfilled in

accordance with applicable Federal and State regulations.

6. Construction Access

The Contractor shall provide temporary site access for City personnel and shall maintain vehicular site access at all times.

7. Clearing and Grubbing

Clearing and grubbing shall be performed by the Contractor to remove and dispose of unwanted debris, vegetative matter, and other items noted on the construction drawings within the construction limits and shall conform to Section 2-01 of the WSDOT Standard Specifications.

8. Excavation

- a. The Contractor shall excavate as necessary to construct the improvements shown on the construction drawings. Excavation includes utility excavation, structural excavation, and grading excavation.
- b. Grading excavation shall be to the finished rough grade of the roadway or easement and shall be completed prior to utility excavation. Grade staking, when required, will be done by the developer's/owner's engineer, or surveyor, prior to installation of the mains.
- c. Utility excavation shall be performed to the depths necessary to complete the construction work shown. Utility excavation shall be performed in accordance with the WSDOT Standard Specifications, Section 2-09, with a minimum cover of 36 inches.
- d. The base of the excavation shall be examined by the City Engineer to determine if it is suitable for backfilling. The City Engineer will evaluate the stability of the base of excavation by determining if all significant organic soils or other unsuitable materials have been removed. The Contractor per direction of the City Engineer shall perform excavation required by the City that is beyond the depth shown at their expense.
- e. All excavated material shall be removed from the site unless approved as backfill material by the City Engineer. Weather conditions may make previously excavated material unsuitable for backfill requiring the material to be removed from the project site. Approval of material as backfill will be made just prior to placement of material as backfill.
- f. If the trench soil is unsuitable for trench backfill, as determined by the Inspector, the Contractor shall remove and dispose of unsuitable material and backfill the trench with approved backfill. The Contractor will keep the City Engineer informed of the disposal site of all unusable material removed from the project. New or refuse material must not be dumped on neighboring properties.
- g. Excavation within City right of way areas shall be in accordance with the City of Port Orchard Public Works Right of Way Permit.

9. Shoring

Where shoring, sheet piling, sheeting, bracing, lagging, or other supports are necessary to prevent cave-ins or damage to existing structures, it shall be the responsibility of the Contractor to design, furnish, place, maintain, and remove supports in accordance with applicable laws, codes, and safety requirements including Chapter 296-155 of WAC, A Safety Standards for Construction Work, Part N, Excavation, Trenching, and Shoring. Design, planning, installation, and removal of sheeting, shoring, piling, lagging, and bracing shall be accomplished in such a manner as to maintain the undisturbed state of soil below and adjacent to excavation. Failure to maintain shoring in accordance with the submitted shoring plan will result in shut down of the job by the City Engineer until required shoring is in place.

10. Hazardous Content of Fill Material

All imported fill material shall be free of hydrocarbons (e.g., gasoline, diesel oil, etc.), pesticides, herbicides, and other hazardous volatile organic compounds (VOCs) and synthetic organic chemicals (SOCs). If required, the Contractor shall provide certification to the City Engineer that the fill is free of these chemicals.

11. General Fill

- a. All fill required for this project that is not specifically defined as another type shall be "General Fill."
- b. General fill shall be free of organics, debris, and other deleterious materials. General fill shall conform to Section 9-03.10 "Aggregate for Gravel Base" of the WSDOT Standard Specifications. The moisture content of the material and weather conditions at the time of placement will be used to determine the suitability of native materials for backfill as general fill. All general fill shall be compacted in uniform layers not to exceed 8 inches in loose thickness and compacted to at least 95 percent maximum dry density based on the ASTM D-1557 test procedure.

12. Structural Fill

- a. All fill placed below and against building components, building structures, vaults, manholes, handholds, slabs, sidewalks, and drives shall be "Structural Fill."
- b. Structural fill shall be free of organics, debris, and other deleterious and conform to Section 9-03.12 (2), "Gravel Backfill for Walls" of the WSDOT Standard Specifications. The City Engineer shall determine if native on-site materials are suitable for use as structural fill. The moisture content of the material and weather conditions at the time of placement will be used to determine the suitability of native materials for backfill as structural fill. Structural fill shall bear on a firm base and be placed in uniform layers not exceeding 8 inches in loose thickness. The backfill area must be free of standing sanitary sewer and the sub-grade soils must be stable. Each layer of structural fill shall be compacted to at least 95 percent of its maximum dry density based on the ASTM D-1557 test procedure.

13. Pipe Bedding

- a. All fill placed below and around buried utilities shall be "Pipe Bedding." Pipe

bedding shall be placed when the trench base is deemed unsuitable by the City Engineer.

- b. Bedding material shall surround the pipe and conduits to the limits shown on the construction drawings and provide uniform support along the entire length without allowing concentrated loading at joints or bells. Bedding material shall conform to Section 9-03.12(3) of the WSDOT Standard Specifications. All bedding material shall bear on firm sub-grade and be compacted to at least 95 percent of maximum dry density based on the ASTM D-1557 test procedure.

14. Trench Backfill

- a. Unless the trench is backfilled with Control Density Fill, all fill material placed above the pipe bedding in a trench shall be "Trench Backfill."
- b. Trench backfill shall be placed and compacted above the pipe bedding to finish grade elevations in un-restored areas or to sub-grade elevations in restored areas. Trench backfill shall consist of a well graded sand or sand and gravel mixture conforming to Section 9-03.12 (2), "Gravel Backfill for Walls" of the WSDOT Standard Specifications and have less than 5 percent passing the U.S. No. 200 sieve based on the fraction passing the ¾-inch sieve. Trench backfill shall bear on a firm base and be constructed in uniform layers not exceeding 8 inches in thickness. Each lift shall be compacted in uniform layers not to exceed 8 inches in loose thickness and compacted to at least 95 percent maximum dry density based on the ASTM D-1557 test procedure. The City Engineer shall determine if native on-site materials are suitable for use as trench backfill.
- c. Finished backfill shall leave all existing drainage ditches, culverts, and other appurtenances in a useable condition equal to or better than their original condition.

15. Gravel Base Course

- a. All fill placed under paving and next to native material shall be "Gravel Base Course."
- b. Aggregate for gravel base course shall conform to Section 9-03.10 of the WSDOT Standard Specifications.

16. Gravel Top Course

- a. All fill placed under paving and next to paving material shall be "Gravel Top Course" or crushed surfacing.
- b. Aggregate for gravel top course shall conform to Section 9-03.09(3) of the WSDOT Standard Specifications.

17. Paving

- a. Cement concrete pavement, sidewalks, and curb shall be Class B concrete (3,000 psi) as specified in the concrete section of these specifications. Construction shall comply with Section 5-05 of the WSDOT Standard Specifications.
- b. Asphalt concrete pavement shall comply with Section 5-04 of the WSDOT Standard

- Specifications and the City of Port Orchard utility permit for the work. Finish, place, spread, and compact Class B asphalt concrete pavement to the thickness shown on the construction drawings or specified in the utility permit. The minimum compacted thickness of asphalt concrete pavement shall be 2 inches.
- c. All paving shall be inspected and approved by the agency issuing the utility permit.

18. Compaction Testing

- a. The Contractor shall arrange, at his own expense, for in place density testing to be performed at intervals not less than every 500 linear feet of pipe run and where required by the City Engineer. At a minimum, density tests shall be performed at 50% of the trench depth and at the surface of the trench. Other depths of the trench may be required by the City Engineer.
- b. The Contractor shall excavate to the depths required to perform the tests and shall provide sheeting, shoring, and bracing of the trench as necessary. Backfill, in all sections where density requirements are not satisfied, shall be removed from the trench, re-compacted, and re-tested until conforming to specifications.
- c. A certified independent testing laboratory acceptable to the City Engineer shall perform density testing. All test results shall be submitted directly to the City Engineer.
- d. The City shall have the right, but not the obligation, to perform such additional density testing, as the City Engineer deems necessary. If the tests show that the density requirements are not satisfied, the Contractor shall reimburse the City for all costs for the tests, and shall remove the unsatisfactory backfill from the trench and re-compact and retest it until conformance with the specifications is obtained.
- e. All compaction shall meet the approval of the agency issuing the utility permit.

19. Surface Restoration

- a. Roads, driveways, shoulders, landscaping, and all other areas removed, broken, caved-in, settled, or otherwise damaged as a result of construction work, shall be repaired and/or resurfaced to match the existing surface or landscaped areas.
- b. Existing shoulders and gravel surfaces shall be restored with like, crushed rock surfacing. Existing lawns shall be restored with sod after proper backfilling and settling. Existing landscaping, fences, mailboxes, ornamentation, etc., shall be restored as close to original conditions as possible. Private driveways, walks, and other surfaced areas shall be repaired, patched, or resurfaced as required to match the original surface condition.
- c. Contractors shall furnish and install new asphalt surface at all locations where the existing asphalt surface or asphalt driveway has been removed or damaged by construction work. Trenches shall be backfilled with select granular material approved by the City Engineer. It shall be mechanically tamped to 95 percent compaction in six inch lifts. The top four inches shall consist of two inches of crushed surfacing top course and two inches compacted depth of asphaltic concrete, Class B.

C. Concrete

3. General

This division covers that work necessary for furnishing and installing all concrete as described in these specifications and shown on the plans.

4. Submittals

Submittal information shall be provided to the City Engineer for the following items:

- a. Concrete design and admixtures
- b. Special placement procedures for hot or cold weather
- c. Schedule of surface finishes
- d. Control Density Fill design mix

Concrete performance mixes shall be submitted to the City Engineer for approval a minimum of two weeks prior to placing any concrete. The performance mix shall include the amounts of cement, fine and coarse aggregate, water and admixtures, as well as the water cement ratio, slump, concrete yield and substantiation strength data in accordance with ACI 318-95, Chapter 5. The use of a performance mix requires batch plant inspection, the cost of which shall be paid by the Contractor. Review of mix submittals by the City indicates only that information presented conforms generally to Agreement documents. Contractor or supplier maintains full responsibility for special performance.

5. Control Density Fill (CDF)

- a. At least 10 days before placing CDF, the Contractor shall submit a mix design for the material to be used. The mix design shall include trial laboratory and testing data with cylinder breaks performed at 7, 14, and 21 days. The mix design shall be approved by the agency issuing the utility permit.
- b. CDF shall be proportioned to be a non-segregating, free flowing, self-consolidating, low shrink slurry.
- c. The Contractor and its supplier shall determine the materials and proportions used to meet the requirements of these Specifications. The mix design shall be prepared for the range of aggregate gradations that are expected to be used.
- d. The unconfined compressive strength at 28 days shall be 200 psi (+50 psi) as per ASTM D4832.
- e. Contain CDF in trench sections using bulkheads or fill materials to confine the flow of material. Take appropriate precautions to prevent pipe displacement and/or flotation.
- f. CDF shall be placed in lifts not exceeding 6 feet in height, with a time interval of not less than 1 hour between lifts.
- g. Provide steel plates to span trenches and prevent traffic contact if necessary. No traffic or construction equipment shall be allowed on CDF for at least 24 hours after placement or until the material is hard enough to prevent rutting or damage. Work shall not proceed unless plates are on the jobsite.

6. Concrete Materials

- a. Concrete shall be mixed, conveyed, and proportioned in accordance with IBC Section 1905. The performance mix shall include the amount of cement, fine and coarse aggregate, water, and admixtures as well as water cement ratio, slump, concrete yield, and sustaining strength data in accordance with these specifications, the minimum requirements of the currently adopted International Building Code, Section 1905, and the requirements of ACI 318-99.
- b. Materials shall conform to the following standards:
 - i. Cement: ASTM C-105
 - ii. Coarse Aggregate: ASTM C-33
 - iii. Fine Aggregate: ASTM C-33
 - iv. Admixtures: ASTM C-494
 - v. Air entraining Admixtures: ASTM-260
 - vi. Water used in concrete shall be potable.
 - vii. Fly ash may be substituted for up to 15% of the required cement.
- c. Thrust Blocking, Driveways, and Sidewalks
 - a. Cement: ASTM C-105
 - b. Coarse Aggregate ASTM C-33
 - c. Fine Aggregate: ASTM C-33
 - d. Admixtures: ASTM C-494
 - e. 28 day strength: 3,000 psi minimum
 - f. Cement content: 5.5 sacks/CY minimum
 - g. Water/Cement ratio: 6 gals/95 lb sack maximum
 - h. Fine aggregate ratio: 45% max by weight
 - i. Coarse aggregate limits: 7/8 inch maximum
 - j. Entrained air ratio: 3% minimum to 5% maximum
 - k. Slump: 4 inches maximum

Provide concrete blocking at all fittings, and horizontal and vertical angle points. Conform to Standard Details for General Blocking, Vertical Blocks, and Deadman Blocking. All fittings to be blocked shall be wrapped with 4-mil polyethylene plastic. Concrete blocking shall be properly formed with plywood or other acceptable forming materials and shall not be poured around joints. The forms shall be stripped prior to backfilling. All blocking must be inspected by the City Inspector prior to backfill.

The City does not use thrust blocks for fire hydrants. Each fire hydrant shall be secured with mega lugs. For mains crossing other pipes, the City will require additional restraints.

D. Special Construction (Pipeline Casings)

1. General

This division covers the boring and jacking of pipeline casings and the installation of carrier pipe.

2. Submittals

Submit the following for review:

- a. Casing pipe drawings, details, and thickness calculations
- b. Carrier pipe placement method and equipment
- c. Utility crossing permits

3. Quality Assurance

The boring contractor shall have regularly engaged in work of this nature for at least five years.

4. Other Utilities

No other utilities are allowed to be placed inside the casing without the prior express written consent of the City Engineer and a satisfactory hold harmless Agreement.

5. Casing Pipe

- a. Provide welded steel pipe of the minimum diameter and thickness approved by the City Engineer. The casing ID shall be at least four inches larger than the carrier bell OD. Provide pipe of sufficient wall thickness and axial strength to withstand the forces encountered during the jacking operation, but in no case less than 3/8 inch. The casing shall be designed to withstand all imposed loads plus a corrosion allowance of 1/4 inch.
- b. Fabricate the pipe in conformance with ASTM A 252, Grade 2 except the hydrostatic test is waived. Provide tapped grout holes at the top of the casing at reasonable intervals. Install plugs in the tapped holes.

6. Joints

Weld sections of casing pipe with a continuous circumferential weld. Provide stress transfer across the joints capable of resisting the jacking forces involved.

7. Casing End Seals

Seals shall be 1/4-inch (minimum) thickness, pull on style end seals fabricated from EPDM synthetic rubber with stainless steel bands and clamps. End seals shall be as manufactured by PSI Industries or approved equal.

8. Carrier Pipe Skids

Provide custom engineered skids/isolators to isolate the carrier pipe from the casing. The

insulator shall consist of a PVC insulating liner (90 mil minimum thickness), 12-inch wide, 12-gauge (minimum) steel bands with steel risers and glass reinforced plastic or ultra-high molecular weight runners. The skids shall be designed to properly support the pipe filled with sanitary sewer. The runners shall be designed so that the carrier pipe joints clear the casing by two inches. The ferrous components of the insulator and steel bands shall be shop coated with a minimum of 10 mils PVC heat fusion coating. All miscellaneous hardware including stud bolts, washers, and nuts shall be 316 stainless steel. Skids shall center the pipe in the casing. Provide skids as manufactured by PSI Industries, Cascade Manufacturing Co., or approved equal.

The minimum number of required skids is 3 per pipe length for the entire length of the casing.

9. Sand

Unless specifically required by the City Engineer, sand shall not be used in a casing for filling between the casing and carrier pipe. In those instances where the City Engineer does require sand, it shall be clean and 90-100 percent will pass the No. 4 sieve. Not more than 5 percent will pass the No. 200 sieve. Sand shall be free from clay and organic material.

10. Casing Excavation and Installation

Prior to installing the casing, thoroughly investigate the locations of existing utilities. The Contractor shall pothole the casing location to verify that there are no interferences.

Equip the leading section of casing pipe with a jacking head securely anchored to prevent any wobble or variation in alignment during jacking operation. Make every effort to avoid loss of ground outside the jacking head. If excessive ground loss occurs, stop excavation and fill void with grout.

The casing shall be installed in such a manner that it is not damaged or deflected to reduce its true circular diameter.

11. Tolerances

A maximum horizontal and vertical tolerance of three inches per 100 linear feet of jacked casing is permitted.

12. Grouting

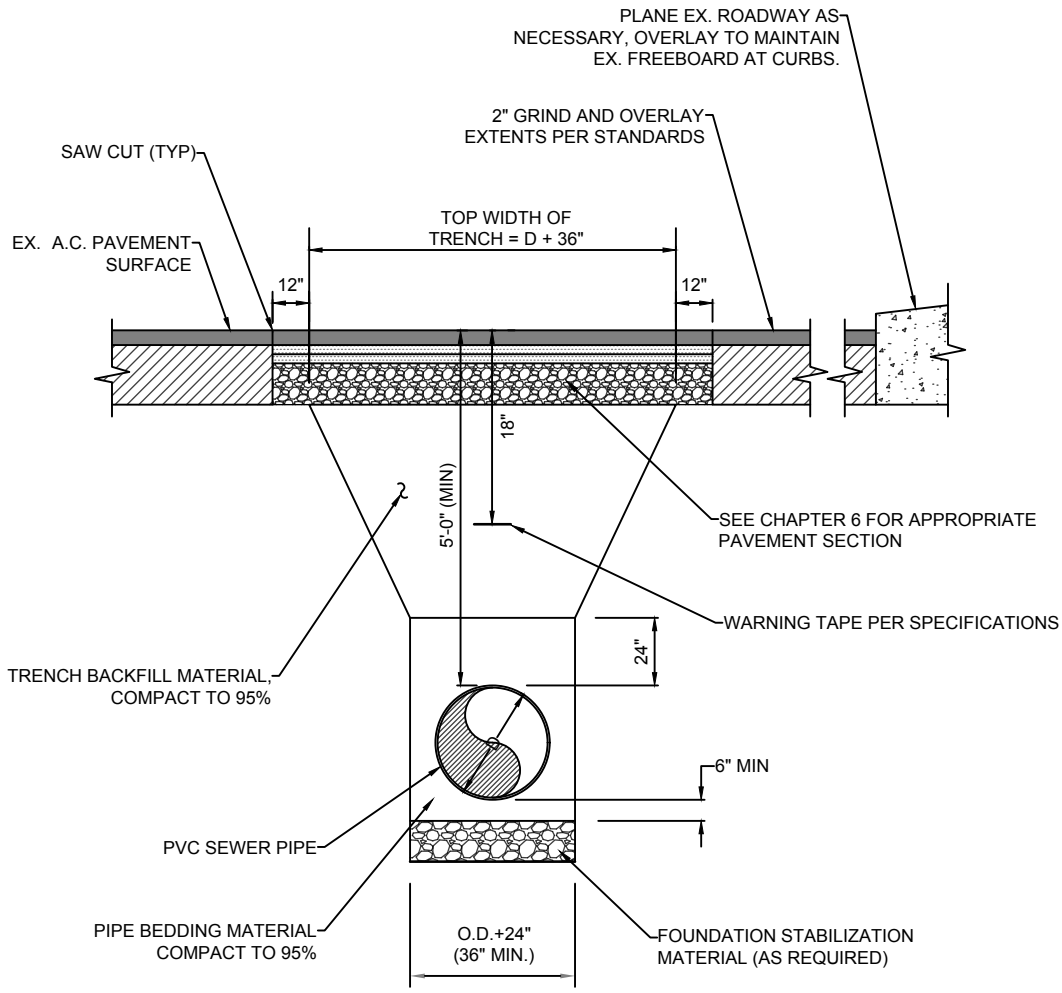
After jacking is completed, fill voids by pumping grout through grout holes in the casing at any locations of ground loss and elsewhere where voids are suspected. Plug grout holes after grouting. Take care to avoid over-pumping grout and disturbing the improvements the casing was jacked under.

13. Carrier Pipe

- a. All pipe installed in casing shall have restrained joints.
- b. Protect pipe as necessary during installation to insure against damage. Install the carrier pipe with the skids located not more than two feet from each end of the pipe joints. The skids shall be adequate in number to hold the pipe to grade, and not less than two skids shall be installed on each section of pipe. Provide skids within 6

-
- inches of each end of the casing.
- c. After installation and testing of the carrier piping, carefully fill the remaining space in the casing with pneumatically placed sand unless directed by the City Engineer to leave the casing unfilled. Take care to avoid floating the carrier pipe.
 - d. Install casing end seals and secure in place with stainless steel bands. Make seals watertight.

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NOTES:

- 1) BED THE ENTIRE WIDTH OF THE TRENCH PAVEMENT
- 2) RESTORATION SHALL BE PER THE APPROPRIATE SECTION IN CHAPTER 6 (PAVEMENT SURFACING).



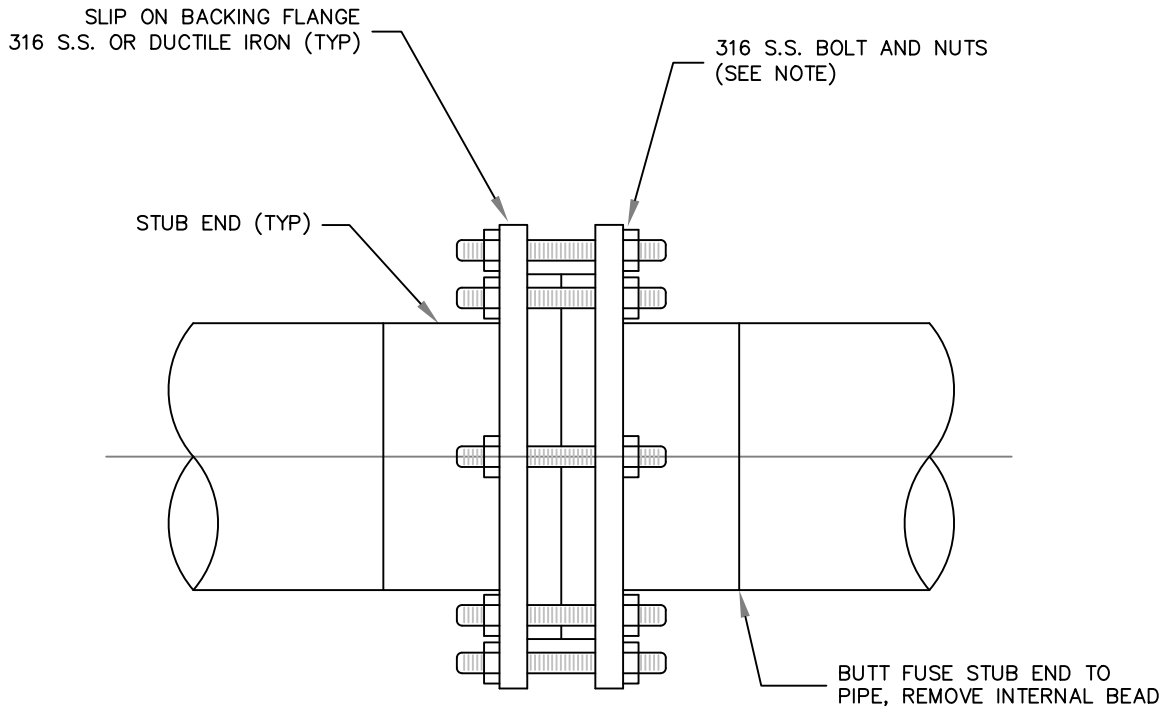
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TRENCHES AND PIPE CONNECTIONS A

SEWER TRENCH DETAILS

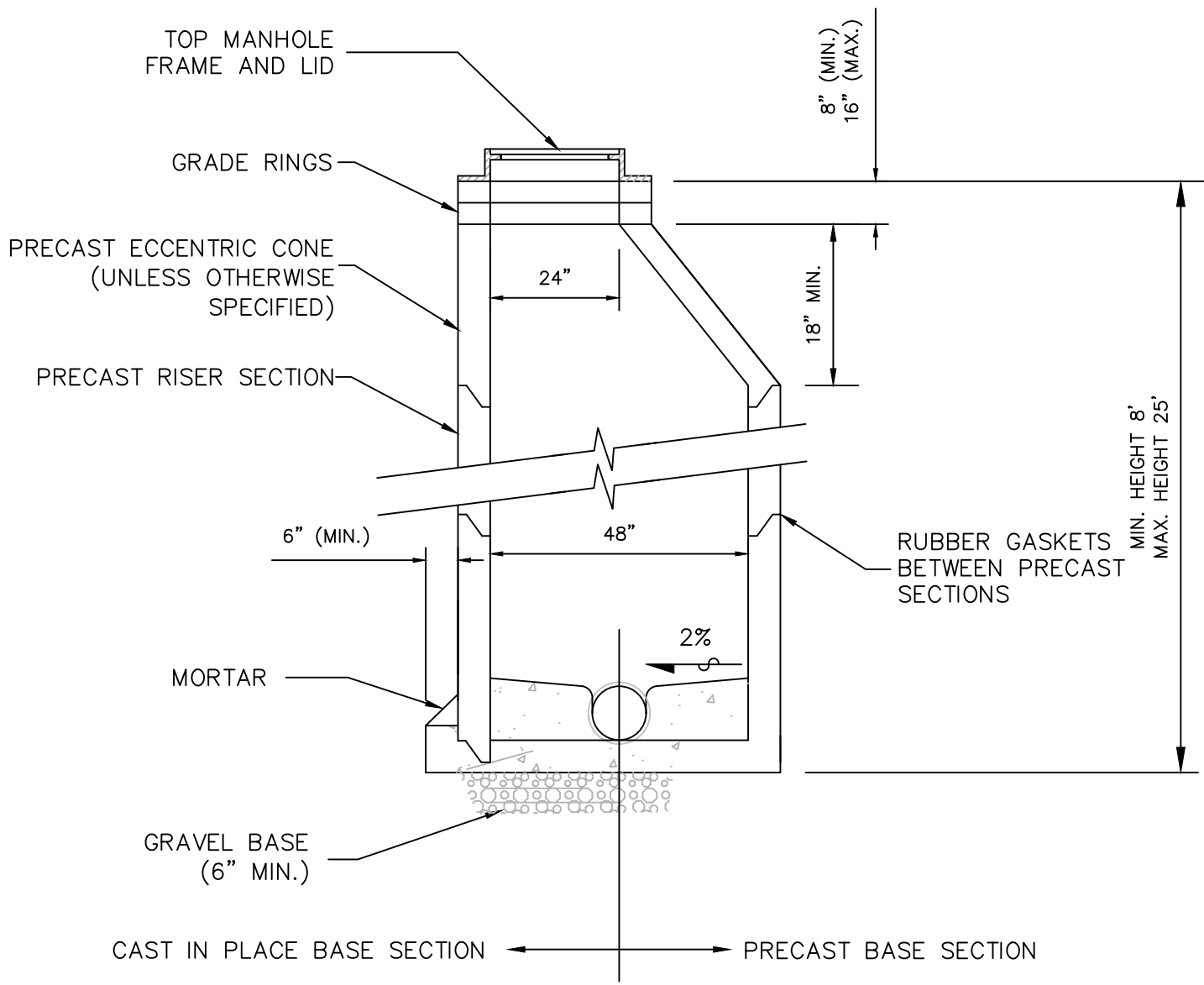
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NOTES:

1. MATCH CROWNS OF SEWERS.
2. FOR CAST IN PLACE BASE, CONSTRUCT IN FIELD CHANNEL AND SHELF TO THE CROWN OF THE PIPE.
3. FOR PRECAST BASE, USE GRAVEL BACKFILL, 6" MIN. COMPACTED DEPTH UNDER THE BASE.
4. ALL RIGID PIPE ENTERING OR LEAVING THE MANHOLE SHALL BE PROVIDED WITH FLEXIBLE JOINTS WITHIN 1 ½ PIPE DIAMETERS OF THE MANHOLE STRUCTURE.
5. INSTALL DROP MANHOLE CONNECTION IF INVERT OF ANY INCOMING SEWER IS MORE THAN 2'-0" ABOVE THE TOP OF THE MAIN SEWER.
6. IN UNIMPROVED AREAS AND EASEMENTS, MANHOLE SHALL EXTEND A MINIMUM OF 2" AND A MAXIMUM OF 4" ABOVE FINISHED GRADE.
7. MANHOLE RING AND COVER SHALL HAVE A CLEAR OPENING. WORDING ON COVER SHALL BE "SEWER" IN 3" RAISED LETTERS.
8. ALL MANHOLE JOINTS SHALL USE A CONFINED ROUND RUBBER GASKET MEETING ASTM C-443 SPECIFICATIONS.



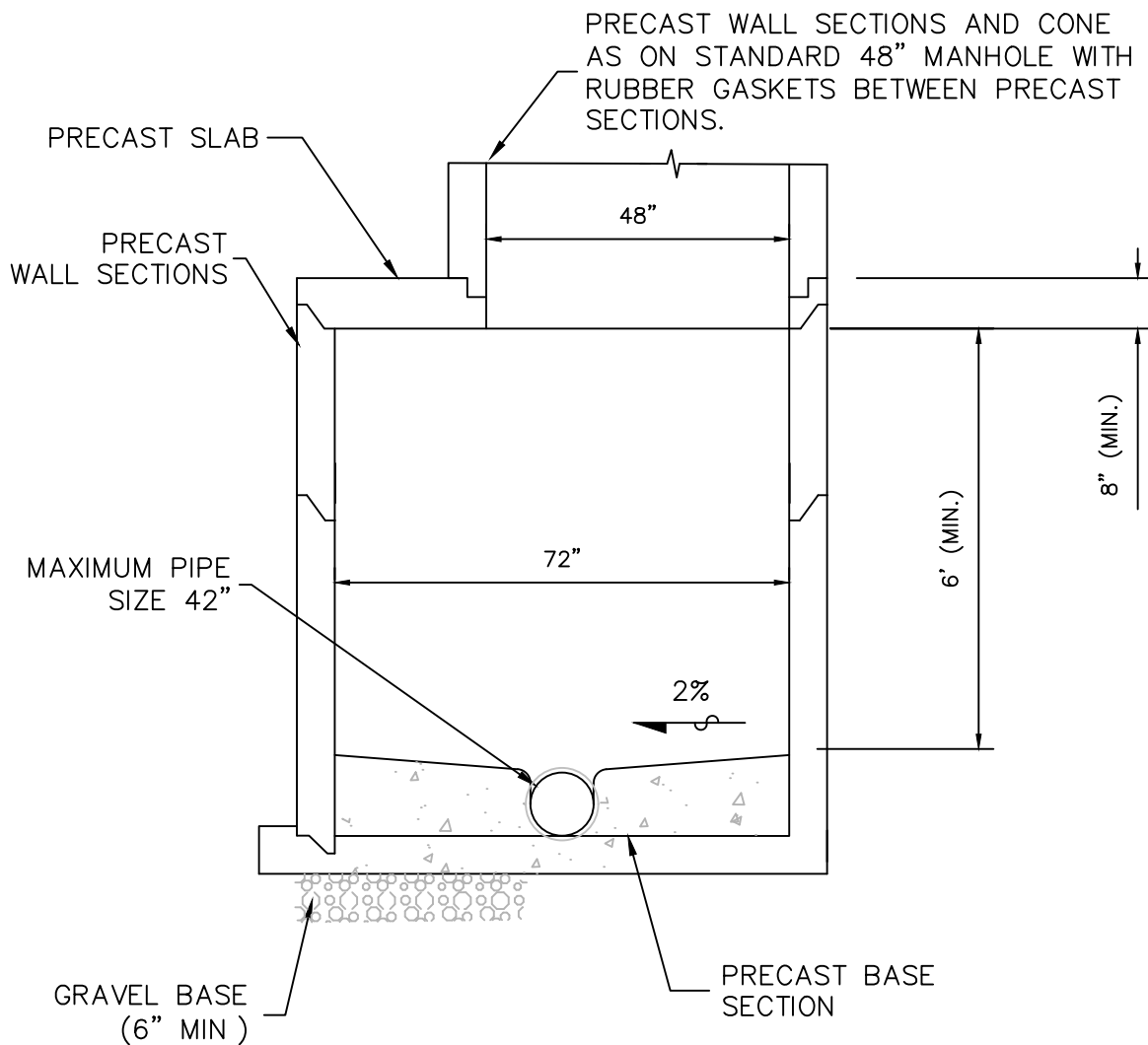
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MANHOLES A

MANHOLE DETAIL 48"

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NOTES:

1. PROVIDE A MINIMUM OF 0.1' OF FALL ACROSS THE MANHOLE BASE FROM INLET TO OUTLET.
2. USE GRAVEL BACKFILL, 6" MIN. COMPACTED DEPTH UNDER THE BASE.
3. ALL RIGID PIPE ENTERING OR LEAVING THE MANHOLE SHALL BE PROVIDED WITH FLEXIBLE JOINTS WITHIN 1 1/2 PIPE DIAMETERS OF THE MANHOLE STRUCTURE.
4. INSTALL DROP MANHOLE CONNECTION IF INVERT OF ANY INCOMING SEWER IS MORE THAN 2'-0" ABOVE THE TOP OF THE MAIN SEWER. IN UNIMPROVED AREAS AND EASEMENTS, MANHOLE SHALL EXTEND A MINIMUM OF 2" AND A MAXIMUM OF 4" ABOVE FINISHED GRADE.
5. MANHOLE RING AND COVER SHALL HAVE A CLEAR OPENING. WORDING ON COVER SHALL BE "SEWER" IN 3" RAISED LETTERS.
6. ALL MANHOLE JOINTS SHALL USE A CONFINED ROUND RUBBER GASKET MEETING ASTM C-443 SPECIFICATIONS.



