

City of Port Townsend

Public Works Department

181 Quincy Street, Suite 301
Port Townsend, WA. 98368
Phone: (360) 385-7212
Fax: (360) 385-7675



Engineering Design Standards Manual

REVISIONS:

These specifications may be revised periodically as necessary. Each revision will be on replacement loose-leaf pages to be inserted as indicated, accompanied by a replacement title page with the effective date of the revision.

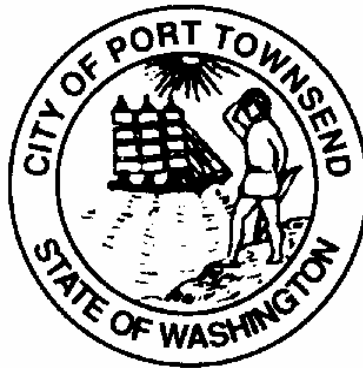
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CITY OF PORT TOWNSEND

DEPARTMENT OF PUBLIC WORKS



ENGINEERING DESIGN STANDARDS MANUAL

April 1997

**Robert L. Wheeler, P. E., Director of Public Works
David L. Peterson, P.E., City Engineer
Colette Kostelec, P.E. Development Review Engineer**

FORWARD

The purpose of the Engineering Design Standards is to establish minimum requirements for all development in the City relating to water, sewer, storm drainage, transportation, utilities, clearing and grading, erosion control and construction activities. This document is intended to be used in conjunction with the City of Port Townsend Municipal Code and other applicable design and construction standards including, but not limited to, the latest edition of the Standard Specifications for Road, Bridge, and Municipal Construction, prepared by the Washington State Department of Transportation and the Washington State Chapter of the American Public Works Association.

The Engineering Design Standards apply whenever any public or private work is performed within the right-of-way of the City of Port Townsend or on-site when required by City ordinance, permits, or action of the City Council, including work performed by private parties at their own expense under authority granted by ordinance of the city council or by the permit process of the Building and Community Development Department and/or the Public Works Department.

Any questions on the interpretation of the material contained in this document should be directed to:

City Engineer
City of Port Townsend
Public Works Department
181 Quincy Street, Suite 301
Port Townsend, WA 98368
(360) 385-7212

Waivers and variances from these standards may be granted by the Public Works Director in accordance with the criteria in Titles 12 and 13 PTMC. Any waiver or variance must be approved in writing prior to construction. These guidelines are intended to be minimum standards. Stricter requirements may be applied to a specific development in order to meet the requirements of the Port Townsend Municipal Code, implement the policies of the Growth Management Act Comprehensive Plan, meet permit conditions, or to protect the public health, safety and welfare.

Failure to comply with these standards and guidelines could result in delay of project approvals, non-acceptance of the work and/or withholding or withdrawing of all approvals associated with the facilities proposed.

These specifications may be revised periodically as necessary. It shall be the responsibility of the individual to check with the City of Port Townsend to insure that the Engineering Design Standards manual being used is the most current on file.

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DEFINITION AND TERMS

The following definitions and terms are used for these Standards. If these definitions and terms conflict with any City ordinance, the ordinance language shall govern. If conflicts exist with other standards and documents referred to in the manual, the definition and terms in the City of Port Townsend Engineering Design Standards shall govern.

1. **Abutting property:** includes all property that fronts upon the margin of any street, right-of-way, alley or other public place.
2. **Airgap:** a backflow prevention device that provides an unobstructed vertical distance of at least twice the inside diameter of the supply line, but never less than one inch, through the free atmosphere between a supply line outlet and the overflow rim of a receiving vessel.
3. **Alley:** a public thoroughfare or way having a width of not more than twenty feet which normally affords only a secondary means of access to abutting properties.
4. **Approved Street:** a public right-of-way accepted and approved, in writing, by the public works director to be fully developed to city street standards or any permitted variation. The city maintains all approved streets, unless a duly authorized development agreement requires private maintenance.
5. **Average daily flow:** the total yearly flow divided by the days of operation.
6. **BCD Director:** the Director, or designee, of the building and community development department of the City of Port Townsend.
7. **Backflow:** the flow of water or other liquids, mixtures, or substances into the distribution pipes of a potable supply of water from any source or sources other than its intended source.
8. **Backflow Prevention Device:** a device, assembly, or means to prevent backflow into the potable water system, either by back-siphonage or back pressure.
9. **Back pressure:** the backflow of used, contaminated, or polluted water from a plumbing fixture or vessel into a water supply pipe due to pressure created by booster pumps, boilers, pressure vessels, or elevated plumbing that exceeds the main pressure or operating pressure of the water supply pipe.
10. **Back-siphonage:** the backflow of used, contaminated, or polluted water from a plumbing fixture or vessel into a water supply pipe due to a negative pressure in such pipe.
11. **Bicycle lane:** a clearly marked lane of travel for bicycles on the side of a street or roadway, separated from the automobile lanes by painted strips, curbs or buttons.
12. **Bicycle path:** a bicycle pathway that is physically separated from the roadway and its associated vehicular traffic. No motorized vehicles are permitted.
13. **Bikeway:** any road, path, or way which in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.
14. **Clerk:** means the clerk of the city of Port Townsend.
15. **City Datum:** the top surface of the copper bolt in the stone monument now standing for the southwest corner of block numbered forty-one in the City of Port Townsend: the intersection of the northerly line of Water Street with the easterly line of Taylor Street, is designated, fixed, established and declared as and for the base, or datum line, to which every grade hereafter established of every street, alley, avenue, or portion thereof, in the city shall refer (PTMC 1.08.010). See also Street Survey Monumentation Plan.

16. City Engineer: The City Engineer for the City of Port Townsend or his/her duly authorized designee.
17. City Street Standards: those standards for right-of-way and transportation system construction and improvement set forth in the city of Port Townsend “Engineering Design Standards,” and in Chapter 12 of the PTMC, together with any other requirements for streets provided by other ordinances of the city.
18. Clean out: a service access in sewer lines designed for maintenance activities.
19. Commercial Services: water or sewer services to businesses engaged in the manufacture and/or sale of a commodity or commodities or the rendering of a service, hotels, motels institutional establishments such as hospitals, nursing homes, places of worship and schools, and mixed use centers (mixed commercial and residential units).
20. Comprehensive drainage plan: a detailed analysis for each drainage basin which compares the capabilities and needs for runoff accommodations due to various combinations of development, land use, structural and nonstructural management alternatives.
21. Council: means city council of the city of Port Townsend.
22. Cross-Connection: any connection between any part of the water system used or intended to supply water for drinking purposes and any source or system containing water or substance that is not or cannot be approved as safe, wholesome potable for human consumption.
23. Cul-de-sac: a short street having one end open to traffic and being terminated at the other end by a vehicular turnaround.
24. Customer: means all persons obtaining water, wastewater or storm drainage utility service through the city of Port Townsend
25. Dedication: conveyance of land to the city for street, pathway, utility or open space purposes by deed or some other instrument of conveyance or by dedication on a duly filed and recorded plat, short plat or binding site plan.
26. Design Storm: the rainfall event which is selected by the public works department for purposes of design, specifying both the return period in years and the duration in hours.
27. Detention facilities: facilities designed to hold runoff while gradually releasing it at a predetermined maximum rate.
28. Developer: any person, including his/her authorized representative, proposing to engage or engaging in, the development of a parcel.
29. Development: (1) construction of a new dwelling unit, mixed use center, commercial or manufacturing establishment, or other new structure on a vacant lot or parcel; or (2) a redevelopment or change in the intensity of the use of an existing structure that creates an appreciable impact on existing infrastructure.
30. Developmental coverage: all developed surface areas within the subject property including, but not limited to, rooftops, driveways, carports, accessory buildings, parking areas, and any other impervious surfaces. During construction “development coverage” shall include the above in addition to the full extent of any alteration of previously occurring soils, slope or vegetation due to grading, temporary storage, access areas, or any other short-term causes.
31. Direct Service Water Customer (or Water Customer): those customers receiving water through a meter installed by the Water Department for end uses directly from the Port Townsend water distribution system and classes as direct service or retail for billing purposes.

32. Director: the public works director for the public works department of the city of Port Townsend, or his/her designee, and shall include without limitation, the city engineer and the city development review engineer
33. Drainage area: the watershed contributing water runoff to and including the subject property.
34. Drainage plan: a plan for collection, transport, treatment, and discharge or recycling of water within the subject property.
35. Easement: the right to use a defined area of property for specific purpose/purposes as set forth in an easement document, on a plat or short plat, or as required for purposes as set forth herein.
36. Engineer: Washington State licensed professional engineer. Engineers are required to have experience and knowledge about the specific field of engineering they are practicing.
37. Fireflow: the rate of water flow needed to fight fires as defined by the city engineering design standards manual.
38. Hammerhead turnaround: an area at the end of a street that is designed to provide a fire apparatus turnaround area.
39. High Strength Waste: any wastewater which has a concentration higher than typical domestic wastewater as further defined under Chapter 13.24 PTMC.
40. Impervious area: any part of a parcel of land that has been modified by the action of persons to reduce the land's natural ability to absorb and hold rainfall. This includes areas that have been cleared, graded, paved, or compacted. Excluded, however, are all lawns and landscaped areas.
41. Industrial Services: means water or sewer service to a business enterprise engaged in the manufacture of products, materials, equipment, machinery and supplies on a substantial or major scale.
42. Interceptor: any gravity sewer main greater than 18 inches in diameter or sewer force main greater than 10 inches in diameter.
43. Irrigation service: a water service with a separate meter used for recreational, landscaping, agricultural, horticultural or other exterior residential or commercial watering system within the city limits and pre-existing, grand fathered systems in the city's out-of-city water service area.
44. Lot Frontage: the boundary of a lot which is along an existing or dedicated public street, or where no public street exists, along a private road, easement or access way. On an interior lot line most parallel to and nearest the street from which access is obtained. On a corner lot the frontage shall be proposed by the property owner, subject to review and approval by the public works director.
45. Maintenance hole: formerly termed manholes, these structures serve as access to sewer and stormwater mains as well as other structures typically found underground.
46. Manifold meter: a separate meter installed for commercial or industrial or establishments in order to separate flow from water and sewer where water is used for non-sewer purposes, such as cooling water, irrigation, landscaping, etc.
47. Non-maintained Street: A non-maintained street is a street which the City does not maintain because:
 - a. The street has not been constructed to city street standards
 - b. The developed properties fronting the street have signed a duly authorized agreement that releases the City from maintenance duties.

48. Opened street: a public right-of-way opened for use by motor vehicles, which may or may not be fully developed to street standards. Opened streets may or may not be accepted or maintained by the city.
49. Park Trees: Trees in public parks, golf courses, and all other city owned land to which the general public has access.
50. Peak discharge: the maximum surface water runoff rate (cfs and cms) determined for the design storm.
51. Person: any person, firm, partnership, association, corporation, organization, or entity of any kind.
52. Planned unit development: residential developments which are planned and/or developed in several stages but submitted together for approvals, and which typically consist of clusters of multi-unit structures interspersed with areas of common open spaces.
53. Plans: the plans, profiles, cross-sections, elevations, details, and supplementary specifications, signed by a licensed professional engineer and approved by the Public Works Director, which show the location, character, dimension, and details of the work to be performed.
54. Potable Water Supply: any water supply system intended or used for human consumption or other domestic uses and which must meet Washington State Department of Health Public Water System Rules and Regulations.
55. Private Sewer: the sewer line and disposal system constructed, installed or maintained where the connection with the public sewer system is not required herein.
56. Private Street: private vehicular access provided for by an access tract, easement, or legal means to serve property that is privately owned and maintained.
57. Project: general term encompassing all phases of the work to be performed and is synonymous to the term "improvement" or "work."
58. Public Sewer: that portion of the system located within public right-of-way or easements and which are operated and maintained by the city.
59. Public Works Director: the Director of the Public Works Department of the City of Port Townsend or his/her designee.
60. Residential Service: a water or sewer service connection to a single-family dwelling unit or duplex (two-family dwelling).
61. Retention facilities: facilities designed to hold water for a considerable length of time and then consume it by evaporation, plant transpiration, or infiltration into the soil.
62. Right-of-Way: property acquired by or dedicated to the city and available for use in pedestrian, vehicular or other transportation modes. Right-of-way may or may not be accessible for public use, and may or may not contain an "opened street."
63. Road: used interchangeably with the term "street."
64. Service Connection (Wastewater): that portion of a line beginning two feet outside the outer foundation wall of the structure to the sanitary sewer main. Side sewers will be maintained by the property owner.
65. Service Connection (Water): that portion of the water system connecting the premises to the water distribution main, including the water tap and all piping and fittings from the main to and including the water meter assembly.
66. Sewer Main: a city-owned pipe or conduit for carrying wastewater.
67. Sewer Service Line: that section of the sewer line extending from the city's main including connection to the structure that has no other common sewers discharging into it.

- Sewer service lines are to be maintained by the property owner.
68. Sidewalk: any and all pedestrian structures or forms of improvements for pedestrians included in the space between the street and the margin, as defined by a curb or the edge of traveled road surface and the line where the public right-of-way meets the abutting property.
 69. Significant Trees and Vegetation: all trees and vegetation, unless otherwise exempted, situated within opened or unopened public rights-of-way as follows (1) trees with a diameter of 12 inches or greater measured four feet from the ground; (2) trees with a diameter of 6 inches or greater measured four feet from the ground and identified in the engineering design standards manual as special, landmark or unique species; or (3) any shrubs or other vegetation identified in the engineering design standards manual as landmark or unique species.
 70. Street: is intended to be broadly defined, and includes any street, highway, easement, avenue, alley or other public right-of-way or public grounds intended for travel, parking or access for pedestrians, vehicles, bicycles, or equestrians or any other legitimate street purpose, whether opened or unopened, platted and partially improved or open but not improved to the level required by the city. Specific street classifications are generally defined as follows:
 - a. Principal Arterial Street: shall have the same meaning as “major arterial” in the Comprehensive Plan, which means a street with access control, channelized intersections, restricted parking, and that collects and distributes traffic to and from minor arterials, and includes any street designated as a major arterial street. Direct access to a principal arterial is usually restricted to intersecting streets or consolidated commercial or industrial entrances.
 - b. Minor Arterial Street: a street, with signals at important intersections and stop signs on the side streets and that collects and distributes traffic to and from collector streets, and includes any street designated as a minor arterial street.
 - c. Collector Street: a street, either existing or proposed, that is intended to carry traffic from local access streets to arterial streets and provides access to abutting property and includes any street shown as a collector street.
 - d. Local Access Street: a public right-of-way used primarily to provide access to abutting residential properties and includes any street not designated as a collector, minor arterial, or principal arterial street.
 71. Street Development Permit: any permit required under the provisions of Titles 12, 13, 16, 17 and 18, PTMC for work in the public right-of-way and is used interchangeably with the terms “street development and utility digging permit,” “street development and utility development permit,” and “water, sewer, storm drainage street development permit.”
 72. Street improvements: subject to reimbursement under Chapter 12.26 PTMC may include: permitting; design; acquisition of right-of-way and/or easements; grading; construction; paving; installation of curbs; streets; gutters; storm drainage; sidewalks or bike lanes incorporated as part of the street improvements; street lighting; signs; planting strips; traffic controls; and other similar improvements as required by the street standards of the city. The term “street improvements” may be used interchangeably with the term “street projects.”
 73. Street Trees: Trees on public right-of-ways between the curb and property line, along the side of streets or in medians of all platted streets, avenues, or ways within the city.