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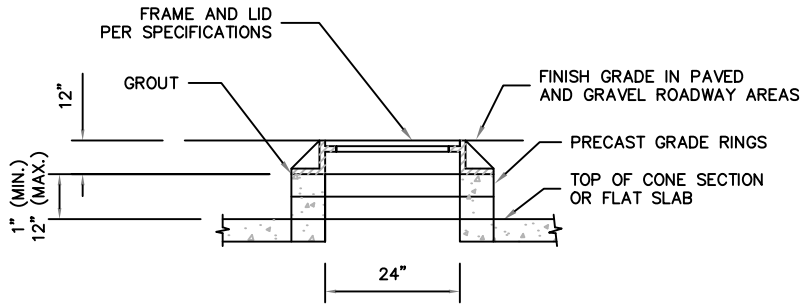
MANHOLES B

MANHOLE DETAIL 72"

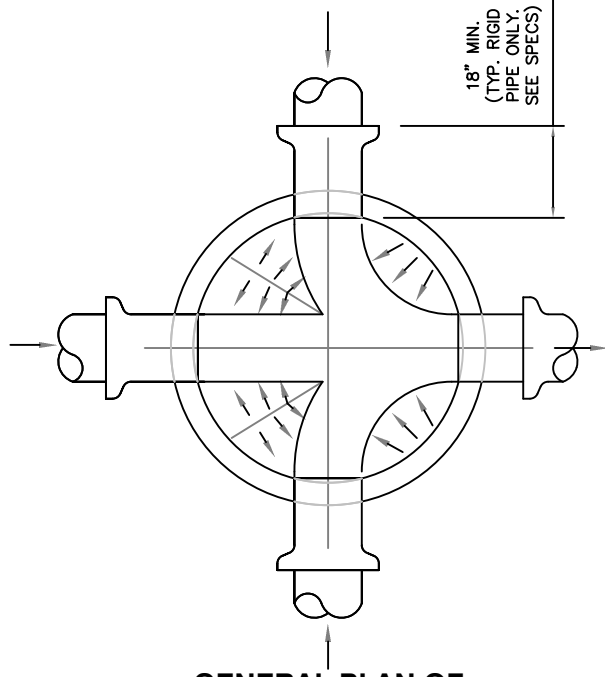
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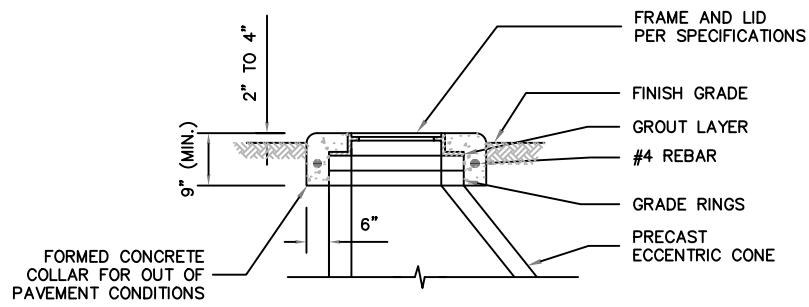
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TYPICAL TOP SECTION



GENERAL PLAN OF CHANNEL INTERSECTION



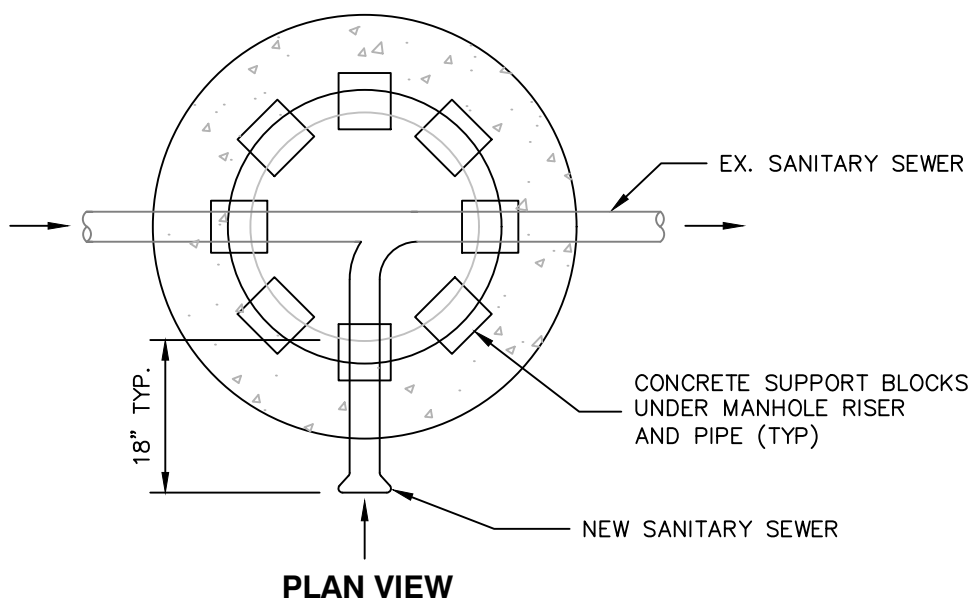
MANHOLE FRAME COLLAR UNPAVED AREAS



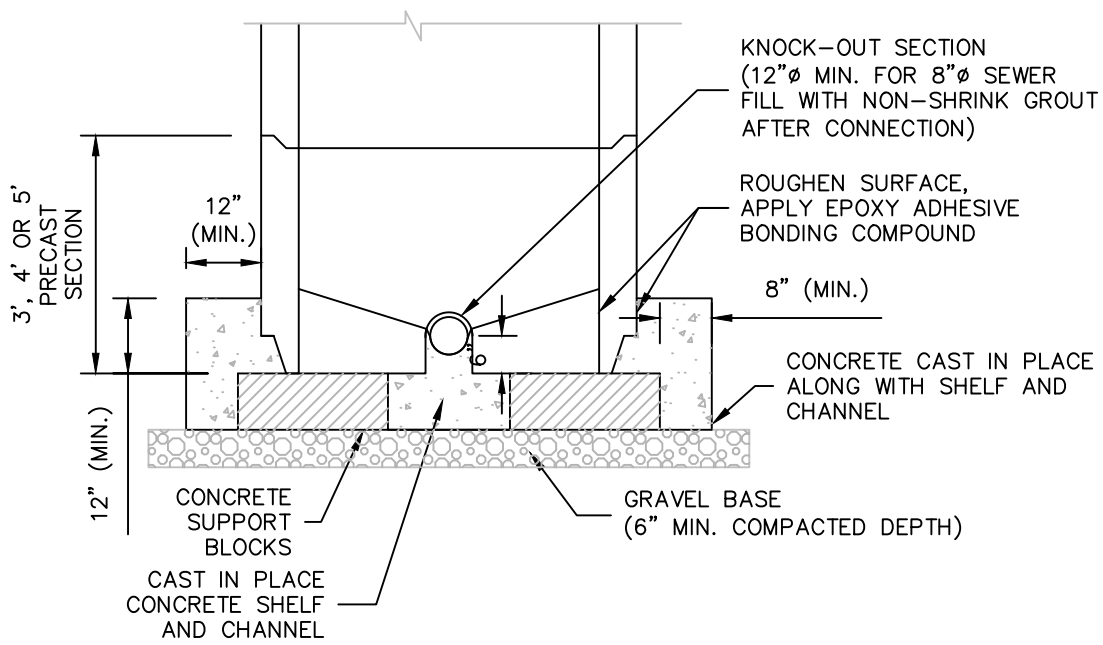
MANHOLES C
TOP SECTION AND CHANNELIZATION
Page 250 of 402

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PLAN VIEW

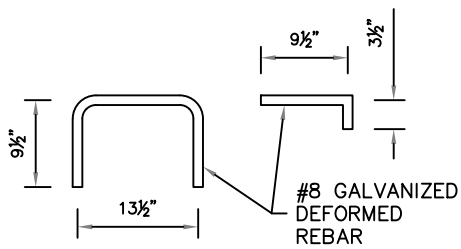


MANHOLE SECTION

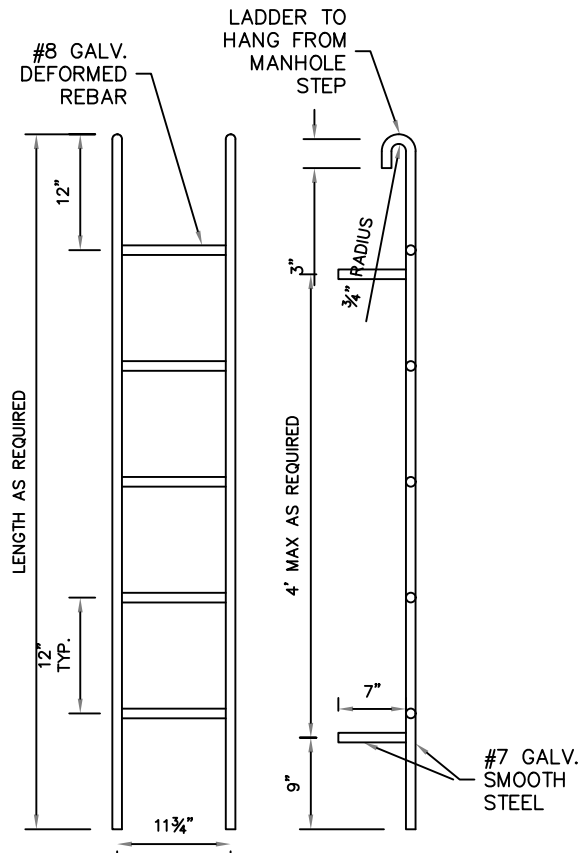


MANHOLES D
 MANHOLE DETAIL - SADDLE
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SAFETY STEP

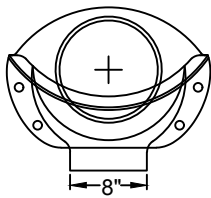


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MANHOLES E

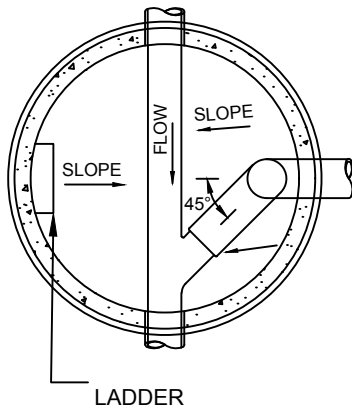
MANHOLE DETAIL - LADDER

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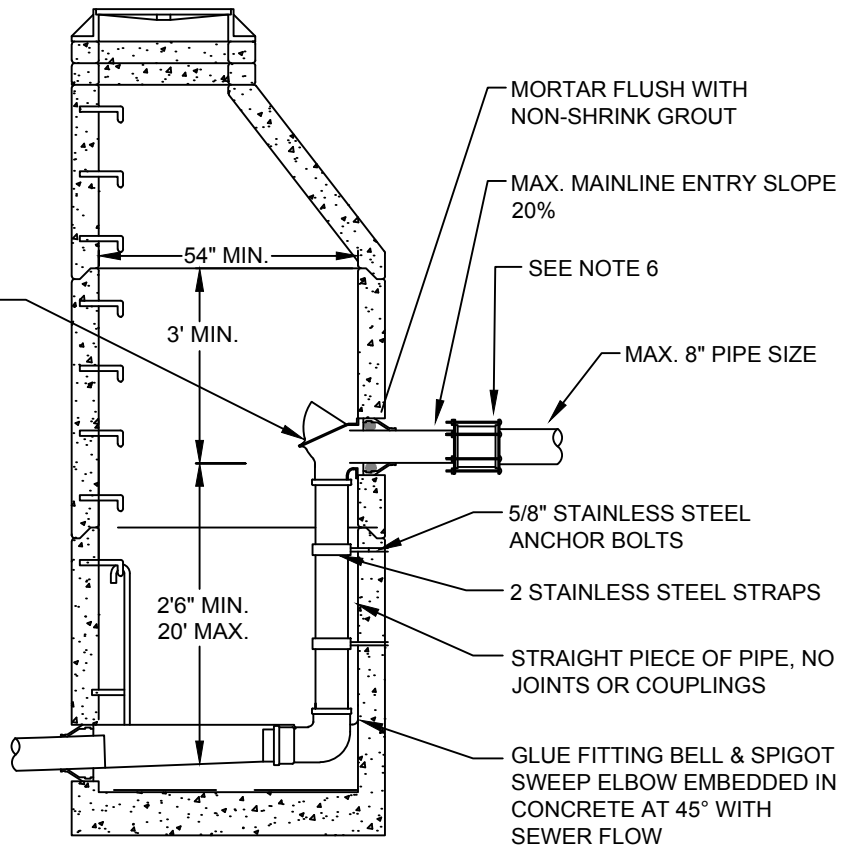


INSIDE DROP BOWL
MOUNTING POSITION

INSIDE DROP BOWL SECURED
WITH 5/8" STAINLESS STEEL
ANCHOR BOLTS



INSIDE DROP - PLAN



NOTES:

1. MANHOLE SHALL CONFORM TO GENERAL NOTES AND ALL APPLICABLE REQUIREMENTS OF STANDARD DETAILS.
2. DROP BOWL TO BE INSTALLED MINIMUM OF 3' BELOW CONE SECTION.
3. INSIDE DROP SHALL BE CONSTRUCTED USING ASTM D3034 SDR 35 PIPE AND FITTING.
4. RECHANNEL BASE WITH 3000 PSI CONCRETE. WIDTH AND DEPTH OF CHANNEL MUST EQUAL THE LARGEST PIPE DIAMETER WITH A SLOPE OF 2% MIN. CHANNEL WALLS MUST BE VERTICAL. SLOPE SHELF TO CHANNEL AT 1" PER FOOT MIN.
5. CORE DRILL OPENINGS FOR NEW PIPE AND USE KOR-N-SEAL CONNECTORS OR EQUAL.
6. USE MECHANICAL TRANSITION COUPLING WHEN CONNECTING TO EXISTING SEWER MAINLINE.
7. CONE MAY NEED TO BE ROTATED AND/OR LADDER MOVED.
8. MINIMUM MANHOLE SIZE IS 54".
9. MAXIMUM OF 2 DROPS PER STRUCTURE.



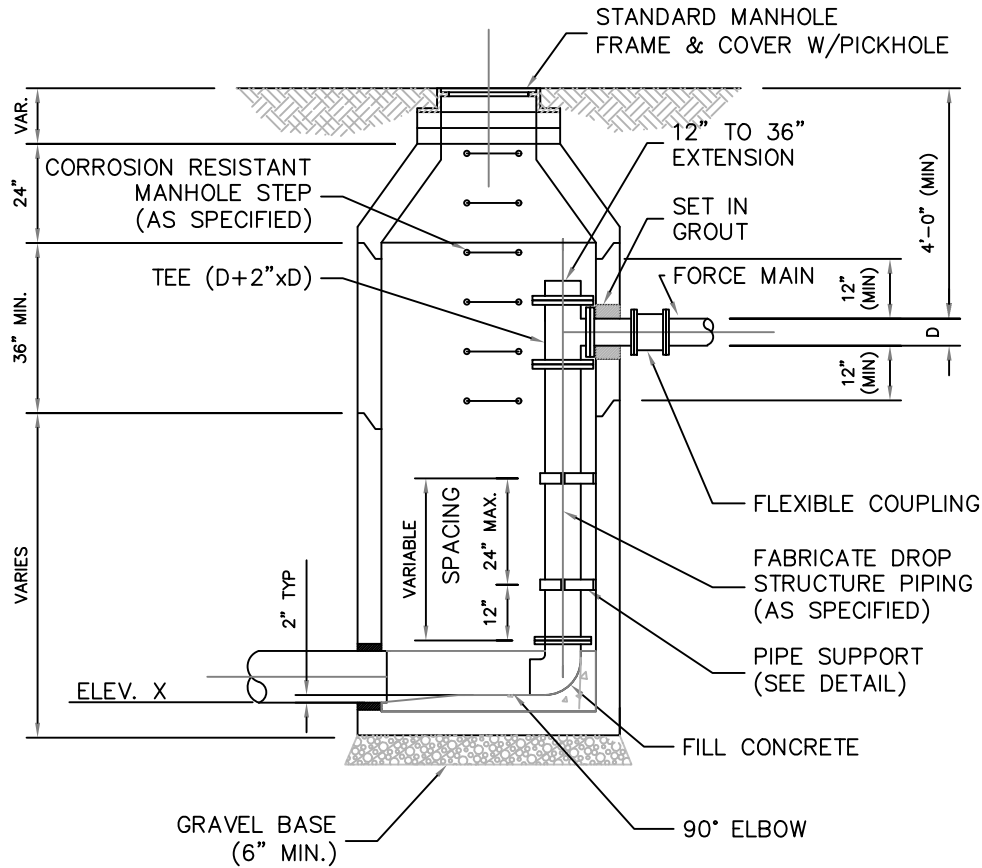
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MANHOLES F

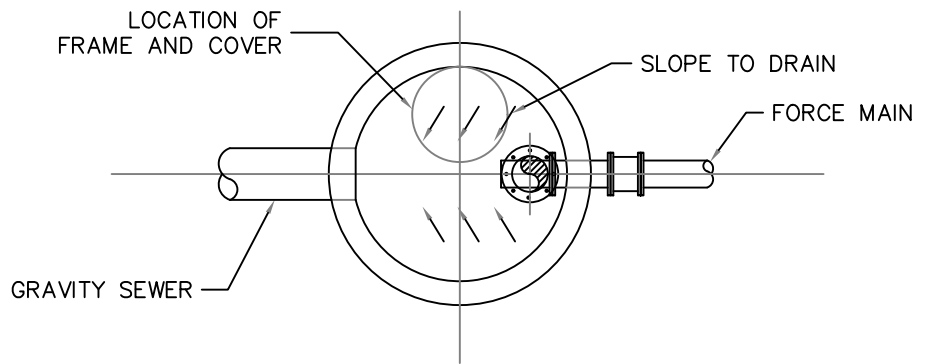
DROP STRUCTURE

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ILLUSTRATIVE SECTION



PLAN

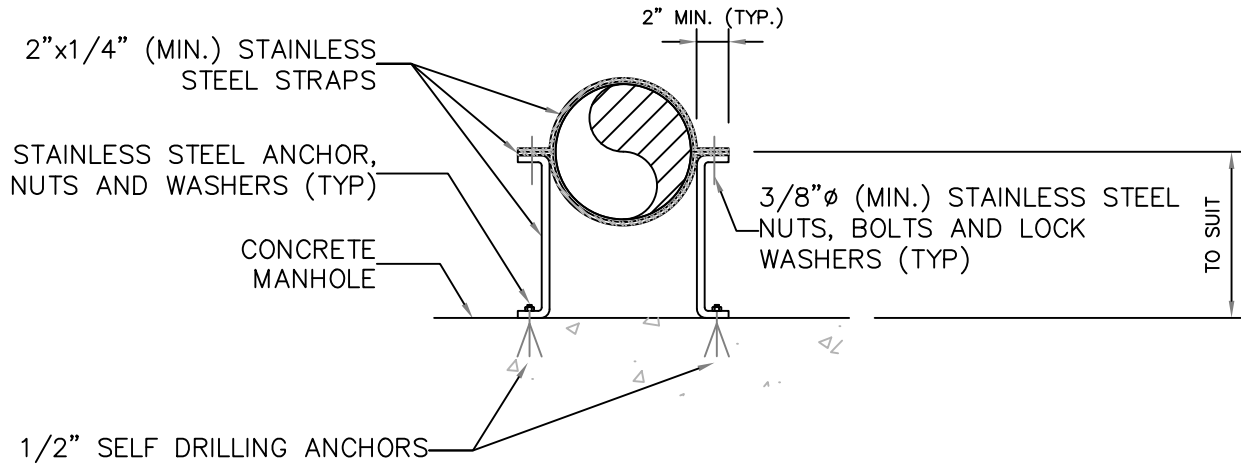


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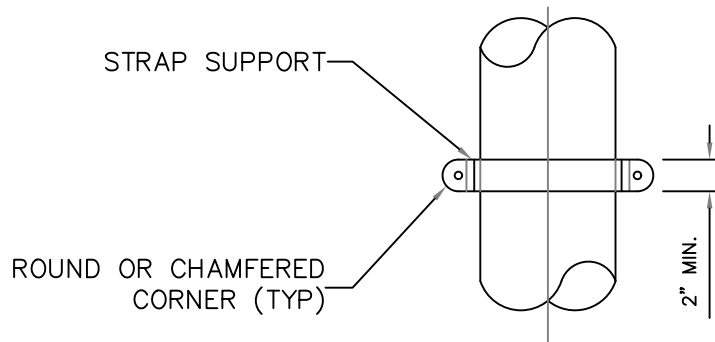
MANHOLES G

FORCE MAIN INSIDE DROP/RECEIVING MANHOLE

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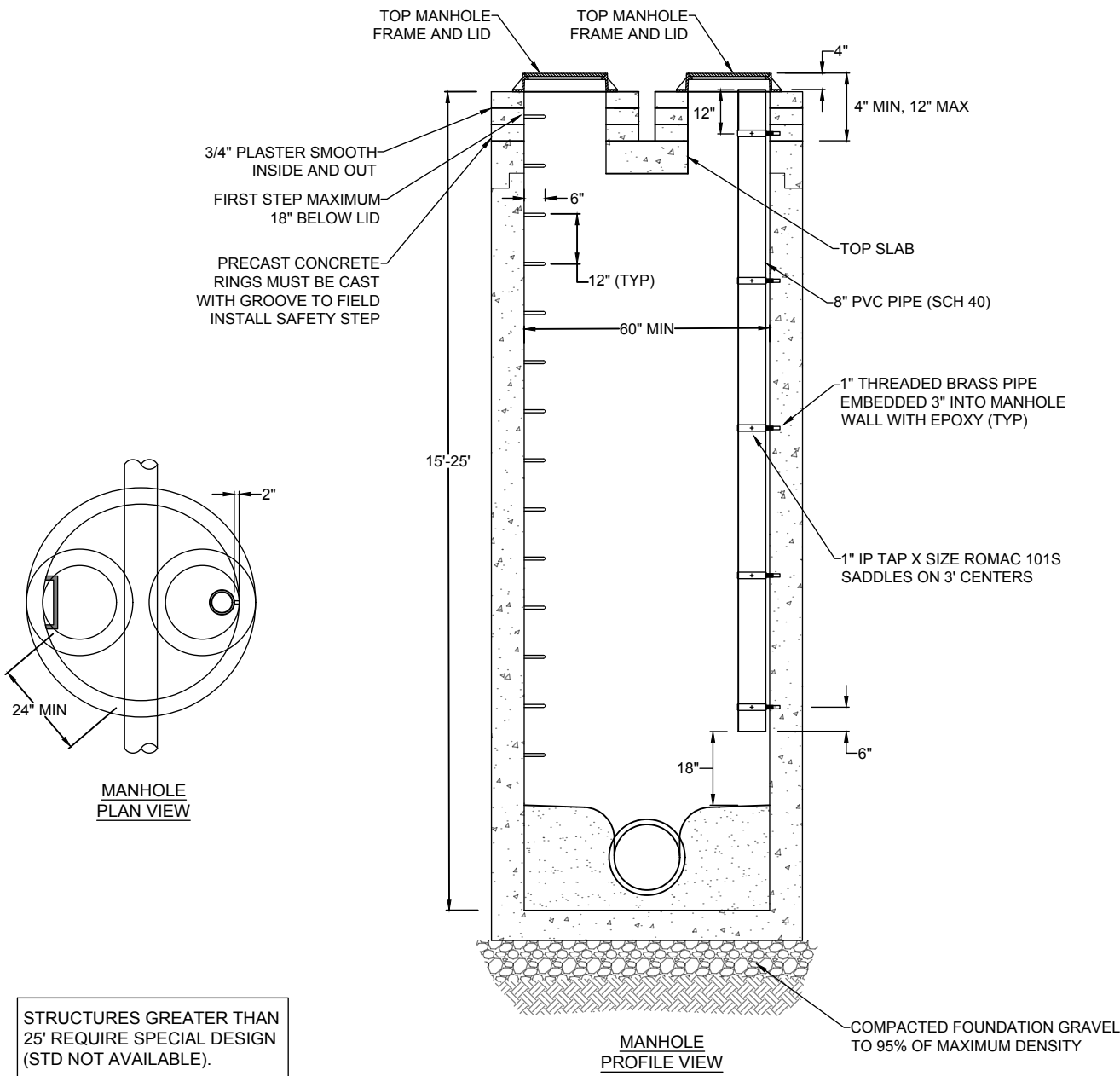


PLAN



SECTION

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NOTES:

1. PROVIDE TWO 24" ACCESS LIDS.
2. MANHOLES SHALL CONFORM TO GENERAL NOTES AND ALL APPLICABLE REQUIREMENTS OF STANDARD 1220.
3. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARDS AND SPECIFICATIONS.
4. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
5. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT, PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
6. ALL MANHOLES SHALL BE LINED PER CITY OF PORT ORCHARD STANDARDS AND SPECIFICATIONS
7. TOP SLAB MUST MEET HS-20 LOADING CRITERIA.



MANHOLES J

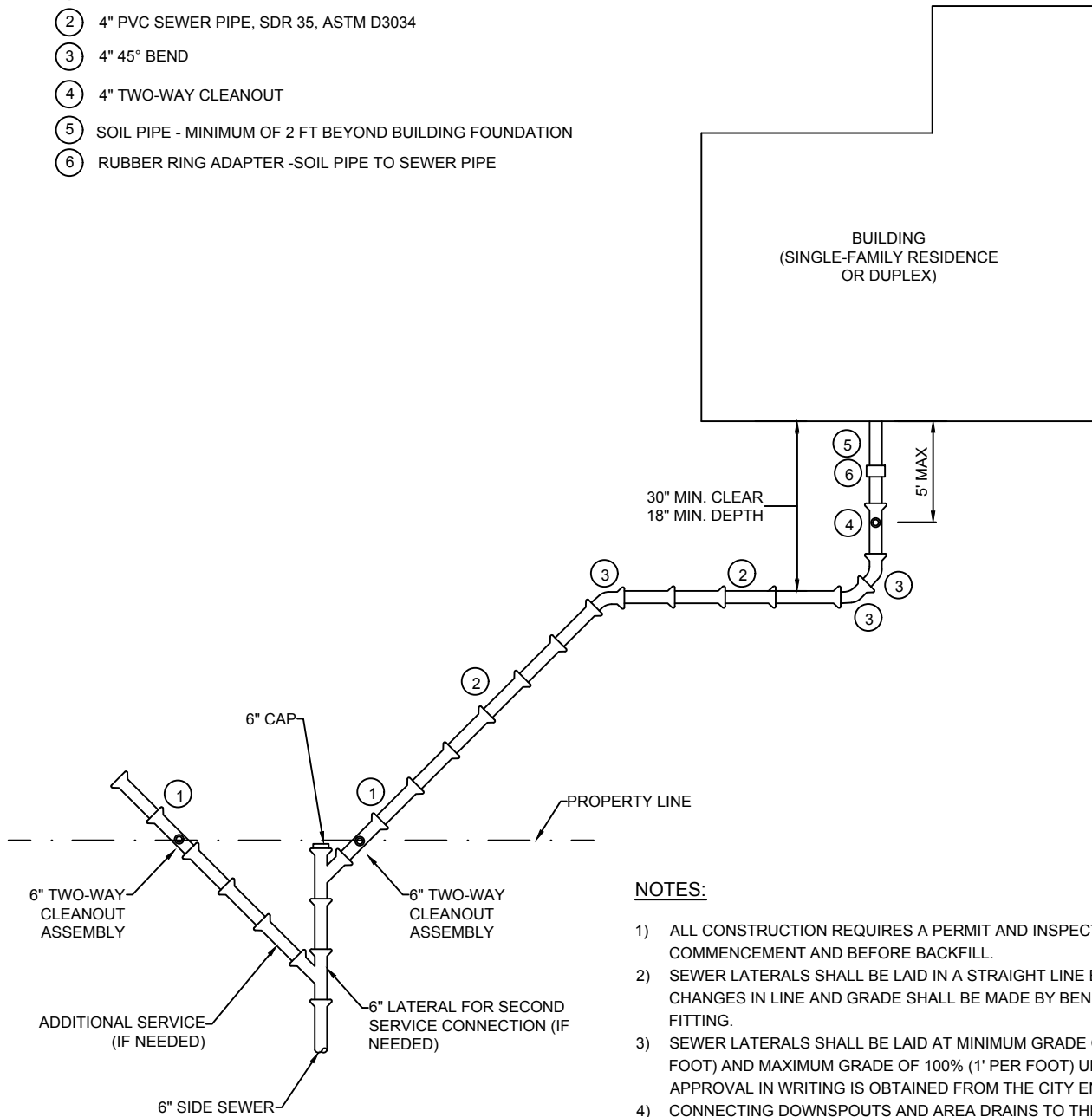
MANHOLE GREATER THAN 15'

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LEGEND:

- ① 6"x4" ECCENTRIC REDUCER
- ② 4" PVC SEWER PIPE, SDR 35, ASTM D3034
- ③ 4" 45° BEND
- ④ 4" TWO-WAY CLEANOUT
- ⑤ SOIL PIPE - MINIMUM OF 2 FT BEYOND BUILDING FOUNDATION
- ⑥ RUBBER RING ADAPTER -SOIL PIPE TO SEWER PIPE



NOTES:

- 1) ALL CONSTRUCTION REQUIRES A PERMIT AND INSPECTION PRIOR TO COMMENCEMENT AND BEFORE BACKFILL.
- 2) SEWER LATERALS SHALL BE LAID IN A STRAIGHT LINE BETWEEN BENDS, CHANGES IN LINE AND GRADE SHALL BE MADE BY BENDS OR WYE FITTING.
- 3) SEWER LATERALS SHALL BE LAID AT MINIMUM GRADE OF 2% (1/4" PER FOOT) AND MAXIMUM GRADE OF 100% (1' PER FOOT) UNLESS PRIOR APPROVAL IN WRITING IS OBTAINED FROM THE CITY ENGINEER.
- 4) CONNECTING DOWNSPOUTS AND AREA DRAINS TO THE SEWER SYSTEM IS PROHIBITED AND WILL RESULT IN FINES.
- 5) CLEANOUTS ARE REQUIRED FOR LATERALS EXCEEDING 100 FT., AT ANY BEND EXCEEDING 1/8" BEND (45°) AND WITHIN TEN (10) FT OF A BUILDING FOUNDATION.
- 6) FROM MAIN TO CLEANOUT AT PROPERTY LINE SHALL BE 6" PIPE. FROM PROPERTY LINE CLEANOUT TO BUILDING SHALL BE 4" FOR SINGLE FAMILY RESIDENCE AND 6" FOR DUPLEX. CLEANOUTS ARE REQUIRED EVERY 100 FEET OR PORTION THEREOF, AT ALL CHANGE OF DIRECTIONS AND AT THE PROPERTY LINE.



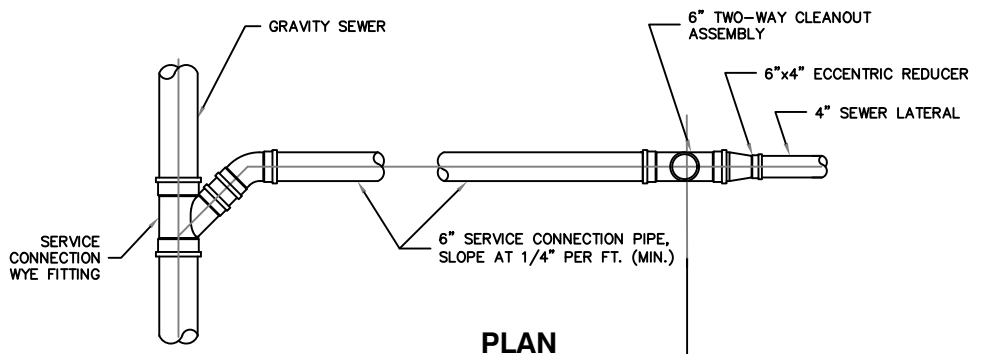
LATERALS AND SERVICE CONNECTIONS A

TYPICAL SFR SEWER LATERAL

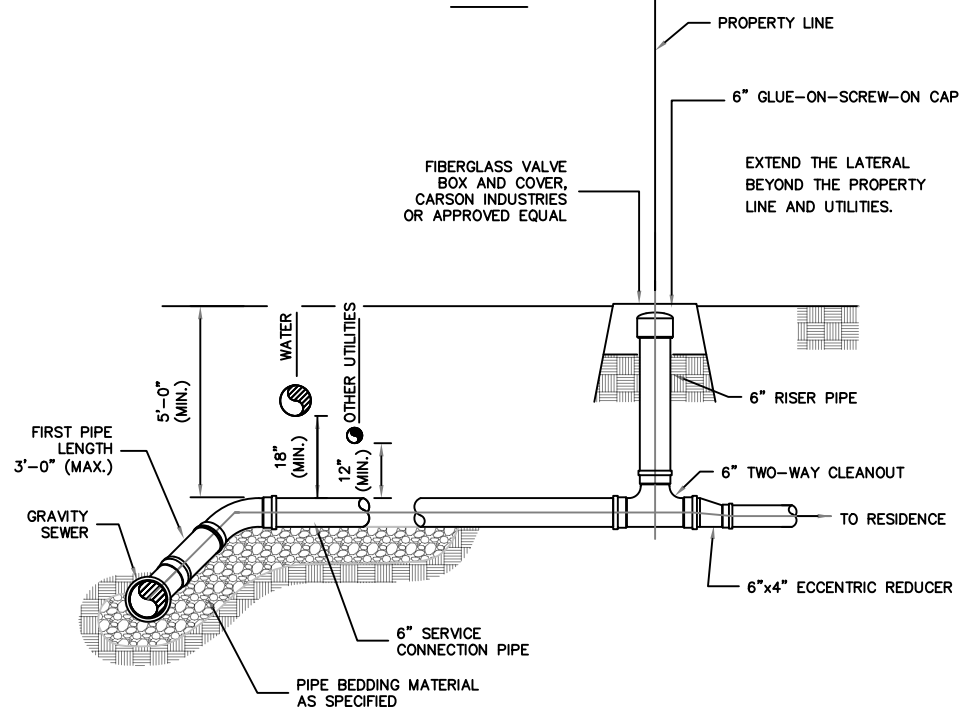
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PLAN



SECTION

INSTALL LOCATOR WIRE ON ALL
LATERALS TO THE SEWER MAIN

NOTE:
CONNECT ALL SERVICE CONNECTIONS 8" AND LARGER AT MANHOLE.
DETAILS TO BE APPROVED BY CITY ENGINEER.



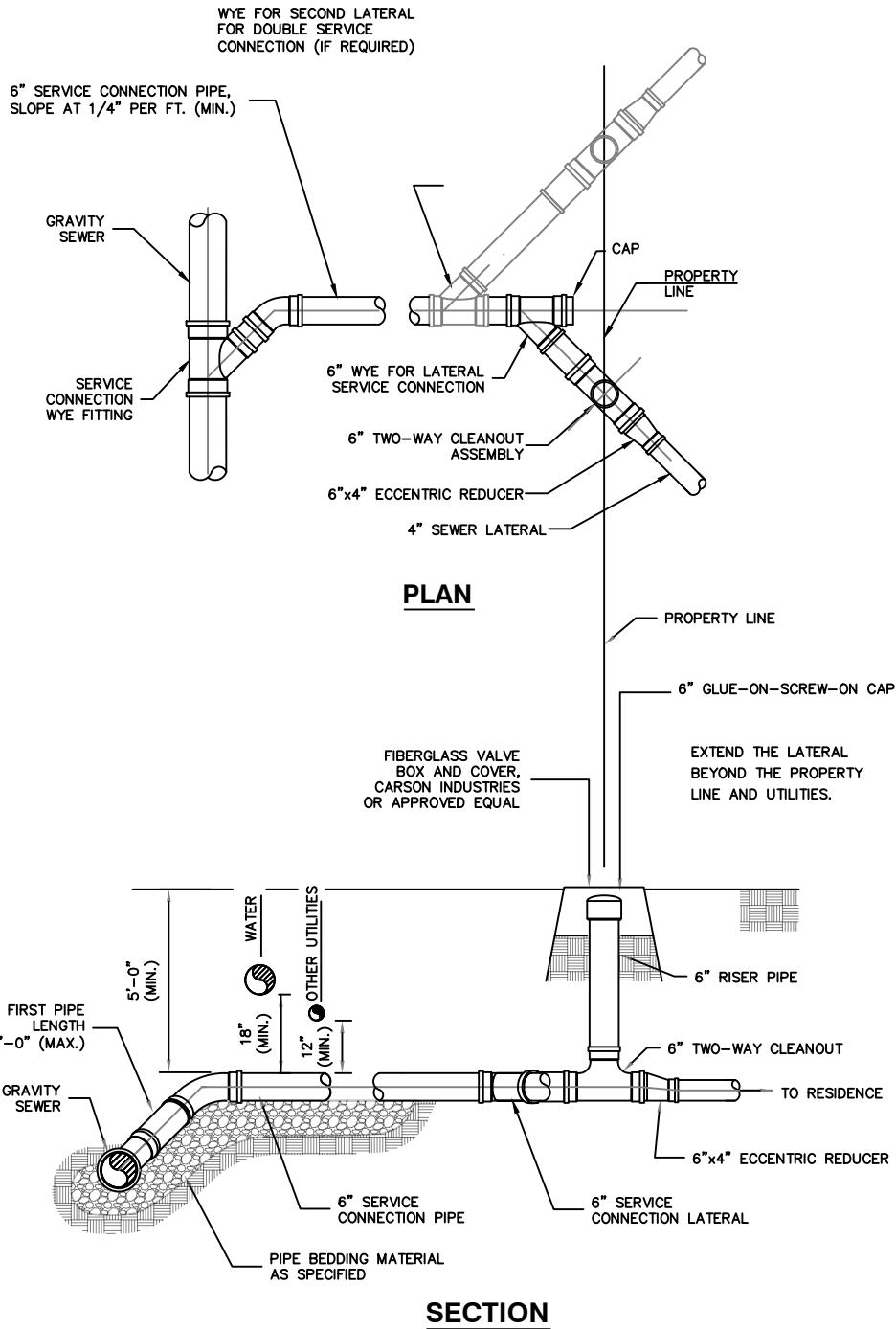
LATERALS AND SERVICE CONNECTIONS B

SINGLE SERVICE CONNECTION

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NOTE:
 CONNECT ALL SERVICE CONNECTIONS 8" AND LARGER
 AT MANHOLE. DETAILS TO BE APPROVED BY CITY ENGINEER.

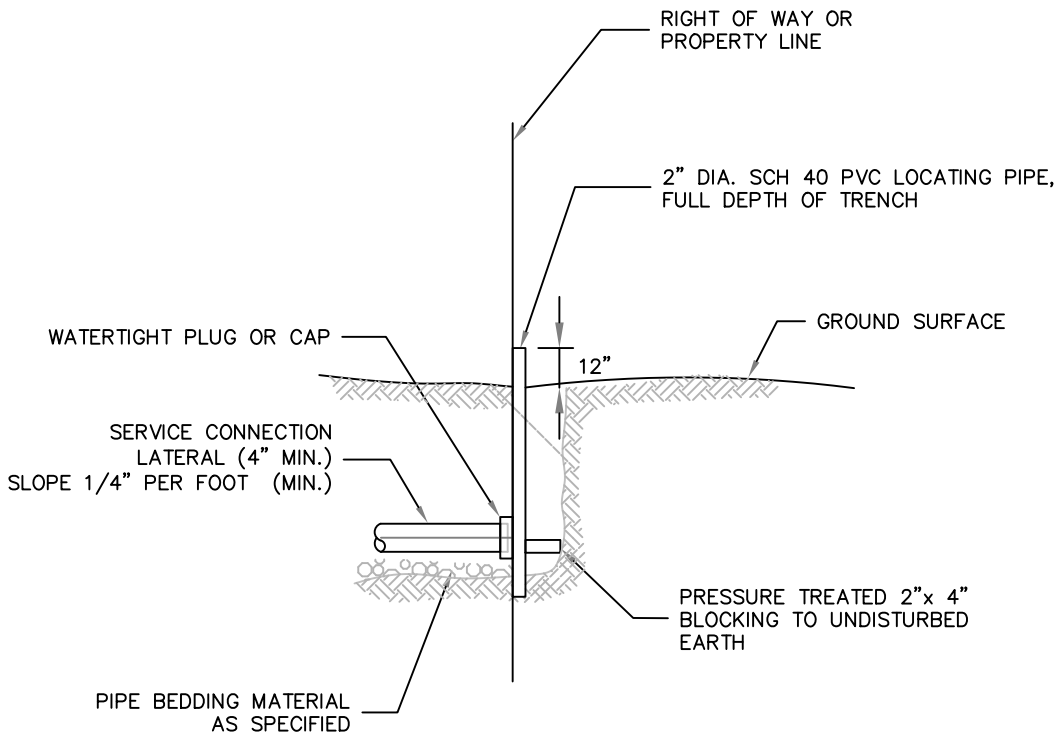
EXTEND THE LATERAL BEYOND THE
 PROPERTY LINE AND UTILITIES.
 INSTALL LOCATOR WIRE ON ALL LATERALS
 TO THE SEWER MAIN.



LATERALS AND SERVICE CONNECTIONS C
DOUBLE SERVICE CONNECTION
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NOTES:

- 1) PROVIDE SOLID COPPER TRACE WIRE (NO. 10 MIN,) WRAPPED ALONG LENGTH OF SERVICE CONNECTION LATERAL AND MARKER.
- 2) STENCIL "SEWER" ON LOCATING PIPES AND DEPTH TO INVERT IN 2" HIGH LETTERS.



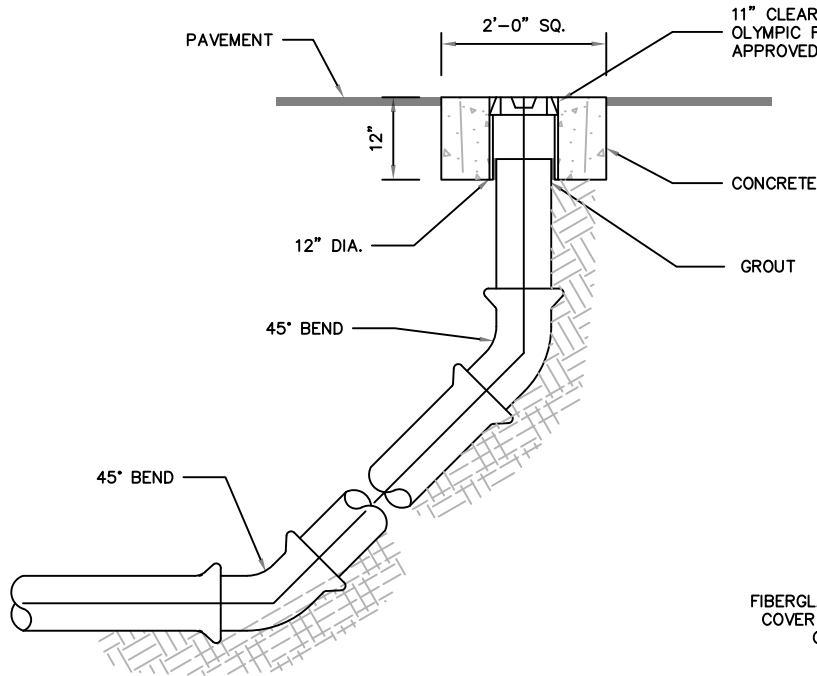
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LATERALS AND SERVICE CONNECTIONS D

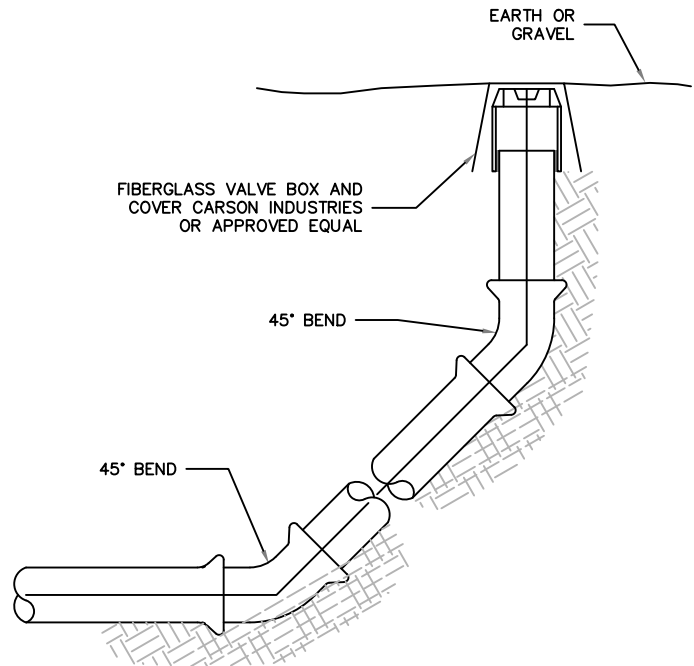
SERVICE CONNECTION MARKER

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8" SIDE SEWER



6" SIDE SEWER

NOTES:

1. IF NOT PERMANENT END OF SEWER, USE TYLOX GASKET OR APPROVED EQUAL, AND SECURE WITH #8 WIRE PIN THRU HOLES DRILLED IN HUB. IF PERMANENT END OF SEWER USE MORTAR TO SECURE PLUG.
2. IF INSTALLATION OCCURS IN UNPAVED AREA USE CONCRETE ANCHOR AS SHOWN FOR ASPHALT PAVING AND BACKFILL TO TOP OF CAST IRON RING WITH SOIL.
3. RESTORATION SHALL BE IN ACCORDANCE WITH CHAPTER 6.
4. TRENCH BACKFILL SHALL BE COMPACTED AND TESTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS.



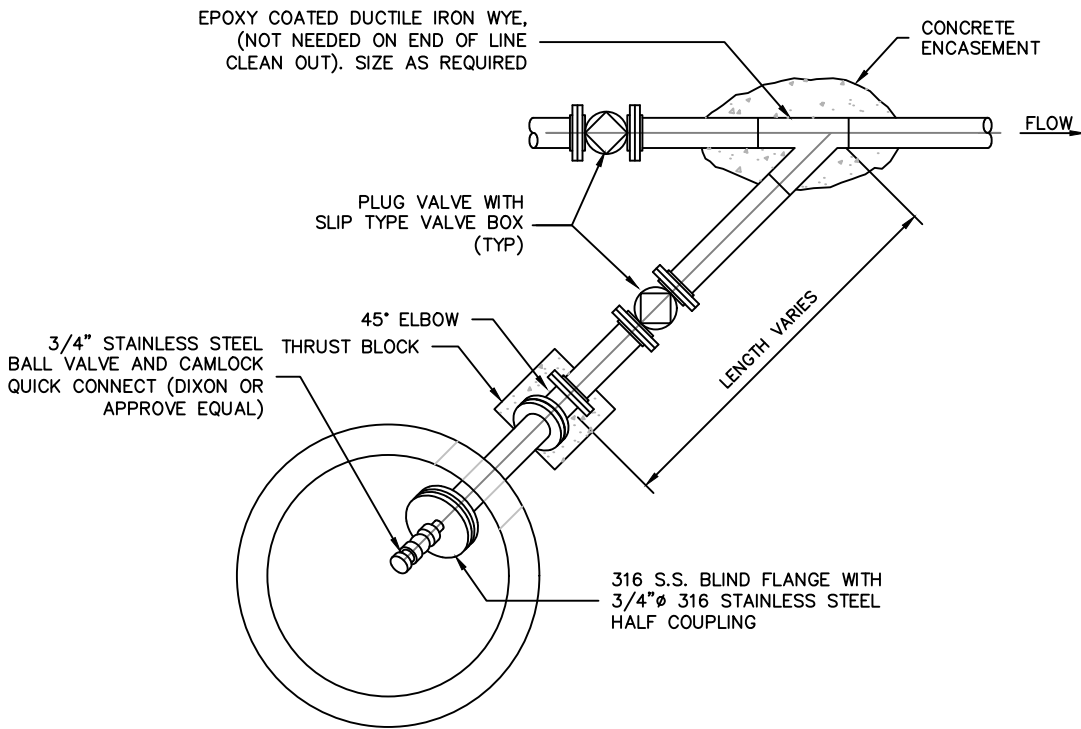
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CLEANOUTS A

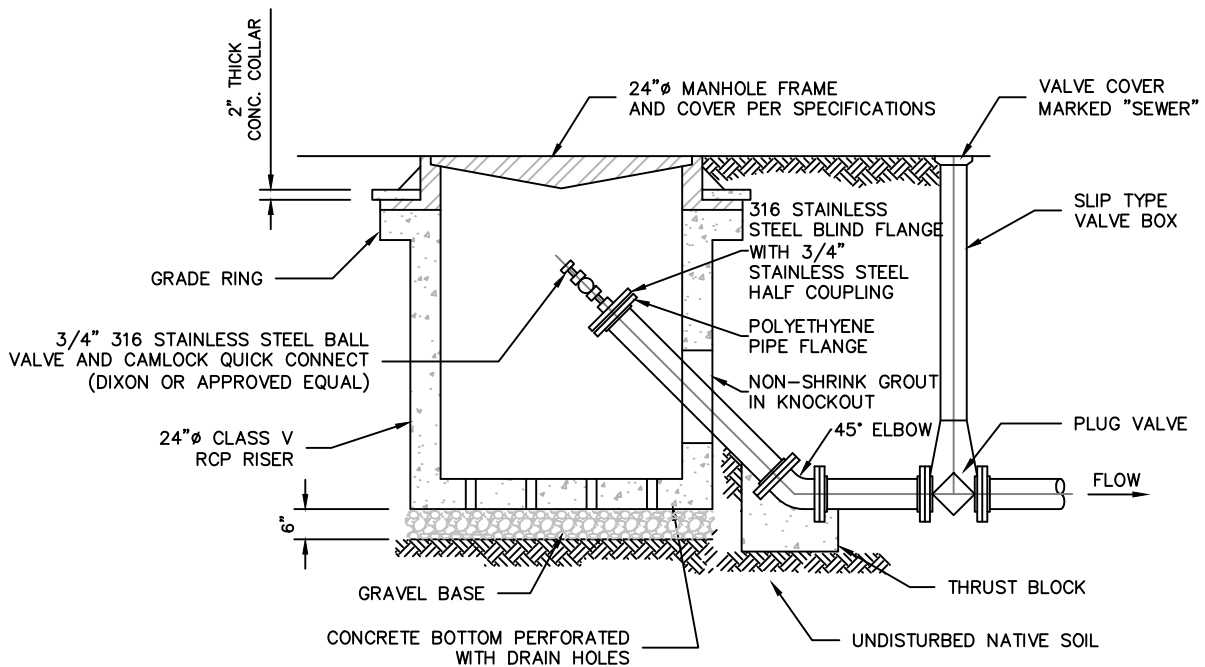
SEWER CLEANOUT DETAIL

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PLAN



PROFILE



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CLEANOUTS B

FORCE MAIN CLEANOUT

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Chapter 10

Small Cell Wireless Telecommunication Facilities

12.1 Introduction

12.2 Pole Mounted Small Cell Telecommunication Facilities

- A. Pole Design

12.3 Ground Mounted Small Cell Telecommunication Facilities

- A. Location Requirements

12.4 Other Small Cell Telecommunication Facility Standards and Specifications

- A. Additional Guidance

12.1 Introduction

On September 26, 2018, the Federal Communications Commission issued a declaratory ruling concerning small cell facilities (FFF 18-133). This chapter of the City's Public Works and Engineering Standard and Specifications is intended to regulate the aesthetics and design of Small Cell Telecommunication Facilities consistent with this ruling.

12.2 Pole Mounted Small Cell Telecommunication Facilities

A. Pole Design.

An existing pole may be replaced or added onto to accommodate small cell antennas and related equipment, subject to the following requirements:

1. Existing Poles. The height of any existing Pole shall not be altered, except when minor deviations up to the minimum additional height are needed to allow sufficient space for the required clearance from electrical utility wires when required to accommodate antennae at the top of a Pole or a pole extender, which shall be no greater than fifteen (15) feet tall and shall be the minimum necessary to achieve required safety clearances and to satisfy pole owner requirements. To accommodate concealed equipment and cabling, the City may also approve minor deviations of up to fifty percent (50%) of the original Pole width or thirty inches (30"), whichever is greater, when housing equipment within the Pole base.
2. Replacement Poles. Replacement Poles shall match the height, width, color (to the extent possible), and material of the original or adjacent Poles. The City may approve minor deviations up to the minimum additional height needed to allow sufficient space for the required clearance from electrical utility wires when required to accommodate antennae at the top of a Pole or a pole extender, which shall be no greater than fifteen (15) feet tall and shall be the minimum required to achieve required safety clearances and to satisfy pole owner requirements. To accommodate concealed equipment and cabling, the City may also approve minor deviations of up to fifty percent (50%) of the original Pole width or thirty inches (30"), whichever is greater, when housing equipment within the Pole base. Replacement Poles shall be located as close as possible to the existing Pole, and the replaced Pole shall be removed.
3. Internal Cabling. Where technically feasible, all equipment and cabling shall be internal to the Pole.

4. **Equipment Concealed.** Where technically feasible, all antennas and equipment shall be fully concealed within a Pole. If such concealment is not technically feasible, antennas shall be configured to reduce the visual impact to the greatest extent feasible. Any equipment that cannot be concealed within a Pole or undergrounded consistent with this chapter due to technical infeasibility shall be camouflaged to appear to be an integrated component of a Pole. Any equipment attached to a Pole pursuant to this subsection shall be contained within the smallest possible enclosure and attached to the Pole in a manner consistent with this Chapter. Section 12.5 of this chapter shows examples of successfully concealed and unsuccessfully concealed small cell equipment.
5. **Flush Mounting and Pole-Top Antennas.** When permitted, a Small Cell Facility shall, to the full extent permitted under the state electrical code, other applicable safety codes, and the Pole owner's requirements. Canisters containing an antenna attached to the top of a Pole shall not exceed the diameter of the Pole. If, due to technical feasibility, a canister must exceed the diameter of a Pole, the canister shall not have a diameter that is more than fifty percent (50%) greater than the diameter of the Pole.
6. **Material and Color.** Where internal cabling or equipment concealing is demonstrated not to be technically feasible, a Small Cell Facility shall be made to match the color of the Pole to the maximum extent possible and shall be non-reflective.
7. **Antenna Design.** Where an enclosure, such as a canister, is proposed to house an antenna, the antenna shall be located in an enclosure of no more than three (3) cubic feet in volume, or in case of an antenna that has exposed elements, the antenna and all of its exposed elements could fit within an enclosure of no more than three (3) cubic feet.
8. **No Illumination.** Small Cell Facilities shall not be illuminated.
9. **Generators and Backup Battery.** Generators are not permitted for Small Cell Facilities. A battery backup may be permitted provided it is concealed or camouflaged, as applicable, in a manner consistent with this Chapter.

12.3 Ground Mounted Small Cell Telecommunication Facilities

A. Location Requirements.

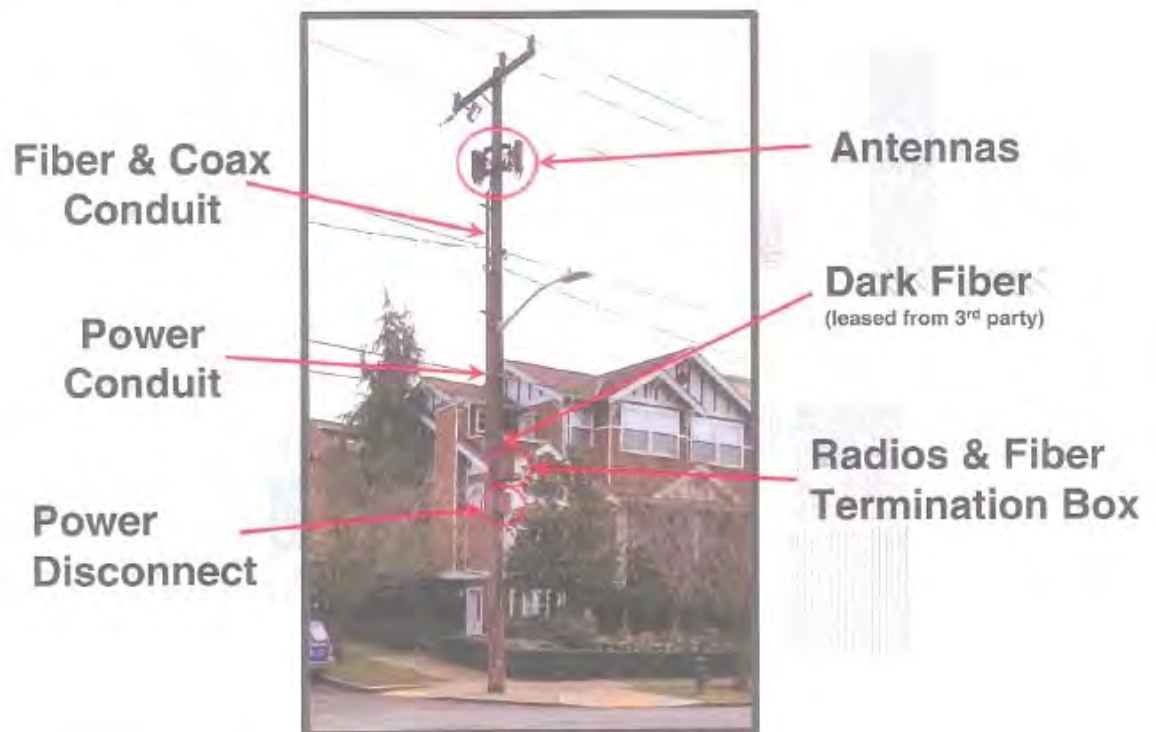
1. To allow full use of the Public Right-of-Way by pedestrians, bicycles and other users, all ground-mounted equipment shall be consistent with Municipal Code, including but not limited to Port Orchard Municipal Code Chapter 12.16, concealed in the base of a Pole, or concealed in street furniture, and shall comply with the Americans with Disabilities Act (ADA), City construction standards, and State and federal regulations in order to provide clear and safe passage within the Public Right-of-Way.

12.4 Other Small Cell Telecommunication Facilities Standards and Specifications

A. Additional Guidance. This section contains examples of acceptable and unacceptable small cell facility applications and should be used to clarify the intent of the written standards found in this chapter.

1. Figures 1 – 6 show examples of acceptable installations on existing poles.
 - a. Figure 1.

Small Cell Components



- b. Figure 2



c. Figure 3.



d. Figure 4.



e. Figure 5.



f. Figure 6



2. Figures 7 -12 show examples of unacceptable installations on existing poles.
 - a. Figure 7.



b. Figure 8.



c. Figure 9.



d. Figure 10.



e. Figure 11.



f. Figure 12.



Appendix A – Definitions and Acronyms

AASHTO – American Association of State Highway and Transportation Officials

Access Way – Travel way with private ownership and maintenance where general public use is allowed.

ACP – Asphalt Concrete Pavement

ADT – Average Daily Traffic. The total two-directional volume of traffic passing through a given point during a given time period, divided by the number of days in that time period. When used as a threshold to determine classification (size) of the access point or street/road, ADT shall be based on the ultimate build out of all land that will potentially be served by the access point or street/road.

Alley – A thoroughfare or right-of-way, usually narrower than a street, which provides access to the rear boundary of two or more residential properties and is not intended for general traffic circulation; privately maintained.

Applicant – The owner or his/her agent seeking approval from the city for any land use or other related permit or approval referenced in Port Orchard Municipal Code and which requires utilization of these Standards.

Appurtenance – Equipment and/or accessories which are a necessary part of an operating utility system or subsystem.

APWA – American Public Works Association

ASTM – American Society of Testing Materials

ATB – Asphalt Treated Base

Auxiliary Lane – The portion of the roadway adjoining the traveled way for weaving, truck climbing, speed change or for other purposes supplementary to through traffic movement.

AWWA – American Water Works Association

Best Management Practice (BMP) – The schedule of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to water of Washington State.

Bollard – Vertical embedded steel pipe intended to prevent motor vehicular passage or for the protection of a structure vulnerable to a collision.

Boring – Grade and alignment-controlled mechanical or other method of installing a pipe or casing under a road without disturbing the surrounding medium.

Breakaway Structure or Breakaway Design – A structure or installation that has been crash tested in accordance with National Cooperative Highway Research Program procedures. (NCHRP 230).

Bulb – A round area for vehicle turnaround typically located at the end of a cul-de-sac street.

Bulb-Out (curb extension) – A traffic calming measure intended to slow the speed of traffic and increase driver awareness, particularly in built-up and residential neighborhoods. They also allow pedestrians and vehicle driver to see each other when vehicles parked in a parking lane would otherwise block visibility.

Capacity – The maximum number of vehicles that have a reasonable expectation of passing over a given roadway or section of roadway in one direction during a given time period under prevailing roadway and traffic conditions.

Casing – A larger pipe enclosing a carrier for the purpose of providing structural or other protection to the carrier and/or to allow for carrier replacement without re-excavation, jacking or boring.

CDF – Controlled Density Fill

Conduit – An enclosed tubular runway for protecting wires or cables.

Channelization – The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands or other suitable means to facilitate the safe and orderly movement of both vehicles and pedestrians.

City Engineer – City of Port Orchard City Engineer having authorities specified in RCW 35 and 35A, along with the applicable authorities as City Engineer as specified in RCW 36.75.050 and 36.80, or his/her duly authorized representative.

City Inspector – Shall mean the City of Port Orchard inspector responsible for verification of work per the City approved plans, or his/her duly authorized representative.

Clear Zone – The total roadside border area, starting at the edge of traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a nonrecoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes, speeds, and the roadside geometry.

Depression – An area which is low-lying and either has no surface water outlet or such a limited outlet that during storm event the area acts as a retention basin.

CMP – Corrugated Metal Pipe

Commercial Property Use – Residential developments with three or more dwelling units (triplex and above) per parcel or commercial developments. This is consistent with building permit administration in Port Orchard which treats triplex and above developments as commercial building permit applications.

Cover – Depth to top of pipe, conduit, casing or gallery below the grade of a road or ditch.

CSTC – Crushed Surfacing Top Course

Curb Cut – An access without a curb radius, generally used where lower traffic volumes are anticipated.

Curb Return – An access with a turning or curb radius. A curb return is generally used in higher traffic volumes to enable vehicles to turn safely off the roadway.

Critical Area – At a minimum, areas which include wetlands, areas with a critical recharging effect on aquifers used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, including unstable slopes, and associated areas and ecosystems.

Cul-de-sac – A short street having one end open to traffic and the other end temporarily or permanently terminated with a vehicle turnaround.

Curb Ramp – A short, depressed section of curb and sidewalk, normally placed at street intersections, designed to facilitate pedestrian travel of physically disadvantaged persons.

CY - Cubic Yard

DCD – Department of Community Development

Deceleration Lane – A speed change lane, including tapered areas, for the purpose of enabling a vehicle that is to make an exit turn from the roadway to slow to a safe turning speed after it has left the main stream of faster moving traffic.

Developer – Any person, firm, partnership, association, joint venture, corporation or any other entity responsible for a given project.

Design Speed – A speed determined for design and correlation of the physical features of a highway that influence vehicle operation: the maximum safe speed maintainable over a specified section of road when conditions permit design features to govern.

Developer Extension Agreement –

Director – The Director of the Port Orchard Public Works Department or his/her authorized representative.

Drain – Appurtenance to discharge accumulated liquids from a casing or other enclosure.

DNS – Determination of Non-significance

DS – Determination of Significance

Easement – The right to use a defined area of property for specific purpose/purposes as set forth in the easement document, on a plat or short plat, or as required for purposes as set forth herein.

Edge of Traveled Way – The face of curb for roads that are or will be constructed to urban standards and the edge of pavement (not shoulder) for roads that are or will be constructed to rural standards.

EIS – Environmental Impact Study

Encroachment – Occupancy of city right-of-way by non-roadway structures or other objects of any kind.

Engineer – Any Washington State licensed professional Engineer who represents the developer.

Eyebrow – A partial bulb located adjacent to the serving street that provides access to lots and serves as a vehicle turnaround.

Force Main – Any sewer main that transports wastewater under pressure.

Geometrics – The arrangement of the visible elements of a street such as alignment, grade, sight distance, widths, and slopes.

Grade – Rate or percent of change in slope, either ascending or descending from or along the roadway. It is measured along the centerline of the roadway or access point.

Grease Interceptor – An interceptor of at least 750 gallon capacity to serve one or more fixtures and which shall be remotely located.

Grease Trap – A device designed to retain grease from one to a maximum of four fixtures.

Grinder Pump – A pump that grinds sewage waste into a fine slurry and then pressurizes it to permit transport through small diameter force main pipes.

Half Street – Street improvements constructed along the entire property frontage utilizing half the regular width of the right-of-way and permitted as an interim facility pending construction of the other half of the street by the adjacent owner. In some instances, it may be necessary to construct more than half the street depending on the classification of the street.

HDPE – High Density Polyethylene Pipe

Infill Development – The development of a parcel of land in an already highly developed area.

Interceptor – A sewer that receives flow from a number of main or trunk sewers, force mains, etc.

Land Disturbing Activity – Any activity which results in a movement of earth or a change in the existing soil cover (both vegetative and non-vegetative) and/or the exiting soil topography. Land disturbing activities include, but are not limited to clearing, grading, filling, excavation and compaction associated with stabilization and/or road construction.

Land Surveyor – Professional Surveyor registered in the State of Washington to practice Land Surveying per RCW 18.43.

Latecomer's Agreement – A written contract between the City and the developer(s) providing the partial reimbursement of the cost of constructing the water and/or sewer facilities.

Lateral – That section of the sewer line extending from the City's main to the right-of-way or easement line (i.e. the building sewer) that has no other common sewers discharging into it.

Lot or Street Frontage – The distance between the two points where the lot lines intersect the boundary of www.cityofportorchard.us publicworks@cityofportorchard.us Updated 02/2019

the public street right-of-way.

Manhole – An opening in an underground utility system into which workers or others may enter for the purpose of making installations, inspections, repairs, connections, cleaning, and testing.

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MDNS – Mitigated Determination of Non-significance

Median – That portion of a divided roadway separating the traveled ways for traffic in opposite directions.

MUTCD – The Manual on Uniform Traffic Control Devices

Off-Street Parking Space – An area accessible to vehicles, exclusive of streets, sidewalks, and other pedestrian facilities, that is improved, maintained and used for the purpose of parking a motor vehicle.

Operating Speed – Used for determination of sight distance. Operating speed should be equal to the P85 speed for existing facilities and be equal to the design speed for new facilities, or as approved by the city engineer.

Passing Sight Distance – The minimum sight distance required for the driver of one vehicle to pass another vehicle safely and comfortably.

Pavement – The combination of sub base, base course, and surfacing placed on a sub grade to support the traffic load and distribute it to the sub grade.

Pavement Width – The distance measured from face of curb to face of curb for curbed sections of roadway or the distance measured from outside edge of shoulder to outside edge of shoulder for shouldered sections of roadway.

PCC – Portland Cement Concrete

Perimeter Streets – Public streets comprising the perimeter of a particular commercial/industrial development.

Permit – A document including any license, permit, or franchise, authorizing specified use of the public right-of-way, and granted under the provisions of the Port Orchard Municipal Code.

Plans – The plans, profiles, cross sections, elevations, details, and supplementary specifications, signed by a licensed professional engineer and approved by the City Engineer, which show the location, character, dimensions, and details of the work to be performed.

Planting Strip – The space between the edge of pavement or back of curb and the sidewalk.

POMC – Port Orchard Municipal Code

Posted Speed – Is the speed actually signed along the roadway.

PRC – Point of Reverse Curve

Pressure – Internal gage pressure in a pipe in pounds per square inch, gage (psig).

Private Driveway – Travel way with private ownership and maintenance that has limited or restricted access by the ownership for no more than two tax parcels or no more than two residential units.

Private Roadway – Travel way with private ownership and maintenance where general public use is limited or restricted at the discretion of the private ownership.

Private Sewer – That portion of the system located on private property where no easements are granted to the City. Maintenance of a private sewer shall be the responsibility of the property owner(s).

Professional Engineer – A professional civil engineer licensed to practice in the State of Washington.

Project – General term encompassing all phases of the work to be performed and is synonymous with the term “improvement” or “work.”

Public Street – Publicly owned and maintained street.

PVC – Point of Vertical Curve

PVC Pipe – Polyvinyl Chloride Pipe

PVI – Point of Vertical Intersection

PVT – Point of Tangency

Radius-Return Access Point – The intersection of an access point with a city road delineated by either pavement edges or curbs laid out at each edge in a curvilinear fashion between tangents formed by the edge of roadway (or curb face) and the edge of access point (driveway) pavement or curb face.

Record Drawing – The plan set, which is certified to contain a true and accurate representation of the actual field conditions for the project during construction and upon completion of construction.

Relocation – Planned change of location of an existing facility to a more advantageous place without changing the character or general physical nature of the facility.

Replacement – Installation of a like element of a utility system or subsystem in the same or near-same physical location normally due to damage, wear or obsolescence of the element.

Residential Property Use – Residential developments with two or less dwelling units (duplex or single family residence) per parcel. Consistent with building permit administration in Port Orchard which treats duplex or single family developments as residential building permit applications.

Restoration – All work necessary to replace, repair or otherwise restore the right of way and all features contained within to the same or equal condition as before any change or construction thereto.

Right-of-Way – A general term denoting public land, property, or interest therein (e.g. an easement) acquired for or devoted to a public street, public access or public use.

Road – The pavement section of a roadway. Used interchangeably with street.

Roadway – An open, generally public way for the passage of vehicles, persons and animals. Limits include the outside edge of sidewalks, or curbs and gutters, or side ditches, including the appertaining shoulder and all slopes, ditches, channels, waterways, and other features necessary for proper drainage and protection within the right-of-way.

SEPA – State Environmental Policy Act

Separate Turn Lane – An auxiliary lane for traffic in one direction which has been physically separated from the intersection area by a traffic island or stripe. Separate turn lanes may be included within intersections or separated from intersection areas by traffic islands.

Shoulder – That portion of the roadway contiguous with the traveled way for accommodating stopped vehicles, for emergency use, and for lateral support of base and surface courses.

Sleeve – Short casing through a pier, wall or abutment of a highway structure.

Speed Change Lane – A separate lane for the purpose of enabling a vehicle entering or leaving a roadway to increase (acceleration lane), or decrease (deceleration lane) its speed to a rate at which it can more safely merge with or diverge from through traffic.

S.T.E.P. Main – Septic Tank Effluent Pumping main. A low pressure, sewer force main that transports only effluent from S.T.E.P. tanks.

Stopping Sight Distance – The distance needed for a vehicle traveling at or near design speed to stop before reaching a stationary object in its path.

Stormwater Management Facilities – Constructed facilities that collect, convey, treat, detain or retain stormwater runoff. Stormwater management facilities may include such elements as concrete gutters, catch basins, manholes, storm pipes, Low Impact Development BMP's, detention or retention ponds, etc.

Street – Used interchangeably with road.

Traffic Control – Those activities necessary to safeguard the general public, as well as all workers, during the construction and maintenance of roadway and other facilities within the right-of-way.

Traveled Way – That portion of the roadway intended for the movement of vehicles, exclusive of shoulders.

Trenched – Installation of a utility in an open excavation.

Trip – A one-direction movement which begins at the origin and ends at the destination. For example, a trip movement from a residence to a work place is a trip from home to work.

Trip Distribution – The process by which the movement of trips between zones is estimated. The data for each distribution may be measured or estimated by a growth factor process or by a synthetic model.

Trip End – A trip origin or a trip destination. Trip ends for a location are the summation of origins and destinations. A trip has two ends, the origin and the destination. A site which has over some period of time 2,000 trips entering and 1,800 trips leaving and has 3,800 trip ends associated with it. Of these, 3,800 occur at locations other than the site in question.

Trip Generation – A general term describing the analysis and application of the relationships that exist between the trip makers, the traffic study area, and the trip making. It relates to the number of trip ends in any part of the traffic study area.

Unmaintained Road – A road within public right-of-way which is accessible to public travel but is not maintained by the city.