74. Street Survey Monumentation Plan: the survey monuments providing horizontal and vertical control as established by the city and approved by the city council.
75. Substandard Street: any street that does not meet the city's engineering design standards and is not an approved street under Chapter 12 of PTMC.
76. Tiers 1, 2, and 3: refer to the city's infrastructure tiering strategy, which is designed to promote infill and discourage "leap frog" development, as further set forth in the Port Townsend comprehensive plan (see Chapter VII, pages VII-4 to VII-5). A map designating the various tiers in accordance with the comprehensive plan is contained in the attached Exhibit 1.
77. Transmission Mains: water mains that transport water to a large geographical area of the city and are generally greater than or equal to 12 inches in diameter.
78. Use of pronoun: as used herein, the singular shall include the plural, and the plural the singular.
79. Utility: a company providing public services including, but not limited to: electric power, street lighting, telephone, water, sewer, solid waste, or cable television, whether or not such company is privately owned or operated by a governmental entity.
80. Walkway: any sidewalk, trail, pathway other form of improvement designed and intended for use by pedestrians.
81. Wastewater: the combination of water and wastes carried from residences, business buildings, institutions and industrial establishments, which wastes contain polluted water requiring treatment at the wastewater treatment facility.
82. Water Service Area: the area consisting of the corporate limits of the city of Port Townsend and those areas outside of the city that have been designated for water service by ordinance of the city council or by the city's Water System Plan.
83. Water System: all water source and supply facilities, transmission pipelines, storage facilities, pump stations, distribution mains and appurtenances, vehicles, and materials storage facilities.

ABBREVIATIONS

ADD	Average daily demand
AC	Asbestos Cement
APWA	American Public Works Association
AWWA	American Water Works Association
AWWU	Average Winter Water Use
CCC	Cross Connection Control
CFP	Capital Facilities Plan
CCP	Concrete cylinder pipe
CFS	Cubic feet per second
CI	Cast iron
CIP	Capital Improvements Program
CWPP	County-Wide Planning Policies
CWSP	Coordinated Water system Plan
CWSSA	Critical Water Supply Service Area
DOH	State of Washington Department of Health
D/Q Plan	Dungeness/Quilcene Water Resources Management Plan
Ecology	State of Washington Department of Ecology
EDC	Economic Development Council
EPA	Environmental Protection Agency
ESA	Environmentally Sensitive Area
FERC	Federal Energy Regulatory Commission
GMA	Growth Management Act
GPCD	Gallons per capita per day
GPM	Gallons per minute
HGL	Hydraulic grade line elevation (hydraulic gradient)
ISO	Insurance Services Office
JCWRC	Jefferson County Water Resources Council
MCL	Maximum contaminant level
MDD	Maximum daily demand
MG	Million gallons
MGD	Million gallons per day
MUTCD	Manual on Uniform Traffic Control Devices
NTU	Nephelometric Turbidity Units
OGWS	Olympic Gravity Water System
PC	Point of curvature
PHD	Peak hour demand
PI	Point of intersection
PRV	Pressure-reducing valve
PT	Point of tangency
PTMC	Port Townsend Municipal Code
PTPC	Port Townsend Paper Company
PUD	Public Utility District
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act

UGA	Urban Growth Area as defined under GMA
WAC	Washington Administrative Code or Water Advisory Committee
WSDOT	Washington State Department of Transportation
WSRB	Washington Survey and Rating Bureau
WUCC	Water Utility Coordinating Committee

Chapter 1
GENERAL CONSIDERATIONS

1. Applicability

- a. These Engineering Design Standards, hereinafter referred to as the “Standards” shall apply to all new construction and upgrading of facilities both in the public right-of-way and on-site for water, wastewater, storm drainage, and transportation systems, and for all land alterations including clearing, grading and erosion control. They shall apply for any public or private work including work performed by private parties at their own expense under authority granted by ordinance of the city council or the City’s permit process. Where there are conflicts or differences between these standards and the Port Townsend Municipal Code (PTMC), the PTMC shall govern.

2. Standard Specifications

- a. Except where these Standards provide otherwise, design, construction and materials shall conform to the current edition of the following publications produced by the Washington State Department of Transportation (WSDOT) and the Washington State Chapter of the American Public Works Association (APWA): “Standard Specifications for Road, Bridge and Municipal Construction” (hereinafter referred to as the “WSDOT/APWA Standard Specifications”) and “Standard Plans for Road, Bridge and Municipal Construction” (hereinafter referred to as the “WSDOT/APWA Standard Plans”).
- b. The conditions and standards set forth in the most current edition of the following plans and specifications are incorporated into these standards by reference and shall be applicable when pertinent or required:
 - i. City of Port Townsend Municipal Code (PTMC)
 - ii. City of Port Townsend GMA Comprehensive Plan and all functional plans incorporated by reference into the Port Townsend Comprehensive Plan
 - iii. City of Port Townsend 1997 Water System Plan
 - iv. City of Port Townsend Arterial Street Plan
 - v. City of Port Townsend Non-Motorized Plan
 - vi. City of Port Townsend Gateway Plan
 - vii. City of Port Townsend Urban Waterfront Plan
 - viii. City of Port Townsend Shoreline Management Master Program
 - ix. Jefferson County Solid Waste Plan
 - x. State Environmental Policy Act
 - xi. Rules and Regulations of the State Board of Health regarding public water supplies, as published by the State Department of Health
 - xii. State of Washington Department of Ecology “Criteria for Sewage Works Design”
 - xiii. AWWA Standards
 - xiv. State of Washington Department of Ecology Stormwater Management

- Manual for Puget Sound (SWMM)
- xv. Uniform Building Code
- xvi. Uniform Fire Code
- xvii. Uniform Electrical Code
- xviii. Uniform Plumbing Code
- xix. Uniform Mechanical Code
- xx. WSDOT Design Manual
- xxi. WSDOT Traffic Manual
- xxii. WSDOT Utilities Manual
- xxiii. WSDOT Construction Manual
- xxiv. WSDOT Local Agency Guidelines (LAG) Manual
- xxv. U.S. Department of Transportation Manual on Uniform Traffic Control Devices (MUTCD), as amended by WSDOT
- xxvi. American Association of State Highway and Transportation Officials (AASHTO) “Policy on Geometric Design of Highways and Streets”
- xxvii. Washington State Barrier-free Facility and Design (WAC 51.30)
- xxviii. Conditions and Standards set forth by the State of Washington Department of Labor and Industries

3. Changes to Engineering Design Standards

- a. The Public Works Director is authorized to make minor, technical amendments to these Standards without further city council approval or adoption, although such minor changes must still be forwarded to city council. Such changes shall be effective upon filing with the city clerk. Significant or substantive changes to these Standards require approval by the city council.

4. Severability

- a. If any part of these Standards shall be found invalid, all other parts shall remain in effect.

5. Permits and Applications Required

- a. Public Works Technical Conference: It is strongly recommended that all persons considering development of property within the city request a public works technical conference and pay the required fee to obtain information on street and utility improvement requirements for their development. The technical conference may be mandatory when utilities are to be extended and/or streets are to be opened. The fee for this public works review is used for an internal city review, a meeting with the developer and city staff and a written report by the city describing the required public works improvements. In the case of Type I permits in Tier 1, the fee for the technical conference is credited to the Street Development and/or Utility Development Permit. The project requirements identified in the written report shall remain valid for a period of one year from the date of the review, unless any changes which would materially impact the design of the utility or right-of-way improvements are made to the proposed

development, in which case requirements related to those changes may be modified.

b. Street Development and/or Utility Development Permit:

- i. A Street Development and/or Utility Development Permit must be obtained before any person shall (1) commence any work to clear, grade, disturb, construct or make improvements within any right-of-way, or open for vehicular traffic, even temporarily, any city right-of-way, or (2) install or construct any water, sewer or stormwater system improvements in the city right-of-way.
 - (1) A permit shall not be required for persons performing minor work in the right-of-way such as landscaping.
 - (2) Street Development - Minor Activities Permit may be submitted for projects such as driveways and sidewalks as defined in Chapter 12.07.070 PTMC and Chapter 6 of these standards.
- ii. Street Development - Minor Activities Permit- specific submittal requirements for this Street Development and Utility Permit are included in Chapters 2, 3 and 6 of these standards.
- iii. In the case of work performed by the public works department, preparation of drawings by the director or signing of a public construction contract shall constitute compliance with the permit requirements of this section. Maintenance work by the public works department shall be exempt from the permit requirements of this section.
- iv. All Street and Utility Development permits not tied to a building permit shall expire unless the work is completed within 12 months after issuance of the permit unless earlier revoked; *provided however*, that written request for extensions may be made prior to expiration upon a showing to the public works director that justifiable delays or unanticipated events beyond the control of the applicant have or will preclude timely commencement or completion of the work. Approval of such request shall be discretionary with the public works director. Any extension shall include a condition that the work will be completed within a reasonable time, not to exceed one year, as specifically set forth in the grant of the extension. Only one extension shall be allowed. All Street and Utility Development permits tied to a building permit shall remain valid so long as the building permit remains active with the building department, as shown in the building department files. In the event the building permit becomes inactive as further set forth in the Uniform Building Code and Title 16 PTMC, the Street and Utility Development permits shall automatically expire.

c. Environmental Review:

- (1) **SEPA:** All development, if not exempt, is reviewed for probable significant environmental impacts in accordance with Chapter 19.04 PTMC and the Washington State Environmental Policy Act of 1971 (SEPA). An environmental checklist must be submitted

with each proposed project/development unless specifically exempt. The Port Townsend Building and Community Development Department (BCD) must be consulted for the determination of exemption from SEPA review requirements. If the project is not exempt, the checklist must be completed with responses to the questions that apply to the proposal. The checklist must be submitted with the fees to the Port Townsend BCD Department in City Hall. Fees for SEPA review are set forth in Chapter 20.09 PTMC.

- (2) **Traffic Impacts:** A Traffic Impact Analysis may be required for certain development proposals. A description of when they are required and what must be included in the analysis is provided in Chapter 6 Appendix-6F.
- (3) **Environmentally Sensitive Areas (ESA) Review:** An ESA permit will be required in accordance with Chapter 19.05 PTMC for development of property which contains an environmentally sensitive area. Fees for ESA review and permits are set forth in Chapter 20.09 PTMC.

d. Other Permits:

- (1) Clearing and Grading Permit (by the Public Works Department). This permit is required for any projects involving the movement of 50 cubic yards or more of material.
- (2) Building Permit (by the Building and Community Development Department). A building permit is required for construction work including alteration, repairs and demolition.
- (3) Water Service Application- (by the Public Works Department). For connection to a City water main. Plans shall be submitted with forms provided by the city.
- (4) Side Sewer Permit- (by the Public Works Department). For connection to a City sewer main. Plans shall be submitted with forms provided by the city.

e. Land Use and Other Permits: There are several other city approvals involving land use that may be required for the project prior to or along with the permits listed above and which may be impacted by the standards as contained herein. These may include, but are not necessarily limited to, the following:

- (1) Certification of Lots of Record (Title 18)
- (2) Conditional Use Permits (Title 17)
- (3) Planned Unit Development Approvals (Title 17)
- (4) Shoreline Substantial Development Permits (Title 17)
- (5) Long and short subdivision approvals (Title 18)

f. Waiver or Variance: A waiver or variance from the requirements of these standards may be requested as set forth in Titles 12 and 13 PTMC.

6. Design and Plan Submittals

- a. Developers proposing extensions, replacement and upgrading of public facilities shall submit complete plans, profiles, and specifications along with the required applications for the work to be done to the Port Townsend Public Works Department for review with the Street and Utility Development permit application.
- b. If base maps prepared by a licensed land surveyor are available, the design and construction plans shall be submitted on such maps. If base maps are unavailable, and the public works director determines that a survey is necessary to avoid conflicts with existing facilities, to determine contours, and/or to determine the limits of the right-of-way for utility placement or transportation system construction and design, the applicant shall have the right-of-way surveyed, including elevations along the proposed utility route, by a licensed land surveyor and the plans shall be prepared and submitted on such surveyed base maps.
- c. All plans for water and sewer main extensions or other system improvements and for a new street or paving of an existing street must be prepared, signed and stamped by a Washington State licensed civil engineer.
 - i. For actions which involve a utility main extension or replacement or a street development of 260 feet (one city block) or less in Tier 1 which do not require licensed plans under another authority of the Port Townsend Municipal Code, the developer has the option of the city performing the engineering for the project for a fee as identified in Chapter 3.36 PTMC. Alternatively, the developer may pay for his or her own engineering with the full cost to be borne by the developer. All other plans shall be prepared at the developer's sole cost and expense.
- d. All plans prepared or required under this subsection must be reviewed and approved by the director prior to proceeding with construction of the proposed improvements.
- e. A temporary erosion/sedimentation control plan may be required prior to commencing land-disturbing activities.
- f. All plans must show property lines or right-of-way lines as necessary to determine the location of proposed water and sewer mains, stormwater facilities or streets or other transportation system improvements within the right-of-way.
- g. All drawings shall be on 22" x 34" or 24" x 36" size sheets unless otherwise approved by the City Engineer. The original shall be accurate, scaled, legible and of good quality reproducible ink on Mylar or CADD disk format. The original drawings of the approved plan will become the property of the city. Copies may be submitted on blue-line, oversized Xerox or plotting paper. The minimum requirements of the drawings are shown on the Plan Review Checklist provided in the Appendix to Chapter 1.
- h. Review and approval of the plans and specifications will be made in an expeditious manner. However, the time frame required for the review and approval is dependent upon the completeness and accuracy of the plans and specifications submitted. If the submitted design does not meet the requirements of these standards or project permits, the drawings will be returned to the

- applicant to revise and resubmit.
- i. The Plan submittal process shall be as follows:
 - i. Public Works Technical Conference as needed. The applicant should discuss the proposed project with the Development Review Engineer prior to permit application submittal in order to identify whether a public works technical conference is required.
 - ii. First Submittal (Draft Plans): A “Street and Utility Development Permit Application,” together with three (3) sets of prints of plans and specifications are to be submitted for review and comment. Following Public Works review, one set will be returned with review comments. If the city will be funding a proportionate share of the cost of the improvements in accordance with Titles 12 and 13, an estimate of the total cost of the project is required.
 - iii. Second Submittal (Final Plans): Submit three (3) sets of prints of corrected plans, specifications (if plan notes are not sufficient), calculations as required, revised cost estimates as required, and a proposed testing and measurement schedule for inspection and quality control. All plans are to be submitted to the Public Works Department to the attention of the Public Works Director. Any necessary easements or dedications shall be submitted for review along with the plans. A cursory check of the plans will be made by city staff. If the plans are deemed complete, they will be routed to the appropriate city staff and the final review process will begin. When final plans have been submitted that meet the requirements of these Standards, the public works department will approve the plans and issue the Street and/or Utility Development Permit and return one set of approved plans. All fees for the permit shall be paid before the final permit is received.
 - j. On some projects, this design submittal process may be modified. Project submittal requirements will be determined during initial project discussions.