Unopened Right-of-Way – A public right-of-way that exists by dedication or deed, for which no vehicular roadway meeting these standards has been constructed by the city or other parties, and is unmaintained by the city.

Untrenched – Installation of a utility without breaking the ground or pavement surface such as by jacking or boring.

Utility – A company providing such public services including, but not limited to, gas, electric power, street lighting, telephone, water, sewer, or cable television, whether or not such company is privately owned or owned by a governmental entity.

Utility Attachment – A service line supported by a structure, e.g., culvert, bridge, retaining wall.

Vent – Appurtenance to discharge gaseous contaminants from casings or other enclosures.

Window Cut – A rectangular cut in asphalt or concrete pavement (typically ranging in size from 4 square feet to 100 square feet) undertaken by a utility company for repair of its underground facilities or to install an underground service connection.

WSDOT – Washington State Department of Transportation.

Appendix B – Standard Forms

List of Bond Forms:

Private Project Maintenance Bond Template
Private Project Performance Bond Template
Private Project Cash-Set-Aside Maintenance Agreement
Private Project Cash-Set-Aside Performance Agreement
ROW Maintenance Bond Template
ROW Performance Bond Template
ROW Cash-Set-Aside-Maintenance Agreement
ROW Cash-Set-Aside-Performance Agreement

List of Additional Forms:

Bill of Sales – Master Form
Utility Developer Extension Agreement

**CITY OF PORT ORCHARD
MAINTENANCE/WARRANTY BOND FOR PRIVATE SECTOR PROJECTS**

(Note: Before the Performance Bond can be released the City must receive the two years Maintenance/Warranty Bond)

Project #, Permit #, and Contract #: _____
Surety Bond #: _____
Date Posted: _____
Expiration Date: _____

RE: Project Name: _____
Owner/Developer/Contractor: _____
Project Address: _____

KNOW ALL PERSONS BY THESE PRESENTS: That we, _____ (hereinafter called the "Principal"), and _____, a corporation organized under the laws of the State of _____, and authorized to transact surety business in the State of Washington (hereinafter called the "Surety"), are held and firmly bound unto the City of Port Orchard, Washington, in the sum of _____ dollars (\$ _____) 20% Total Contract Amount, lawful money of the United States of America, for the payment of which sum we and each of us bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, by these presents. THE CONDITIONS of the above obligation are such that:

WHEREAS, the above named Principal has constructed and installed certain improvements on public property in connection with a project as described above within the City of Port Orchard; and

WHEREAS, the Principal is required to post a bond for the twenty-four (24) months following written and final acceptance of the project in order to provide security for the obligation of the Principal to repair and/or replace said improvements against defects in workmanship, materials or installation during the twenty-four (24) months after written and final approval/acceptance of the same by the City;

NOW, THEREFORE, this Maintenance Bond has been secured and is hereby submitted to the City. It is understood and agreed that this obligation shall continue in effect until released in writing by the City, but only after the Principal has performed and satisfied the following conditions:

A. The work or improvements installed by the Principal and subject to the terms and conditions of this Bond are as follows: (insert complete description of work here)

B. The Principal and Surety agree that the work and improvements installed in the above-referenced project shall remain free from defects in material, workmanship and installation (or, in the case of landscaping, shall survive,) for a period of twenty-four (24) months after written and final acceptance of the same and approval by the City. Maintenance is defined as acts carried out to prevent a decline, lapse or cessation of the state of the project or improvements as accepted by the City during the twenty-four (24) month period after final and written acceptance, and includes, but is not limited to, repair or replacement of defective workmanship, materials or installations.

C. The Principal shall, at its sole cost and expense, carefully replace and/or repair any damage or defects

in workmanship, materials or installation to the City-owned real property on which improvements have been installed, and leave the same in as good condition as it was before commencement of the work.

D. The Principal and the Surety agree that in the event any of the improvements or restoration work installed or completed by the Principal as described herein, fail to remain free from defects in materials, workmanship or installation (or in the case of landscaping, fail to survive), for a period of twenty-four (24) months from the date of approval/acceptance of the work by the City, the Principal shall repair and/replace the same within ten (10) days of demand by the City, and if the Principal should fail to do so, then the Surety shall:

1. Within twenty (20) days of demand of the City, make written commitment to the City that it will either:
 - a). remedy the default itself with reasonable diligence pursuant to a time schedule acceptable to the City; or
 - b). tender to the City within an additional ten (10) days the amount necessary, as determined by the City, for the City to remedy the default, up to the total bond amount.

Upon completion of the Surety's duties under either of the options above, the Surety shall then have fulfilled its obligations under this bond. If the Surety elects to fulfill its obligation pursuant to the requirements of subsection D(1)(b), the City shall notify the Surety of the actual cost of the remedy, upon completion of the remedy. The City shall return, without interest, any overpayment made by the Surety, and the Surety shall pay to the City any actual costs which exceeded the City estimate, limited to the bond amount.

2. In the event the Principal fails to make repairs or provide maintenance within the time period requested by the City, then the City, its employees and agents shall have the right at the City's sole election to enter onto said property described above for the purpose of repairing or maintaining the improvements. This provision shall not be construed as creating an obligation on the part of the City or its representatives to repair or maintain such improvements.

E. Corrections. Any corrections required by the City shall be commenced within ten (10) days of notification by the City and completed within thirty (30) days of the date of notification. If the work is not performed in a timely manner, the City shall have the right, without recourse to legal action, to take such action under this bond as described in Section D above.

F. Extensions and Changes. No change, extension of time, alteration or addition to the work to be performed by the Principal shall affect the obligation of the Principal or Surety on this bond, unless the City specifically agrees, in writing, to such alteration, addition, extension or change. The Surety waives notice of any such change, extension, alteration or addition thereunder.

G. Enforcement. It is specifically agreed by and between the parties that in the event any legal action must be taken to enforce the provisions of this bond or to collect said bond, the prevailing party shall be entitled to collect its costs and reasonable attorney fees as a part of the reasonable costs of securing the obligation hereunder. In the event of settlement or resolution of these issues prior to the filing of any suit, the actual costs incurred by the City, including reasonable attorney fees, shall be considered a part of the obligation hereunder secured. Said costs and reasonable legal fees shall be recoverable by the prevailing party, not only from the proceeds of this bond, but also over and above said bond as a part of any recovery (including recovery on the bond) in any judicial proceeding. The

Surety hereby agrees that this Agreement shall be governed by the laws of the State of Washington. Venue of any litigation arising out of this Agreement shall be in Kitsap County Superior Court.

H. Bond Expiration. This bond shall remain in full force and effect until the obligations secured hereby have been fully performed and until released in writing by the City at the request of the Surety or Principal.

DATED this _____ day of _____, 2015.

SURETY COMPANY
(Signature must be notarized)

DEVELOPER/OWNER
(Signature must be notarized)

By: _____
Its _____

By _____
Its _____

Business Name: _____

Business Name: _____

Business Address: _____

Business Address: _____

City/State/Zip Code: _____

City/State/Zip Code: _____

Telephone Number: _____

Telephone Number: _____

CITY OF PORT ORCHARD

By: _____
Its Public Works Director/City Engineer

Date: _____

CHECK FOR ATTACHED NOTARY SIGNATURE

- _____ **Individual (Form P-1)**
- _____ **Corporation (Form P-2)**
- _____ **Surety Company (Form P-2)**

FORM P-1 / NOTARY BLOCK
(Use For Individual/Sole Proprietor Only)

STATE OF WASHINGTON)
) ss.
COUNTY OF KITSAP)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)
NOTARY PUBLIC in and for the
State of Washington, residing
at: _____
My Commission expires: _____

FORM P-2 / NOTARY BLOCK
(Use For Partnership or Corporation Only)

(Developer/Owner)
STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)
NOTARY PUBLIC in and for the
State of Washington, residing
at: _____
My Commission expires: _____

NOTARY BLOCK

(Surety Company)

STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing

at: _____

My Commission expires: _____

**CITY OF PORT ORCHARD
PERFORMANCE BOND FOR PRIVATE SECTOR PROJECTS**

(Note: City must receive the two years Maintenance/Warranty Bond prior to releasing Performance Bond)

PROJECT #, PERMIT #, _____
CONTRACT # _____
SURETY BOND #: _____
DATE POSTED: _____
PROJECT COMPLETION DATE: _____

RE: Project Name: _____

Owner/Developer/Contractor: _____

Project Address: _____

KNOW ALL PERSONS BY THESE PRESENTS: That we, _____
(hereinafter called the "Principal"), and _____ a corporation organized under the laws of
the State of _____, and authorized to transact surety business in the State of Washington
(hereinafter called the "Surety"), are held and firmly bound unto the City of Port Orchard, Washington, in the
sum of _____ (\$ _____), 150% of the
total construction amount for Private Developers, lawful money of the United States of America, for the
payment of which sum we and each of us bind ourselves, our heirs, executors, administrators, successors and
assigns, jointly and severally, by these presents. THE CONDITIONS of the above obligation are such that:

WHEREAS, the above named Principal has entered into a certain agreement with the City, to
perform the following project within the City: _____
_____ ; and

WHEREAS, the agreement with the City requires that certain improvements be made as part of the
project; and that such improvements be constructed in full compliance with City standards, and the plans and
specifications as required by the City; and

WHEREAS, the agreement with the City requires that the improvements are to be made or
constructed within a certain period of time, unless an extension is granted in writing by the City; and

NOW, THEREFORE, it is understood and agreed that this obligation shall continue in effect until
released in writing by the City of Port Orchard, but only after the Principal has performed and satisfied the
following conditions:

A. Conditions.

1. The improvements to be constructed by the Principal include: (insert complete description here)

2. The Principal must construct the improvements to conform to the design, location, materials and other specifications for the indicated site improvements, as required by the City in the above-referenced project. In addition, the Principal must construct the improvements according to the applicable ordinances and standards of the City and/or state statutes, as the same now exist or are hereafter amended.
3. The Principal must have completed all improvements required by the above-referenced conditions, plans and City file within _____ which time period shall begin to run from the earlier of _____ unless an extension is granted by the City.
4. The Principal must have paid all sums owing to laborers, contractors, mechanics, subcontractors, material-men and suppliers or others as a result of such work for which a lien against any City property has arisen or may arise. The Principal shall indemnify and hold harmless the City of Port Orchard, its officers, officials and agents from any claim for such payment.
5. The Principal must obtain acceptance by the City of the work completed, all on or before thirty (30) days after the completion date set forth in Section A(3) above. Therefore, a Performance Bond in the amount of 150% of the anticipated construction costs to guarantee the Work to be completed shall be provided prior to the commencement of Work and will be released upon completion and acceptance of all Work and upon receipt of the 2-year Maintenance/Warranty Bond. All bonds must be in a form approved by the City.
6. The Principal shall indemnify and hold harmless the City of Port Orchard, its officers, officials and agents from any claims relating to defect(s) in any of the workmanship entering into any part of the work or designated equipment covered by the contract between the Principal and the City. Once the work has been completed and accepted by the City, and all other conditions of this Bond have been satisfied, this Performance bond will be released and replaced with a two (2) year Maintenance Bond, not to exceed the sum of _____ dollars (\$ _____), 20% of the total contract amount. This hold harmless and indemnification agreement shall survive the expiration of this Bond.

B. Default.

1. If the Principal defaults and does not perform the above conditions within the time specified, then the Surety shall, within twenty (20) days of demand of the City, make a written commitment to the City that it will either:
 - a). remedy the default itself with reasonable diligence pursuant to a time schedule acceptable to the City; or
 - b). tender to the City within an additional ten (10) days the amount necessary, as determined by the City, for the City to remedy the default, up to the total bond amount.

Upon completion of the Surety's duties under either of the options above, the Surety shall then have fulfilled its obligations under this bond. If the Surety elects to fulfill its obligation pursuant to the requirements of subsection B(1)(b), the City shall notify the Surety of the actual cost of the remedy, upon completion of the remedy. The City shall return, without interest, any overpayment made by the Surety, and the Surety shall pay to the City any actual costs, which exceeded the City's estimate, limited to the bond amount.

2. In the event the Principal fails to complete all of the above referenced improvements within the time period specified by the City, then the City, its employees and agents shall have the right at the City's sole election to enter onto said property described above for the purpose of completing the improvements. This provision shall not be construed as creating an obligation on the part of the City or its representatives to complete such improvements.
- C. Corrections. Any corrections required by the City shall be commenced within seven (7) days of notification by the City and completed within thirty (30) days of the date of notification. If the work is not performed in a timely manner, the City shall have the right, without recourse to legal action, to take such action under this Bond as described in Section B above.
- D. Extensions and Changes. No change, extension of time, alteration or addition to the terms of the contract or to the work to be performed by the Principal or the specifications accompanying the same shall in any way affect the obligation of the Principal or Surety on this bond, unless the City specifically agrees, in writing, to such alteration, addition, extension or change. The Surety waives notice of any such change, extension, alteration or addition thereunder. The Surety hereby agrees that modifications and changes may be made in the terms and provisions of the aforesaid contract without notice to Surety and any such modifications or changes increasing the total amount to be paid the Principal shall automatically increase the obligation on this Performance Bond in a like amount.
- E. Enforcement. It is specifically agreed by and between the parties that in the event any legal action must be taken to enforce the provisions of this bond or to collect said bond, the prevailing party shall be entitled to collect its costs and reasonable attorney fees as a part of the reasonable costs of securing the obligation hereunder. In the event of settlement or resolution of these issues prior to the filing of any suit, the actual costs incurred by the City, including reasonable attorney fees, shall be considered a part of the obligation hereunder secured. Said costs and reasonable legal fees shall be recoverable by the prevailing party, not only from the proceeds of this bond, but also over and above said bond as a part of any recovery (including recovery on the bond) in any judicial proceeding. The Surety hereby agrees that this Agreement shall be governed by the laws of the State of Washington. Venue of any litigation arising out of this Agreement shall be in Kitsap County Superior Court.
- F. Bond Expiration. This bond shall remain in full force and effect until the obligations secured hereby have been fully performed and a Maintenance Bond as described in Section A(6) of this Bond has been submitted to the City, in a form suitable to the City and until released in writing by the City.

DATED this _____ day of _____, 201 ____.

SURETY COMPANY
(Signature must be notarized)

DEVELOPER/OWNER
(Signature must be notarized)

By: _____
Its _____

By: _____
Its _____

Print Name: _____

Print Name: _____

Business Name: _____

Business Name: _____

Business Address: _____

Business Address: _____

City/State/Zip Code: _____

City/State/Zip Code: _____

Telephone Number: _____

Telephone Number: _____

CITY OF PORT ORCHARD

By: _____
Its: Public Works Director/City Engineer

Date: _____

CHECK FOR ATTACHED NOTARY SIGNATURE	
<input type="checkbox"/>	Individual (Form P-1)
<input type="checkbox"/>	Corporation (Form P-2)

FORM P-1 / NOTARY BLOCK
(Use For Individual/Sole Proprietor Only)

STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing
at: _____
My Commission expires: _____

FORM P-2 / NOTARY BLOCK - (Use For Partnership or Corporation Only)

STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the State of
Washington, residing
at: _____
My Commission expires: _____

(For Surety Company)

STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing
at: _____
My Commission expires: _____

**CITY OF PORT ORCHARD
CASH SET ASIDE AGREEMENT
MAINTENANCE – 2 YEAR WARRANTY PRIVATE SECTOR**

DATE POSTED: _____

PROJECT COMPLETION DATE: _____

Project Name and Permit No.: _____

Owner/Developer Contractor: _____

Project Address: _____

WHEREAS, _____ hereinafter referred to as "the Contractor" has applied to the City of Port Orchard, hereinafter referred to as "the City", to construct _____ for the project known as _____ on a site located at _____, in Port Orchard, Washington, and

WHEREAS, the Contractor has constructed and installed certain improvements in connection with the above described project; and

WHEREAS, in order to provide security for the obligation of the Contractor to repair and/or replace said improvements against defects in workmanship, materials or installation for a period of twenty-four (24)-months after written and final acceptance of the same and approval by the City; and

WHEREAS, in order to enable the City to release the performance bond or other instrument of security filed by the Contractor with the City in connection with the installation and/or construction of such improvements, this Cash Set Aside Agreement has been secured and hereby submitted to the City;

WHEREAS, _____ hereinafter referred to as "the Financial Institution" is a financial institution qualified to do business in the State of Washington, now, therefore,

NOW, THEREFORE, it is understood and agreed that this obligation shall continue in effect until released in writing by the City, after the Contractor has performed and satisfied the following conditions:

1. Escrow Account.

Developer shall establish an escrow account with the Financial Institution in the sum of _____ Dollars (\$ _____), 20% of Total Contract Amount. **Account No.** _____.

At no time shall any portion of the sums in said account be released without written authorization from the City. Such amount shall represent the City's estimate of the amount necessary to ensure repair and replacement of the improvements during the period of this Agreement, as established by the City.

2. Funds to Secure Implementation of Warranty. The City agrees to accept this Agreement in lieu of a maintenance bond to ensure the Contractor's warranty that the improvements constructed in conjunction with the project either remain free from defects in materials, workmanship or installation for a period of two (2)-years from the date of acceptance of the installation of the improvements by the City. The Institution agrees that it shall have no duty or right to evaluate the correctness or appropriateness of any such notice or demand by the City, and shall not interplead, or in any manner, delay payment of said funds to the City.
3. Contractor's Warranty. The Contractor hereby warrants that in the event any of the improvements installed by the Contractor pursuant to the above-referenced plans, conditions and specifications contained in the City's file, fail to remain free from defects in materials, workmanship or installation, or in the case of landscaping, that the landscaping fails to survive, for a period of two (2) years from the date of acceptance of the installation of the improvements by the City, then the Contractor shall either remedy the default, or forfeit the funds set aside in the escrow account for this purpose.
4. Contractor's Remedy of Default. If the Contractor decides to remedy the default, it shall within twenty (20) days of demand of the City make a written commitment to the City that it will: (a) remedy the default itself with reasonable diligence pursuant to a time schedule acceptable to the City; and (b) remedy the default.
5. Financial Institutions Release of Funds. In the event that the Contractor fails to remedy the defect as provided above, then the Institution shall, upon the demand of the City, remit to the City within ten days of receipt of said demand, the amount of funds in the escrow account, or such lesser amount as may be specified in the City's demand.
6. City's Completion of Corrections Under Warranty. In the event the Contractor fails to satisfactorily repair, replace or correct the improvements as requested by the City, the City's employees and agents are hereby authorized to enter onto said property and perform such work. Funds obtained by the City pursuant to paragraph 5 of this Agreement may be used by the City to restore said improvements and pay any and all sums owing to subcontractors, suppliers, laborers, materialmen, suppliers, subcontractors or others as a result of such work for which a lien against any City property or property where the improvements are located, has arisen or may arise. Further, said funds may be used to cover the cost of correcting any damage which may have occurred off-site due to disrepair of the project, including damage, if any, to public property. This provision shall not be construed as creating any obligation on the City, its employees, agents and representatives to perform such corrective work.
7. Inspection. The Contractor shall pay all additional costs of the City incurred in the administration of this Agreement. As long as payment for such services has been made, the Director of Public Works or his/her designee shall periodically inspect said improvements while under the two-year warranty period and inspect completed improvements insofar as possible within five (5) working days after receiving written notice that the repairs have been completed. Lack of inspection within said five (5) days, however, shall not signify the City's approval.
8. Expiration. This Agreement shall remain in full force and effect for a period of two (2)-years after final acceptance of the improvements by the City; the obligations secured hereby have been fully performed and formal written notice from the City has been submitted to and

received by the Contractor, releasing the Contractor from further obligation to restore improvements.

- 9. Enforcement. It is specifically agreed by and between the parties that in the event any legal action must be taken to enforce the provisions of this Agreement or to collect the funds in the escrow account, the prevailing party shall be entitled to collect its costs and reasonable attorneys fees as a part of the reasonable costs of securing the obligation hereunder. In the event of settlement or resolution of these issues prior to the filing of any suit, the actual costs incurred by the City, including reasonable attorneys fees, shall be considered a part of the obligation hereunder secured. Said costs and reasonable legal fees shall be recoverable by the prevailing party, not only from the funds set aside, but also over and above the funds in the account as a part of any recovery in any judicial proceeding.

The Institution hereby agrees that this Agreement shall be governed by the laws of the State of Washington. Venue of any litigation arising out of this Agreement shall be in Kitsap County Superior Court.

DATED this _____ day of _____, 20__.

FINANCIAL INSTITUTION
(Signature must be notarized)

By: _____
Print Name: _____

Its _____

Business Name: _____

Business Address: _____

City/State/Zip Code: _____

Telephone Number: _____

CONTRACTOR/DEVELOPER/OWNER
(Signature must be notarized)

By _____
Print Name: _____

Its _____

Business Name: _____

Business Address: _____

City/State/Zip Code: _____

Telephone Number: _____

CITY OF PORT ORCHARD

By: _____
Print Name: _____

Its _____

Public Works Director

Date: _____

City of Port Orchard
216 Prospect Street
Port Orchard, WA 98366
(360) 876-4991

CHECK FOR ATTACHED NOTARY SIGNATURE

- _____ Individual (Form P-1)
- _____ Partnership or Corporation (Form P-2)
- _____ Financial Institution (Form P-3)

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing

at: _____

My Commission expires: _____

FORM P-3

(Use for Financial Institution Only)

STATE OF WASHINGTON)

) ss.

COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing

at: _____

My Commission expires: _____

**CITY OF PORT ORCHARD
PRIVATE SECTOR
CASH SET ASIDE PERFORMANCE AGREEMENT**

DATE POSTED: _____
PROJECT COMPLETION DATE: _____
PERMIT NO: _____

RE: PROJECT/SUBDIVISION/PLAT: _____
OWNER/DEVELOPER/CONTRACTOR: _____
PROJECT ADDRESS: _____

WHEREAS, _____ hereinafter referred to as "the Contractor" has applied to the City of Port Orchard, hereinafter referred to as "the City", to construct _____ for the project known as _____ on a site located at _____, in Port Orchard, Washington, and

WHEREAS, the Contractor is required to construct certain improvements in connection with the above described project and that such improvements must be constructed in full compliance with City standards, the plans and specifications and/or the approvals or permits; and

WHEREAS, the agreement and/or approvals or permit require that these improvements are to be made, constructed or installed within a certain period of time, unless an extension is granted in writing by the City; and

WHEREAS, hereinafter referred to as "the Financial Institution" is a financial institution qualified to do business in the State of Washington, now, therefore,

NOW, THEREFORE, it is understood and agreed that this obligation shall continue in effect until released in writing by the City, after the Contractor has performed and satisfied the following conditions:

1. Escrow Account

Developer shall establish an escrow account with the Financial Institution in the sum of _____ (\$_____.____), which is 150% of the total contract amount or cost of installation of the improvements/landscaping.

Account No. _____.

At no time shall any portion of the sums in said account be released without written authorization from the City. Such amount shall represent the City's estimate of the amount necessary to ensure repair and replacement of the improvements during the period of this Agreement, as established by the City.

2. Funds to Secure Performance

The City agrees to accept this Agreement in lieu of a performance bond to ensure the Contractor's construction of the improvements to conform to the design, location, materials and

other specifications for the indicated site improvements, as required by the City in the agreement/approvals/permit for the above-referenced project. In addition, the Contractor shall construct the improvements according to the applicable ordinances and standards of the City and/or state statutes, as the same now exist or are hereafter amended. The specific conditions secured by this Cash Set Aside are:

3. **Deadline**

The Contractor must have completed all of the above improvements within _____, which time period shall being to run from the earlier of _____, unless an extension is granted by the City.

4. **Liens – Hold Harmless**

The Contractor must have paid all sums owing to laborers, contractors, mechanics, subcontractors, material-men and suppliers or others as a result of such work for which a lien against any City property has arisen or may arise. The Contractor shall indemnify and hold harmless the City of Port Orchard, its officers, officials and agents from any claim for such payment(s).

5. **Indemnification**

The Contractor shall indemnify and hold harmless the City of Port Orchard, its officers, officials and agents from any and all claims relating to defect(s) in any of the workmanship entering into any part of the work or designated equipment covered by the contract/permit/approval. Once the work has been completed and accepted by the City, and all other conditions of this Cash Set Aside Performance Agreement have been satisfied, this Cash Set Aside Performance Agreement will be released (as set forth in Section 9 below) and replaced with a two (2) year Maintenance Bond or Cash Set Aside Maintenance Agreement, not to exceed the sum of \$ _____, which is not less than 20% of the total contract amount. This hold harmless and indemnification agreement shall survive the expiration of this Cash Set Aside.

6. **Contractor's Warranty**

The Contractor hereby warrants that in the event any of the improvements installed by the Contractor pursuant to the above-referenced plans, conditions and specifications contained in the City's file, fail to remain free from defects in materials, workmanship or installation, or in the case of landscaping, that the landscaping fails to survive, for a period of two (2) years from the date of acceptance of the installation of the improvements by the City, then the Contractor shall either remedy the default, or forfeit the funds set aside in the escrow account for this purpose.

7. **Acceptance by City**

The Contractor must obtain acceptance by the City of the work completed, or in the case of landscaping, installation of such landscaping, all on or before thirty (30) days after the completion date set forth in Section (3) above.

8. **Default**

If the Contractor defaults and does not perform the above conditions within the time specified, then the City may demand that the Contractor perform as required herein. If the Contractor decides to remedy the default, it shall within twenty (20) days of demand of the City make a written commitment to the City that it will: (a) remedy the default itself with reasonable

diligence pursuant to a time schedule acceptable to the City; and (b) remedy the default.

9. Financial Institution's Release of Funds

In the event that the Contractor fails to remedy the defect as provided above, then the Institution shall, upon the demand of the City, remit to the City within ten days of receipt of said demand, the amount of funds in the escrow account, or such lesser amount as may be specified in the City's demand. The Institution agrees that it shall have no duty or right to evaluate the correctness or appropriateness of any such notice or demand by the City, and shall not interplead, or in any manner, delay payment of said funds to the City.

10. City's Completion of Corrections Under Warranty

In the event the Contractor fails to satisfactorily repair, replace or correct the improvements as requested by the City, the City's employees and agents are hereby authorized to enter onto said property and perform such work. Funds obtained by the City pursuant to paragraph 9 of this Agreement may be used by the City to restore said improvements and pay any and all sums owing to subcontractors, suppliers, laborers, materialmen, suppliers, subcontractors or others as a result of such work for which a lien against any City property or property where the improvements are located, has arisen or may arise. Further, said funds may be used to cover the cost of correcting any damage which may have occurred off-site due to disrepair of the project, including damage, if any, to public property. This provision shall not be construed as creating any obligation on the City, its employees, agents and representatives to perform such corrective work.

11. Inspection

The Contractor shall pay all additional costs of the City incurred in the administration of this Agreement. As long as payment for such services has been made, the Director of Public Works or his/her designee shall periodically inspect said improvements while under the two-year warranty period and inspect completed improvements insofar as possible within five (5) working days after receiving written notice that the repairs have been completed. Lack of inspection within said five (5) days, however, shall not signify the City's approval.

12. Expiration

Once the work has been completed and accepted by the City and all other conditions of this agreement have been satisfied, this Cash Set Aside Performance Agreement will be released and replaced with a two (2) year Maintenance Bond or two (2) year Cash Set Aside Maintenance Agreement, not to exceed the sum of _____ dollars (\$ _____) which is 20% of the total contract amount. This hold harmless and indemnification agreement shall survive the expiration of this Bond.

13. Enforcement

It is specifically agreed by and between the parties that in the event any legal action must be taken to enforce the provisions of this Agreement or to collect the funds in the escrow account, the prevailing party shall be entitled to collect its costs and reasonable attorneys fees as a part of the reasonable costs of securing the obligation hereunder. In the event of settlement or resolution of these issues prior to the filing of any suit, the actual costs incurred by the City, including reasonable attorneys fees, shall be considered a part of the obligation hereunder secured. Said costs and reasonable legal fees shall be recoverable by the prevailing party, not

only from the funds set aside, but also over and above the funds in the account as a part of any recovery in any judicial proceeding.

The Institution hereby agrees that this Agreement shall be governed by the laws of the State of Washington. Venue of any litigation arising out of this Agreement shall be in Kitsap County Superior Court.

DATED this _____ day of _____, 20__.

FINANCIAL INSTITUTION
Signature must be notarized

CONTRACTOR/DEVELOPER/OWNER
Signature must be notarized

BY: _____	BY: _____
PRINTED NAME: _____	PRINTED NAME: _____
ITS: _____	ITS: _____
BUSINESS NAME: _____	BUSINESS NAME: _____
BUSINESS ADDRESS: _____	BUSINESS ADDRESS: _____
CITY/STATE/ZIP: _____	CITY/STATE/ZIP: _____
PHONE NUMBER: _____	PHONE NUMBER: _____

CITY OF PORT ORCHARD

BY: _____
PRINTED NAME: MARK DORSEY, P.E.
ITS: CITY ENGINEER
BUSINESS NAME: CITY OF PORT ORCHARD
BUSINESS ADDRESS: 216 PROSPECT STREET
CITY/STATE/ZIP: PORT ORCHARD, WA 98366
PHONE NUMBER: 360.876.4407

<p align="center">CHECK FOR ATTACHED NOTARY SIGNATURE</p> <p><input type="checkbox"/> Individual – Form P-1</p> <p><input type="checkbox"/> Partnership or Corporation – Form P-2</p> <p><input type="checkbox"/> Financial Institution – Form P-3</p>

**CITY OF PORT ORCHARD
MAINTENANCE/WARRANTY BOND FOR PRIVATE SECTOR PROJECTS
WITHIN THE CITY'S RIGHT OF WAY**

(Note: Before the Performance Bond can be released the City must receive this two-year Maintenance/Warranty Bond)

Permit #: _____
Surety Bond #: _____
Date Posted: _____
Expiration Date: _____

RE: Project Name: _____
Contractor: _____
Project Address: _____

KNOW ALL PERSONS BY THESE PRESENTS: That we, _____ (hereinafter called the "Principal"), and _____, a corporation, organized and existing under and by virtue of the laws of the State of _____, and duly authorized to transact business in the State of Washington, as surety (hereinafter called the "Surety"), are held and firmly bound unto the City of Port Orchard, Washington, for and in behalf of [*Name of Project*] in the sum of _____ dollars (\$_____), 20% of the total construction amount, lawful money of the United States of America, for the payment of which sum well and truly be made, we and each of us bind ourselves, our heirs, executors, administrators, successors and assigns, jointly, severally and firmly, by these presents.

THE CONDITIONS of the above obligation are such that:

WHEREAS, the above named Principal has performed certain construction work within the City right-of-way (ROW) in connection with the project referenced above within the City of Port Orchard; and

WHEREAS, the Principal is required to post a bond for the twenty-four (24) months following written and final acceptance of the project in order to provide security for the obligation of the Principal to repair and/or replace said improvements against defects in workmanship, materials or installation during the twenty-four (24) months after written and final approval/acceptance of the same by the City;

NOW, THEREFORE, this Maintenance Bond has been secured and is hereby submitted to the City. It is understood and agreed that this obligation shall continue in effect until released in writing by the City, but only after the Principal has performed and satisfied the following conditions:

A. The construction work performed by the Principal and subject to the terms and conditions of this Bond are as follows: (insert complete description of work here)

B. The Principal and Surety agree that the construction work performed in connection with the above-referenced project shall remain free from defects in material, workmanship and installation for a period of twenty-four (24) months after written and final acceptance of the same and approval by the City. Maintenance is defined as acts carried out to prevent a decline, lapse or cessation of the state of the project or improvements as accepted by the City during the twenty-four (24) month period after final and written acceptance, and includes, but is not limited to, repair or replacement of defective workmanship, materials or

installations.

C. The Principal shall, at its sole cost and expense, carefully replace and/or repair any damage or defects in workmanship, materials or installation in the City ROW on which construction work has been performed, and leave the same in as good condition as it was before commencement of the work.

D. The Principal and the Surety agree that in the event any of the construction work performed by the Principal as described herein, fails to remain free from defects in materials, workmanship or installation for a period of twenty-four (24) months from the date of approval/acceptance of the work by the City, the Principal shall repair and/replace the same within ten (10) days of demand by the City, and if the Principal should fail to do so, then the Surety shall:

1. Within twenty (20) days of demand of the City, make written commitment to the City that it will either:
 - a). remedy the default itself with reasonable diligence pursuant to a time schedule acceptable to the City; or
 - b). tender to the City, within an additional ten (10) days, the amount necessary, as determined by the City, for the City to remedy the default, up to the total bond amount.

Upon completion of the Surety's duties under either of the options above, the Surety shall then have fulfilled its obligations under this Bond. If the Surety elects to fulfill its obligation pursuant to the requirements of subsection D(1)(b), the City shall notify the Surety of the actual cost of the remedy, upon completion of the remedy. The City shall return, without interest, any overpayment made by the Surety, and the Surety shall pay to the City any actual costs that exceeded the City estimate, limited to the bond amount.

2. In the event the Principal fails to make repairs or provide maintenance within the time period requested by the City, then the City, its employees and agents shall have the right at the City's sole election to enter onto said property described above for the purpose of repairing or maintaining the improvements. This provision shall not be construed as creating an obligation on the part of the City or its representatives to repair or maintain such improvements.

E. Corrections. Any corrections required by the City shall be commenced within ten (10) days of notification by the City and completed within thirty (30) days of the date of notification. If the work is not performed in a timely manner, the City shall have the right, without recourse to legal action, to take such action under this Bond as described in Section D above.

F. Extensions and Changes. No change, extension of time, alteration or addition to the work to be performed by the Principal shall affect the obligation of the Principal or Surety on this Bond, unless the City specifically agrees, in writing, to such alteration, addition, extension or change. The Surety waives notice of any such change, extension, alteration or addition thereunder.

G. Enforcement. It is specifically agreed by and between the parties that in the event any legal action must be taken to enforce the provisions of this Bond or to collect said Bond, the prevailing party shall be entitled to collect its costs and reasonable attorney fees as a part of the reasonable costs of securing the obligation hereunder. In the event of settlement or resolution of these issues prior to the filing of any suit, the actual costs incurred by the City, including reasonable attorney fees, shall be considered a part of the obligation hereunder secured. Said costs and reasonable legal fees shall be recoverable by the prevailing party, not only from the proceeds of this Bond, but also over and above said Bond as a part of any recovery (including recovery on the Bond) in any judicial proceeding.

The Surety hereby agrees that this Agreement shall be governed by the laws of the State of Washington. Venue of any litigation arising out of this Agreement shall be in Kitsap County Superior Court.

H. Bond Expiration. This Bond shall remain in full force and effect until the obligations secured hereby have been fully performed and until released in writing by the City at the request of the Surety or Principal.

DATED this _____ day of _____, 201_.

SURETY COMPANY
(Signature must be notarized)

PRINCIPAL
(Signature must be notarized)

By: _____
Its _____

By _____
Its _____

Business Name: _____

Business Name: _____

Business Address: _____

Business Address: _____

City/State/Zip Code: _____

City/State/Zip Code: _____

Telephone Number: _____

Telephone Number: _____

CITY OF PORT ORCHARD

By: _____
Its Public Works Director/City Engineer

Date: _____

CHECK FOR ATTACHED NOTARY SIGNATURE
____ **Individual (Form P-1)**
____ **Corporation (Form P-2)**
____ **Surety Company (Form P-3)**

FORM P-1 / NOTARY BLOCK
(Use For Individual/Sole Proprietor Only)

STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing

at: _____

My Commission expires: _____

FORM P-2 / NOTARY BLOCK
(Use For Partnership or Corporation Only)

STATE OF WASHINGTON)

COUNTY OF

) ss.
)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing
at: _____
My Commission expires: _____

**CITY OF PORT ORCHARD
PERFORMANCE BOND FOR PRIVATE SECTOR PROJECTS
WITHIN THE CITY'S RIGHT OF WAY**

(Note: City must receive the two-year Maintenance/Warranty Bond prior to releasing this Performance Bond)

PERMIT #, _____
SURETY BOND #: _____
DATE POSTED: _____
PROJECT COMPLETION DATE: _____

RE: Project Name: _____
Contractor: _____
Project Address: _____

KNOW ALL PERSONS BY THESE PRESENTS: That we, _____
(hereinafter called the "Principal"), and _____ a corporation, organized and existing
under and by virtue of the laws of the State of _____, and duly authorized to transact business
in the State of Washington, as surety (hereinafter called the "Surety"), are held and firmly bound unto the
City of Port Orchard, Washington, for and in behalf of [Name of Project] in the sum of _____
_____ (\$ _____), 150% of the total construction amount,
lawful money of the United States of America, for the payment of which sum well and truly be made, we and
each of us bind ourselves, our heirs, executors, administrators, successors and assigns, jointly, severally and
firmly, by these presents.

THE CONDITIONS of the above obligation are such that:

WHEREAS, the above named Principal has obtained a certain permit from the City, to perform the
following project within the City right-of-way (ROW): _____
_____ ; and

WHEREAS, the permit requires that the project be constructed in full compliance with City
standards, and any plans and specifications as required by the City; and

WHEREAS, the permit requires that the project is to be constructed within a certain period of time,
unless an extension is granted in writing by the City;

NOW, THEREFORE, it is understood and agreed that this obligation shall continue in effect until
released in writing by the City of Port Orchard, but only after the Principal has performed and satisfied the
following conditions:

A. Conditions.

1. The improvements to be constructed by the Principal include: (insert complete description here)

2. The Principal must construct the improvements to conform to the design, location, materials
and other specifications as required by the City in the above-referenced project. In addition,
the Principal must construct the improvements according to the applicable ordinances and
standards of the City and/or state statutes, as the same now exist or are hereafter amended.

3. The Principal must have completed all project work by the Project Completion Date set forth above unless an extension is granted by the City.
4. The Principal must have paid all sums owing to laborers, contractors, mechanics, subcontractors, material-men and suppliers or others as a result of such work for which a lien against any City property has arisen or may arise. The Principal shall indemnify and hold harmless the City of Port Orchard, its officers, officials and agents from any claim for such payment.
5. The Principal must obtain acceptance by the City of the work completed within thirty (30) days after the Project Completion Date set forth above or any extension thereof granted by the City. This Performance Bond, in the amount of 150% of the anticipated construction costs, to guarantee the Work to be completed must be provided prior to the commencement of work on the project and will be released upon completion and acceptance of all work on the project, and upon receipt of the 2-year Maintenance/Warranty Bond. All bonds must be in a form approved by the City.
6. The Principal shall indemnify and hold harmless the City of Port Orchard, its officers, officials and agents from any claims relating to defect(s) in any of the workmanship entering into any part of the work or designated equipment for the project. Once the work has been completed and accepted by the City, and all other conditions of this Bond have been satisfied, this Performance Bond will be released and replaced with a two (2) year Maintenance Bond, not to exceed the sum of _____ dollars (\$ _____), or 20% of the total construction amount. This hold harmless and indemnification agreement shall survive the expiration of this Bond.

B. Default.

1. If the Principal defaults and does not perform the above conditions within the time specified, then the Surety shall, within twenty (20) days of demand of the City, make a written commitment to the City that it will either:
 - a). remedy the default itself with reasonable diligence pursuant to a time schedule acceptable to the City; or
 - b). tender to the City, within an additional ten (10) days, the amount necessary, as determined by the City, for the City to remedy the default, up to the total bond amount.

Upon completion of the Surety's duties under either of the options above, the Surety shall then have fulfilled its obligations under this Bond. If the Surety elects to fulfill its obligation pursuant to the requirements of subsection B(1)(b), the City shall notify the Surety of the actual cost of the remedy, upon completion of the remedy. The City shall return, without interest, any overpayment made by the Surety, and the Surety shall pay to the City any actual costs that exceeded the City's estimate, limited to the bond amount.

2. In the event the Principal fails to complete all of the above referenced improvements within the time period specified by the City, then the City, its employees and agents shall have the right at the City's sole election to enter onto said property described above for the purpose of completing the improvements. This provision shall not be construed as creating an obligation on the part of the City or its representatives to complete such improvements.

- C. Corrections. Any corrections required by the City shall be commenced within seven (7) days of notification by the City and completed within thirty (30) days of the date of notification. If the work is not performed in a timely manner, the City shall have the right, without recourse to legal action, to take such action under this Bond as described in Section B above.

- D. Extensions and Changes. No change, extension of time, alteration or addition to the work to be performed by the Principal or the specifications accompanying the same shall in any way affect the obligation of the Principal or Surety on this bond, unless the City specifically agrees, in writing, to such alteration, addition, extension or change. The Surety waives notice of any such change, extension, alteration or addition thereunder. The Surety hereby agrees that modifications and changes may be made in the terms and provisions of the work to be performed without notice to Surety and any such modifications or changes increasing the total construction amount shall automatically increase the obligation on this Performance Bond in a like amount.

- E. Enforcement. It is specifically agreed by and between the parties that in the event any legal action must be taken to enforce the provisions of this Bond or to collect said Bond, the prevailing party shall be entitled to collect its costs and reasonable attorney fees as a part of the reasonable costs of securing the obligation hereunder. In the event of settlement or resolution of these issues prior to the filing of any suit, the actual costs incurred by the City, including reasonable attorney fees, shall be considered a part of the obligation hereunder secured. Said costs and reasonable legal fees shall be recoverable by the prevailing party, not only from the proceeds of this Bond, but also over and above said Bond as a part of any recovery (including recovery on the Bond) in any judicial proceeding. The Surety hereby agrees that this Agreement shall be governed by the laws of the State of Washington. Venue of any litigation arising out of this Agreement shall be in Kitsap County Superior Court.

- F. Bond Expiration. This Bond shall remain in full force and effect until the obligations secured hereby have been fully performed and a Maintenance Bond as described in Section A(6) of this Bond has been submitted to the City, in a form suitable to the City, and until released in writing by the City.

DATED this _____ day of _____, 20__.

SURETY COMPANY
(Signature must be notarized)

PRINCIPAL
(Signature must be notarized)

By: _____

By _____

Its _____

Its _____

Print Name: _____

Print Name: _____

Business Name: _____

Business Name: _____

Business Address: _____

Business Address: _____

City/State/Zip Code: _____

City/State/Zip Code: _____

Telephone Number: _____

Telephone Number: _____

CITY OF PORT ORCHARD

By: _____
Its: Public Works Director/City Engineer

Date: _____

STAFF ONLY:

CHECK FOR ATTACHED NOTARY SIGNATURE

- Individual (Form P-1)
- Corporation (Form P-2)
- Surety Company (Form P-3)**

FORM P-1 / NOTARY BLOCK
(Use For Individual/Sole Proprietor Only)

STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____
Signed: _____

(print or type name)

NOTARY PUBLIC in and for the State of
Washington, residing
at: _____
My Commission expires: _____

FORM P-2 / NOTARY BLOCK
(Use For Partnership or Corporation Only)

STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

Signed: _____

(print or type name)

NOTARY PUBLIC in and for the State of
Washington, residing
at: _____

My Commission expires: _____

CITY OF PORT ORCHARD
CASH SET ASIDE MAINTENANCE AGREEMENT
2 YEAR WARRANTY FOR PRIVATE SECTOR PROJECTS
WITHIN THE CITY'S RIGHT OF WAY

(Note: Before the Performance Bond can be released the City must receive this two-year Maintenance/Warranty Cash Set Aside Agreement)

PERMIT #: _____
DATE POSTED: _____
PROJECT COMPLETION DATE: _____

Project Name: _____
Contractor: _____
Project Address: _____

WHEREAS, _____ hereinafter referred to as "the Contractor" has performed certain construction work within the City of Port Orchard right-of-way (ROW) in connection with the project referenced above within the City of Port Orchard, hereinafter referred to as "the City," and

WHEREAS, the City requires security for the obligation of the Contractor to repair and/or replace said improvements against defects in workmanship, materials or installation for a period of twenty-four (24) months after written and final acceptance of the same and approval by the City; and

WHEREAS, in order to enable the City to release the performance bond or other instrument of security filed by the Contractor with the City in connection with the installation and/or construction of such improvements, this Cash Set Aside Maintenance Agreement has been secured and hereby submitted to the City; and

WHEREAS, _____, hereinafter referred to as "the Financial Institution," is a financial institution qualified to do business in the State of Washington;

NOW, THEREFORE, it is understood and agreed that this obligation shall continue in effect until released in writing by the City, after the Contractor has performed and satisfied the following conditions:

1. Escrow Account.

Contractor shall establish an escrow account with the Financial Institution in the sum of _____ Dollars (\$ _____),
20% of Total Contract Amount. **Account No.** _____.

At no time shall any portion of the sums in said account be released without written authorization from the City. Such amount shall represent the City's estimate of the amount necessary to ensure repair and replacement of the improvements during the period of this Agreement, as established by the City.

2. Funds to Secure Implementation of Warranty. The City agrees to accept this Agreement in lieu of a maintenance bond to ensure the Contractor's warranty that the improvements constructed in conjunction with the project remain free from defects in materials, workmanship or installation for a period of two (2) years from the date of acceptance of the installation of the improvements by the City. The Financial Institution agrees that it shall have no duty or right to evaluate the correctness or appropriateness of any such notice or demand by the City, and shall not interplead or in any manner delay payment of said funds to the City.
3. Contractor's Warranty. The Contractor hereby warrants that in the event any of the improvements installed by the Contractor pursuant to the above-referenced plans, conditions and specifications contained in the City's file, fail to remain free from defects in materials, workmanship or installation for a period of two (2) years from the date of acceptance of the installation of the improvements by the City, then the Contractor shall either remedy the default, or forfeit the funds set aside in the escrow account for this purpose.
4. Contractor's Remedy of Default. If the Contractor decides to remedy the default, it shall within twenty (20) days of demand of the City: (a) make a written commitment to the City that it will remedy the default itself with reasonable diligence pursuant to a time schedule acceptable to the City; and (b) remedy the default.
5. Financial Institutions Release of Funds. In the event that the Contractor fails to remedy the defect as provided above, then the Financial Institution shall, upon the demand of the City, remit to the City within ten (10) days of receipt of said demand, the amount of funds in the escrow account, or such lesser amount as may be specified in the City's demand.
6. City's Completion of Corrections Under Warranty. In the event the Contractor fails to satisfactorily repair, replace or correct the improvements as requested by the City, the City's employees and agents are hereby authorized to enter onto said property and perform such work. Funds obtained by the City pursuant to paragraph 5 of this Agreement may be used by the City to restore said improvements and pay any and all sums owing to subcontractors, suppliers, laborers, materialmen, suppliers, subcontractors or others as a result of such work for which a lien against any City property or property where the improvements are located, has arisen or may arise. Further, said funds may be used to cover the cost of correcting any damage which may have occurred off-site due to disrepair of the project, including damage, if any, to public property. This provision shall not be construed as creating any obligation on the City, its employees, agents and representatives to perform such corrective work.
7. Inspection. The Contractor shall pay all additional costs of the City incurred in the administration of this Agreement. As long as payment for such services has been made, the Director of Public Works or his/her designee shall periodically inspect said improvements while under the two (2) year warranty period and inspect completed improvements insofar as possible within five (5) working days after receiving written notice that the repairs have been completed. Lack of inspection within said five (5) days, however, shall not signify the City's approval.
8. Expiration. This Agreement shall remain in full force and effect for a period of two (2) years after final acceptance of the improvements by the City; and until the obligations secured hereby have been fully performed; and until formal written notice from the City has been submitted to

and received by the Contractor, releasing the Contractor from further obligation to restore said improvements.

- 9. Enforcement. It is specifically agreed by and between the parties that in the event any legal action must be taken to enforce the provisions of this Agreement or to collect the funds in the escrow account, the prevailing party shall be entitled to collect its costs and reasonable attorneys fees as a part of the reasonable costs of securing the obligation hereunder. In the event of settlement or resolution of these issues prior to the filing of any suit, the actual costs incurred by the City, including reasonable attorneys fees, shall be considered a part of the obligation hereunder secured. Said costs and reasonable legal fees shall be recoverable by the prevailing party, not only from the funds set aside, but also over and above the funds in the account as a part of any recovery in any judicial proceeding.

The parties, including the Financial Institution, hereby agree that this Agreement shall be governed by the laws of the State of Washington. Venue of any litigation arising out of this Agreement shall be in Kitsap County Superior Court.

DATED this _____ day of _____, 20__.

FINANCIAL INSTITUTION
(Signature must be notarized)
By: _____
Print Name: _____
Its _____
Business Name: _____
Business Address: _____
City/State/Zip Code: _____
Telephone Number: _____

CONTRACTOR/DEVELOPER/OWNER
(Signature must be notarized)
By _____
Print Name: _____
Its _____
Business Name: _____
Business Address: _____
City/State/Zip Code: _____
Telephone Number: _____

CITY OF PORT ORCHARD

By: _____
Print Name: _____
Its _____
Public Works Director
Date: _____

City of Port Orchard
216 Prospect Street
Port Orchard, WA 98366
(360) 876-4991

CHECK FOR ATTACHED NOTARY SIGNATURE
____ Individual (Form P-1)
____ Partnership or Corporation (Form P-2)
____ Financial Institution (Form P-3)

FORM P-3

(Use for Financial Institution Only)

STATE OF _____)
) ss.
COUNTY OF _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing
at: _____
My Commission expires: _____

CITY OF PORT ORCHARD
CASH SET ASIDE PERFORMANCE AGREEMENT FOR PRIVATE SECTOR PROJECTS
WITHIN THE CITY'S RIGHT OF WAY

(Note: City must receive the two-year Maintenance/Warranty surety prior to releasing the Performance Cash Set Aside)

DATE POSTED: _____
PROJECT COMPLETION DATE: _____
PERMIT NO: _____

RE: PROJECT NAME: _____
CONTRACTOR: _____
PROJECT ADDRESS: _____

WHEREAS, _____ hereinafter referred to as "the Contractor" has obtained a permit from the City of Port Orchard, hereinafter referred to as "the City", to perform the following project with the City right-of-way (ROW):
_____, and

WHEREAS, the permit requires that the project be constructed in full compliance with City standards, and any plans and specifications as required by the City; and

WHEREAS, the permit requires that the project be constructed within a certain period of time, unless an extension is granted in writing by the City; and

WHEREAS, _____, hereinafter referred to as "the Financial Institution," is a financial institution qualified to do business in the State of Washington;

NOW, THEREFORE, it is understood and agreed that this obligation shall continue in effect until released in writing by the City, after the Contractor has performed and satisfied the following conditions:

1. **Escrow Account**
Developer shall establish an escrow account with the Financial Institution in the sum of _____ (\$ _____), which is 150% of the total contract amount or cost of installation of the improvements/landscaping.

Account No. _____.

At no time shall any portion of the sums in said account be released without written authorization from the City. Such amount shall represent the City's estimate of the amount necessary to ensure repair and replacement of the improvements during the period of this Agreement, as established by the City.

2. **Funds to Secure Performance**
The City agrees to accept this Agreement in lieu of a performance bond to ensure the Contractor's construction of the improvements to conform to the design, location, materials and other specifications for the indicated site improvements, as required by the City in the agreement/approvals/permit for the above-referenced project. In addition, the Contractor shall

construct the improvements according to the applicable ordinances and standards of the City and/or state statutes, as the same now exist or are hereafter amended. The specific conditions secured by this Cash Set Aside Performance Agreement are:

3. **Deadline**

The Contractor must have completed all project work by the Project Completion Date set forth above unless an extension is granted by the City.

4. **Liens – Hold Harmless**

The Contractor must have paid all sums owing to laborers, contractors, mechanics, subcontractors, material-men and suppliers or others as a result of such work for which a lien against any City property has arisen or may arise. The Contractor shall indemnify and hold harmless the City of Port Orchard, its officers, officials and agents from any claim for such payment(s).

5. **Indemnification**

The Contractor shall indemnify and hold harmless the City of Port Orchard, its officers, officials and agents from any and all claims relating to defect(s) in any of the workmanship entering into any part of the work or designated equipment covered by the contract/permit/approval. Once the work has been completed and accepted by the City, and all other conditions of this Cash Set Aside Performance Agreement have been satisfied, this Cash Set Aside Performance Agreement will be released (as set forth in Section 9 below) and replaced with a two (2) year Maintenance Bond or Cash Set Aside Maintenance Agreement, not to exceed the sum of \$ _____, which is not less than 20% of the total contract amount. The hold harmless and indemnification provisions herein shall survive the expiration of this Cash Set Aside Performance Agreement.

6. **Contractor's Warranty**

The Contractor hereby warrants that in the event any of the improvements installed by the Contractor pursuant to the above-referenced plans, conditions and specifications contained in the City's file, fail to remain free from defects in materials, workmanship or installation, or in the case of landscaping, that the landscaping fails to survive, for a period of two (2) years from the date of acceptance of the installation of the improvements by the City, then the Contractor shall either remedy the default, or forfeit the funds set aside in the escrow account for this purpose.

7. **Acceptance by City**

The Contractor must obtain acceptance by the City of the work completed, or in the case of landscaping, installation of such landscaping, all on or before thirty (30) days after the Project Completion Date set forth above.

8. **Default**

If the Contractor defaults and does not perform the above conditions within the time specified, then the City may demand that the Contractor perform as required herein. If the Contractor decides to remedy the default, it shall: (a) within twenty (20) days of demand of the City make a written commitment to the City that it will remedy the default itself with reasonable diligence pursuant to a time schedule acceptable to the City; and (b) remedy the default.

9. **Financial Institution's Release of Funds**

In the event that the Contractor fails to remedy the defect as provided in paragraph 8 above, then the Financial Institution shall, upon the demand of the City, remit to the City within ten (10) days of receipt of said demand, the amount of funds in the escrow account, or such lesser amount as may be specified in the City's demand. The Financial Institution agrees that it shall have no duty or right to evaluate the correctness or appropriateness of any such notice or demand by the City, and shall not interplead or in any manner delay payment of said funds to the City.

10. **City's Completion of Corrections Under Warranty**

In the event the Contractor fails to satisfactorily repair, replace or correct the improvements as requested by the City, the City's employees and agents are hereby authorized to enter onto said property and perform such work. Funds obtained by the City pursuant to paragraph 9 of this Agreement may be used by the City to restore said improvements and pay any and all sums owing to subcontractors, suppliers, laborers, materialmen, suppliers, subcontractors or others as a result of such work for which a lien against any City property or property where the improvements are located, has arisen or may arise. Further, said funds may be used to cover the cost of correcting any damage which may have occurred off-site due to disrepair of the project, including damage, if any, to public property. This provision shall not be construed as creating any obligation on the City, its employees, agents and representatives to perform such corrective work.

11. **Inspection**

The Contractor shall pay all additional costs of the City incurred in the administration of this Agreement. As long as payment for such services has been made, the Director of Public Works or his/her designee shall periodically inspect said improvements while under the two (2) year warranty period and inspect completed improvements insofar as possible within five (5) working days after receiving written notice that the repairs have been completed. Lack of inspection within said five (5) days, however, shall not signify the City's approval.

12. **Expiration**

Once the work has been completed and accepted by the City and all other conditions of this Agreement have been satisfied, this Cash Set Aside Performance Agreement will be released and replaced with a two (2) year Maintenance Bond or two (2) year Cash Set Aside Maintenance Agreement, not to exceed the sum of

_____ dollars (\$ _____) which is 20% of the total contract amount. The hold harmless and indemnification provisions of this Agreement shall survive the expiration of such Maintenance Bond or Cash Set Aside Maintenance Agreement.

13. **Enforcement**

It is specifically agreed by and between the parties that in the event any legal action must be taken to enforce the provisions of this Agreement or to collect the funds in the escrow account, the prevailing party shall be entitled to collect its costs and reasonable attorneys fees as a part of the reasonable costs of securing the obligation hereunder. In the event of settlement or resolution of these issues prior to the filing of any suit, the actual costs incurred by the City, including reasonable attorneys fees, shall be considered a part of the obligation hereunder secured. Said costs and reasonable legal fees shall be recoverable by the prevailing party, not only from the funds set aside, but also over and above the funds in the account as a part of any recovery in any judicial proceeding.

The parties, including the Financial Institution, hereby agree that this Agreement shall be governed by the laws of the State of Washington. Venue of any litigation arising out of this Agreement shall be in Kitsap County Superior Court.

DATED this _____ day of _____, 20__.

FINANCIAL INSTITUTION
Signature must be notarized

CONTRACTOR/DEVELOPER/OWNER
Signature must be notarized

BY: _____	BY: _____
PRINTED NAME: _____	PRINTED NAME: _____
ITS: _____	ITS: _____
BUSINESS NAME: _____	BUSINESS NAME: _____
BUSINESS ADDRESS: _____	BUSINESS ADDRESS: _____
CITY/STATE/ZIP: _____	CITY/STATE/ZIP: _____
PHONE NUMBER: _____	PHONE NUMBER: _____

CITY OF PORT ORCHARD

BY: _____
PRINTED NAME: MARK DORSEY, P.E.
ITS: CITY ENGINEER
BUSINESS NAME: CITY OF PORT ORCHARD
BUSINESS ADDRESS: 216 PROSPECT STREET
CITY/STATE/ZIP: PORT ORCHARD, WA 98366
PHONE NUMBER: 360.876.4407

CHECK FOR ATTACHED NOTARY SIGNATURE

- Individual – Form P-1
- Partnership or Corporation – Form P-2
- Financial Institution – Form P-3

FORM P-1 NOTARY BLOCK

(Use for Individual/Sole Proprietor Only)

STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing
at: _____

My Commission expires: _____

FORM P-2 NOTARY BLOCK

(Use for Partnership, Corporation Only)

STATE OF WASHINGTON)
) ss.
COUNTY OF)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

(print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing
at: _____

My Commission expires: _____

FORM P-3 NOTARY BLOCK

(Use for Financial Institution Only)

STATE OF _____)
) ss.
COUNTY OF _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged as the _____ of _____ that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it to be (his/her) free and voluntary act for the uses and purposes mentioned in the instrument.

Dated: _____

_____ (print or type name)

NOTARY PUBLIC in and for the
State of Washington, residing
at: _____

My Commission expires: _____

BILL OF SALE

THIS BILL OF SALE is made and executed this _____ day of _____, 20__, by and between _____, a Washington Limited Liability Corporation, hereinafter called the "Grantor" and the City of Port Orchard, a Municipal Corporation, hereinafter called the "Grantee."

WITNESSETH:

That the Grantor, for good and valuable consideration, the receipt of which is hereby acknowledged, hereby conveys, sets over, assigns, transfers and delivers and warrants to the City of Port Orchard ownership in the following described personal property situated in Kitsap County, State of Washington, and installed by the Grantor to date, TO WIT:

The Grantor hereby warrants that it is the lawful and sole owner of all the personal property above conveyed, that such items are free from all liens and encumbrances, that the Grantor has the full power to convey and transfer the same, and that the Grantor will defend the same against the claims and demands of any and all persons lawfully making claims thereto. The Grantor further warrants that the execution of this Bill of Sale is an authorized act of said Grantor.

Dated at _____, Washington, this _____ day of _____, 20__

GRANTOR: (_____)

By: _____

Its: _____

Print Name: _____

[Remainder of page intentionally left blank]

STATE OF WASHINGTON)
)ss
COUNTY OF _____)

On this day of _____, 20__, before me personally appeared _____, to me known to be the managing member for _____, a limited liability corporation, that executed the within and foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that he/she was authorized to execute said instrument.

Given under my hand and official seal this ____ day of _____, 20__.

Notary Public in and for the State of Washington,
residing in _____
My commission expires _____

Dated at Port Orchard, Washington, this ___ day of _____, 20__

STATE OF WASHINGTON)
)ss
COUNTY OF KITSAP)

On this day and year above personally appeared before me, Mark R. Dorsey, who executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of the City of Port Orchard for the uses and purposes therein mentioned, and on oath states he is authorized to execute the said instrument.

Given under my hand and official seal this ___ day of _____, 20__.

CITY OF PORT ORCHARD

By: _____
Mark R. Dorsey, PE, PW Director

Notary Public in and for the State of Washington,
residing in _____
My commission expires _____

NOTE: THE FOLLOWING EXHIBITS A AND B ARE EXAMPLES ONLY
EXHIBIT A

LIST OF REQUIRED IMPROVEMENTS

The following provides a general description of the improvements conveyed under this Bill of Sale related to the “Southwest Sidney Plaza Mixed Use Development” project as shown in the approved construction plans prepared by Barghausen Consulting Engineering Inc, with the City approval dated June 17, 2013.

1. Specific improvements conveyed under this Bill of Sale includes the following elements found within this approved construction drawings set as follows:
 - a. Public water main extension, associated fire hydrants and appurtenances, within the plat and along Sedgwick Road as shown on Sheets C3.0 though C3.6 of the approved construction plans.
 - b. Public sewer main extension, associated manholes and appurtenances, within the plat and on Sedgwick Road as shown on Sheets C4.0 though C4.5 of the approved construction plans.

2. The “Southwest Sidney Plaza Mixed Use Development – Offsite Water Main Extension” project as shown in the approved construction plans prepared by Barghausen Consulting Engineering Inc, City approval dated December 12, 2013. Specific improvements conveyed under this Bill of Sale includes the following elements within this approved construction drawings set as follows:
 - a. Public water main extension, associated fire hydrants and appurtenances, within the plat and along the Sidney Road & Sedgwick Road frontages as shown on Sheets 1 -5 of the approved construction plans.

3. The “Southwest Sidney Plaza Mixed Use Development – Offsite Frontage Improvements” project as shown in the approved construction plans prepared by Barghausen Consulting Engineering Inc, City approval dated December 12, 2013. Specific improvements conveyed under this Bill of Sale includes the following elements within this approved construction drawings set as follows:
 - a. Public frontage improvements, including curb, gutter, sidewalks, storm drainage and asphalt pavement along both he Sidney Road & Sedgwick Road frontages as shown on Sheets R1-R14 of the approved construction plans.

The items, quantity and value of the improvements describe above and conveyed under this Bill of Sale are presented in Exhibit B.



CONSTRUCTION COST ESTIMATE Exhibit B

PROJECT NAME: Southwest Sidney Plaza
LOCATION/DESCRIPTION: Water, Sewer, and Roadway Improvements
DATE: November 19, 2014
OUR JOB NO. 15386

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
WATER MAIN AND APPURTENANCES					
On-Site Water Main					
1.	12-Inch D.I. Water Main	1,351	LF	\$75.00	\$101,325
2.	8-Inch D.I. Water Main	976	LF	\$60.00	\$58,560
3.	Fire Hydrant	7	Each	\$5,000.00	\$35,000
Off-Site Sidney Road Water Main and Improvements					
4.	12-Inch D.I. Water Main	249	LF	\$95.00	\$23,655
Off-Site Sedgwick Road Water Main and Improvements					
5.	8-Inch D.I. Water Main	591	LF	\$90.00	\$53,190
Sanitary Sewer Main and Improvements					
6.	8-Inch PVC Sanitary Sewer	1,572	LF	\$45.00	\$70,740
7.	Sanitary Sewer Manhole	11	Each	\$4,000.00	\$44,000
OFF-SITE ROAD IMPROVEMENTS					
Sidney Road Improvements					
8.	New Curb and Gutter	785	LF	\$15.00	\$11,775
9.	New Concrete Sidewalk	525	SY	\$30.00	\$15,750
10.	Type I Catch Basin	4	Each	\$1,500.00	\$6,000
11.	12-Inch Storm Pipe	372	LF	\$40.00	\$14,880
12.	24-Inch Storm Pipe	38	LF	\$75.00	\$2,850
13.	Asphalt Pavement	698	SY	\$25.00	\$17,450
14.	Type II 48-Inch Structure	1	Each	\$3,500.00	\$3,500

1 of 2

15386.012 wo Contingency.xls

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
Sedgwick Road Improvements					
15.	New Curb and Gutter	1,025	LF	\$15.00	\$15,375
16.	New Concrete Sidewalk	685	SY	\$30.00	\$20,550
17.	Type II 60-Inch Structure	1	Each	\$7,500.00	\$7,500
18.	Type II 48-Inch Structure	1	Each	\$3,500.00	\$3,500
19.	Type I Catch Basin	9	Each	\$1,500.00	\$13,500
20.	12-Inch Storm Pipe	331	LF	\$75.00	\$24,825
21.	Asphalt Pavement	940	SY	\$25.00	\$23,500
TOTAL:					\$567,425

Return Address:
City of Port Orchard
216 Prospect Street
Port Orchard, WA 98366

AGREEMENT
(for UTILITY EXTENSION)

Grantor(s): (1) Grantee(s): (1) Legal Description (abbreviated): Additional legal on: Assessor's Tax Parcel ID#:

THIS AGREEMENT is entered into this _____ day of _____, 20_____, between the City of Port Orchard, Washington, hereinafter referred to as "the City" and _____, hereinafter referred to as "the Owner".

WHEREAS, the Owner is the owner of certain real property located in Kitsap County which is legally described as set forth on Exhibit A attached hereto and incorporated herein by this reference as though set forth in full, and

WHEREAS, the Owner's property is not currently within the city limits of the City, and

WHEREAS, the Owner desires to connect to the City _____ system, hereinafter referred to as "the utility", and the City is willing to allow connection only upon certain terms and conditions in accord with City Ordinance No. _____, as now enacted or hereinafter amended, now therefore,

FOR AND IN CONSIDERATION of the mutual benefits and conditions hereinafter contained, the parties agree as follows:

1. Warranty of Title. The Owner warrants that they are the Owner of the property described on Exhibit A and are authorized to enter into this agreement.

2. Extension Authorized. The City hereby authorizes the Owner to extend service to Owner's property at _____, as described in
address

Exhibit A, from the existing utility line on _____ .

3. Costs. Owner will pay all costs of designing, engineering and constructing the extension. All construction shall be done to City standards and according to plans approved by the City's Public Works Department and City Engineer. Any and all costs incurred by the City in reviewing plans and inspecting construction shall be paid for by the Owner.
4. Permits - Easements. Owner shall secure and obtain, at Owner's sole cost and expense, any necessary permits, easements and licenses to construct the extension, including, but not limited to, all necessary easements, excavation permits, street use permits or other permits required by Kitsap County.
5. Turn Over of Capital Facilities. If the extension of utility service to Owner's property involve the construction of water or sewer main lines, pump stations, wells and/or other City required capital facilities, the Owner agrees to turn over and dedicate such facilities to the City, at no cost, upon the completion of construction and approval and acceptance of the same by the City. As a prerequisite to such turn over and acceptance, the Owner will furnish to the City the following:
 - A. As built plans or drawings in a form acceptable to the City Public Works Department and City Engineer;
 - B. Any necessary easements, permits or licenses for the continued operation, maintenance, repair or reconstruction of such facilities by the City, in a form approved by the City Attorney;
 - C. A bill of sale in a form approved by the City Attorney; and
 - D. A bond or other suitable surety in a form approved by the City Attorney and in an amount approved by the City Engineer, ensuring that the facilities will remain free from defects in workmanship and materials for a period of two (2) years.
6. Connection - Charges. The Owner agrees to pay the following charges, in addition to any costs of construction, as a condition of connecting to the City utility system:
 - A. A utility hook-up fee as established by ordinance in effect on the date hook-up is requested.
 - B. A new account fee as established by ordinance in effect on the date of application for a new account.
 - C. Any other applicable fees as established by ordinance.

7. Service - Charges. In addition to the charges for connection, the Owner agrees to pay for utility service rendered according to the rates for services applicable to properties outside the city limits as such rates exist, or as they may be hereafter amended or modified.
8. Consequences of Annexation. Owner understands that annexation to the City of the property described on Exhibit "A" will result in the following consequences:
- A. Kitsap County ordinances, resolutions, rules and regulations will cease to apply to the property upon the effective date of annexation;
 - B. City of Port Orchard ordinances, resolutions, rules and regulations will begin to apply to the property upon the effective date of annexation;
 - C. Governmental services, such as police, fire and utility service, will be provided to the property by the City of Port Orchard upon the effective date of annexation;
 - D. The property may be required to assume all or any portion of the existing City of Port Orchard indebtedness; and property tax rates and assessments applicable to the property may be different from those applicable prior to the effective date of annexation;
 - E. Zoning and land use regulations applicable to the property after annexation may be different from those applicable to the property prior to annexation; and
 - F. All or any portion of the property may be annexed and the property may be annexed in conjunction with or at the same time as other property in the vicinity.
9. Consent to Annexation. With full knowledge and understanding of these consequences of annexation and with full knowledge and understanding of the Owner's right to oppose annexation of the property to the City of Port Orchard, Owner agrees to sign a petition for annexation to the City of the property described on Exhibit A as provided in RCW 35.13, as it now exists or as it may hereafter be amended, at such time as the Owner is requested by the City to do so. The Owner also agrees and appoints the Mayor of the City as Owner's attorney in fact to execute an annexation petition on Owner's behalf in the event that Owner shall fail or refuse to do so and agrees that such signature shall constitute full authority from the Owner for annexation as if Owner had signed the petition himself. Owner further agrees not to litigate, challenge or in any manner contest annexation to the City. This Agreement shall be deemed to be continuing; and, if Owner's property is not annexed for whatever reason including a decision by the City not to annex, Owner agrees to sign any and all subsequent petitions for annexation. In the event that any property described on Exhibit A is subdivided into smaller lots, the purchaser of each subdivided lot shall be

bound by the provisions of this paragraph. Notwithstanding any other provision of this Agreement, this consent to annexation and waiver of right to protest annexation shall only be valid for a period of ten (10) years from the date this Agreement is signed by the Owner.

10. Land Use. The Owner agrees that any development or redevelopment of the property described on Exhibit "A" shall meet the following conditions:

- A. The use of the property will be restricted to _____.
- B. The development or redevelopment of the property shall comply with all requirements of the City comprehensive land use plan, zoning code and building regulations for similar development or redevelopment in effect at the time of such development or redevelopment. The intent of this section is that future annexation of the property to the City of Port Orchard shall not result in a development which does not conform to City standards.

11. Specific Conditions:

- A. The design and construction of the extension shall conform to City Standards.
- B. The City will not be responsible for providing minimum water pressure at the meter. Should it be necessary to increase the pressure, it will be the developer-owner's responsibility to install a booster pump. If a booster pump is installed, an approved backflow prevention device shall be installed at the owner's expense. The device shall be tested at the time of installation and once each year thereafter, at the owner's expense, by a backflow assembly tester certified by the State of Washington.
- C. Mains must extend across the entire frontage of the property.
- D. Staff/Council recommendations: _____

12. Boundary Review Board. This Agreement is subject to potential review and approval by the Boundary Review Board pursuant to RCW 36.93.