7. Construction Plan- General Conditions

- a. The following GENERAL CONDITIONS and those contained in the specific chapters dealing with water, wastewater, transportation and other facilities shall be included on any plans when a permit is required.
 - i. A preconstruction meeting shall be held with the city prior to the start of construction
 - ii. All workmanship and materials shall be in accordance with the City of Port Townsend Standards, the current edition of the State of Washington Standard Specifications for Road, Bridge and Municipal Construction, and any project-specific special provisions or conditions and requirements.
 - iii. Temporary erosion control measures are required and shall comply with the stormwater code, Chapter 5 of these Standards and WSDOT/APWA Specification 1-07.15 as follows:
 - (1) Erosion control plans shall be submitted to the city, approved by the

- city, and implemented by the contractor prior to disturbing any soil on the site. Submittal and approval of these plans shall precede any construction activity on the site.
- (2) All permanent storage and retention/detention areas used as part of the temporary erosion control and water pollution/flood activities and conveyance systems shall be cleaned of all silts, sand and other materials following completion of construction and the permanent facilities shall then be completed including permanent infiltration areas.
- iv. Horizontal and vertical controls/datum as adopted by the city shall be used, unless approved otherwise.
 - v. The contractor shall be fully responsible for the location and protection of all existing utilities. The contractor shall verify all utility locations prior to construction by calling Underground Locate at **1-800-424-5555** a minimum of 48 hours prior to any excavation work.
 - vi. All non-ferrous pipe and services shall be installed with continuous tracer tape installed 12" to 18" under the final ground surface. The marker tape shall be 4" wide minimum plastic non-biodegradable, metal core or backing marked and color coded for the utility to be marked and which can be detected by a standard metal detector. Tape shall be Terra Tape "D" or approved equal. In addition to tracer tape, force mains and curved mains shall have a 14 gauge coated copper wire, wrapped around the pipe, brought up, coating stripped, and tied off at the valve stem or manhole ring. The tape and wire shall be furnished and installed by the contractor.
 - vii. Temporary street patching may be allowed with the approval of the City Engineer. Temporary street patching shall be as described in Chapter 6.
 - viii. The contractor shall provide a traffic control plan(s) for review and approval by the City Engineer in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).
 - ix. The contractor shall have a copy of the approved plans and permits at the construction site at all times.
 - x. Special structures shall be installed per plans and manufacturers' recommendations.
 - xi. All disturbed areas shall receive temporary and permanent erosion control in the form of vegetation establishment such as grass seeding. A means shall be established to protect the permanent storm drain system prior to establishment of the permanent erosion control measures. These methods shall be included in the erosion and sediment control plans in accordance with Chapter 5 of these standards.
 - xii. Construction work hours shall be restricted to 7 A.M. to 6 P.M., Monday through Friday, unless otherwise approved in writing.
 - xiii. The city public works inspector shall be notified a minimum of 24 hours in advance of the need for an inspection. Every effort will be made to accommodate same-day inspections if the city is notified before 8 am.

8. Construction

- a. All construction in the public right-of-way, other than that performed by city forces, shall be by a licensed and bonded contractor of the State of Washington.
- b. It is emphasized that no construction shall be started until approval of plans by the Public Works Department.
- c. Pre-construction Conference. Prior to the start of any clearing and grading activities or other construction approved through Public Works Department permits, an on-site pre-construction conference shall be held to review the requirements of the project and the project schedule. It is the responsibility of the owner, contractor, developer or their representatives to notify the city and schedule this meeting.
- d. All construction surveying and staking shall be as described under the heading "Surveying."
- e. All work performed within the public rights-of-way or easements or as described in these standards, whether by or for a private developer, by city forces, or by a city contractor shall be done to the satisfaction of the Director and in accordance with the WSDOT/APWA Standard Specifications, any approved plans and these Standards. Any revision to construction plans must be approved in writing, by the City Engineer, before being implemented. Failure to receive city approval can result in removal or modification of construction at the contractor's or developer's expense to bring it into conformance with approved plans, as well as civil penalties and other enforcement remedies pursuant to Chapter 20.10 PTMC.
- f. The contractor is required to supply sufficient skilled workers and suitable materials and equipment, and must furnish or perform the work in such a way that the completed work will conform to the approved plans.
- g. If temporary erosion and sediment control measures used by the contractor do not prevent sediment from leaving the site, the city will require further measures be taken to prevent erosion, and if not implemented, the city may order the contractor to stop work until corrective measures are taken.

9. Inspection

- a. All construction must be inspected by the city and the cost paid for by the developer.
- b. The city shall have the authority to enforce these standards as well as other referenced or pertinent specifications. The city will appoint project engineers, assistants and/or inspectors as necessary to inspect the work and they will exercise such authority as the Director may delegate.
- c. Specific inspections, test measurements or actions required of all work and materials will be set forth in the design submittals. Tests shall be performed at the developer's or contractor's expense.
- d. Failure to comply with the provisions of these standards may result in stop work orders, removal of work accomplished, non-acceptance of the work, or other penalties as established by 20.10 PTMC.
- e. It is the responsibility of the developer, contractor or their agents to have an approved set of plans and permits on the job site whenever work is being accomplished. These plans shall be made available to any representative of the city involved with inspecting

- or monitoring the project.
- f. The city has the authority to disapprove of defective work, or work that will not produce a completed project that conforms to the approved plans or that will prejudice the integrity of the design of the completed project as a functioning whole as indicated by the approved plans.
 - g. Upon notice from the contractor that the entire work or an agreed portion thereof is complete, the city representative will make a final inspection with the applicant and contractor and will notify the contractor in writing of all particulars in which this inspection reveals that the work is incomplete or defective. The contractor shall immediately take such measures as are necessary to complete such work or remedy such deficiencies.

10. Project Approval and Acceptance

- a. A project is considered final and accepted by the city when the city issues a notice of final acceptance indicating that the contractor has completed all work and corrections as needed and as-builts are approved.
- b. The city reserves the right to reject any installation not inspected, tested and approved by the department. Upon satisfactory completion of all required tests and acceptance of the improvements, the department shall cause the improvements to be connected to the city system. All costs incurred in such connection(s) shall be the responsibility of the customer.
- c. As a condition of acceptance of the improvements by the city, the permit holder shall provide the city with (1) a statement of the actual cost of design and construction of the improvements (2) a properly executed bill of sale for all improvements; and (3) as-built drawings as described below.
- d. No main shall be energized other than for test purposes by duly authorized personnel until the main has been accepted by the city and all fees and charges have been paid.
- e. No permanent water service will be permitted for any lot or building served by a project until final approval of the improvements has been granted.
- f. “As Builts” and Final Submittal: Following construction, one (1) set of reproducible Mylar and one set of copies of “As Builts” shall be submitted with the completed “Conveyance of Public Facilities Form” prior to final City acceptance of the wastewater, water, street, and/or storm drain facility installation. For any work designed by engineers, as-builts shall be stamped by a Professional Engineer stating that the facilities were built according to the City Design Standards and that the facilities were built as shown in the As-Builts. Digital records are desirable for all projects and are required for all final plats in accordance with Title 18.

11. Fees

- a. Fees and charges are established in the Port Townsend Municipal Code.
- b. All plan check fees are due upon approval of the plans and permit applications.
- c. Developers will be charged for all inspection time spent on a project that exceeds the two (2) hours included in the initial inspection fee. Poor performance, delays, etc.,

will generally require extra time spent on the part of the City. The project will not be accepted by Public Works until all bills are paid.

- d. In addition, there are various miscellaneous service and connection fees and charges. We strongly urge all applicants to request an estimate of the fees and charges for a project from the Building and Community Development Department early on in a project.

12. City Performed Work

- a. When work related to a development is to be performed by the city, the city will provide all material required for the work. The cost for the material and the work performed shall be at the developer's expense. Any requests for city work should be scheduled at least one week in advance. Coordination with the specific department will help minimize delays.

13. Latecomer Agreements

- a. When water, wastewater, stormwater or transportation facilities are required for a development, the developer may be eligible for reimbursement of a portion of the capital costs. This potential should be discussed with the city early in the project.
- b. Latecomer Agreements must be set up in accordance with PTMC Chapter 13.04 (Utilities) and PTMC Chapter 12.26 (Streets).

14. Bonding

- a. The public works director may require that the developer furnish the city with a performance bond in which assurance is given that the required improvements will be installed as provided in the approved plans and that the installed improvements will perform free of material defects for a period of one year from the date of city acceptance of the improvements. Types of securities include a bond with a surety qualified to do bonding business in the State of Washington, a cash deposit or an assigned bank account. Any security posted with the city shall be in an amount equal to 120 percent of the estimated cost for the city to contract for construction or replacement of the improvements as determined by the public works director, and shall be for a period of one year from the date of acceptance of the improvements by the city.

15. Utility Locations

- a. Utilities within the right-of-way or easement on new roads or in roadways where existing utilities are not in conflict, shall be located in the standard locations as shown on Standard Drawings. Where existing utilities are in place, new utilities shall conform to these standards as nearly as practical and yet be compatible with the existing installations. Deviations of locations shall be approved by the City Engineer. Existing utilities shall be shown using the best information available. Field exploration/excavation may be required if utilities are in conflict with the proposed

design.

- b. Call Before You Dig. All developers/contractors are responsible for timely notification of all utilities in advance of any construction in right-of-way or within utility easements. The utilities one-call Underground Location Center phone number is **1-800-424-5555**. This number can be used for design as well as construction.

16. Easements

- a. Where public utilities and/or their conveyance systems cross private lands or are not otherwise in the public right-of-way, an easement shall be granted to the city. The applicant will generally process, record and file all easements. Prior to recording, the easement must be reviewed and approved by the City Attorney. If ownership of the property upon which the easement is proposed, unknown or in dispute, the City may require title insurance. If the property is platted, the easement may be conveyed when the short plat or final plat is filed. All easements not shown on the plat must be prepared by a licensed surveyor or engineering firm capable of performing such work. All easements shall be filed prior to approval for construction.
- b. Easements are required for all sanitary sewer lines, water mains, storm drains, streets, pathways or other improvements installed outside of existing city right-of-way. No permanent structures or fences are allowed on the easement.
- c. Easement widths shall be a minimum of 20 feet for a single utility and a minimum of 25 feet for multiple utilities. Construction easements shall be 30 feet minimum in total width, including the permanent easement. When deeper trench depths dictate or where pipe diameter or vault widths exceed four feet, a wider easement may be required by the Director.
- d. Vehicle access will be provided to all valves, maintenance holes or other facilities requiring maintenance.
- e. Easements are required to be submitted in draft, unsigned for review and approval prior to plan approval. Any change in design which places an amenity outside of the easement may necessitate stopping of construction until plans and easements can be resubmitted and approved.
- f. If it is necessary to install a sewer storm drain, or water main in a private road, the minimum easement width shall be the width of the traveled road surface plus two feet.
- g. The location and elevation of sewer, water, and storm drain facilities within all easements shall be verified and certified in writing by a licensed land surveyor or engineer.
- h. Landscaping in utility easements should be restricted to low growing shrubs, grasses and shallow rooted plants.

17. Utility Extensions

- a. Anyone who wishes to extend any city utility should contact the Department of Public Works for information on the policies and procedures relating to the extension of utilities.
- b. Utility mains shall be extended to and through the lot frontage of the property being developed and to the next street intersection, unless otherwise approved by the Public

Works Director. Larger or remotely located projects may be required to provide looped connections or extensions beyond the development property to ensure adequate delivery of services.

- c. City utility extensions shall only be allowed inside the city limits or in the city's out-of-city water service areas.

18. Traffic Control

- a. Whenever work is done within the city's right-of-way which obstructs vehicular or pedestrian traffic, the developer/contractor shall be responsible for providing a certified flagger or flaggers on site. The developer/contractor shall be responsible for interim traffic control during construction on or along traveled roadways. Traffic control shall follow the guidelines of the WSDOT/APWA Standard Specifications and the MUTCD. At the city's discretion a traffic control plan may be required prior to construction.
- b. Signs must be legible and visible and should be removed at the end of each workday if not applicable after construction hours. The MUTCD provides further specification of sign materials and some standard procedures.
- c. When road closures and detours are anticipated, and cannot be avoided, the contractor/developer shall notify the Public Works Department. The city requires a detour plan be prepared, submitted and approved prior to closing any portion of a city roadway. It is the responsibility of the developer to keep the police and emergency services, transit and school bus dispatchers notified of changes in the traffic pattern.

19. Surveying, Staking and Monumentation

- a. All survey work required by these Standards or the Port Townsend Municipal Code shall be performed by or under the direct supervision, of a Professional Land Surveyor (PLS) licensed in the State of Washington.
- b. Surveying necessary to construct a given project per the approved plans, shall be furnished by the developer at no expense to the city.
- c. Construction Staking. Survey stakes shall be set for new street and curb and gutter construction, for both horizontal and vertical control. Additionally, any water, storm drain, or sanitary sewer mains which are to be constructed in easements are to have survey offset stakes set prior to starting that work, and any deviation from that staked line must be left uncovered and resurveyed to realign easement as required and for corrected as-built information.
- d. Where required by the Land Division Ordinance (Title 18), it shall be the developer's/contractor's responsibility to provide the surveying required to establish or perpetuate land corner monumentation as may be required on the project.
- e. All land corner surveying shall conform to the requirements of RCW 58.09. If the developer's or contractor's surveyor replaces or restores an existing or obliterated "General Land Office" (GO) corner(s), it shall be their responsibility to file "Land Corner Records" for these monuments with the Jefferson County Auditor's Office.
- f. When all land corners have been established, replaced or restored and monumented, the surveyor shall certify this information with a letter to the Public Works Director.