13. Liens. The Owner understands and agrees that delinquent payments under this agreement shall constitute a lien upon the above-described property, as provided by law.

14. Termination for Non Compliance. In the event Owner fails to comply with any term or condition of this agreement, the City shall have the right to terminate utility service to the Owner's property in addition to any other remedies available to it.

15. Specific Enforcement. In addition to any other remedy provided by law or this agreement, the terms of this agreement may be specifically enforced by a court of competent jurisdiction.
16. Covenant. This agreement shall be recorded with the Kitsap County Recorder and shall constitute a covenant running with their land described on Exhibit A and shall be binding on the Owner, his heirs, successors and assigns. All costs of recording this Agreement with the Kitsap County Recorder shall be borne by the Owner.
17. Attorneys' Fees. In any suit or action seeking to enforce any provision of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees and costs in addition to any other remedy provided by law or this agreement.
18. Severability. If any provision of this Agreement or its application to any circumstances is held invalid, the remainder of the Agreement or the application to other circumstances shall not be affected.

DATED as of the day and year first above written.

IN WITNESS WHEREOF, the parties hereto have signed and sealed this Agreement on the day and year first above written.

CITY OF PORT ORCHARD

DEVELOPER

By: _____
Lary Coppola, Mayor

ATTEST:

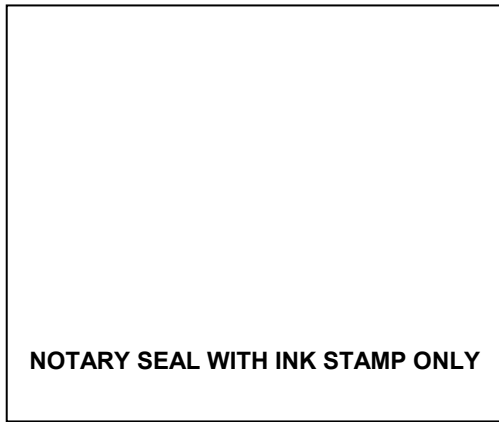
Patricia J. Kirkpatrick, CMC
City Clerk

STATE OF WASHINGTON)
) SS.
COUNTY OF KITSAP)

I certify that I know or have satisfactory evidence that _____

_____ signed this instrument and acknowledged it to be his/her free and voluntary act for the purposes mentioned in this instrument.

DATED this _____ day of _____, 20_____.



Print Name

Signature
NOTARY PUBLIC in and for the State of

Washington residing at _____

My commission expires _____

SAMPLE

DO NOT WRITE BEYOND THE END OF LINES or WITHIN THE MARGINS

ACKNOWLEDGMENT

STATE OF WASHINGTON)
) SS.
COUNTY OF KITSAP)

I certify that I know or have satisfactory evidence that _____

signed this instrument and acknowledged it to be his/her free and voluntary act for the purposes mentioned in this instrument.

DATED this _____ day of _____, 20_____.

NOTARY SEAL WITH INK STAMP ONLY

Print Name

Signature

NOTARY PUBLIC in and for the State of

Washington residing at _____

My commission expires _____

EXHIBIT "A"
Legal Description

SAMPLE

MAP

SAMPLE



Appendix C – Traffic Impact Analysis

Appendix A

Scope of Transportation Impact Analysis

It is recommended that the applicant's traffic engineer consult with the City DCD and PWD staff prior to preparing the study to establish the scope and basic assumptions of the study and any requested deviations from these Guidelines to avoid unnecessary delays or revisions. The appropriate level of traffic analysis is determined by the specifics of a project, the prevailing roadway conditions servicing the project, and the forecasted traffic volumes. The City will review each development application on a case-by-case basis and may make recommendations that differ from the guidelines. A preliminary scoping memorandum, including but not limited to, the following project-related information must be submitted to the City for review and comment:

- Description of the proposed development and zoning
- Type and size of development (number of residential units and/or square footage of building)
- Project location (vicinity map and site plan)
- Proposed access and relationship to adjacent properties/driveways and streets
- Phasing and timing of development - If the proposed development/redevelopment is to be constructed in phases, describe each phase and the proposed implementation timing
- Trips generation per the latest edition of the Institute of Transportation Engineers (ITE) Trip Generation manual and Trip Generation handbook, and assumptions used for trip generation
- Project trip distribution percentages and assignment at project driveways and/or localized nonconcurrency intersections

The City will review the scoping memo to determine whether or not further analyses are needed. If a TIA is required, the following items will be provided to the applicant:

- Available traffic count data
- Accident data
- Existing Synchro files
- Programmed/funded motorized and non-motorized improvements in the study area
- Pipeline projects and area wide growth assumptions (background traffic calculation methods)
- Need for special analyses/studies

A TIA scoping meeting may need to be held after review of the preliminary information to clarify issues surrounding a project or some elements of the review process. The City reserves the right to establish the study area as may be deemed necessary. Correspondence with other affected jurisdictions impacted by the development shall be discussed at the scoping meeting.

Appendix B

Transportation Impact Analysis

Format and Required Elements

The TIA should document the purpose, procedures, data sources, assumptions, findings, conclusions and recommendations of the study. The report might be of interest to decision makers and other nontechnical people. Hence, technical terms and jargon need to be explained, clarity should not be sacrificed, and it should be concise and complete. Description of coordination efforts with other affected jurisdictions impacted by the development shall be included in the report. The report format presented below provides a uniform framework that will facilitate both the preparation and the review of the report. **However, not all of the contents described below may be required for each development. Rather the City will identify the sections required for each development TIA at the scoping meeting based on the *Thresholds for Probable Adverse Significant Impacts* described on pages 2 through 4.**

Report Cover

Include development name and location, applicant's name, preparer's name and organization, and report date.

Title Page

Include project name and address, application number, applicant's name, address and telephone number, date of original report and revision date, preparer's name, title, organization, address and telephone number, name, address, phone number and/or email address of licensed engineer, stamp and expiration date.

Table of Contents, List of Figures, Tables and Appendices

The report should contain a table of contents and a list of figures, tables and appendices.

Executive Summary

The Executive Summary of the report shall include the study purpose, a general description of the project scope, site location, development description, study area, concise description of major findings, recommendations and mitigation measures.

Description of Proposed Development

The TIA should provide a full description of the proposed development including but not limited to the following:

- A vicinity map shall be provided illustrating the site location, study area, and the surrounding transportation network (major streets and key intersections). The limits of the study area will have been determined at the scoping meeting with the City.
- Location of approved or proposed developments in the vicinity of the project should be included in the report. These can be obtained from the City. These developments should be included as base assumptions where applicable in the analysis of the transportation impacts.
- Location and type of existing and proposed improvements, buildings, building appurtenances, fuel pumps, and drive through facilities.
- Size of Development (total development area, total area of each building and locations, floor space including a summary of each type of land use including number of residential units, etc.).
- Existing land use and zoning.

- Proposed land use and zoning – Intended use of the site, including the range of uses allowed without additional land-use approvals. The land use with the greatest overall traffic impact shall be assumed in the study (worst case scenario), unless the applicant specifies the uses for the site.
- Existing and proposed parking (number of spaces, dimensions, circulation).
- A detailed site plan including location and orientation of existing and proposed access points and type of access (full access, right-in/right-out, turning movement restrictions, sight lines, etc.), driveway throat lengths, other access points adjacent to or opposite the site, project internal roadway system, adjacent streets, parking facilities, internal circulation patterns for vehicles, bicyclists and pedestrians, fire lanes, traffic control devices and tracking patterns of the design vehicles for the access, circulation, loading docks and garbage receptacles. Distances from existing streets, driveways, and/or median openings to development access should also be shown. The site plan shall be at an appropriate scale to allow proper review by the City staff and should be included in the appendix of the report if possible or submitted as an attachment to the traffic study. For situations where a site plan does not exist, a prototypical site roadway and access system should be assumed for purposes of the study. Subsequent update will be necessary when a site plan becomes available.
- The TIA shall describe the proposed development schedule and staging/phasing, including the anticipated opening date, the anticipated completion date for each major phase of development and the anticipated full build out completion date.
- Each TIA shall present an analysis of the traffic conditions without and with the proposed project at year of completion, including all pipeline development at project driveways and local non-concurrency intersections. The future year traffic volumes, including pipeline development, can be obtained from the City's travel demand model, or by other means approved by the City.
- The critical time periods for traffic is directly associated to the scope of the TIA and with the peaking characteristics of the background traffic and the proposed development traffic. In most cases, the weekday evening (PM) peak hour of the street will be the only analysis period required for the traffic study. For certain types of development (e.g., churches, schools, some retail uses, shopping centers, etc.) other peak hours may be added (e.g., a.m., midday or weekend, holidays, project peak hours, etc.) or eliminated from the analysis, if approved by the DSD or PWE Department.
- Any other pertinent information

Existing Conditions

Study Area Roadway System

A thorough review of available data and description of the existing transportation system within the study area, using a combination of maps and other documentation should identify relevant information, such as the following:

- All applicable roads on which a driveway is proposed and/or an impact to a non-concurrency intersection has been identified. The road description should include the number of lanes, lane usage (i.e., identify through lanes, two-way left-turn lanes, merge lanes, shoulders/curbing, parking/type, etc.), pavement type, right-of-way width, shoulder and sidewalk widths, general topography, roadway classification and posted speed limits.
- Traffic control devices including signalizations, signing and pavement markings that might affect or be affected by the project.
- Distances from existing streets and driveways to development access points.
- Alignment with existing streets and driveways to development access points.
- If appropriate, on-street parking in the vicinity of the development site and those that affect the operation of key intersections being analyzed.
- Heavy vehicle prohibitions and restrictions
- Marked pedestrian crosswalks in the vicinity of the development site.
- School route plan (if relevant to the proposed development).

- Existing and planned bicycle and pedestrian facilities including bike lanes, sidewalks, and multiuse paths adjacent to the project site, utilized by the project, connected to by the project, or impacted by the project should be identified and described in detail.
- Any transit facilities including the service provider(s), route numbers, frequency, and location/amenities of existing bus stops in the immediate vicinity of the project should be provided.
- Minimum turning path of design vehicles, following the AASHTO guidelines of selecting the design vehicle and measuring, recording and reporting existing and proposed turning radii.
- Other pertinent information

Traffic Volumes

Daily and peak hour traffic counts should be collected for use in the study at impacted intersections where the City does not already maintain an existing count. If counts are required, these counts shall typically be collected between 4-6 PM on a typical Tuesday, Wednesday, or Thursday for all roadways and intersections in the study area. However, the type of development or local conditions may require counts be also taken on weekends or other time periods. Establishment of times for turning movement and daily counts will be made during the scoping meeting.

The counts should be conducted during weeks which have no holidays and if possible during the school year. In situations when traffic counts must be conducted while school is not in session, a seasonal adjustment shall be applied to daily and peak hour volumes collected for use in the study. The seasonal adjustment should be approved by the DSD or PWE staff. For projects which include improvements to schools or sites adjacent to schools, it will be necessary to include peak hour counts from the school take-in and dismissal times. No counts should be performed from the end of the school year through the week of Labor Day. In addition, traffic data should not be collected during the following:

- December 15 to the week which includes New Year's Day
- School holidays or late opening/early closing
- Occasions influenced by an accident, road or lane closure, inclement weather, or other events

Typical traffic data should be collected in 15-minute increments. Intersection turning movement counts shall include peak hour factor calculations, heavy vehicle percentages, pedestrian and bicycle counts, and HOV lane counts. The exact locations, how, and when counts were taken should be included in the report. The existing counts should be presented in a diagram format in the report.

Future Conditions Programmed Roadway Improvements

Projects from the City's Capital Improvement Program (roadways and intersections or any other transportation circulation improvements) may be used in the future year analysis. The traffic study should include a discussion of the scope and the status of the assumed improvements. The improvements of other jurisdictional agencies within the study area should also be identified. DCD and PWD staff will determine what approved City traffic improvements may be considered in the analysis. A map showing the committed and funded improvements should be included in the report.

Projected Traffic Volumes

For estimating the traffic impacts of a proposed development, it is recommended to use the traffic volumes from the City's travel demand model for two cases: (a) without the proposed development, and (b) with the proposed development. The incremental impacts are attributed to the site-generated traffic. The report should include graphical presentations which illustrate peak hour and daily (including turning movements at the study intersections) forecast volumes for the future year with and without the proposed project traffic.

Future/Background Traffic Volumes without Development

Background traffic should reflect any existing facilities plus planned future traffic. Planned future traffic is included in the City's travel demand model.

Proposed Project Traffic

The latest edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual, Trip Generation Handbook, or other industry publications such as the ITE Journal should be used to estimate project-generated trips for the daily and study peak periods. Data limitations, data age, choice of peak hour or adjacent street traffic, choice of independent variable and choice of average rate versus statistical significant modification shall be presented and discussed.

In cases where published trip generation rates are based on very limited data or do not adequately represent the proposed land use(s), a local trip generation study following procedures prescribed in the ITE Trip Generation manual may be required to provide sufficient justification for the proposed generation rate. Deviations from ITE rates must be justified, documented and approved by the City DCD or PW Department prior to the submittal of the report.

Trip credits can be taken for land uses that will be discontinued once the development is complete, assuming those uses were active within one year of the traffic study submittal. Trip generation adjustments may be justified to account for internal and/or pass-by trips. Internal trip reductions can only be applied for mixed-use types of developments and pass-by reductions for retail/commercial type developments (e.g., fast food restaurants with drive-through windows, service stations). Pass-by trip reductions greater than 15% require approval by the City, and should be discussed in the traffic study. Captured/internal trip reduction greater than 5% requires consultation and acceptance by City, and should be discussed in the traffic study. The justification for internal or pass-by trip reductions will require analytical support based on verifiable actual similar developments to demonstrate how the figures were derived and will require approval by DCD or PWD staff prior to use.

All trips, including pass-by trips, must be included in the analysis of the project's driveways. Trip generation adjustments for transit and Transportation Demand Management (TDM) actions must also be justified with analytical support to show how the figures were derived. Optimistic assumptions regarding transit use and TDM actions will not be acceptable unless accompanied by specific implementation proposals that will become a condition of approval. Such implementation proposals must have a reasonable expectation of realization within a 2-year period after project initiation.

A table must be provided in the study report identifying the categories and quantities of land uses, with the corresponding trips rates or equations and the resulting number of trips. This table also needs to identify all adjustments to the trip generation, specifically pass-by trips, existing trips, internal trips, TDM and transit trips. For large developments that will be constructed in phases, the table should identify each significant phase separately.

Project Trip Distribution and Assignment

The City's travel demand model or other City approved methods should be used to estimate site trip distribution and assignment. Any adjustments to the model distribution shall be fully documented and subject to approval by the DCD or PWD staff. As needed, the City's travel demand model may need to be disaggregated in the vicinity of the proposed project to provide sufficient detail to appropriately analyze study area facilities/driveways. All model assumptions and modifications should be documented. No modifications other

than documented land use or roadway network assumptions should be made to the travel demand model without approval of the DCD or PWD.

The distribution of site generated traffic at project driveways and/or local non-concurrency intersections should be presented (including distribution/assignment of pass-by trips) in the report in a graphic format showing, by direction, percentage and number of site generated trips. The presentations should include Average Daily Traffic (ADT) and peak hour directional volumes as well as turning movements.

Future Traffic Volumes with Development

Total peak hours and daily traffic volumes shall be graphically shown combining project and background traffic for the project horizon years.

Traffic Analysis and Impact

To determine the potential localized traffic impacts of a proposed development, the following scenarios shall be analyzed for the study time periods when appropriate:

- Existing Traffic Conditions without project traffic
- Future/Background Traffic Conditions without Development
- Future Traffic Conditions with Development

Conclusions regarding the adverse impacts caused by the project on the roadway system should be discussed in this section. Depending on the development type, size, location, etc., all or some of the following technical analyses may need to be included in the traffic study.

Operational/Capacity Analysis

Capacity analyses must be performed using the principles of the latest version of the Highway Capacity Manual for all identified intersections/access points determined through the scoping meeting. Synchro/SimTraffic version 8.0 software or other City approved software should be used for the capacity analysis. City may recommend the use of other traffic analysis software where applicable.

The City's traffic operations model will be provided with the available existing conditions Synchro files that contain the existing signalized intersections channelization and signal timings, etc. These files may need to be updated with the new traffic counts (e.g., volumes, peak hour factors, heavy vehicle %, pedestrian and bicycle volumes, etc.) and other applicable project related information (e.g., new roadways or intersections, adding unsignalized intersection or driveways, etc.). No changes to signal timing/phasing from those included in the City's Synchro model shall be made without the approval of the DCD or PWD staff. The City will determine whether or not the existing timings should be used for the future condition analysis after review of the project information and horizon year(s). Geometric data such as the number of lanes, lane widths, adjacent parking lanes and grade may be available from the City (Synchro files). Where not available, the consultant will have to obtain the missing data.

All assumptions and modifications used in the performance of analysis concerning lane configurations/use, pedestrian activity, saturation flows, lane utilization factors and other relevant parameters should be noted and justified in the text of the report. Modifications without justification can lead to delays in review as we wait for clarification from the Consultant. Appendix C contains the City of Issaquah Synchro Modeling Guidelines which provides a listing of the various assumptions, factors and methodologies to be used for Synchro analyses. The performance of intersections should be reported as overall intersection LOS, delay and V/C ratio (for signalized, roundabout, and all-way stop intersections); and individual intersection approach movements LOS,

delay, V/C ratio for all intersection control types. The analysis results, deficiencies and impacts should be discussed in the report especially for the following conditions:

- The overall V/C ratio of an intersection exceeds 0.85;
- The V/C ratio of an individual thru movement or shared thru/turning movement exceeds 0.85;
- The V/C ratio of an exclusive turning movement exceeds 1.0; or,
- LOS and delay for the overall intersection or any individual movement exceeds the acceptable LOS threshold.

Supplementary surveys or analyses may be needed to assess saturation flows and gap availability. In the case of congested intersections, particularly where the existing volume/capacity ratio is greater than 1.0, it is advisable to conduct further field observations of intersection operations, saturation flows, queues, and delays to confirm and/or rationalize the results of the performance analysis. Where the traffic volumes through an intersection do not appear to reflect actual demand, for example, where the intersection throughput is constrained by downstream congestion, performance analyses may indicate low (good) volumes/capacity ratios which mask actual problems. Field observations may be necessary in these situations to determine the necessary adjustments to performance calculations so that actual conditions are fairly represented.

All software outputs should be clearly labeled indicating the time frame for analysis. The output sheets should show all of the capacity analysis results that are listed in the tables included in the body of the report. Software output must explicitly show all input and phase lengths used in analysis. All electronic data files for software must be provided on a CD as a supplement to the report. Please ensure that staff can interrelate data tables in your report, printouts in your appendices and all data files on the CD.

Traffic Control Needs

When needed, an analysis to determine whether traffic control warrants (traffic signals, stop signs, or yield signs) are met with the development traffic may be required. The warrant analysis should be based on the procedures in the latest edition of the Manual on Traffic Control Devices (MUTCD). The percentage of right-turns-on-red must be justified on the signal warrant analysis.

In cases where a new signal is being proposed within a corridor of existing signals, a supplementary analysis of traffic signal "system" operations may be required to assess effects on traffic signal coordination. In this scenario, both concurrency and non-concurrency intersections may be included in the analysis. The acceptability of the signal locations must be demonstrated through a signal progression analysis. Signal warrant analyses may be conducted using projected traffic volumes to identify potential need for the installation of traffic signals. However, traffic signals will not be installed until actual traffic counts at the intersection meet warrant thresholds.

Gap Study

A gap study identifies the gaps in traffic to determine if the frequency and duration of the gaps is sufficient to permit the safe crossing and merging of side-street traffic, and/or pedestrians. Particular attention should be given to elderly pedestrians and children who have slower than average walking speeds. A gap analysis will need to be performed on a driveway where a signal is requested.

Accident Analysis

Five years of the most current accident data shall be obtained for intersections and roadways within the study area. Accidents involving pedestrian and bicyclists should also be included. This data shall be summarized within the report in tabular form (accident type, number and severity for each location) along with a brief written description at each location. A discussion of accident occurrence as it relates to sight distance or other roadway geometric deficiencies, signing, and illumination should be included.

Average accident rates should be calculated and compared with statewide averages for similarly classified roadways and/or the citywide averages provided by the City of Issaquah. Intersection rates are calculated independently from mid-block segment accident rates. Intersection accident rates should be calculated as accidents per million entering vehicles, whereas mid-block accident rates should be calculated as accidents per million vehicle miles.

Site Access and Circulation

Access points should be evaluated in terms of capacity, safety and adequacy of queue storage. Access points should be free of all encumbrances and provide appropriate sight triangles. The quality of access as it relates to the internal site circulation will have a direct relationship on the quality of traffic flow in and around the site development, as well as a direct impact on public safety. Proposed access points should be evaluated with respect to possible mutual interference with other adjacent or opposed access points. Joint access and cross access by two or more properties may be desirable depending upon use.

Site access and circulation analysis shall be conducted and recommendations shall be included in the traffic study to address safe and acceptable traffic operations. The identification of access points between the site and the external roadway system and subsequent recommendation concerning the design of those access points is directly related to both the directional distribution of site traffic and the internal circulation of the facility.

Provisions for appropriate vehicular-exit queuing should be made at all access drives to a development. For small developments, parking areas and access points should be designed so that exiting drivers can align their vehicles perpendicular to the off-site roadway system. For large developments, queuing areas should be sufficient so that vehicles stored at exits do not block internal circulation.

The traffic study should calculate anticipated queues and minimum required throat depth at the project access points. The analysis should also evaluate the proposed site plan for sight distance and other unsafe traffic conditions and provide recommendations to mitigate them. The need to restrict certain movements to avoid conflicts should be assessed. Direct access to arterial roads should be justified in the context of available alternative access opportunities.

Adverse effects of site access on road and transit operations should be identified and appropriate remedial measures identified and evaluated. The requirements for left-turn and right-turn lanes at the driveway (exiting the site) and on the public roadway at the project driveway (entering the site) should be evaluated. Where appropriate, potential weaving problems should be assessed and evaluated, including the need for acceleration or deceleration lanes, and conflicts with pedestrian and bicycle movements. Internal circulation should provide access to all areas in a manner understood to drivers. Internal roadways should be marked and signed in accordance with recommendations in the MUTCD. Delivery vehicle/courier loading/unloading facilities and the tracking of design vehicle movements related to access points, circulation roads/aisles, loading docks, and garbage receptacles should be evaluated with respect to location, size and design. Convenient access should be provided to off-street loading facilities to minimize the possibility that pick-up/delivery operation will occur on the public street. Evaluate the potential for access and circulation movements associated with on-site parking or other activity (such as drive-through service windows) resulting in queues extending onto public streets, or vehicles backing onto public streets. Describe and evaluate site access provisions for pedestrians and cyclists with particular emphasis on convenient and safe access to transit services.

Sight Distance Evaluation

At each access point and at each intersection where a new road is proposed, the sight distance requirements (intersection, stopping, entering, corner sight distance, etc.) should be determined based on appropriate standards (City, WSDOT and AASHTO standards), and the availability of sight distance determined from actual

field measurements of existing streets or based on subdivision plans for large scale developments. Line of sight triangles for determining sight distances and landscape and/or other restrictions shall be drawn on the site plan. If a deficiency exists, recommendations to improve the deficiency need to be incorporated into the report. Necessary line-of-sight-clearing to insure adequate sight distance should be clearly indicated.

Neighborhood Impacts

Neighborhood transportation impacts are primarily caused by site generated traffic using neighborhood streets as short cuts. This “cut-through” traffic can impact pedestrian safety and community cohesion. Most neighborhoods are sensitive to cut-through traffic and hence an analysis should be conducted (if applicable) to evaluate the neighborhood impacts of the proposed development.

Evaluation of Transit, Bicycle and Pedestrian Facilities

Impacts to non-motorized facilities (including park-and-ride) should be identified, particularly in cases where the development is located in an area with incomplete non-motorized facilities, and/or the existing facilities will be modified by the proposed development. Evaluate future pedestrian activity associated with the development and related implications for signal warrant calculation and signal timing requirements to provide pedestrian road-crossing opportunities. Of particular interest are pedestrian connections to transit services.

Other Special Analyses and Studies

Specific focused traffic analyses and studies may be requested by the City relevant to the proposed development to address issues such as; truck estimates and pavement design, parking impacts (including on-street and off-street and special events), safe school routes, spot speed studies, queue length studies, emergency routes, etc.

Mitigation Identification and Recommendations

This section outlines the process of identification of operational and safety transportation improvements and other measures required to ensure that acceptable and safe operation of the transportation system is maintained. Project impacts (i.e., capacity, operational, safety, etc.) are measured by comparing “Future without Project” to “Future with project” traffic conditions. For identified impacts, the traffic study must identify and discuss mitigation measures that will be implemented by the proposed development. Mitigation measures should be specific and feasible actions that will improve adverse transportation impacts to acceptable levels of service or safety levels. An effective mitigation measure shall adequately avoid, minimize, rectify, or compensate an impact. The capacity analysis results, summaries, and software output should be prepared as described in the Operational/Capacity Analysis section of these guidelines. Potential mitigation measures include:

- Locate access point(s) to optimize visibility/sight distance and reduce potential conflicts. Dedicate visibility easement to assure adequate sight distance at intersections and driveways.
- Addition of travel lanes (left, right, thru, acceleration and deceleration lanes). The report must identify the impacts associated with such a change (right-of-way need and feasibility). All mitigations should be reviewed in the field to make sure that they can be accommodated.
- Increasing the length of turn lanes storage pockets/bays.
- Traffic control modification.
- Upgrade and/or modification of phasing at existing signals.
- Signal timing modification. If signal timing modifications are proposed for an intersection within a coordinated signal system, the entire signal system must be analyzed to ensure that any proposed changes do not cause the entire system or part of the system to fail.
- Provide channelized islands.
- Restriction of project driveway(s) turning movements.
- Installation of traffic signs

- ITS improvements such as CCTV traffic cameras and fiber optic communication equipment
- Transit facilities, such as bus turn-outs, park-and-ride lots, and/or bus stops.
- Design on-site traffic circulation and parking facilities to allow free flow access and to avoid queuing onto public streets. Provide adequate off-street parking in accordance with City Code and ITE Demand statistics.
- Bicycle and Pedestrian Facilities - Provide for access to, from, and through development for bicyclists and pedestrians. Recommend designing bicycle paths, lanes, and facilities; sidewalks, shared use routes, other walkways.
- Reduce or change proposed land use
- Provide transportation demand management (TDM) measures, where feasible. TDM measures include flexible work hours or adjusting shift schedules to avoid peak hours of the adjacent roadways, promoting ridesharing or vanpools, and promoting alternate modes of travel to include bicycles, pedestrians and public transportation. When TDM plans are proposed as mitigation measures, the applicant may be required to submit a report to PWE Transportation to document the success of the program two years after full occupancy of the development. Maps and graphics shall be included in the report depicting all mitigation measures dealing with roadway, parking and access points. These maps and graphics must be drawn to scale with existing and recommended roadway geometrics dimensioned (e.g., road width, lane width, 95th percentile queue length, etc.). The intent of such graphics is to assist in determining the feasibility of a proposed mitigation. Graphics must include adjacent structures/trees, parking areas, bus stops, pedestrian crosswalks, driveways, etc. All recommended improvements shall meet current City standards. It is important to structure recommendations for improvements within appropriate time perspectives.

Recommendations should be sensitive to the following issues:

- Timing of short- or long-range network improvements that are already planned and scheduled
- Anticipated time schedule of adjacent developments
- Size and timing of individual phases of the proposed developments
- Logical sequencing of various improvements or segments
- Availability and feasibility of additional right-of-way within the appropriate time frames
- Local priorities for transportation improvements and funding
- Cost-effectiveness of implementing improvements at a given stage of development
- Necessary lead-time for additional design and construction.

All recommended improvements including construction schedule and financing plan should be identified on a summary sheet in this section of the report. In cases where phased development of a project is proposed, a schedule identifying the improvements needed to mitigate traffic impacts at each phase will be required. Transportation system changes proposed in conjunction with the development or redevelopment proposal must be compatible with other elements of the transportation system and must be warranted, safe, and contribute to more effective and efficient movement of people and goods. Generally, the proponent of a development or redevelopment proposal is financially responsible for transportation improvements reasonably required to accommodate the proposal or to mitigate adverse impacts of the proposal. Normally such changes will be included as conditions of development approval.

Appendix

The following information when applicable should be included in the appendices of the report:

- Site Plan drawn to scale
- Raw traffic count data
- Plots and other applicable information from the Transportation Model runs
- Capacity and Queue calculations (detailed worksheets). Software output must explicitly show all input and phase lengths used in analysis.
- Signal Progression/Arterial Analyses (all input and output)

- Warrant worksheets for signals, all-way stops, right and left-turn lanes, etc.
- Intersection and driveway sight distance (drawn to scale)
- Accident Data
- Additional tables or figures not included in the report
- Maps (drawn to scale) and graphics not contained in the body of the report
- Other relevant supportive information and/or analyses



City of Port Orchard
 216 Prospect Street, Port Orchard, WA 98366
 (360) 876-4407 • FAX (360) 895-9029

Agenda Staff Report

Agenda Item No.:	<u>Business Item 7D</u>	Meeting Date:	<u>February 26, 2019</u>
Subject:	<u>Adoption of a Resolution Adopting a</u>	Prepared by:	<u>Noah Crocker</u>
	<u>Reimbursement of Equipment</u>		<u>Finance Director</u>
	<u>Expenditures Paid Prior to Financing</u>	Atty Routing No:	<u>NA</u>
		Atty Review Date:	<u>NA</u>

Summary: The City of Port Orchard recently created an Equipment Rental and Revolving Fund. As part of the 2019-2020 Budget the City Council approved the acquisition of vehicles and equipment amounting to a total expense of \$1,226,000 for the biennium.

In order to best manage the City’s cash resources, some or all of these vehicle acquisitions may be financed at a future date. The City Council desires to have the flexibility to reimburse itself from the proceeds of the borrowed funds if they choose to seek financing. A reimbursement resolution is a document which can provide the City the flexibility to achieves its goals.

The concept of a reimbursement resolution was brought forward to the Finance Committee on February 19, 2019. The Finance Committee discussed the benefits of a reimbursement resolution and recommended it be brought forward to the full Council for approval to provide flexibility and to allow the City to reimburse itself from any future borrowed funds.

Relationship to Comprehensive Plan: N/A

Recommendation: The Council Finance Committee recommends approval of the Reimbursement Resolution as presented.

Motion for consideration: “I move to adopt a Resolution approving the reimbursement to the City of equipment expenditures paid by the City prior to the financing of such expenditures.”

Fiscal Impact: N/A.

Alternatives: Do not approve

Attachments: Reimbursement Resolution.

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RESOLUTION NO. _____

A RESOLUTION OF THE CITY OF PORT ORCHARD, WASHINGTON, APPROVING THE REIMBURSEMENT OF EQUIPMENT EXPENDITURES PAID BY THE CITY PRIOR TO THE FINANCING OF SUCH EXPENDITURES.

WHEREAS, the City of Port Orchard (the “Local Agency”) reasonably expects to reimburse to itself the expenditures described herein with the proceeds of various financing contracts to be entered into by the Local Agency (the “Reimbursement Obligations”); and

WHEREAS, the expenditures with respect to which the Local Agency reasonably expects to be reimbursed from the proceeds of Reimbursement Obligations are for acquisition of police vehicles, public works trucks, water trucks, sewer trucks, CCTV truck, vactor truck, storm vehicles, administrative vehicles and corresponding equipment needed for the operation of the city; and

WHEREAS, the expenditures with respect to which the Local Agency reasonably expects to be reimbursed from the proceeds of Reimbursement Obligations will be made from Fund 500, Equipment Rental and Revolving Fund used for the acquisition, maintenance, and operations of the City’s Fleet; and

WHEREAS, the maximum principal amount of Reimbursement Obligations expected to be issued for the property described in Section 2 is \$1,226,000; **NOW THEREFORE**,

THE CITY COUNCIL OF THE CITY OF PORT ORCHARD, WASHINGTON, HEREBY RESOLVES AS FOLLOWS:

THAT: The reimbursement to the City of equipment expenditures paid prior to the financing of such expenditures, to be made from the borrowed funds, is approved.

PASSED by the City Council of the City of Port Orchard, SIGNED by the Mayor and attested by the City Clerk in authentication of such passage this 26th day of February 2019.

Robert Putaansuu, Mayor

ATTEST:

Brandy Rinearson, MMC, City Clerk

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City of Port Orchard

216 Prospect Street, Port Orchard, WA 98366
(360) 876-4407 • FAX (360) 895-9029

Agenda Staff Report

Agenda Item No.:	<u>Business Item 7E</u>	Meeting Date:	<u>February 26, 2019</u>
Subject:	<u>Approval of Change Order No. 13 to Contract</u>	Prepared by:	<u>Mark Dorsey, P.E.</u>
	<u>No. 037-17 with Active Construction, Inc.</u>		<u>Public Works Director</u>
	<u>for the Tremont Street Widening Project</u>	Atty Routing No:	<u>N/A</u>
		Atty Review Date:	<u>N/A</u>

Summary: On November 27, 2018, the Port Orchard City Council Authorized Change Order No. 2A and Change Orders No. 8 through 11 for Contract No. C037-17 with Active Construction, Inc., thereby bringing the current value of all change orders to date to a total \$1,237,474.91, or 123.75% of the Contingency Value. Change Order No. 12 was an administrative ‘no cost’ change order approved by the Public Works Director on December 19, 2018 concerning DBE realignment. Tonight’s action is for the approval of Change Order No. 13, being a design-based change needed for the East/West Detention Vault access lids at an estimated value of \$24,500.00. Approval of this change order brings the current value of all change orders to date to a total \$1,261,974.91, or 126.2% of the Contingency Value. Please note, the City’s CACM Team continues to prepare an updated cost to complete value, whereby change orders and credits from the Schedule of Value are determined.

Relationship to Comprehensive Plan: Project 1.1 – Chapter 8: Transportation.

Recommendation: Staff recommends that the City Council authorize the Mayor to execute Change Order No. 13 with Active Construction, Inc. in an amount not to exceed \$24,500.00.

Motion for Consideration: I move to authorize the Mayor to execute Change Order No. 13 with Active Construction, Inc. in an amount not to exceed \$24,500.00.

Fiscal Impact: Funding up to a \$1M Contingency Value provided within the approved 2017-2018 Budget for this Project. A budget amendment will be required.

Alternatives: None.

Attachments: Amended ACI Change Order No. 13

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CITY OF PORT ORCHARD

Authorization for Change Order No. 13

Date: February 26, 2019
Project: TREMONT STREET WIDENING
Contract / Job # C037-17

Contractor: ACTIVE CONSTRUCTION, INC.
PO BOX 430
PUYALLUP, WA 98371

THIS CHANGE ORDER AUTHORIZES THE ADDITIONAL WORK: ADDITIONAL QUANTITIES FOR EXISTING AND NEW ITEMS, ADDING ROCK WALLS AT EAST/WEST DETENTION VAULT ACCESS LIDS, VALUE ESTMATED AT \$24,500.00.

Change Order 1	\$250,000.00	Included	\$250,000.00	24-Apr-18	COUNCIL
Change Order 1A	-\$7,093.67	Included	-\$7,093.67	08-May-18	COUNCIL
Change Order 2	\$150,000.00	Included	\$150,000.00	08-May-18	COUNCIL
Change Order 2A	-\$21,305.63	Included	-\$21,305.63	27-Nov-18	COUNCIL
Change Order 3	\$116,889.50	Included	\$116,889.50	26-Jun-18	COUNCIL
Change Order 3A	\$24,703.27	Included	\$24,703.27	25-Sep-18	COUNCIL
Change Order 4	\$18,309.41	Included	\$18,309.41	24-Jul-18	COUNCIL
Change Order 5	\$69,720.34	Included	\$69,720.34	24-Jul-18	COUNCIL
Change Order 6	\$75,179.29	Included	\$75,179.29	24-Jul-18	COUNCIL
Change Order 7	\$114,820.78	Included	\$114,820.78	11-Sep-18	COUNCIL
Change Order 8	\$40,753.56	Included	\$40,753.56	27-Nov-18	COUNCIL
Change Order 9	\$142,256.52	Included	\$142,256.52	27-Nov-18	COUNCIL
Change Order 10	\$138,477.60	Included	\$138,477.60	27-Nov-18	COUNCIL
Change Order 11	\$124,763.94	Included	\$124,763.94	27-Nov-18	COUNCIL
Change Order 12	\$0.00	Included	\$0.00	19-Jan-19	PWD
Change Order 13	\$24,500.00	Included	\$24,500.00	26-Feb-19	COUNCIL
Total Contract			\$14,041,154.08		

I have reviewed the Change Order information above and certify that to the best of my knowledge descriptions and costs are true and accurate.



Contractor Approval Signature

Public Works Director/City Engineer

Printed Name & Title

MARK R. DORSEY, P.E.

Printed Name

Change Orders that do not exceed 10%, with a maximum of \$50,000, of either legally authorized budget limit or contract amount established by City Council can be approved by the Public Works Director.

Approved:

Mayor

Change Orders that do not exceed 10%, with a maximum of \$100,000, of either legally authorized budget limit or contract amount established by City Council are to be approved by the Mayor.

Attest:

City Clerk

Change Orders over \$100,000 or exceed a total of 10% require Council Action.

Council Approval Date

CHANGE ORDER



216 Prospect St.
Port Orchard, WA 98366

Date: January 17, 2019
 Federal Aid: STPUS-6610(004)
 State Contract: N/A
 Contract: LA 5855
 Projects: _____
 Change Order: CO 13

Review
 Documentation _____
 Resident Engr. _____
 Materials Appr Engr. _____
 City Project Manager _____
 WSDOT _____
 Finance (>10%)

CONTRACTOR:

Active Construction Inc.
5110 River Rd. E
Tacoma, WA 98443

PROJECT:

Tremont Street Widening
SR 16 to Port Orchard Boulevard

RECAPITULATION

ORIGINAL CONTRACT:	\$ 12,779,179.17
PREVIOUS ADDITIONS:	\$ 1,258,780.54
PREVIOUS DEDUCTIONS:	\$ (21,305.63)
PREVIOUS TOTAL:	\$ 14,016,654.08
THIS CHANGE (ADD.):	\$ 24,500.00
(DED.):	\$ 0.00
ADJUSTED TOTAL:	\$ 14,041,154.08

Sections 1-04.4 and 1-04.5 of the 2016 Standard Specifications shall govern the issuance of this Change Order. The work of this contract is herein modified to include the change detailed below. Additional quantities for existing and new items shall constitute the complete and final settlement for all costs of labor, material, equipment, overhead, profit, permit fees, damages (whether direct or indirect), and all other claims by the contractor as a result of this change.

The Contractor requested Three (3) added working days. This will be evaluated when the schedule is approved.

Your proposal and this acceptance shall constitute and become part of the contract, subject to all conditions contained therein, as modified by this Change Order.

Accepted on: _____
Date

Approved by: _____
Public Works Director/City Engineer
City of Port Orchard
2/20/19
Date

By: _____
Active Construction Inc.

Acknowledged by: _____
N/A
Surety

Surety Seal if Applicable

2.11.2019			
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**CITY OF PORT ORCHARD
CHANGE ORDER**

Tremont Street Widening
Change Order 13
January 17, 2019

Description

The East and West detention vaults will need access for maintenance. This change order includes adding 3 additional rock walls around the vault lids which includes some out of sequence structural excavation, backfill, additional traffic control and survey.

This Change Order adds quantity to the following existing Bid Items:

- Bid Item A44 CSBC per Ton with a unit price of \$22.50 per Ton and an estimated quantity of 20 Tons.
- Bid Item A140 Structure Ex Cl B incl haul per CY with a unit price of \$4.00 per C.Y. and an estimated quantity of 40 C.Y.
- Bid Item A156 Rock for Rock Wall per Ton with a unit price of \$135.00 per Ton and an estimated quantity of 50 Tons.
- Bid Item A157 Backfill for Rockwall per Ton with a unit price of \$40.00 per Ton and an estimated quantity of 23 Tons.

This Change Order creates the following Bid Item with the following quantity to the project:

- New Bid Item A1301 Additional labor and equipment per L.S. with a cost of \$11,981.89.
- New Bid Item A1302 Added Traffic Control for Wall Installation per L.S. with a cost of \$4,238.11.

Measurement and Payment

Measurement and Payment for Increased Items of Work will be in accordance with the Project Specifications and the Unit Contract Price.

Bid Item A1301 Additional labor and equipment, will be paid by lump sum.

Payment for "Additional labor and equipment" per Lump Sum.

The Bid Item price "Additional labor and equipment" paid by lump sum shall be full payment for furnishing all labor, materials, tools, equipment, and incidentals for out of sequence work, additional survey, additional mobilization and any other work not covered by existing bid items.

Measurement and Payment for A1302 Added Traffic Control for Wall Installation will be by L.S.

The total cost for this change is as follows:

The total cost for this change is as follow:

A44	CSBC	20	TON	22.50	\$450.00
A140	STRUCTURE EX CLASS B INCL HAUL	40	CY	\$4.00	\$160.00
A156	ROCK FOR ROCK WALL	50	TON	\$135.00	\$6750.00
A157	BACKFILL FOR ROCKWALL	23	TON	\$40.00	\$920.00

**CITY OF PORT ORCHARD
CHANGE ORDER**

Tremont Street Widening
Change Order 13
January 17, 2019

A1301	ADDITIONAL LABOR AND EQUIPMENT	1	LS	\$11,981.89	\$11,981.89
A1302	ADDED TRAFFIC CONTROL FOR WALL	1	LS	\$4,238.11	\$4,238.11

The total cost for this change is \$24,500

Time Statement

This Change adds Zero(0) working days to the contract duration.

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2019 Comprehensive Plan Update – Preliminary Agenda

Pursuant to Port Orchard Municipal Code Section (POMC) 20.04.050, the City's Community Development Director has initiated the process for the 2019 annual amendments to the Port Orchard Comprehensive Plan. In compliance with POMC 20.04.060(3), the Director has compiled and will maintain for public review this recommended comprehensive plan amendment agenda. All comprehensive plan amendment applications are required to be completed and submitted to the Community Development Department by 5:00 pm on January 31 of any year in order to be considered during that year's amendment process. The Director has based the agenda recommendations on a preliminary evaluation of the need, urgency, and appropriateness of the suggested comprehensive plan amendments, as well as the staff and budget availability to accommodate the public review process.

The following preliminary agenda is provided for the 2019 update to the Port Orchard Comprehensive Plan:

Comprehensive Plan Amendments for Consideration in 2019:

Text Amendments

- The Public Works Department has updated the City's 6-Year Transportation Improvement Program for 2019-2024, to be reflected in Appendix B of the Comprehensive Plan.
- Appendices A-F of the Bethel and Sedgwick Corridor Right of Way Acquisition Plan will be added to Appendix B.
- The descriptions and map of the City's local centers have been revised to correspond with the criteria and terminology adopted by the Puget Sound Regional Council.

Review Process:

The final comprehensive plan amendment agenda shall be determined by the City Council no later than April 30, 2019. When the final agenda is approved, a public notice and comment period will be provided in compliance with the Type V (legislative) permit process requirements in POMC 20.22.070 and 20.25.040. A public hearing will also be held per POMC 20.22.070(2), and a notice of the hearing will be issued in compliance with POMC 20.25.050. The Planning Commission shall make its recommendations regarding the proposed comprehensive plan amendments to the City Council no later than June 30, 2019. The City Council shall make a final decision on each proposed amendment by December 15, 2019.

The preliminary agenda and a summary of each amendment application, including maps for the site-specific amendments, are available for review on the City's website at:

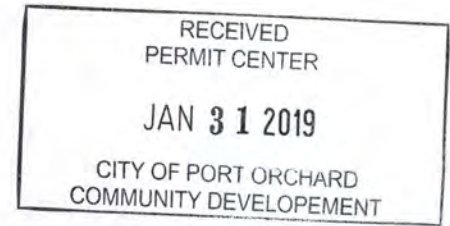
<https://www.cityofportorchard.us/2019-comprehensive-plan-amendments/>

Comments or questions regarding the 2019 update to the City's Comprehensive Plan should be sent to the City of Port Orchard, Community Development Department, 720 Prospect Street, Port Orchard, WA 98366, planning@cityofportorchard.us.

Appendix B: Plans Adopted by Reference

PLAN OR DOCUMENT
South Kitsap School District 2014-2019 Capital Facilities Plan
West Sound Utility District / Joint Wastewater Treatment Facility 2009 Capital Facilities Plan
West Sound Utility District 2007 Sewer Plan
West Sound Utility District 2013 Water Plan
Kitsap County 2003 South Kitsap UGA/ULID#6 Sub-Area Plan & EIS
Kitsap County 2012 Port Orchard/South Kitsap Sub-Area Plan
2016 Kitsap County Comprehensive Plan 10-Year Update
City of Port Orchard 1987 Blackjack Creek Comprehensive Management Plan
City of Port Orchard 1994 Ross Creek Comprehensive Management Plan
City of Port Orchard 2005 Economic Development Plan
City of Port Orchard 2010 McCormick Village Park Plan
City of Port Orchard 2012 Shoreline Master Program
City of Port Orchard 2013 Public Art Program
City of Port Orchard 2014 – 2020 Capital Facilities Plan
City of Port Orchard 2015 Water System Plan
City of Port Orchard 2015 Comprehensive Sanitary Sewer Plan Update
City of Port Orchard 2016 Transportation Plan Update
City of Port Orchard 2016 Comprehensive Parks Plan
City of Port Orchard 2016 Transportation Impact Fee Project List
City of Port Orchard 2019-202 34 ³⁴ – 6 Year Transportation Improvement Plan
City of Port Orchard Bethel/Sedgwick Corridor Right-of-Way Acquisition Plan

Chapter 2. Land Use



2.1 Introduction

The Land Use element represents the heart of the Comprehensive Plan, as land use goals, policies, map designations, and decisions connect and relate to all other elements. The purpose of this section is to provide a framework to guide future land use to help the city grow in an orderly, rational, and efficient way and help the community realize its potential during the 20-year planning horizon. The goals and policies contained herein recognize that haphazard and disorderly development can reduce efficiency and increase the cost of utilities, roads, and other services, consume valuable open space, and result in higher taxes and fees for service to fund infrastructure and services.

The Growth Management Act (GMA) requires plans to contain land use elements that describe the proposed distribution, location, and extent of land uses. Once adopted, land use goals and policies will be functionally implemented in Port Orchard's development regulations. The challenge of this element is to plan for population and employment growth while ensuring development occurs in accordance with the community's aspirations and values and the requirements of the GMA.

2.2 Key Issues and Concepts

As a community, Port Orchard is growing due to a healthy birth rate, immigration, and annexation. This plan accommodates Port Orchard's 2036 population and employment growth allocation, as distributed through the Vision 2040 framework and agreed upon in coordination with other Kitsap County municipalities in the Countywide Planning Policies. Port Orchard's land use and zoning designations currently provide sufficient land capacity within city boundaries to accommodate the projected 8,235 additional residents who will make Port Orchard their home (during the 2010-2036 planning period). In conjunction with the findings of the Buildable Lands Report, the Future Land Use Map shows how the 6,235 additional projected and allocated residents in the adjacent Urban Growth Area can be accommodated.

Residents have emphasized that it is critical to manage new growth in a way that protects the small town character of the community while allowing for new and innovative development that responds to changing household needs and growth pressures. In 2000, the city's population density was 1,943 residents per square mile. By 2012, taking into account new annexations, density had dropped to 1,213 residents per square mile. This decrease in density is due to the annexation of several areas, including the Bethel Corridor, which had far lower densities than the existing city. Based on population allocations for 2036 and no additional annexations, Port Orchard must plan for a density of 2,068 residents per square mile, an increase in density of 70%.

Port Orchard's population appears to be aging, but this trend has likely been skewed by recent annexations. Figure 1 shows the changes in different age groups from 2000 to 2010, with a significant increase--in both proportional and absolute terms--in people aged 40-69, reflecting the aging of the baby boomer generation. As Port Orchard's population ages, the city needs the flexibility to adapt to the changing needs and desires of this age group and the foresight to plan for those changes as well.

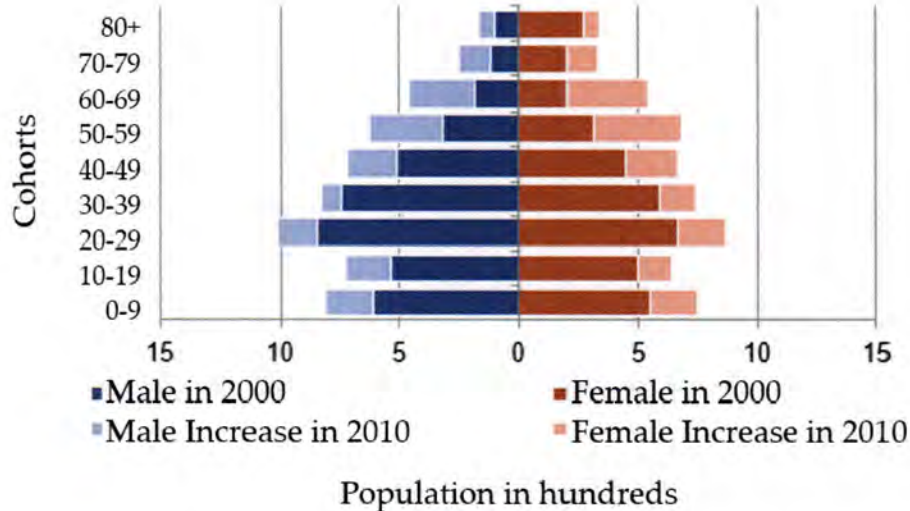


Figure 1

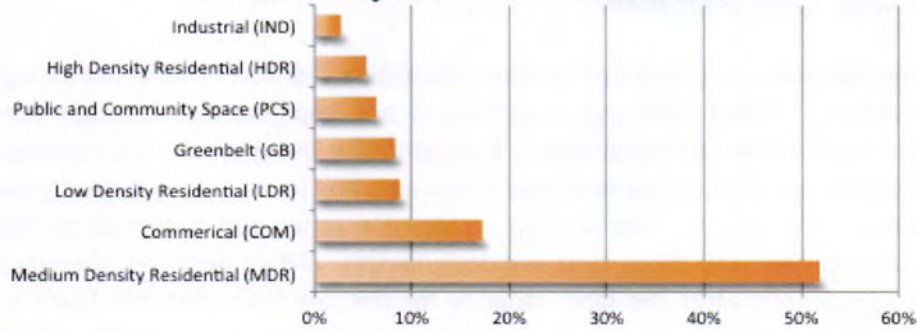
The fundamental goal of the Land Use element, as established by the GMA, is to establish broad, general direction for the City's land use policies. This element provides the City's policy plan for growth over the next twenty years. It also implements many of the goals and objectives in the other plan elements through suggested land use designations and other action recommendations. The Land Use Element specifically considers the general distribution and location of land uses, and the appropriate intensity and density of land uses given development trends and allocated population. The City's development regulations and permitting processes are used to direct growth in a manner consistent with the provisions of this element. To accomplish this, the Land Use element establishes goals and policies that seek to:

- Accommodate changes in population and demographics
- Encourage development in urban areas, reduce sprawl, and deliver services efficiently
- Ensure land use designations reflect need and demand
- Minimize traffic congestion and encourage the development of a multimodal transportation system
- Protect open spaces and the natural environment
- Promote physical activity
- Support a range of employment opportunities

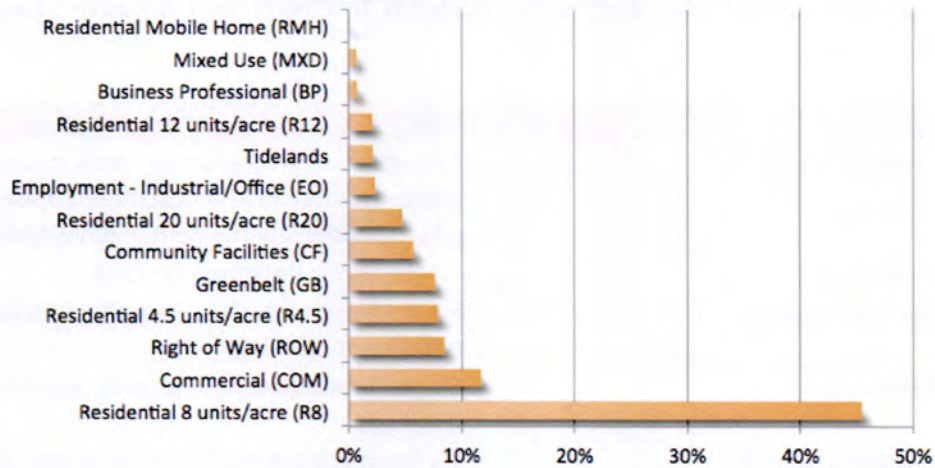
2.3 Current Land Use Characteristics

Figure 2 shows the percent of land uses and zoning based on the city's total land area as of 2014. Most land in the city is devoted to housing. Commercial areas and the downtown offer a range of goods and services, provide employment for local residents and those living in surrounding rural areas, and provide additional tax revenue to help fund public services and facilities. Industrial lands allow for light manufacturing and warehousing businesses, which also provide job opportunities and support the area's economy. Figure 2-4 shows the amount of developable land in residential land use areas.

Land Use by Share of Total Land



Zoning by Share of Total Land



Net Developable Acres by Zoning Designation

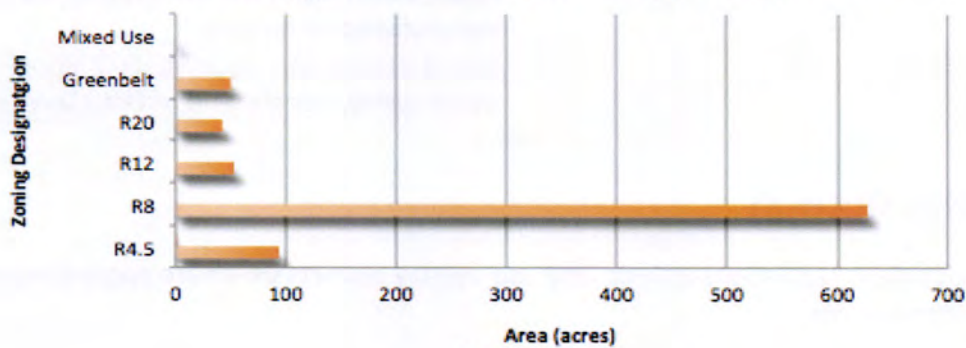


Figure 2

2.4 Land Use Designations

The City's comprehensive plan land use element identifies 7 different land use designations which are listed in Table 1. These land use designations are implemented through the city's zoning regulations contained in the municipal code. Each land use designation may correspond to one or more zoning designation. As the City develops sub-area plans for its [countywide and](#) local centers as described in section 2.7, the city may wish to create new zones and standards consistent with this plan, its goals and policies, and these land use designations. When doing so, the city should ensure that it doesn't significantly alter the land capacity for the city such that the City's population and employment growth allocations adopted in the countywide planning policies can't be accommodated. Likewise, if sub-area plans are likely to accelerate population and employment growth rates, the City should take reasonable measures to ensure that it doesn't surpass its 2036 growth targets.

Land Use Designations	Uses
Open Space / Conservation	Protection of critical areas, habitat management areas, greenbelts and designated open space to allow low density residential development.
Low Density Residential	Single-family detached housing
Medium Density Residential	Single-family detached and attached housing, apartment buildings
High Density Residential	Single-family attached housing, apartment buildings
Public and Community Spaces	Government services, utilities, parks, schools and related community facilities.
Commercial	Retail, office, mixed-use commercial/residential, and professional services.
Urban Industrial	Manufacturing and assembly, bulk storage and warehousing, transfer and trucking services.

Table 1

2.5 Overlay Districts

The city's development regulations include land use overlay districts which are applied in parts of the city, as summarized below.

- Downtown [Height](#) Overlay District
- ~~Tremont Corridor District~~
- ~~Government/Civic Center District~~
- View Protection Overlay District

These ~~downtown~~ overlay districts, ~~Tremont overlay district~~, and ~~Government Center District~~ all overlap with [the countywide local centers](#) designations described in section 2.7. These ~~three~~ overlay districts and their associated regulations may be updated as sub area plans are prepared for each

~~countywide local center. The view protection overlay district was enacted to limit building height and protect views in certain parts of the city.~~

2.6 Land Use Goals & Policies

Goals are not listed in any particular order. Port Orchard strives to:

Goal 1. Retain Port Orchard's small town commercial and residential character while accommodating allocated growth citywide.

- Policy LU-1 Ensure that land use and zoning regulations maintain and enhance existing single-family residential neighborhoods, while encouraging that new development provides a mixed range of housing types.
- Policy LU-2 Limit industrial development to locations accessible from arterials or freeways and discourage industrial access through residential areas.
- Policy LU-3 Update and establish building and site design standards that support an attractive and functional built environment in all areas of the City.
- Policy LU-4 Encourage the subdivision of large parcels and, through private subdivisions and public acquisitions, the creation of a continuous street grid similar in scale to the downtown's, especially in designated centers ~~of local importance.~~

Goal 2. Ensure that sufficient land is available for development to accommodate allocated growth in population and employment.

- Policy LU-5 Ensure land use and development regulations enable a supply of housing units within the city and adjacent UGA that will accommodate forecasted population growth. Ensure land use and development regulations enable a supply of commercial retail and office space within the city and adjacent UGA that will accommodate forecasted employment growth.
- Policy LU-6 Ensure adequate land is available for light industrial and commercial uses, including high technology, medical, and office uses, in appropriate areas to diversify Port Orchard's economic base and provide for the community's changing needs.
- Policy LU-7 Monitor the rate of residential, light industrial and commercial growth against the 20-year targets established in VISION 2040 and the Countywide Planning Policies, and if growth appears to deviate from a rate that complies with these targets, consider adopting reasonable measures such as reducing/increasing adopted transportation levels of service, reducing/increasing impact fees, or accelerating/delaying projects within the City's Capital Improvement Program.

Policy LU-8 Provide a variety of housing types and employment opportunities that meet the needs of diverse socioeconomic interests.

Policy LU-9 Notify adjacent military facilities of relevant local land use decisions.

Goal 3. Implement a strategy to develop countywide and local centers of importance.

Policy LU-10 In consultation with stakeholders and the general public, develop a comprehensive strategy to implement countywide and local centers of importance as a means of directing residential and commercial growth.

Policy LU-11 Within countywide centers of local importance, set minimum building densities that enable lively and active streets and commercial destinations. Such limits may take the form of: minimum floors or building height, floor-area-ratios, and lot coverage; and maximum street setbacks and parking spaces.

Goal 4. Ensure that both public services and infrastructure are developed in an efficient and cost-effective manner.

Policy LU-12 Prioritize capital facilities and transportation investment in those locations targeted for growth and higher land use densities.

Policy LU-13 Coordinate with Kitsap County to develop a plan and timeline to annex UGA land adjacent to the city, consistent with the city's capability to provide municipal services and applicable law.

Policy LU-14 Identify land in the UGA that is useful for public purposes, such as utility corridors, transportation corridors, parks, schools, and other public uses.

Goal 5. Protect, enhance, and maintain the values and functions of Port Orchard's natural areas, open spaces, and critical areas.

Policy LU-15 Evaluate a range of incentives to encourage compact development to preserve open space throughout the city, possibly to include density credits, incentive zoning, and transfer of development rights.

Policy LU-16 Prioritize the development of new parks, open space, and passive and active recreational opportunities in underserved neighborhoods and centers of local importance.

Policy LU-17 Incentivize infill development to preserve and protect open space, critical areas, and natural resources.

Policy LU-18 Identify land in the UGA that is useful for open space corridors, including land for recreation, wildlife habitat, trails, and connections of critical areas.

Policy LU-19 Protect the quality and quantity of groundwater used for public water supplies through zoning designations, development regulations, and the local critical areas ordinance.

Goal 6. Reduce congestion and greenhouse gas emissions, promote public health, reduce auto dependency, and increase multimodal transportation opportunities for accessing retail services, health care services, and places of employment.

Policy LU-20 Ensure orderly development, concurrency of infrastructure provision, and protection of environmentally sensitive areas through an effective and predictable permitting process.

Policy LU-21 Remove barriers to low-impact development in zoning, subdivision, and street regulations. Encourage the minimization of impervious surface areas in development.

Policy LU-22 Promote local food security and public health by enabling the establishment of urban agriculture, community gardens, farmers markets, and food production and distribution infrastructure.

Policy LU-23 Enable land use patterns that allow all residents to safely and efficiently access commercial services, especially grocery stores and healthcare facilities, without an automobile.

Policy LU-24 Encourage the expansion of transit networks that enable both incorporated and unincorporated neighborhoods outside of the city to access job centers within Port Orchard.

Goal 7. Encourage the development of active, vibrant, and attractive destinations throughout the community.

Policy LU-25 Incorporate the following principles in planning for commercial areas:

- Create lively and attractive places at a human scale.
- Support a mix of retail, office, and residential uses in multistory structures.
- Create transitions between commercial areas and surrounding residential neighborhoods.
- Protect residential areas from excessive noise, exterior lighting, glare, visual nuisances, and other conditions that detract from the quality of the living environment.
- Encourage multi-modal transportation options, especially during peak traffic periods.

- Promote an intensity and density of land uses sufficient to support effective transit and pedestrian activity.
- Promote a street pattern that provides through connections, pedestrian and vehicular access.
- Establish urban and architectural design standards that support an attractive and functional pedestrian environment, such as block size limits and requiring street-facing windows and doors.
- Encourage pedestrian travel to and within commercial areas by providing:
 - Safe and attractive walkways.
 - Close groupings of land uses.
 - Parking lot design that provides safe walking routes and pedestrian connections between adjacent properties.
 - Off-street surface parking to the backs or sides of buildings to maximize pedestrian access from the sidewalk(s).

Goal 8. Connect new and existing neighborhoods to each other, to commercial and employment centers, and to public facilities.

Policy LU-26 Require adequate transitions between different land uses to mitigate potential negative impacts of noise, light, and air pollution.

Policy LU-27 Require new development to provide connections to and through-access for existing and planned trails and roads. Explore strategies to encourage existing development to provide the same as part of a city- and region-wide trail and open space network.

Goal 9. Encourage the ongoing development of downtown as an active, vibrant community, commercial, social, and civic center while respecting its historic character.

Policy LU-28 In conjunction with the proposed Centers strategy, enhance downtown Port Orchard's role as the center of the South Kitsap region, reflecting the following principles in development standards and land use plans:

- Encourage land uses that support transit centers and promote pedestrian activity.
- Promote a mix of uses, including retail, office, and housing.
- Encourage uses that will provide both daytime and evening activities.
- Support civic, cultural, and entertainment activities.
- Provide sufficient public open space and recreational opportunities.
- Enhance, and provide access to, the waterfront.
- Develop enhanced design guidelines and design review requirements that promote attractive, pedestrian-scale development and redevelopment within the City's historic downtown area.

- Policy LU-29 Consider conducting a downtown parking study to assess current and future parking needs and develop solutions and strategies to address identified constraints or oversupply.
- Policy LU-30 Ensure land use designations and development support existing maritime industries, promote creative uses of the waterfront, and facilitate the planning and construction of waterfront parks and gathering places.

2.7 The Centers Strategy

2.7.1 Introduction

The post-war 1920s have become synonymous with the beginning of a development pattern known as urban sprawl. Sprawl expands development over large amounts of land, resulting in long distances between homes, jobs, and stores. It also significantly increases dependence on the automobile and traffic on neighborhood streets and highways, as driving is required for nearly every activity. This development pattern also draws economic resources away from existing communities and spreads them thinly and inefficiently, far away from a community's historic core. This increases spending on new roads, new water and sewer lines, and police and fire protection. This ultimately leads to the degradation of the older city, higher taxes, and fewer available resources for already existing communities. In the early 1990s, Washington sought to combat this adverse development style by adopting the GMA. Among other ambitions, the GMA suggested a new development pattern broadly known as Centers.

The criteria for designation of ~~a-countywide~~ ~~centers-of-local-importance~~ are found in the Puget Sound Regional Council (PSRC) VISION 2040, which is a regional strategy for accommodating the expected 2040 population of the Puget Sound region. According to VISION 2040, ~~countywide~~~~local~~ centers serve important roles as sub-regional hubs and secondary concentrations of development. They provide a dense mix of housing and services, such as stores, medical offices, and libraries. They serve as focal points where people come together for a variety of activities, including business, shopping, living, and recreation. They often have a civic character with community facilities, such as municipal buildings and other public places. ~~Countywide~~~~Local~~ centers should be served by regular local transit and regional express transit service, and should have a complete network of sidewalks and access to bicycle paths and transit facilities.

[VISION 2040 also provides for smaller, local centers and other types of centers, which may range from neighborhood centers to active crossroads in communities of all sizes. These centers can define community character, provide local gathering places, serve as community hubs, and are often appropriate places for additional growth and focal points for services. The Old Clifton Industrial Park is a local industrial/employment center.](#)

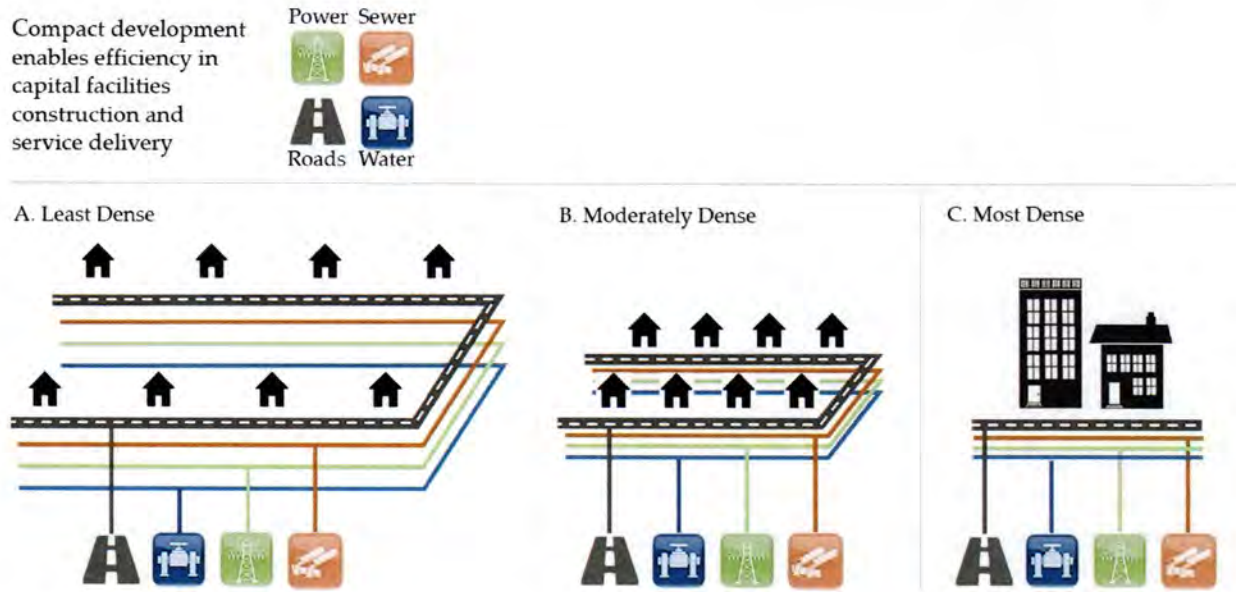


Figure 3 – The advantages of infrastructure and land use concurrency

2.7.2 What are Centers?

Traditional neighborhoods often had smaller business districts that served surrounding residential areas. These districts typically had retail shops, markets, and services that were a short walk from the homes in the area. Additionally, these districts created a unique identity that solidified the neighborhood. With the increased cost of fuel and the economic recession, residents of Port Orchard have expressed a preference for the development of smaller, local retailers and service providers in places that knit people and commerce together on a local level.

Centers are focused areas of development that have key uses which enable the City to deliver services more cost-efficiently and equitably, pursue a development pattern that is environmentally and economically sound, and provide a means of influencing growth and change through collaboration with the community in planning for the future of these areas. This strategy helps to accommodate growth in designated areas while preserving the existing character of the community, thereby retaining more open space and the dominant pattern of existing development. Centers accomplish these objectives by:

- Concentrating a thoughtful mix of supporting uses.
- Allowing more intense development while maintaining appropriate scale.
- Offering a wider variety of housing types that meets the needs of the broader community.
- Minimizing the dependence on vehicle trips.

The Centers strategy is a comprehensive and long-term approach to planning for a sustainable future that helps preserve those aspects of the community that residents value. This approach is intended to maximize the benefit of public investment in infrastructure and services and promote collaboration with private interests and the community to achieve mutual benefits.

Providing opportunities for residents, jobs, stores, services, and open spaces to be located in close proximity can reduce the reliance on cars for shopping and commuting and offer better access to daily wants and needs. Increasing residential and employment densities in key locations makes transit and other public services convenient for more people and therefore makes these services more efficient.



Figure 4 – Community Recreation Space

The CPPs define four different types of Centers:

1. Town or City Centers
2. Mixed-Use Centers
3. Activity/Employment Centers
4. Transportation Hubs

To see more detailed definitions of these Centers please refer to the Kitsap County Countywide Planning Policies.