This certification letter shall include the location of the monumented corner(s) and that all land corner(s) have been monumented as described herein.

- g. The city reserves the right to check survey points and/or the correct locations and elevations of new construction. These spot checks will not change the requirements for normal checking and testing as described elsewhere, and do not relieve the contractor of the responsibility of producing a finished product that is in accordance with the approved construction plans. If unacceptable errors are found due to errors or omissions by the contractor's survey activities, then the applicant shall be responsible for work necessary to correct these errors including removing and replacing improvements and pay all expenses incurred by the city including the re-survey.
- h. Survey Monuments. All existing survey control monuments which are disturbed, lost, or destroyed during surveying or building shall be replaced with the proper monument as outlined below by a land surveyor registered in the State of Washington. All such work shall be at the expense of the responsible builder or developer. Monuments shall be as follows:
 - i. Street Type: Arterials and Collectors. A precast concrete monument per WSDOT/APWA Standard Plan No. H-7, except that the cover shall read "MON." If the monument case and cover are placed in cement concrete pavement, the pre-cast base will not be necessary.
 - ii. Street Type: Local Access. A cast-in-place concrete surface monument with sufficient ferrous metal embedded to allow for detection by a magnetic detection device. Cap shall be "Berntsen RB Series" or brass plug marker.
 - iii. Monument Locations. Appropriate monuments shall be placed at the following locations, unless otherwise directed by the City Engineer:
 - (1) At all street centerline intersections.
 - (2) At the PC and PT's of all horizontal curves.
 - (3) At PI of all horizontal curves of street where the PI lies within the limits of the traveled roadway.
 - (4) At all right-of-way corners, control points and angle points around the perimeter of subdivisions. Internal monuments shall be those as required in platting.
 - (5) At all section corners, quarter corners, and sixteenth corners that fall within the right-of-way.
 - iv. The monument case shall be installed after the final course of surfacing has been placed.

CHAPTER 1 - APPENDIX

Exhibit 1	Tiering Map
Exhibit 2	Plan Review Checklist

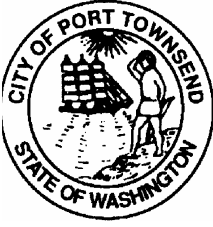


Exhibit 2

City of Port Townsend – Public Works Department
Public Improvements – Plan Review Checklist

Project Name: _____

NA	"OK"	REVIEW ITEM
General		
		Vicinity Map
		Legend (APWA Standard Symbols)
		North Arrows
		Scale Bar
		Datum - Bench Mark Elevation and Location
Title Block		
		Title
		Design By:
		Drawn By:
		Date:
		Checked By:
		Port Townsend Drawing Number
		Signature Approval Block: Approved for Construction By: _____ (City Engineer) Date: _____ Approval Expires: _____
		Number of Total Sheets
		Section, Township, and Range or Block, Lot, TPA
		Engineer's Stamp (Signed and Dated)
		Project Title Cover Sheet and Sheet Index
		Utility System Map - Showing all Proposed Utility Changes on one Drawing (1"=300')
		Plans Submitted on 24" by 36" Sheets
		Detail Sheet(s)
		Engineering Calculations and Basis for Design
		Traffic Control Plan - per MUTCD
		Coordinates for the Project, as needed
Plan Standard Items		
		Centerline Stations
		Edge of Pavement and Width
		Right-of-Way and Width
		Proposed Survey Monumentation
		Sidewalk and Width
		Match Lines
		Roadway Typical Sections
		Existing Utilities (Above and Below Ground)
		Coordinates (Two Known Points)
		Adjacent Property Lines, Ownerships, and Parcel Number

NA	"OK"	REVIEW ITEM
		Identify Where to Match Existing
		Define Survey Baseline (Basis of Bearings)
		Easements
		Stations and Offsets for Structures
		Flow Direction Arrows
		Identify Street Names, Right-of-Way, Parcels, House Numbers and Lots
		Profile Grades (Decimal Ft/Ft or Percentage)
		Existing Ground
		Scale (Horizontal and Vertical)
		Stationing
		Vertical Curve Data
		Vertical Elevation Increments and Grid
Sanitary Sewer		
Plan View		
		System Map (1"=300') Showing Existing and Proposed Line Sizes, Manholes, etc.
		Station Shown at Each Manhole
		Manholes Numbered
		Manhole Type Designation
		Flow Direction with Arrow on Pipe
		Depth at Property Line and Distance from Downstream Manhole for Side Sewer
		Distance from Water Lines
Profile View		
		Manholes Numbered
		Invert In and Out Elevation to Nearest 1/100 Foot
		Rim Elevation
		Grades Shown to Decimal Form Ft/Ft or Percentage
		Type of Pipe
		Size of Pipe
		Length of Pipe in L.F. to nearest 1/10 Foot
		Existing Utilities Shown
Water		
Plan View		
		System Map (1"=300') Showing Existing and Proposed Line Sizes, Valves, and Hydrants
		Conflicts with Existing Utilities
		Fire Hydrant Locations
		Blow-Off Locations
		Vacuum and Air Release Valves
		Tees, Crosses, Elbows, Adapters, and Valves need Coupling Type
		Meter Locations and Sizes
		Fire Department Connections
		Thrust Blocking Required at All Fittings Including In-Line Valves
		Distance to Sewer
Profile View		
		Existing Utility Crossings
		Show Fixture such as Hydrants, Valves, Blow-Offs, etc.
		Size of Water Main

NA	"OK"	REVIEW ITEM
		Length of Water Main in L.F. to nearest 1/10 foot
		Engineered Design Grade of Flow Line (Ft/Ft or %)
Storm Drainage		
Drainage and Erosion Control Plan		
		Site Soil Conditions - Geotechnical Report, as required
		Site Map with Topographic Features: <ul style="list-style-type: none"> • Project Boundaries • Basin Boundaries • Major Drainage Features • 100 Year Flood Plain • Environmentally Sensitive Areas • Location of Well within 1,200 Ft of Proposed Retention/Detention Facilities • Location of Existing and Proposed Fuel Tanks • Existing and Proposed On-Site Sanitary Systems within 100 Ft of Proposed Retention/Detention Facilities • Easements for Existing and Proposed Utilities • Proposed Structures including Roads and Parking Surfaces • Lot Dimensions and Areas • Contours of Existing and Proposed Final
		Details of Siltation Ponds and Channels
		Site Plan Showing Flow Directions, Maximum Velocities, and Channel Slopes
		Location of Check Dams, Filter Fabric, and Other BMP's Recommended
		Mulching Vegetation Plan
		Maintenance Schedule of All Drainage Facilities
		Copy of Insurance
		Security Bond, as required by City Engineer
		Method of Construction Access Control to be Employed
		Vicinity Map
		Engineer's Construction Estimate
		Limits of Clearing and Grading
		Construction Sequence
		Hydraulic Calculations
Plan View		
		Station and Number of each Manhole and Catch Basin
		Manhole and Catch Basin Type and Size
		Flow Direction with Arrow on Pipe
		Size of Pipe
Profile View		
		Manhole and Catch Basin Rim Elevation
		Type and Size of Pipe
		Length of Pipe in L.F. to nearest 1/10 Foot
		Station and Number of each Manhole and Catch Basin
		Invert Elevation in and out of Manhole and Catch Basin
		Grades in Ft/Ft or Percentage
		Design Velocity in Pipe
Maintenance Report		
		Required Type and Frequency of Long-Term Maintenance
		Identification of Responsible Maintenance Organization
		Frequency of Sediment Removal

NA	"OK"	REVIEW ITEM
		Clearing of Catch Basins
		Vegetation Control
		Annual Cost Estimate of Maintenance
Street		
Plan View		
		Identify Surrounding Parcels, Ownerships and House Numbers
		Flow Direction Arrows at Curb Returns Showing Grade
		Spot Elevations on Curb Returns
		Station PC, PT, PI and Intersections
		Curve Information Delta, Radius, Length and Tangent
		Begin Curve Radius and End Curve Radius
		Identify All Field Design Situations
		Match Existing Flow, Directions and Elevations
		Typical Sections
		Pavement Marking Details with Stations and Offsets
		Sidewalk's Location and Type
		Driveway Entrances, Location and Type
		Roadway Materials, Location and Width
		Handicap Ramps - Detail and Type
Profile View		
		Vertical Information on VPI, BVC, EVC, AP, Low Point, High Point
		Show Grades in Decimal Form with (+ or -) Slope (Curb Return Profiles)
		Super Elevated Roadways: <ul style="list-style-type: none"> • Detail-Show Transitions • Special Detail Showing Gutter Flowing Adequately
Illumination and Signals		
Lighting		
		Station and Offset Fixtures
		Pole Type, including Manufacturer and Model Number
		Mounting Height, Arm Length, Anchor Bolt Size, and Pattern
		Power Source, Size of Wire, Conduit Type, Line-Loss Calculations
		Luminaire Type and Lamp Wattage
		Location of Service Disconnects
		J-Box Locations
Signals		
		Follow WSDOT Specifications
		Station and Offset to Signal Base, Cabinets, Ped. Lead, Loops, etc.
		Wiring Schedule
		Signal Heads and Mounting Assembly
		Detection Loops
		Optigom
		Control Cabinet, Size and Layout
		Power Source
		Conduit
		Wire Size and Type
		Construction Notes
		J-Box Schedule

Chapter 2
WATER

1. General Requirements

- a. Water system refers to water treatment, storage and transmission facilities for domestic, fire protection, commercial and industrial, irrigation, recreation and other uses.
- b. Treatment of water shall comply with Washington State Department of Health requirements.
- c. Any extension of the Port Townsend Water System must be approved by the Public Works Department and all extensions must conform to these standards, the Port Townsend Water System Plan, the rules and regulations of the Department of Health (Chapter 246-290 WAC), the Port Townsend Fire Department requirements, and the Washington Surveying and Rating Bureau (ISO).
- d. These standards apply to both the in-city and out-of-city water service areas.
- e. In designing and planning for any development, it is the developer's responsibility to see that adequate water for both domestic and fire protection use is attainable. The developer must show, in the proposed plans, how water will be provided, whether the existing system will be adversely impacted, and how adequate water will be supplied at the required pressures in case of fire. A detailed hydraulic analysis of the system may be required, if it appears that the system might be inadequate.
- f. Anyone that wishes to extend or connect to the city's water system should contact the Department of Public Works for preliminary information and discussion of the extension proposed. The design of a water system extension is the responsibility of the Developer proposing the construction and upgrading of the public water system.
- g. Prior to the installation of any water meters, all Public Works improvements must be completed and approved including granting of right-of-way or easements, and all applicable fees as set forth in Chapter 3.36 PTMC must be paid.
- h. Issuance of building permits for new construction of single family residences within new subdivisions shall not occur until final Public Works approval of all improvements is given, unless otherwise allowed through an approved improvement methods report and/or construction bond. For commercial projects, building permits may be issued upon completion and acceptance of the required fire protection facilities, providing the necessary easements have been filed and all required fees and connection charges paid. Certificates of occupancy will not be granted until final Public Works approval and acceptance of all improvements is given.
- i. Standard References
 - i. Except as otherwise superseded in these standards, water system design, installation, modification, and operation is subject to the "Rules and Regulations of the State Board of Health Regarding Public Water Systems," Latest Revision, WAC 246-290.

- ii. Water facilities design and construction shall conform to appropriate AWWA, and WSDOT/APWA Standard Specifications. In cases where conflicts exist between specifications, the order of precedence shall be City of Port Townsend Standards, AWWA and Washington DOT/APWA Standard's latest revisions.
- j. Warranty. The developer or owner shall warranty water lines and other water system improvements for one year after installation, approval and acceptance by the City and shall be responsible for one year for any unanticipated settling of excavations or repairs to restored street surfaces. All necessary repairs shall be performed immediately or the city shall perform the repairs at the developer's expense.
- k. Traffic Control: For work in opened streets and rights-of-way, the contractor shall follow procedures described in Chapter 1 of these standards.
- l. Approval for Construction Outside of Business Hours: Any work performed in any street right of way at any time other than Monday to Friday 7 am to 6 pm, must have the approval of the Public Works Department.
- m. Noncompliance Penalty: Utility development permits may be revoked from any contractor not complying with these specifications.
- n. Survey: See Chapter 1 of these standards.
- o. Standard Details: All construction shall comply with city Standard Details.

2. Design Standards

- a. The design of any water extension/connection shall conform to these standards and any applicable standards as set forth in other chapters of these standards.
- b. The layout of extensions shall provide for the future continuation and/or "looping" of the existing system as determined by the Director
- c. The following GENERAL CONDITIONS along with those in Chapter 1, shall be included on any plans for water system design and construction.
 - i. The city shall be given 72 hours notice prior to scheduling a shutdown of any portion of the water system. The existing valve must be pressure tested to city standards prior to connection. If an existing valve fails to pass the test, the contractor shall make the necessary provisions to test the new line prior to connection to the existing system or install a new valve.
 - ii. The existing valves shall only be operated by city employees during construction.
 - iii. During the construction of mains and services, the contractor shall cap, plug, or secure the ends of such lines whenever the project is shut down at the end of the day so that contaminants will not enter the lines.
 - iv. All lines shall be chlorinated and tested in conformance with the standard specifications. Dechlorination will be done by city forces at contractor expense.
 - v. All water mains shall be staked for grades and alignment.

3. Water Service Connections

- a. Connection Required Within City Limits. It is a requirement of the City of Port Townsend that all new development within the City limits must connect to the city water system. Wells for domestic use are prohibited.
- b. Out-of-City Service Area. In the out-of-city service area the city has the right of first refusal regarding water service. If the City elects not to provide water service, the applicant may seek service from another service provider in accordance with the adopted Coordinated Water System Plan (CWSP). City water service shall not be provided outside the city's currently adopted service area, unless a prior contractual obligation exists committing the city to provide service.

4. **Water Main Extensions and other System Improvements**

Water main extensions, replacements or other system improvements are required:

- a. Whenever a customer requests service and the premises to be served does not abut a water main;
- b. Whenever the existing water main(s) is not adequate to provide the necessary water pressure or flow requirements (including fire flow);
- c. Whenever system looping is necessary or where other components of the water system are inadequate to handle the increased water demands caused by the development;
- d. Whenever necessary to protect public health and safety; or
- e. Where indicated by the City's Water System Plan or the CWSP.

5. **Procedural Requirements**

- a. Public Works Technical Conference. Anyone wishing to connect to or extend the city's water system is encouraged to request a meeting with Public Works staff to obtain preliminary information of the location of existing facilities and to review water system extension requirements. A technical conference will generally be required for anyone proposing a main extension.
- b. Application for water service. Any person seeking to connect to the City's water system shall submit an application to the Public Works Department on forms provided by the city.
 - i. Information required for the water service application shall include:
 - (1) The name of the owner or agent and his or her mailing address, the street address or name of the premises to be served, and the legal description of the premises to be served.
 - (2) The purpose for which the water is to be used, the type of development proposed and the number of living units within the premises to be supplied. The applicant shall also designate all fixtures to be installed. Such information must be sufficient to determine the size of water service, cross-connection control requirements and fire flow requirements.
 - (3) A scaled site plan showing the proposed location for the service connection and meter.

- (4) Upon request by the director, a hydraulic analysis of the system used to serve the development.
 - (5) Any other information deemed reasonably necessary by the director to review the application for compliance with Title 13 PTMC and these Standards, or required by other provisions of the City's code, Department of Health requirements, SEPA, permit conditions, or city ordinance.
 - (6) The design drawings and specifications for the water system improvements required under "item e" below.
- ii. **Complete Application Required.** The city will not process any application unless and until the information required above is substantially complete. The public works director may reject an application as incomplete within a reasonable time of review, in which case the director shall return it to the applicant with an indication of the additional information needed to make the application complete.
- c. **Water Reservation for Out-of-City Service Area.** A water reservation application must be submitted on forms provided by the City for anyone located outside of the City limits but within the service area. Information required for the water reservation is included on the application form. If a water line extension or other water system improvement is required as a result of the development, engineered plans shall be prepared and submitted for review in accordance with "item e" below.
 - d. **Utility Development Permit.** A Utility Development Permit is required for any water main extension, replacement, and other system improvements in the City.
 - i. The Utility Development Permit shall contain all design drawings and information necessary for the Public Works Department to determine compliance with these Standards and the applicable codes and standards incorporated by reference into these Standards.
 - ii. When the City receives the application, the application will first be checked for completeness. Once it is determined to be complete the City will begin its review of the application.
 - iii. Utility Development Permits are reviewed and approved by the Public Works Department. Construction shall not commence until the permit is approved by the Director.
 - e. **Construction Drawings and Engineered Plans.** All applicants for water system connections and improvements shall furnish drawings and specifications necessary to describe and illustrate the proposed water system improvements. If base maps prepared by a licensed land surveyor are available, the design and construction plans shall be submitted on such maps. If base maps are unavailable, the public works director may require a survey to avoid conflicts with existing facilities, to determine elevations and contours, and to determine the right-of-way for utility placement.
 - i. All plans for main extensions and water system improvements shall be prepared, signed and stamped by a civil engineer licensed in the State of

- Washington.
- ii. For main extensions and replacements of 260 feet (one city block) or less in Tier 1 which do not require engineered plans under another authority of the PTMC, the developer has the option of the city performing the engineering for the fee identified in Chapter 3.36 PTMC. Alternatively, the developer may pay for his or her own engineering with the full cost to be borne by the developer.
- iii. All design and construction plans and specifications shall be prepared in accordance with current DOT/APWA standard specifications and the city's engineering design standards. If discrepancies exist in the standards and specifications, the city engineering design standards shall take precedence.
- iv. The requirement for engineered plans may be waived in certain instances as defined by the PTMC and approved by the City Engineer for minor improvements to the water system that can be adequately inspected and certified by the City Engineer, and that will still assure the long-term integrity of the water system. As-builts must be submitted for the project.
- v. All plans must be reviewed and approved by the Director prior to proceeding with construction.
- f. Inspection: All water system installations shall be inspected and approved by the City. It is the responsibility of the developer or contractor to notify the city 24 hours in advance of necessary inspections at the proper point in construction. All excavations must be left open until inspection is complete.
- g. Approval, Acceptance and Conveyance. Prior to installation of any water meters, all water system improvements must be completed and approved including granting of right-of-ways or easements, receipt of a bill of sale conveying the improvements to the City, and all applicable fees paid.
- h. As-Builts. Certificates of occupancy will not be granted nor final Public Works approval and acceptance of all improvements given until as-built drawings are received.

6. General Facility Placement:

- a. Underground facilities shall be located in accordance with applicable city ordinance and the utility location drawing in Chapter 6. Water mains shall be installed at a location which is compatible with the existing water system, the terrain, and the location of other utilities and so as to minimize present and future conflicts with sewer and storm drainage piping and improvements.
- b. All piping, pumping, storage, and other facilities shall be located on public rights-of-way or dedicated utility easements. Utility easements must be a minimum of 20 feet in width, and piping shall be installed no closer than 5 feet from the easement's edge unless approved by the city. Easements/rights-of-way for multiple utilities shall be a minimum of 25 feet wide.
- c. Generally, water and sewer lines shall be located on opposite sides of a street.
- d. There shall be no obstructions placed in a public right-of-way or utility easement

that restricts access to public water system lines and public fire hydrants.

7. Distribution System - Flow and Pressure Requirements

- a. Hydraulic Modeling. In designing and planning for any development, it is the responsibility of the developer to verify that adequate water for both domestic and fire protection use is attainable. The developer must show, in the proposed plans, how water will be provided, where other parts of the system will be adversely impacted, and how adequate water will be supplied at the required pressures in case of fire. A detailed analysis of the system may be required if it appears that the system is inadequate. Connection to the system may be denied if water pressures or flow are inadequate, unless replacement of inadequate lines is included with the proposed project.
 - i. All water system modeling shall be done using the City's water system data and its projected water demands at build out. Modeling shall be performed using the latest version of EPANET, unless an alternative modeling approach is approved by the Director.
 - ii. If modeling is necessary, the developer may pay the cost for the city to perform the modeling. Alternatively, the developer may use the City's model to perform the modeling, and the final result will be checked by the City.
- b. Minimum System Pressure: For all new developments or reconstruction projects, a minimum pressure of 30 psi shall be maintained throughout the distribution system at peak hourly demand (PHD) [WAC 246-290-230], except where booster pumps are allowed as provided under chapter 13.13 PTMC. Property owners are responsible for owning and maintaining booster pumps.
- c. Static Distribution Pressure Range: Whenever possible, static distribution pressures should range between 40 psi minimum and 80 psi maximum. Minimum static pressure must enable delivery of water to highest points in any zone at 30 psi during PHD conditions. The City may recommend or require that all services with static pressures at the service to the building in excess of 80 psi install individual pressure-reducing valves, per Uniform Plumbing Code requirements [UPC 608]. Property owners are responsible for owning and maintaining pressure reducing valves.
- d. Minimum Fire Flow System Pressure: In all new developments or reconstruction projects, a minimum pressure of 20 psi must be maintained throughout the distribution system when the required fire flow plus PHD is supplied. [WAC 246-290-230]
- e. Minimum Residential Fire Flow: Minimum fire flow for single family residential units is 1,000 gpm for 2 hours. [UFC Appendix III-A].
- f. Minimum Commercial Fire Flow: The fire flow for new or redeveloped commercial areas shall be a minimum of 1,500 gpm, for 2 hours, or as established by the Fire Marshal with jurisdiction for the project.
- g. Minimum Industrial Fire Flow: The fire flow for industrial developments shall be a minimum of 2,000 gpm for 2 hours, or as established by the Fire Marshal with

- jurisdiction for the project.
- h. Maximum Pipe Velocity: To avoid excessive head loss, pipe velocities should not exceed 10 feet per second at PHD.

8. Service Installation or Service Connections

- a. General
- i. All water service connections shall be made by city forces, except as approved by the director for projects which are not on live water lines.
 - ii. All service connections to the city water system shall be metered and all premises shall be separately metered.
 - iii. No service connections shall be made to transmission lines unless approved in writing by the director.
 - iv. Initial service connections shall be installed at the expense of the property owner.
 - v. Connections to Main. Each served premises must have a separate connection to a main *except* as approved by the director in the following instances:
 - (1) Where separate connection is impossible or impractical.
 - (2) Adjacent residential or commercial premises services may share a common connection to the main.
 - vi. Replacement of Buildings. When buildings are replaced by new buildings, the existing water service connection may be used unless determined by the director to be unacceptable, in which case a new water service connection shall be installed and the applicant shall pay fees as described in **Chapters 13.05 and 3.36 PTMC**.
- b. Sizing.
- i. The size of service connection and the main to the premises served shall be determined based on the Uniform Plumbing Code and these standards.
 - ii. Over-sizing. The city may require oversizing of any service connection to improve service to the customer; however, SDCs and base rates will be assessed on the basis of the service size required by the water demands of the premises.
 - iii. Change in Use. A change of use that increases water use may require a larger tap size and a new service connection, unless the existing service is adequate for the changed use, as determined by the director.
 - iv. Down-sizing. Upon payment of required fees and charges identified in **Chapter 3.36 PTMC**, the city will reduce the charges for a customer who makes an application and receives approval for a down-sizing of their meter effective the date payment is made.
- c. Service Taps: Service taps shall be installed to all designated building sites at the time of water main installation and before the street is paved. At its discretion, the City may install or cause to be installed water taps for undeveloped lots not part of the development proposal and/or existing customers at the time when a water main is extended in city streets. The developer or contractor shall

- coordinate construction installation with City crews.
- d. Service Connections: Service connections shall conform to the standard detail drawings in this chapter and to WSDOT/APWA Standard Specifications Section 7-15.

9. Distribution Mains

- a. Minimum Pipe Diameter: Every new water distribution main placed into service shall be 8 inches in diameter, unless a larger size is indicated by the Water System Plan or city engineering design standards; *provided however*, that a 4-inch pipe extending not more than 200 feet beyond a fire hydrant may be installed in a dead-end street if there is no foreseeable need for extending the water main to connect to other water mains or for improvement of water service or other hydraulic needs. Taps off existing 4-inch diameter lines may be allowed when fire flow requirements can be met to serve the property and if the customer signs a no-protest agreement for future improvements to the system.
- b. Pipe Materials: AWWA approved C900 PVC or Class 52 ductile iron pipe, unless other materials are approved in writing by the City Engineer.
- c. Distribution System Looping: New distribution mains of 500 feet or more should be looped with at least two connections into the existing grid and shutoff valves shall be provided as necessary for system isolation.
- d. Line Termination: Distribution mains shall be constructed along the frontage of the property and extended to the next street intersection for orderly development of the system. A valve is required at every termination. Valves and fire hydrants as well as bends in pipe which cause non-uniform forces must be restrained and provided with thrust blocks. Fire hydrants or blowoffs are required at terminations, unless waived by the City Engineer.
- e. Air Releases and Blowoffs: Mains shall be provided with appropriately sized air release assemblies at all high points and blow-off assemblies at all low points. In no case shall the location of blowoffs be such that there is a possibility of back-siphonage into the distribution system. Discharges from a blowoff valve shall be controlled to minimize undesirable impacts on nearby property and activity. Air release and blowoff assemblies shall be constructed in vaults with suitable drains and protection from potential contamination.
- f. Gate Valve Spacing: Gate valves shall be provided at every intersection of two mains and at intervals on straight pipe runs to facilitate shutdowns for maintenance. Unvalved lengths of pipe shall not exceed 500 feet in school, mixed use, commercial, or multi-family areas, and 800 feet in single-family residential areas, where customers are being served unless other lengths are determined by the Public Works Director.
- g. Corrosion Control: Depending upon individual site conditions, cathodic protection or other appropriate corrosion control measures may be required in the pipeline design.

10. Water and Sewer Main Separation Distance:

- a. Water mains shall maintain ten (10) feet horizontal and 18" vertical separation above sewers (sanitary sewer, storm sewer, or irrigation water). If ductile iron pipe is used for the new water main, horizontal separation may be reduced to three (3) feet and vertical separation may be reduced to 6" (outside to outside of pipe). Where an existing sewer is above a proposed water main, and the proposed water main must cross the existing sewer, the sewer shall be replaced with a 20 foot section of ductile iron pipe such that the sewer line joints are equidistant from the center of the new water main.
- b. Crossings. Where water and sewer lines must cross, a minimum vertical separation of 18 inches shall be maintained. The minimum cover for a water main may be reduced to 18 inches upon approval of the Director to provide as much separation as possible. The longest standard length of pipe shall be installed so that the joints will fall equidistant from any sewer crossing. In some cases where minimum separation cannot be maintained, it may be necessary to encase the water pipe and/or sewer pipe in a pipe or concrete. Concrete encasing shall not be used unless specifically approved by the City.

11. Fire Hydrants

- a. Fire Hydrants: All buildings connected to the city water system shall be served by fire hydrants. Maximum fire hydrant spacing shall be 500 feet in residential areas and 300 feet, or as directed by the Fire Marshall, in multi-family, mixed use, and commercial areas. [UFC Appendix III-B] Hydrants shall not be installed on mains less than 6 inches in diameter. Placements shall be made to provide unhindered access for fire hose connection and testing and maintenance.
- b. Testing of Fire Protection Facilities: All fire protection facilities shall be tested for operation upon initial installation.
- c. Painting: All hydrant barrels shall be painted yellow except for the caps which shall be painted in accordance with the following: red (0-499 gallons per minute (gpm)), orange (500-999 gpm), green (1000-1500 gpm), blue (greater than 1500 gpm). All standpipes shall be painted red.

12. Water Main Installation

- a. Locations of water lines shall be staked for city inspection prior to excavation.
- b. Minimum Pipe Cover: Minimum cover on all distribution mains less than 12 inches in diameter shall be 3 feet. Minimum cover on mains 12 inches and greater in diameter shall be 3.5 feet.
- c. Pipe installation shall conform to WSDOT/APWA Standard Specifications Section 7-11 and AWWA C600. Detection (locator) wire shall be installed during all pipe laying at the bottom of the excavation; the wire shall be insulated solid core, 14 gauge or larger.
- d. Alignment: Pipe alignment shall conform to WSDOT/APWA Standard Specifications Section 7-10.3(5). Under normal circumstances the actual pipe alignment shall not deviate from the design by more than 4 inches in either direction.

- e. Detector Tape Requirement: An acceptable metallic tape marked with appropriate information shall be used in all piping installations. Detectable pipe identification tape shall be installed 16 inches above pipe material along pipe center line.
- f. Appurtenances: Valves, hydrants, and other appurtenances shall be installed in accordance with APWA 7-12, 7-14, and AWWA C600 and with the city standard installation drawings.
- g. Joint Deflection: Joint deflection shall be no more than 80 percent of maximum deflections recommended by manufacturers.
- h. Concrete Blocking: The design of concrete blocking shall be based on available soil bearing pressure data.
- i. Hydrostatic Testing: A hydrostatic and pressure leakage test will be conducted on all newly constructed water mains, fire lines, fire hydrant leads, and stub-outs in accordance with WSDOT/APWA Standard Specifications Section 7-11.3(11) and AWWA C-600 specifications in the presence of the City Inspector.
- j. Disinfection and Flushing: All pipes, valves, service connections, reservoirs, and appurtenances shall be flushed and disinfected in accordance with the standards of the DOH, AWWA C601-68 and D105-80, and WSDOT/APWA Standard Specifications Sections 7-11.3(12) and 7-15. Disinfection water must be dechlorinated before discharging to water bodies, wetlands or storm sewers. Such discharges must meet all federal and state requirements.