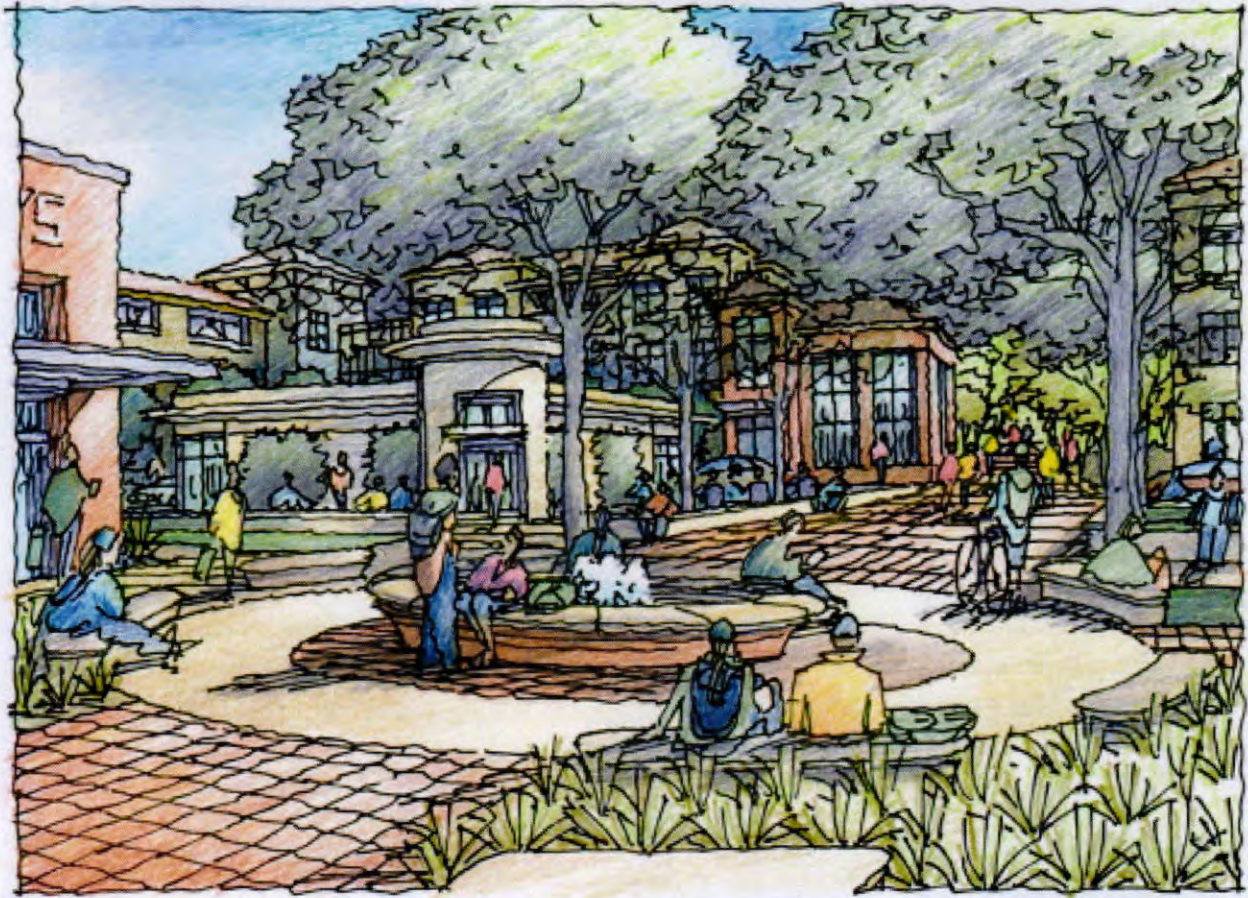


Figure 5 – Rendering of a concept for a pedestrian-focused town center.

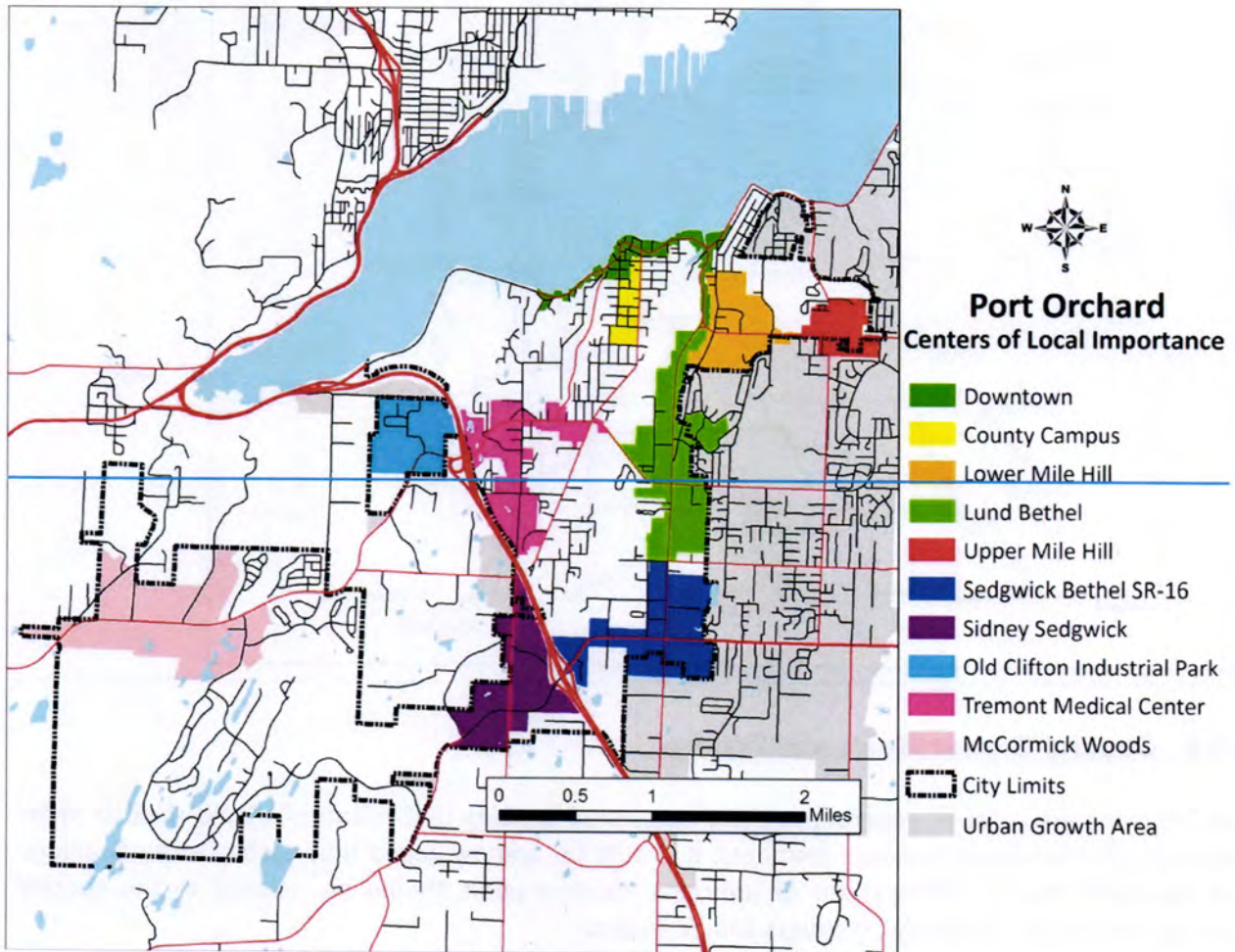
2.7.3 Designated ~~Countywide~~Local Centers (Existing and Planned)

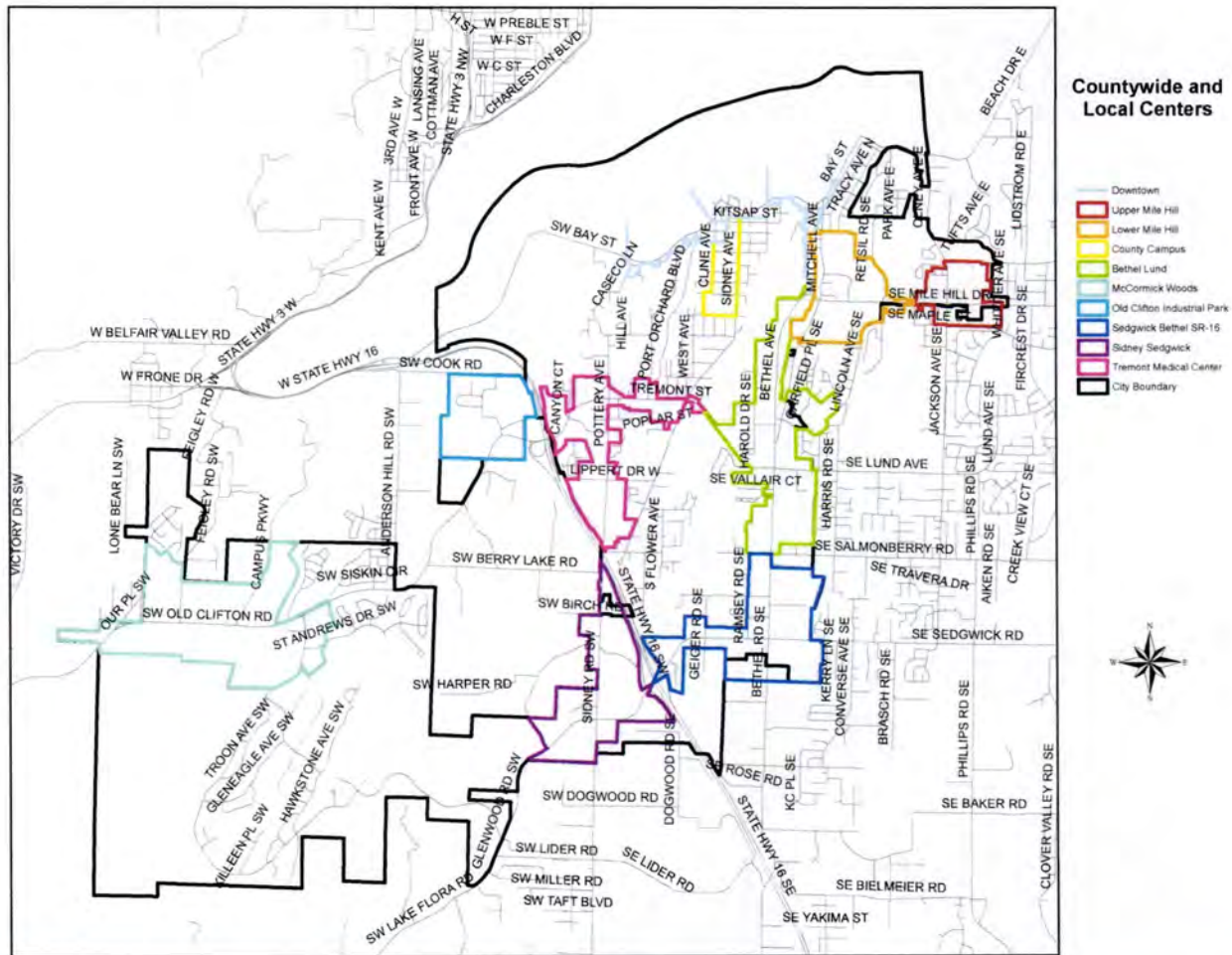
Prior to 2014, Port Orchard had ~~three~~3 identified local centers (now called countywide centers) in its comprehensive plan; the Downtown, the Tremont Center and the South Kitsap Mall Centers. After completing a series of annexations, the City Council filed a comprehensive plan amendment in 2014 to expand the number of designated local centers within Port Orchard. Sub-area planning had previously occurred for some of these areas while other newly designated areas were identified as areas for which subarea planning would need to occur in the future.

As of 2019, the following countywide and local centers~~Center's of Local Importance (local centers)~~ have been designated through the City's comprehensive planning process and are consistent with the requirements of VISION 2040 and the Countywide Comprehensive Plan policies:

1. Downtown Port Orchard Countywide Growth Center (City Center)
2. Tremont Medical Countywide Growth Center (Activity/Employment Center)
3. County Campus Countywide Growth Center (Activity/Employment Center) – Previously known as the Government/Civic Center District
4. South Kitsap Mall/Lower Mile Hill Countywide Growth Center (Mixed Use Center)
5. Upper Mile Hill Countywide Growth Center (Mixed Use Center)

6. Sedgwick Bethel [Countywide Growth Center](#) (Mixed Use Center)
7. Tremont/Lund/Bethel [Countywide Growth Center](#) (Mixed Use Center)
8. Sedgwick/Sydney [Countywide Growth Center](#) (Mixed Use Center)
9. Old Clifton Industrial Park [Local Industrial Center](#) (Activity/Employment Center)
10. McCormick Woods/Old Clifton [Countywide Growth Center](#) (Mixed Use Center)





2.7.4 General Center Goals and Policies

The following are a list of general goals and suggested policies that **cCenters** should seek to fulfill. Although **cCenters** have common elements, it should be acknowledged that each **cCenter** is unique and have/will have a different set of priorities. Centers goals should be tailored to the specific **cCenter** in question. Generally, **cCenters** should seek to:

- Policy CN-1 Prioritize the City's residential, commercial and light industrial growth and infrastructure investments within designated **cCenters**, in accordance with VISION 2040 and the Countywide Planning Policies.
- Policy CN-2 Focus future growth in designated, higher intensity areas in an effort to encourage the preservation of open space and maintain surrounding neighborhood character.
- Policy CN-3 Shorten commutes by concentrating housing and employment in strategic locations, which provides residents opportunities to live and work in the same neighborhood.

- Policy CN-4 Provide commercial services that serve the population of the Center, surrounding neighborhoods, the city, and the region (dependent on the suitability of the scale of each Center).
- Policy CN-5 Support pedestrian and transit uses by promoting compact, mixed-use areas with appropriate infrastructure that provide a variety of activities.
- Policy CN-6 Balance objectives for accommodating growth, encouraging compatibility, promoting housing affordability, and offering a wide range of housing types.
- Policy CN-7 Provide access to parks and public pedestrian spaces by creating them within each Center or by creating connections to existing public and open spaces.
- Policy CN-8 During subarea planning for Centers, develop an implementation plan that addresses how the City will meet Center goals through appropriate land use designations, annexation, development of capital facilities and utilities, and related measures.

Suggested Policies (for Individual Centers)

Policies are the principles the City will use to guide decisions. The following are general suggested policies for future Center subarea plans to be incorporated into the comprehensive plan. These policies should be tailored to achieve the identified goals for each of the proposed Centers. Each policy is followed by numbers that correspond to the Centers goals that it advances, and titles that identify its connections to other elements of the plan.

- Policy CN-9 In coordination with Kitsap County, the City shall designate [countywide and](#) local [Centers](#) and direct growth to them through focused regulations and directed capital projects. (Centers Goals 1,2,3,4,5,6; Housing, Parks, Economic Development, Transportation, and Capital Facilities Elements)
- Policy CN-10 The City should support employment growth, the increased use of non-automobile transportation options, and the preservation of the character of existing built-up areas by encouraging residential and mixed-use development at increased densities in designated Centers. (Centers Goals 1,2,3,4,5,6; Housing, Parks, Economic Development, Transportation, and Capital Facilities Elements)
- Policy CN-11 The City shall ensure that higher density development in Centers is either within walking or biking distance of jobs, schools, and parks or is well-served by public

transit. (Centers Goals 1,2,3,4,5,6; Housing, Parks, Economic Development, Transportation, and Capital Facilities Elements)

- Policy CN-12 The City shall create and designate zoning that allows a mix of uses to accommodate concentrations of employment and housing. (Centers Goals 2,3,4; Economic Development and Housing Elements)
- Policy CN-13 The City should explore appropriate zoning to facilitate predetermined capacities of jobs and housing units for each individual Center. (Centers Goals 2,3,4,5; Housing and Economic Development Elements)
- Policy CN-14 In consultation with local businesses and property developers, the City should reevaluate existing overlay districts and their associated regulations to address potential barriers to development. Existing overlay areas should be evaluated for potential inclusion in the proposed Centers strategy. (Centers Goal 3; Economic Development Element)
- Policy CN-15 To ensure compatibility with the character of the city, the City should consider establishing design guidelines for Centers that preserve a small town character, establish a human-scale residential image, and encourage interaction among residents. The City should ensure development regulations promote attractive site and building design that is compatible in scale and in character with existing development. (Centers Goals 1,4,5,6; Housing Element)
- Policy CN-16 The City shall encourage a broad range of housing types and commercial uses within designated Centers, through zoning and development regulations that serve a local, citywide, or regional market. (Centers Goals 3,5; Housing and Economic Development Elements)
- Policy CN-17 The City shall promote convenient and direct connections to adjacent areas for pedestrians and bicyclists. (Centers Goals 2,4,6; Transportation and Capital Facilities)
- Policy CN-18 The City shall encourage direct access to either existing or potential public open spaces in the vicinity of each Center. (Centers Goals 4,6; Parks and Transportation Elements)

2.7.5 Specific Center Descriptions, Goals, and Policies

2.7.5.1 Downtown Port Orchard (City Center)

The Port Orchard Downtown is the cultural, civic, and recreational hub of the community. Founded in 1890 as the Town of Sidney, it became the county seat in 1892 and was renamed Port Orchard in 1903. During this time, transportation around the Kitsap peninsula was highly dependent on the water. The town's first dock was built in 1889, and within a few years the private steam vessels that became known as the "Mosquito Fleet" began to serve the citizens. By the 1920s, diesel-electric ferries from San Francisco replaced the steamship ferries, and today Port Orchard is still served by foot ferry service to Bremerton.

In 1890, the town had no streets, and was divided into three sections by Pottery Creek and Black Jack Creek. Mass grade and fill efforts highly altered the waterfront and its associated creek and marsh system, and many of the downtown buildings on the water side of Bay Street are on pilings and subject to subterranean tidal influence. Currently, the downtown contains a mix of land uses, including Port Orchard's City Hall and public library, numerous retail and service businesses, a marina and ferry dock, public parking, and a waterfront park and trail. With access from the water and from state highways 3 and 16, it remains the City's primary center for community events and activities. The City continues to work toward a balance of historic preservation, environmental restoration, and economic improvement for the downtown center.

Goal 10. Update the existing Downtown Development Regulations (currently known as the Downtown Overlay District) to better define design guidelines, the design review process, and to encourage a balance between historic preservation and redevelopment in accordance with the following purposes:

1. Implement the land use goals and policies set forth in the Comprehensive Plan.
2. Provide for the development of an integrated mixed use downtown district that contains office, service, retail, residential and recreational uses within close proximity to one another.
3. Encourage imaginative site and building design and development while maintaining view corridors and a small town feel.
4. Identify potential significant environmental impacts, and utilize mitigation sequencing in project review with emphasis on avoidance and minimization of impacts.
5. Promote sustainable and low-impact development.
6. Encourage restoration and enhancement of degraded shorelines and critical areas in the downtown area as part of new development and redevelopment.
7. Encourage environmentally sustainable development.
8. Promote economic development and job creation in the City.

9. Encourage energy conservation in building design and layout.
10. Promote an integrated system of pedestrian-friendly walkways and parking areas.
11. Enhance the City's waterfront character while maintaining the maritime presence.
12. Encourage the development of buildings with ground floor retail with office uses and residential uses above.
13. Promote a walkable community by encouraging the development of public open spaces, waterfront access, and pedestrian-friendly walkways.
14. Locate and combine parking areas in order to minimize the number of points of access to and from Bay Street.
15. Encourage architectural and site designs that serve as gathering places in wet and dry conditions.
16. Promote greater public transportation availability within Port Orchard and across Sinclair Inlet during the evening hours to improve access to/from the DOD.

Goal 11. Provide zoning that is consistent with Port Orchard's existing built environment, topography, and lot sizes that allow for financially viable, high quality development.

Policy CN-17 Allow bulk standards (height, setbacks, building size, parking requirements, etc.) and a minimum unit size to determine residential density.

Goal 12. Retain existing maritime industries.

Policy CN-18 Encourage incentives for maritime industries to remain and expand development to serve the Puget Sound boating industry.

Goal 13. Encourage mixed use development within the Downtown and Gateways.

Policy CN-19 Encourage residential use above commercial and retail ground floor developments, including incentives and public amenities.

Policy CN-20 Adopt design standards for Gateways.

Goal 14. Encourage facilities that will draw local residents and tourists to Downtown and the Gateways.

Policy CN-21 Facilitate the planning and construction of waterfront parks or gathering places.

- Policy CN-22 Consider developing a parking garage for use by downtown residents, visitors, and employees.
- Policy CN-23 Require a 10-foot wide boardwalk and/or upland trail, dedicated to the public, on the shoreline for redevelopment projects, and seek funds to acquire easements on private properties and build a boardwalk and/or upland trail on public property, with removal or pulling back of rip rap and restoration of shoreline vegetation where feasible, for a contiguous pedestrian shoreline connection that minimizes shoreline impacts.
- Policy CN-24 Create an aesthetically pleasing entryway to the City with the use of high-quality signs, artwork, and landscaping.

Goal 15. Plan for protection of existing buildings and other structures within the downtown area that are vulnerable to flooding from existing high tide events and from future sea level rise.

- Policy CN-25 Continue to implement City code requirements for flood damage prevention, in accordance with the recommendations of the Federal Emergency Management Agency, by identifying special flood hazard areas and restricting new development and redevelopment in those areas.
- Policy CN-26 Identify buildings and structures that are currently affected by high tide events and that are most vulnerable to future sea level rise, and develop potential actions to prevent worsening of flooding problems.

2.7.5.2 Tremont Medical Center

1. Purpose. The purpose of the Tremont sub-area plan is to ensure that future development in the Tremont Corridor is guided by specific guidelines and land use regulations that have been generated by community wide involvement. This Comprehensive Plan and Tremont Corridor District plan incorporates existing comprehensive or other documents related to properties within the Tremont Corridor Sub Area. This plan will establish certain important Visions, Goals, and Policies as well as standards and guidelines within the Tremont Corridor sub-area.
2. Vision. The Tremont Corridor is one of three primary entry points into the City of Port Orchard from Highway 16. Presently the area is a mix of single-family residences, commercial, health care facilities and multi-family residences. The expanded Harrison Hospital Urgent Care Campus and Group Health facilities are the anchors for businesses along the corridor, particularly from Pottery Avenue west to Highway 16 forming the basis for a Hospital Benefit District. The Tremont Corridor is a through-way for travelers and residents wanting to access shops and services in the core of the city and businesses and homes in outlying areas. The Tremont Corridor also

announces to residents and visitors alike that the city has economic vitality and provides services and opportunities to its citizens and residents in the south Kitsap area.

Tremont Corridor residents and Port Orchard citizens have determined that they would like to see the corridor developed in way that encourage professional businesses that support the health care facilities already in place and businesses that allow the continuing free flow of traffic from Highway 16 into the downtown areas. Focus should be placed upon pedestrian connections within the district as well as providing a regional connection to the South Kitsap areas served by the hospitals and emergency service providers within the district.

Tremont Avenue will be improved and widened with sidewalks, street trees and a landscaped island that will create a boulevard style of roadway. The Tremont corridor is promoted to include design standards that will necessitate new development to provide a consistent, attractive landscape edge while maintaining a human scale to new and redevelopment projects. A system of trails that are pedestrian and bike friendly connecting the Tremont Corridor to the Port Orchard marine walkway with trails through natural areas are key to the success of the Tremont district.

The Tremont district is envisioned with some multi-family residences to accommodate the combination of residential and employment land uses within walking distances of the major health care facilities. Some cafes and neighborhood services are also envisioned to support those living, working or visiting the health care facilities. Regulations and design guidelines should help to ensure that parking is provided in a manner that is beneficial to the neighborhood and enhances the flow of transportation through the district. In addition, Tremont Corridor stakeholders envision monument signage that are tastefully designed and constructed of natural materials.

The corridor from Pottery Avenue east to Sidney Road consists primarily of single-family residences and small clinics. Single family uses are encouraged as a desired mix of services and residential uses within this district.

3. Tremont Medical Center Goals

Goal 16. Encourage development within the area that supports the major hospital and medical installations (Harrison Hospital and Group Health) and assists the emergency response agencies in the corridor (South Kitsap Fire District).

Policy CN-25 Encourage regulations that enhance existing businesses while providing incentives that promote economic growth in the corridor while maintaining sensitivity to residents in the area.

Policy CN-26 Encourage professional and office uses that support the medical industry and create pedestrian oriented health care focus.

Policy CN-27 Adopt Tremont Corridor Design Standards for non-residential structures within the Tremont Overlay District.

Policy CN-28 Promote the creation of a hospital benefit district that will create opportunities for additional community and economic development funding.

Goal 17. Create landscaping requirements specific to the Tremont Corridor with emphasis on the boulevard (Tremont Street) and creating an attractive entry way to the city.

Policy CN-29 Incorporate revised landscape standards into the Port Orchard Municipal Code and apply landscaping standards developed for the Tremont Corridor.

Policy CN-30 Require new developments to utilize landscaping that creates visually interesting and environmentally sustainable design.

Goal 18. Encourage residential units in walking distance to employment, services, and health care facilities.

Policy CN-31 Require sidewalks or interconnected pedestrian paths or a system of trails for non-motorized transportation with all new development.

Goal 19. Encourage development of an efficient multimodal transportation system and develop a funding strategy and financing plan to meet its needs.

Policy CN-32 Encourage all new developments to limit direct access to Tremont Street.

Policy CN-33 All future City paving projects on streets within the Tremont Corridor should include continuous 5-foot paved walkways for pedestrian use. These walkways shall be coordinated with an area wide Trail Plan as necessary.

Policy CN-34 Developments abutting public rights-of-way within the Tremont Corridor should include sidewalks and bicycle lands.

Policy CN-35 The City shall help to facilitate the development of trail systems that connect the Tremont Corridor with transportation facilities in the surrounding areas.

Policy CN-36 Encourage the expansion of Kitsap Transit's service to increase trip frequency within the Tremont Corridor.

2.7.5.3 County Campus Center

The City of Port Orchard has benefited from being the Kitsap County seat, as well as Kitsap County long serving as the City's largest employer. Kitsap County has proposed several phased development scenarios to provide options for the expansion of County facilities within the City of Port Orchard over the next 40 years. The District included land use and regulation proposals derived from the Kitsap County Campus Master Plan created in 2003, which was designed to accomplish the expansion of community facilities and allow uses that would serve to buffer the residential areas from the Campus.

Figure 6 – Kitsap County Campus Master Plan 2003, courtesy of Kitsap County.



Vision. The vision of the County Campus Center is to encourage the aesthetic development of the Kitsap County Government buildings in a campus-like setting. The Government / Civic Center District, (GCCD), has been delineated to be bounded by Dwight Street, Cline Avenue, Kendall Street, and Sidney Avenue. The purpose of the design standards and review criteria is to insure that site development and structures in the Government / Civic Center overlay districts meet the intent of the City for high quality construction in a campus-like setting. The proposed standards address an array of design elements related to pedestrian safety, along with design standards to promote compatibility with surrounding residential uses such as setbacks, landscaping, architectural elements and screening.

Goal 20. Encourage campus-like development in an orderly and aesthetic manner supporting the needs of the Kitsap County Government Uses.

Policy CN-37 Encourage development of community oriented uses and services that support the mission of the County Seat.

Policy CN-38 Support limited business and professional uses that serve the governmental offices and provide services to the employees and citizens.

- Policy CN-39 Encourage the development of a pedestrian plaza within the campus as a gathering spot and center for meetings, rallies, and public organization efforts.
- Policy CN-40 Support residential use within the overlay district and ensure new development is sensitive to those uses.
- Policy CN-41 Create design review criteria for government development within the overlay district and require review by a design review board for all new government structures.
- Policy CN-42 Encourage use of landscaping to mitigate impacts of noise, lighting, odor, and aesthetics on surrounding residential neighbors, through the use of such measures as evergreen plant screens, sound barriers, fences, mounding, berming, etc.
- Policy CN-43 Encourage Green Building Standards and low impact development for all governmental development within the overlay district. Structures designed LEED Silver standard for all new government development is strongly supported.
- Policy CN-44 Require pedestrian friendly development that encourages non-motorized mobility throughout the overlay district with connections to adjacent points of interest or [areacenters](#) of activity.

2.7.5.4 South Kitsap Mall/Lower Mile Hill

The South Kitsap Mall Lower Mile Hill [Mixed-Use](#) Center consists of the lower sections of the Mile Hill Road commercial corridor, adjacent multi family development, and South Kitsap School District facilities including the administrative offices, the transportation center, and the High school. The area is served by Kitsap Transit. The City should work to develop a sub area plan for this area prior to the next periodic comprehensive plan update.

2.7.5.5 Upper Mile Hill

The Upper Mile Hill [Mixed-Use](#) Center consists of the upper sections of the Mile Hill Road commercial corridor and contains a mix of multi family and single family development. The area is served by Kitsap Transit. The City should work to develop a sub area plan for this area prior to the next periodic comprehensive plan update.

2.7.5.6 Sedgwick/Bethel

The Sedgwick/Bethel [Mixed-Use](#) Center consist of the Bethel Commercial corridor from Salmonberry to the North to the city boundary to the south and along the Sedgwick corridor connecting to SR-16 to the west. In addition to commercial development and commercially zoned vacant land, this area includes a future park site and land zoned for multifamily development. The area is served by Kitsap Transit. The City should work to develop a sub area plan for this area prior to the next periodic comprehensive plan update.

2.7.5.7 Tremont/Lund/Bethel Center

The Tremont/Lund/Bethel Center consists of the Bethel commercial corridor from the intersection of Mile Hill Road south to Salmonberry, the adjacent multifamily housing developments, The area is served by Kitsap Transit. The City should work to develop a sub area plan for this area. Prior to the next periodic comprehensive plan update. The City should work to develop a sub area plan for this area prior to the next periodic comprehensive plan update.

2.7.5.8 Sedgwick/Sidney

The Sedgwick/Sidney Center is a rapidly developing area of the city that has seen more than 220 units of multifamily housing develop since 2010 along with significant new commercial development. The area is served by Kitsap Transit. The City should work to develop a sub area plan for this area prior to the next periodic comprehensive plan update.

2.7.5.9 Old Clifton Industrial AreaCenter

The Old Clifton Industrial Area Employment Center is located at the site of reclaimed sand and gravel mine. Its close proximity to transportation facilities and its isolation as a result of past mining activities make it an ideal site for industrial and employment uses. The site is served by Kitsap Transit and is located along Old Clifton Road near SR-16. The City should work to develop a sub area plan for this area prior to the next periodic comprehensive plan update.

2.7.5.10 McCormick Woods/Old Clifton Mixed Use Center

The McCormick Woods/Old Clifton Mixed Use Center includes a portion of the McCormick Woods master planned community, the recently developed city park McCormick Village Park, the site a future South Kitsap High School (an additional high school), recreational facilities including trails and a golf course, and areas zoned for multifamily and commercial development. The area is not presently served by Kitsap Transit. The City should work to develop a sub area plan for this area prior to the next periodic comprehensive plan update.

2.7.6 Road Map to Implementation

Further planning for each identified local center is required in order to implement the City's vision for the overall centers strategy. The city is committed to undertaking a sub area planning process for each center, to better identify center boundaries, develop a vision, goals, and policies for each center. This planning process will also provide recommendations for amending the development regulations, zoning designations, design guidelines and capital facility plans to reflect and implement the sub area plans. Sub-area plans for the centers will be adopted into the City's comprehensive plan.



Figure 7 - Rendering of a conceptual center.



Figure 8 - Rendering of a centers concept.

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After Hours Use of City Hall

Build was not designed to be used as a shelter.

If we want to use City Hall in this manner, we need to develop policy's & procedures.

Would require the amendment of Ordinance 2.74

Requires staffing & training for the staff. Not recommended that Council Members perform staff functions, its not the role of Council Members.

Our insurance company was concerned that Council Members had keys to the building.

Chapter 2.74
CITY HALL FACILITIES

Sections:

2.74.010 Port Orchard City Hall facilities use policy.

2.74.010 Port Orchard City Hall facilities use policy.

(1) Rooms available for use are the council chambers, council conference/workroom, third floor conference room, and the courtroom. Use of the courtroom is limited to judicial or quasi-judicial hearing.

(2) There would not be any rent for city of Port Orchard government, which includes elected officials, city planning commissioners, city-appointed boards and city staff working on city business.

(3) There would not be any rent for local governmental or quasi-governmental agencies which the mayor or designee is on the board or is an active participant. This would include Kitsap Regional Coordinating Council, Kitsap County Health District, Kitsap Transit, Economic Development Council, and the Kitsap County Housing Authority.

(4) There would not be any rent for groups in which a council member participates and it addresses city-affiliated business. Examples of this would be task forces in which a council member participates in special committees, such as the Christmas tree lighting committee or Bethel Corridor task force.

(5) Facilities are not available for use by commercial, fraternal, political, or religious organizations.

(6) There would not be any rent for town meetings sponsored by state or federal officials.

(7) Other governmental agencies which are not listed above shall pay the rental fees.

(8) Community organizations receiving financial support from the city may use the rooms without paying the rental fee in the year they receive that financial support.

(9) Community groups not listed above shall pay the rental fee.

(10) No regular, prescheduled, reoccurring reservations for any noncity groups or organizations will be allowed.

(11) All scheduling shall be made and confirmed through the city clerk's office.

(12) City council and city planning commission meetings have priority if a scheduling conflict is experienced. In the event of a special council or planning commission meeting, a prescheduled reservation by a noncity organization will be cancelled. Attempts will be made to relocate such rescheduled groups to another area. If relocation is not workable, application fees and deposit will be refunded.

(13) City staff will open and secure the facility. No keys will be given to noncity personnel at any time. In the event a room is scheduled for use after normal business hours, a staff member or city official must be present.

(14) City audio/visual equipment will only be operated by city-authorized personnel.

(15) The mayor or designee shall be authorized to waive fees, rule on any exceptions or clarify rules or provisions of this policy. Exceptions or clarifications shall be in written signed format.

(16) The rental fee would not be prorated.

(17) No food or coffee is allowed in the council chambers. (Ord. 1780 § 1, 1999)

RESOLUTION NO. 1880

A RESOLUTION OF THE CITY OF PORT ORCHARD, WASHINGTON
ESTABLISHING FEES FOR USE OF CITY HALL FACILITIES AND
REPEALING RESOLUTION NO. 1867.

WHEREAS, it is the desire of the City Council to provide fees for use of city hall facilities,
and,

WHEREAS, the City of Port Orchard has adopted Ordinance No. 1780 establishing
procedures and policies for the use of city hall facilities, and authorizing fees established by city
resolution, and

WHEREAS, the City Council deems it in the best interest of the City of Port Orchard to
periodically review and update such resolutions, now, therefore,

**THE CITY COUNCIL OF THE CITY OF PORT ORCHARD, WASHINGTON HEREBY
RESOLVES AS FOLLOWS:**

SECTION 1. Port Orchard City Hall Facilities Use Fees. The following fees are
established for use of certain rooms within Port Orchard City Hall. Use of city hall facilities are subject to
policies and procedures as set forth in Port Orchard City Hall Facilities Use Policy adopted by Ordinance No.
1780.

- | | | |
|-----|-----------------------------|---|
| (1) | Council Chamber | \$40.00 per hour, minimum of two hours |
| (2) | Courtroom | \$40.00 per hour, minimum of two hours |
| (3) | Council Conference Room | \$25.00 per hour, minimum of two hours |
| (4) | Conference Room #306 | \$25.00 per hour, minimum of two hours |
| (5) | After hour staffing charges | \$35.00 per hour |
| (6) | Cleaning/damage deposit | \$100.00 |
| | (a) | Refundable if no extra
cleaning or maintenance
is required after use. |
| | (b) | In the event that extra
cleaning or maintenance
is required, the amount
of deposit forfeited will
be determined by the
City Clerk based upon
time and cost of
cleaning or repairing
damage. |

(7) Audio/Visual equipment fee.


Fee shall be determined at time of scheduling or use by the City Clerk, based upon availability and cost of equipment operator.

(8) Room set up fee \$20 per hour, minimum one hour

PASSED by the City Council of the City of Port Orchard, APPROVED by the Mayor and attested by the Clerk in authentication of such passage this 22nd day of November 1999.



LESLIE J. WEATHERILL, MAYOR

ATTEST:


Patricia Parks, City Clerk