13. Materials Specifications

- a. Pipe
 - i. Ductile Iron Pipe: Class 52, AWWA C-150; WSDOT APWA Standard Specifications Section 9-30.1(1)
 - ii. PVC Pipe: AWWA C-900 only, WSDOT/APWA Standard Specifications Section 9-30.I(5)
- b. Fittings
 - i. Ductile Iron Pipe: WSDOT/APWA Standard Specifications Section 9-30.2(1); MJ fittings
 - ii. PVC Pipe: AWWA C-900 only, WSDOT/APWA Standard Specifications Section 9-30.2(5); MJ fittings, no glue.
 - iii. Hot Taps: Stainless steel tapping sleeve, Romac only
- c. Valves and Appurtenances
 - i. Gate Valves: Resilient Wedge, AWWA C500
 - ii. Butterfly Valves: AWWA C504
 - iii. Backflow Preventers: Resilient seat, DOH approved, AWWA C605
 - iv. Standpipes: Standpipes shall be equipped with at least a 2-1/2 inch National Standard Thread connection port. An emergency port may also be installed on above ground facilities to the same specifications.
 - v. Valve Boxes: WSDOT/APWA Standard Specifications Section 9-30.3(4)
- d. Hydrants: AWWA C502; Mueller Model Century 200 with two 2-1/2 inch (National Standard Thread) side ports and one 4-inch (National Standard Thread)

-
- steamer nozzle with 4-inch Stortz adapter.
 - e. Meters and Services
 - i. Meters: Sensus SR11, or approved equal
 - ii. Corporation Stops: Mueller Model number H1502H(1" & 3/4"; H9969 (1 1/2" & 2"), WSDOT/APWA Standard Specifications Section 9-30.6(2), IPT x 110
 - iii. Service Saddles: WSDOT/APWA Standard Specifications Section 9-30.6(1)
 - iv. Curb Stops: Mueller H-15175, or approved equal, with copper inlet and inside IP outlet. IPT x 110 compression
 - v. Meter Boxes: PVC or concrete meter box 16 inches by 22 inches by 12 inches.
 - vi. Service Pipes: WSDOT/APWA Standard Specifications 9-30.6(3); 3/4 inch or 1 inch Type (K) copper, or larger as necessary
 - f. Miscellaneous
 - i. Guard Posts: WSDOT/APWA Standard Specifications Section 9-30.5(6)
 - ii. Marker Post: WSDOT/APWA Standard Specifications Section 9-30.3(5)
 - iii. Thrust Blocking: AWWA C600
 - iv. Pipe Gaskets: AWWA C115 A1

14. Cross Connection Control

- a. Cross connections to the City's water system are prohibited.
- b. Cross connection control shall be in accordance with WAC 246-290-490 et seq and the *Accepted Procedure and Practice in Cross Connection Control Manual* -- Pacific Northwest Section of the American Water Works Association, latest edition.
- c. Information on the City's cross connection control program is contained in the Cross Connection Control Policy Document which is available on request.

15. Pump Stations

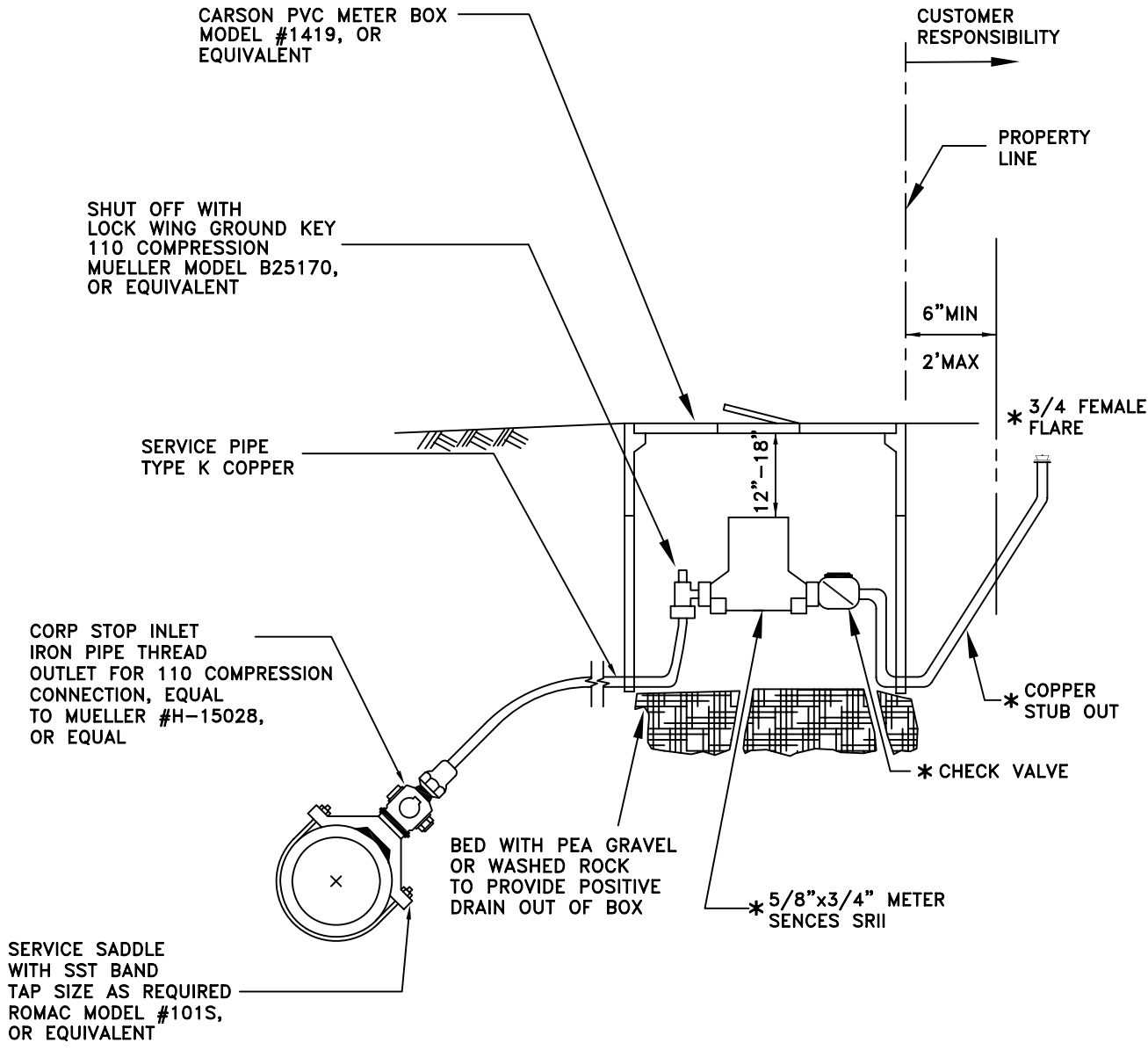
- a. Pump Station (General): Pump stations must be designed and installed to take into account pressure and hydraulics of distribution system, safety and aesthetics.
- b. Pump Station Design Life: Pump stations will be designed for a minimum useful life of 25 years for all equipment and structures.
- c. Pump Station Capacity:
 - i. with storage: Supply pump stations that pump directly to storage shall be designed to supply maximum daily demand (MDD). Redundancy that enables the station to supply the MDD with one pump out of service is required.
 - ii. to distribution and storage: Pump stations that pump to distribution and storage must be sized so that the combination of storage and pumping capacity can supply peak hourly demand (PHD) plus fire flow. The pump station capacity must be 25 to 50 percent greater than the required capacity to enable storage replenishment. The station and storage

- combination should have adequate capacity with the largest pump out of service. Station and storage combination should have adequate capacity with the largest pump out of service.
- iii. direct to distribution: Pumps stations supplying distribution directly shall be equipped with two fire pumps, each of which is capable of producing the maximum fire flow requirement. Domestic pumps within a direct distribution station must be capable of supplying the maximum instantaneous demand to the system. If appropriately sized hydro-pneumatic tanks are used, domestic pumps may be sized for the peak hour flow. At least one redundant domestic pump must be provided such that, with the largest pump out of service, the remaining domestic pumps can still provide the peak hour demand flow to the system.
 - d. Booster Pump Station: Booster pump stations for individual residences shall be equipped with shut-off switches such that they are incapable of reducing pressure below zero. A low pressure cut-off shall be installed on the suction side of the pump.
 - e. Emergency Power: Except as noted, all pump stations shall be provided with onsite emergency power. If the pump station supplies an area with no direct storage available, onsite emergency power sized for the design capacity of the station is required. When pumping to main city reservoirs, the capability to connect to a portable power supply must be available that would allow at least the largest pump in the pump station to operate during the longest power outage experienced in the area over the last 10 years, as determined by the local power supplier.
 - f. Noise Control: The following shall be provided for noise abatement and control:
 - i. All pump stations will be provided with adequate noise control to meet state noise guidelines.
 - ii. Pumps shall be housed in a concrete or equivalent structure with sound attenuation provided.
 - iii. Pump stations shall be located away from residences where feasible.
 - g. Alarms: Pump stations shall be provided with intrusion and shutoff alarms compatible with the city's SCADA system.
 - h. Maintenance: Spare parts commonly needed for pump station repairs shall be provided with the installation. Examples of commonly needed parts include packing glands or mechanical seals, bearings, motor starters, fuses, etc. Manufacturer's recommendations and/or city maintenance history shall be used to determine spare parts inventory requirements.



City of Port Townsend - Public Works Department

Standard Detail



NOTE:

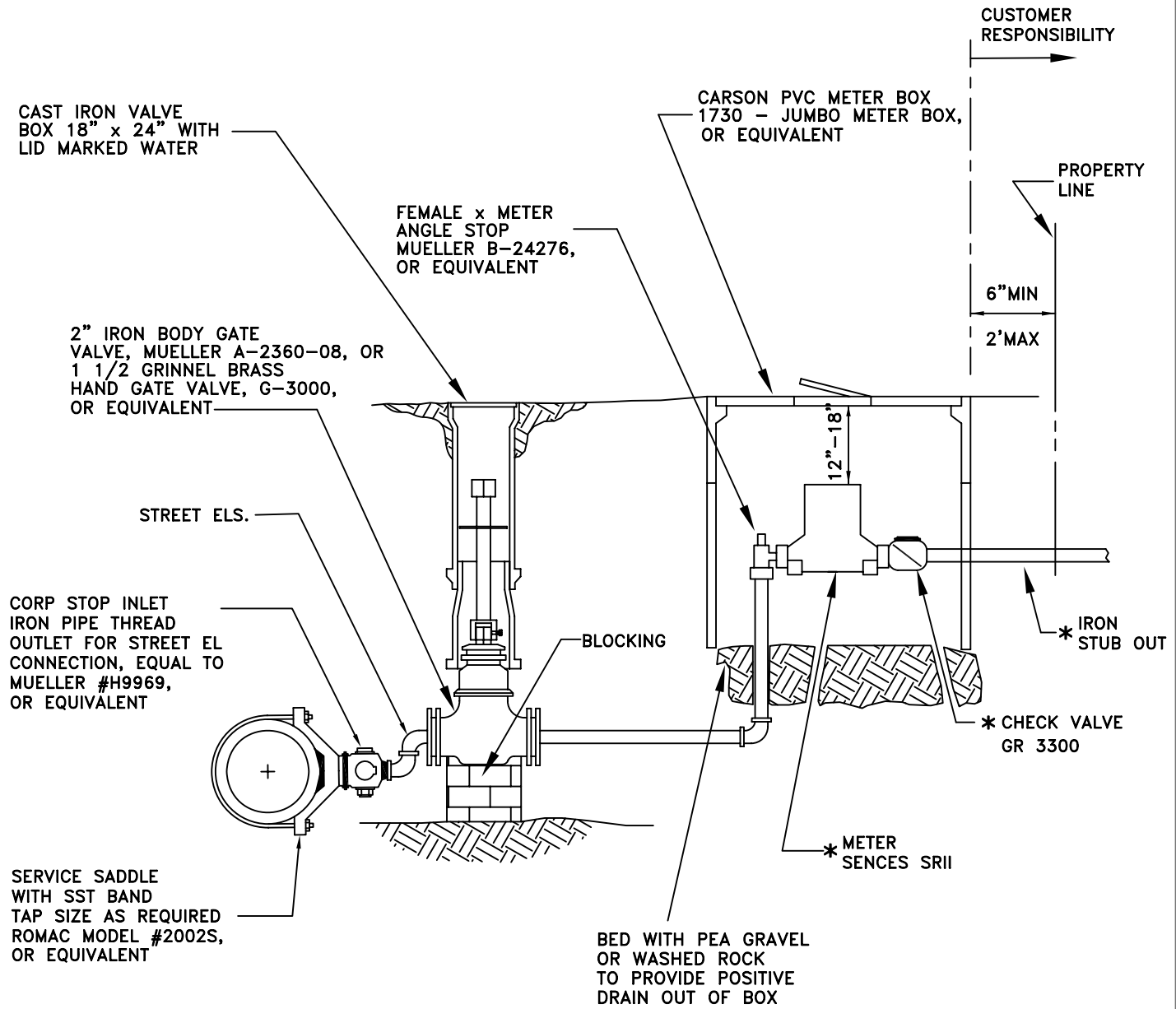
1. A PRESSURE REDUCING VALVE INSIDE A SEPARATE METER BOX IS RECOMMENDED WHERE STATIC PRESSURE IS GREATER THAN 80 PSI.
2. PRESSURE REDUCING VALVES SHALL BE INSTALLED ON CUSTOMERS PROPERTY AT LEAST 3' FROM THE WATER METER BOX.
3. SIZE OF FITTINGS AND TAP SIZE SHALL BE AS REQUIRED FOR THE TYPE OF SERVICE.
4. * INDICATES ITEMS TO BE INSTALLED BY CITY.

Date: April 1997	No.	Date	Revision	By	Apvd	Water Service Connection Single 3/4" and 1" Service Detail: W-1A
Approved By:						
File: E:\eng_std\standard\water						



City of Port Townsend - Public Works Department

Standard Detail



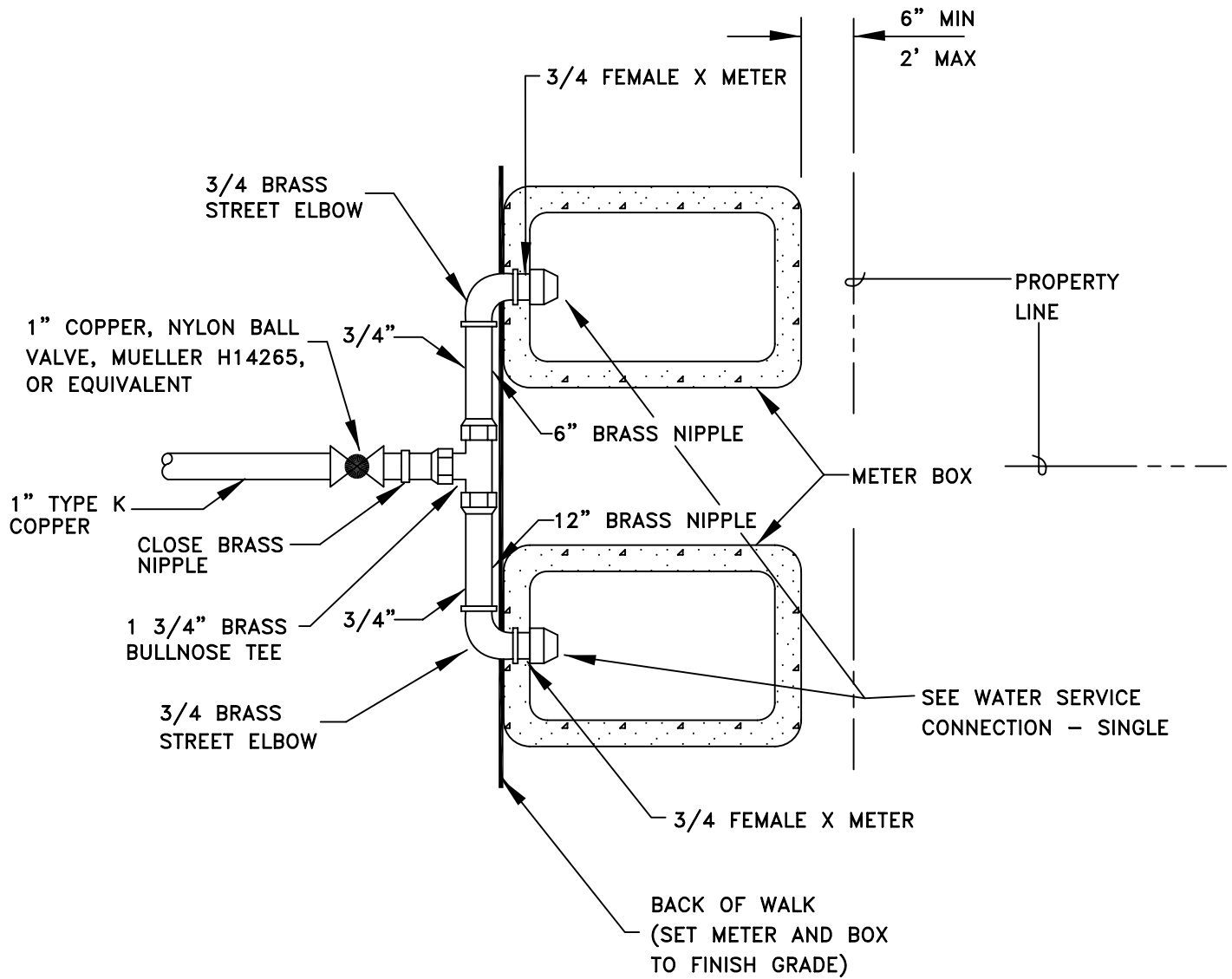
NOTE:
 1. * IDICATES TO BE INSTALLED BY CITY.

Date: April 1997	No.	Date	Revision	By	Apvd	Water Service Connection Single 1 1/2" and 2" Service Detail: W-1B
Approved By:						
File: E:\eng_std\standard\water						



City of Port Townsend - Public Works Department

Standard Detail

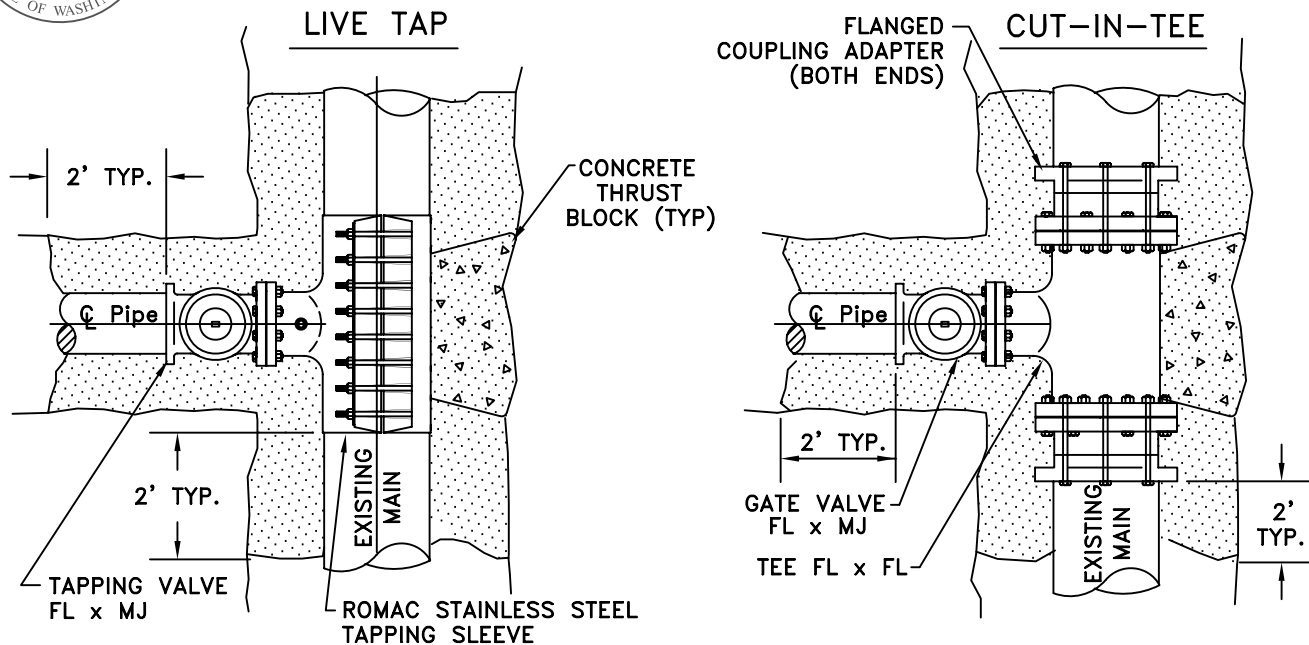


Date: April 1997	No.	Date	Revision	By	Apvd	Water Service Connection -Double Detail: W-2
Approved By:						
File: E:\eng_std\standard\water						

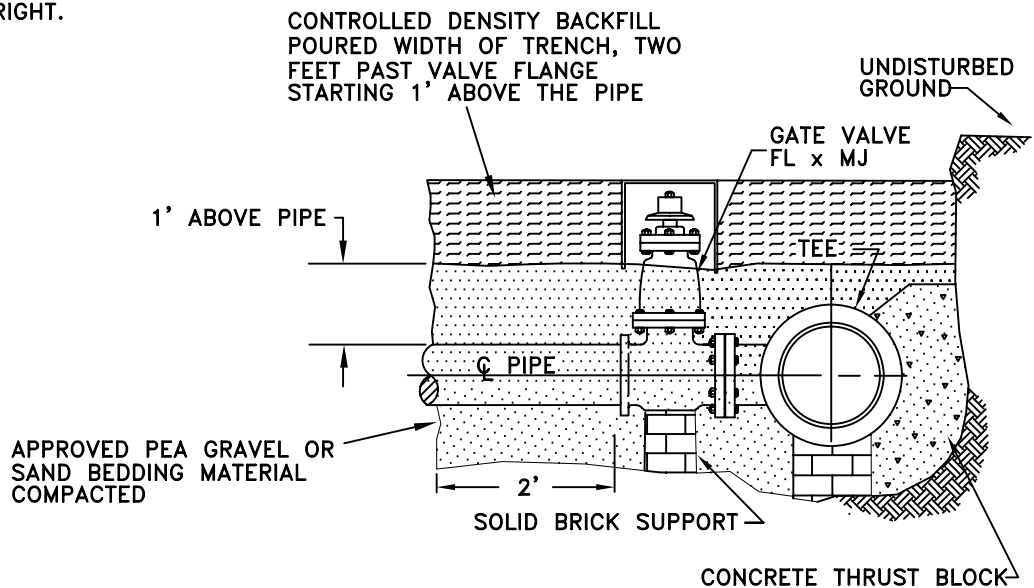


City of Port Townsend - Public Works Department

Standard Detail



VALVE AND SLEEVE SHALL BE SUPPORTED AND BACKFILLED AS SHOWN BELOW—RIGHT.



NOTE:

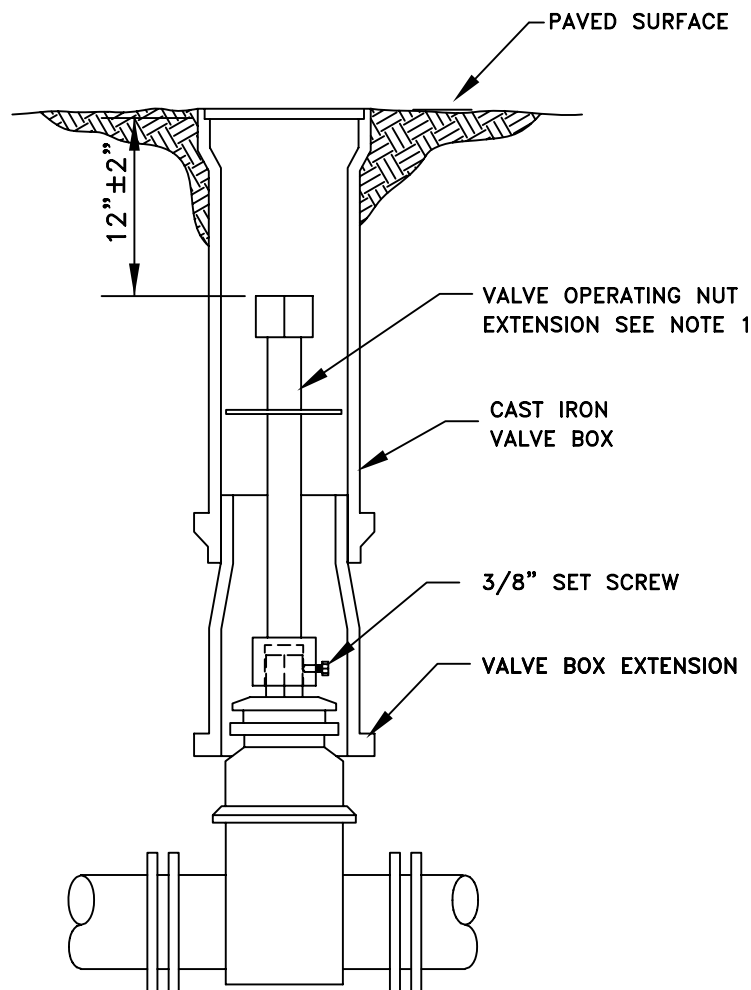
1. 11 MIL PLASTIC OR CONSTRUCTION FABRIC SHALL BE WRAPPED AROUND PIPE AND FITTINGS BEFORE THRUST BLOCK AND BACKFILL ARE Poured.
2. CONTROLLED DENSITY BACKFILL IS A PLANT MIX CONSISTING OF: 3100# SAND, 450# WATER, AND ONE SACK (94#) OF CEMENT.
3. MJ CUT IN TEES SHALL NOT BE PERMITTED.
4. SUPPORT VALVE AND SLEEVE CONTINUOUSLY THROUGH INSTALLATION.
5. ALL THRUST BLOCKS TO BE PLACED AGAINST UNDISTURBED GROUND.
6. FOR ROAD REPAIR SEE STREET STANDARDS.

Date: April 1997	No.	Date	Revision	By	Apvd	Connection to Existing Main Detail: W-3
Approved By:						
File: E:\eng_std\standard\water						



City of Port Townsend - Public Works Department

Standard Detail



VALVE BOX AND EXTENSION

NOTES:

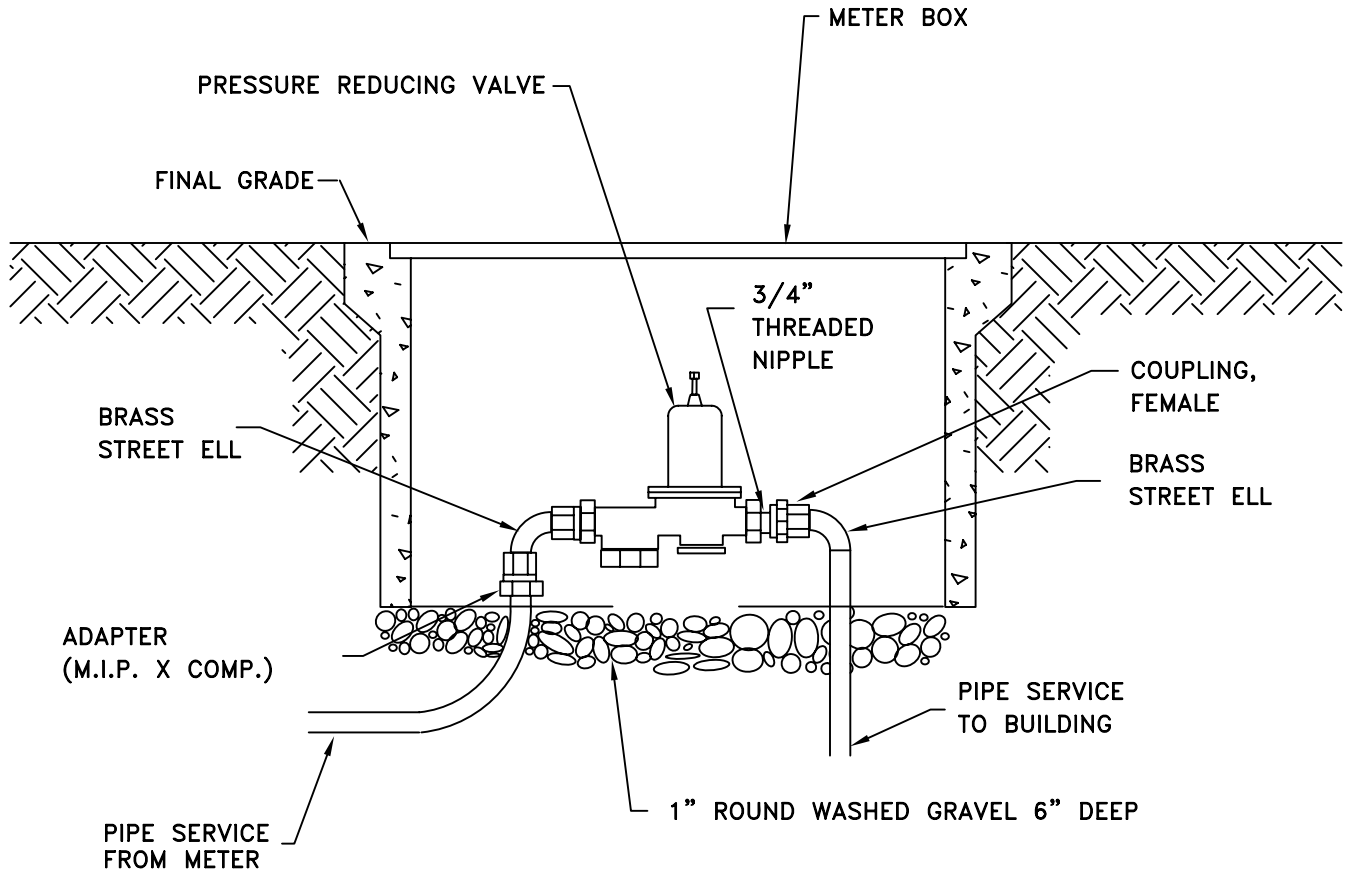
- 1 VALVE OPERATING NUT EXTENSIONS ARE REQUIRED WHEN THE VALVE NUT IS MORE THAN TWO (2) FEET BELOW FINISHED GRADE. EXTENSIONS ARE TO BE A MINIMUM OF ONE (1) FOOT LONG. ONLY ONE EXTENSION WILL BE ALLOWED PER VALVE.

Date: April 1997	No.	Date	Revision	By	Apvd	Valve Box and Extension Detail: W-4
Approved By:						
File: E:\eng_std\standard\water						



City of Port Townsend - Public Works Department

Standard Detail



NOTE:

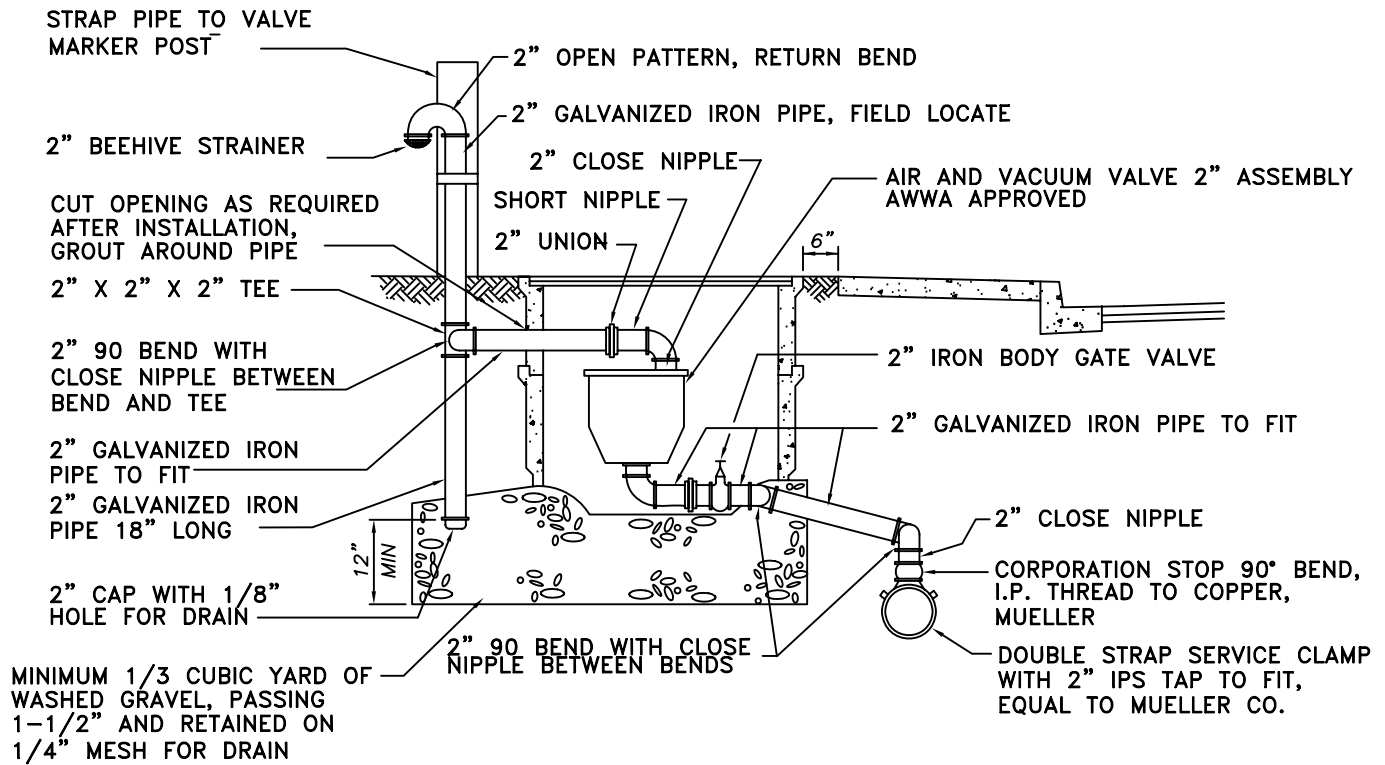
PRESSURE REDUCING VALVE INSTALLATION AND MAINTENANCE ARE THE COMPLETE RESPONSIBILITY OF THE CUSTOMER. THIS DETAIL IS PROVIDED FOR THE INFORMATION AND CONVIENCE OF THE CUSTOMER ONLY.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Standard Pressure Reducing Valve Assembly</h3> <p style="font-size: 1.2em; margin: 10px 0 0 0;">Detail: W-5</p>
Approved By:						
File: E:\eng_std\standard\water						



City of Port Townsend - Public Works Department

Standard Detail



NOTE:

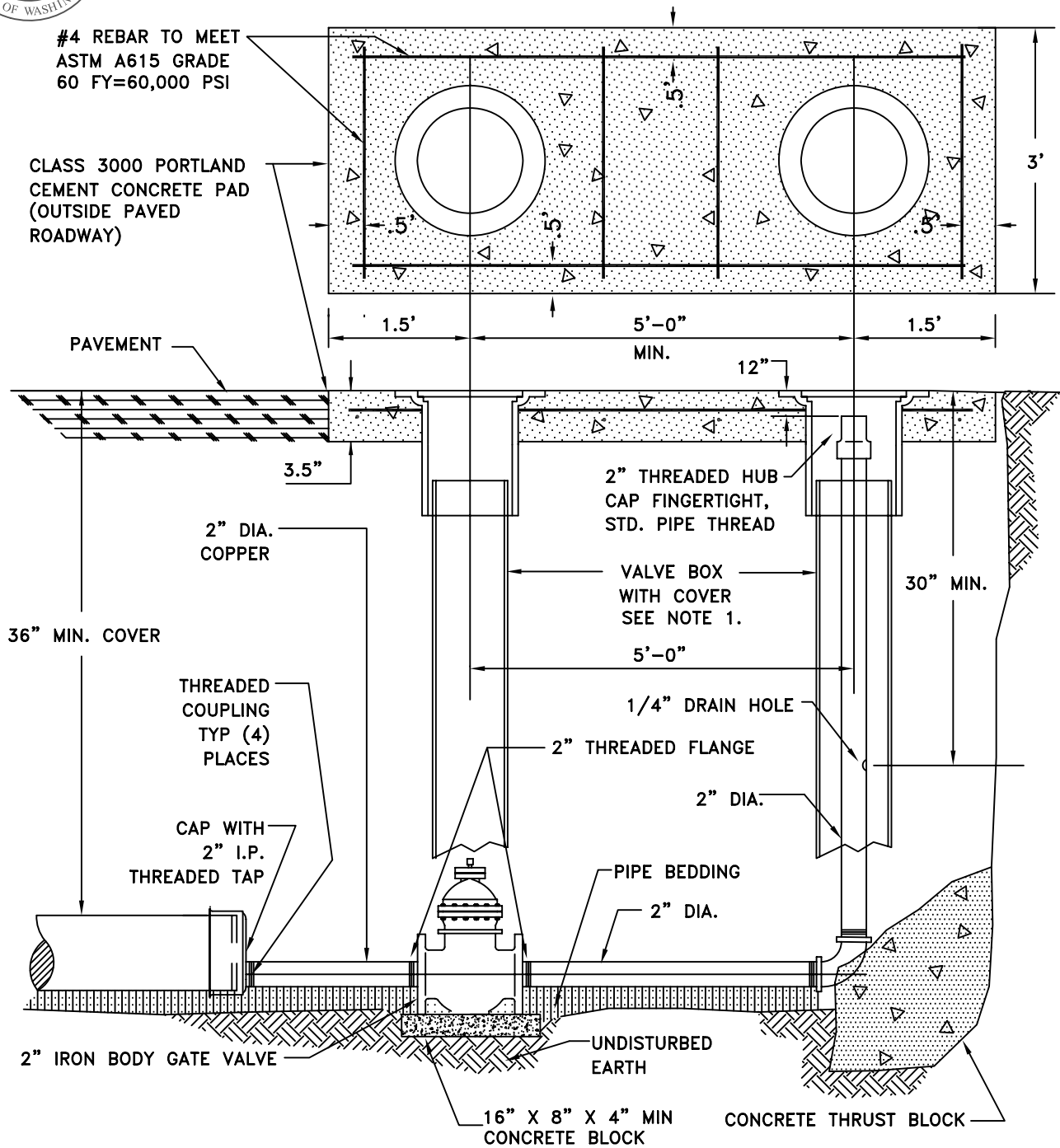
AIR AND VACUUM RELEASE VALVE ASSEMBLY SHALL BE INSTALLED AT HIGHEST POINT OF LINE. IF HIGH POINT FALLS IN A LOCATION WHERE ASSEMBLY CANNOT BE INSTALLED, PROVIDE ADDITIONAL DEPTH OF LINE TO CREATE A HIGH POINT AT A LOCATION WHERE ASSEMBLY CAN BE INSTALLED.

Date: April 1997	No.	Date	Revision	By	Apvd	Combination Air Release/ Air Vacuum Valve Assembly Detail: W-6
Approved By:						
File: E:\eng_std\standard\water						



City of Port Townsend - Public Works Department

Standard Detail



NOTE:

1. VALVE AND METER BOX COVERS SHALL BE PER STANDARD DETAILS.
2. CONCRETE PAD MAY, WITH CITY APPROVAL, BE DELETED.

Date: April 1997

No.	Date	Revision	By	Apvd

Approved By:

File: E:\eng_std\standard\water

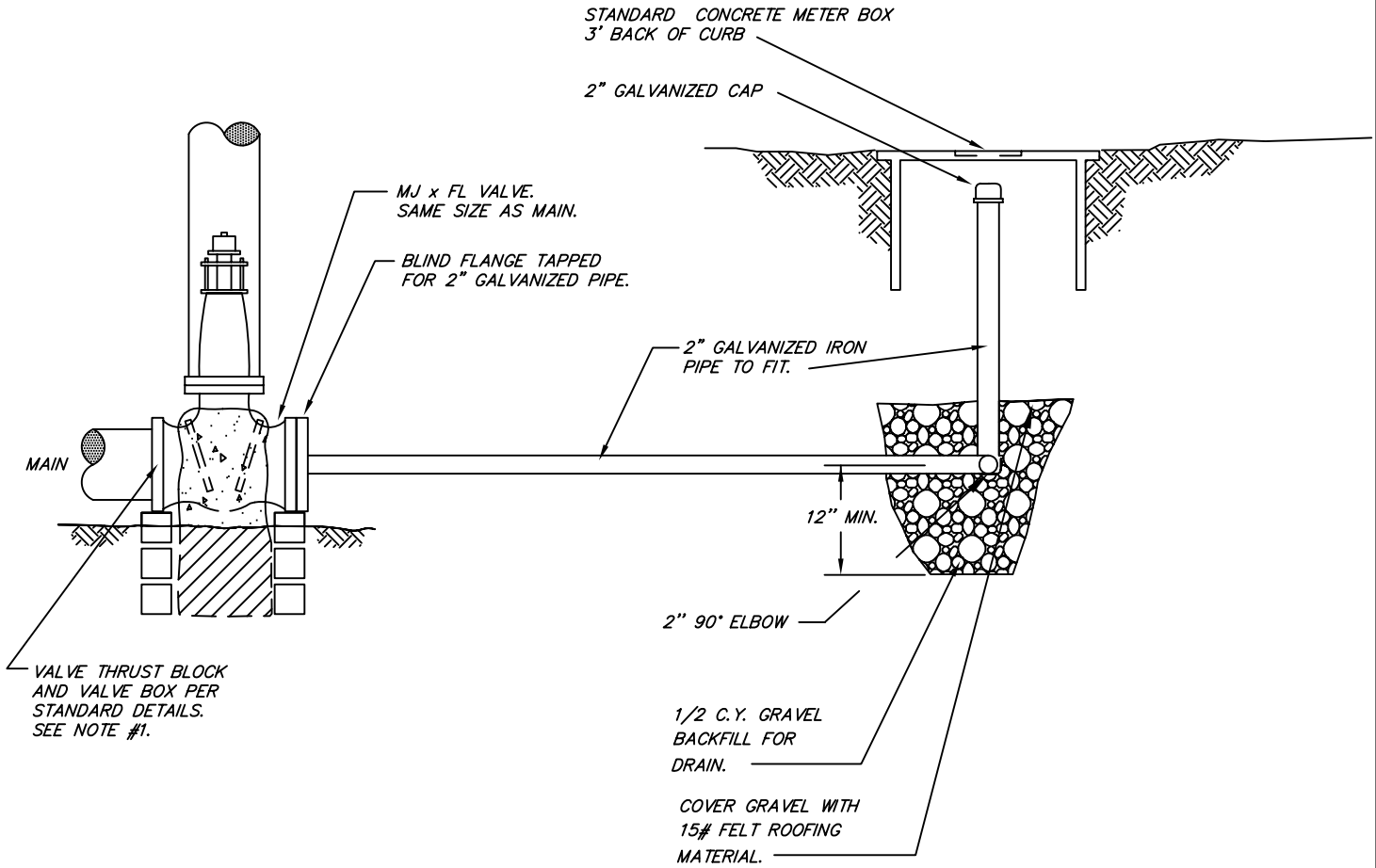
Permanent
2" Blowoff Assembly

Detail: W-7A



City of Port Townsend - Public Works Department

Standard Detail

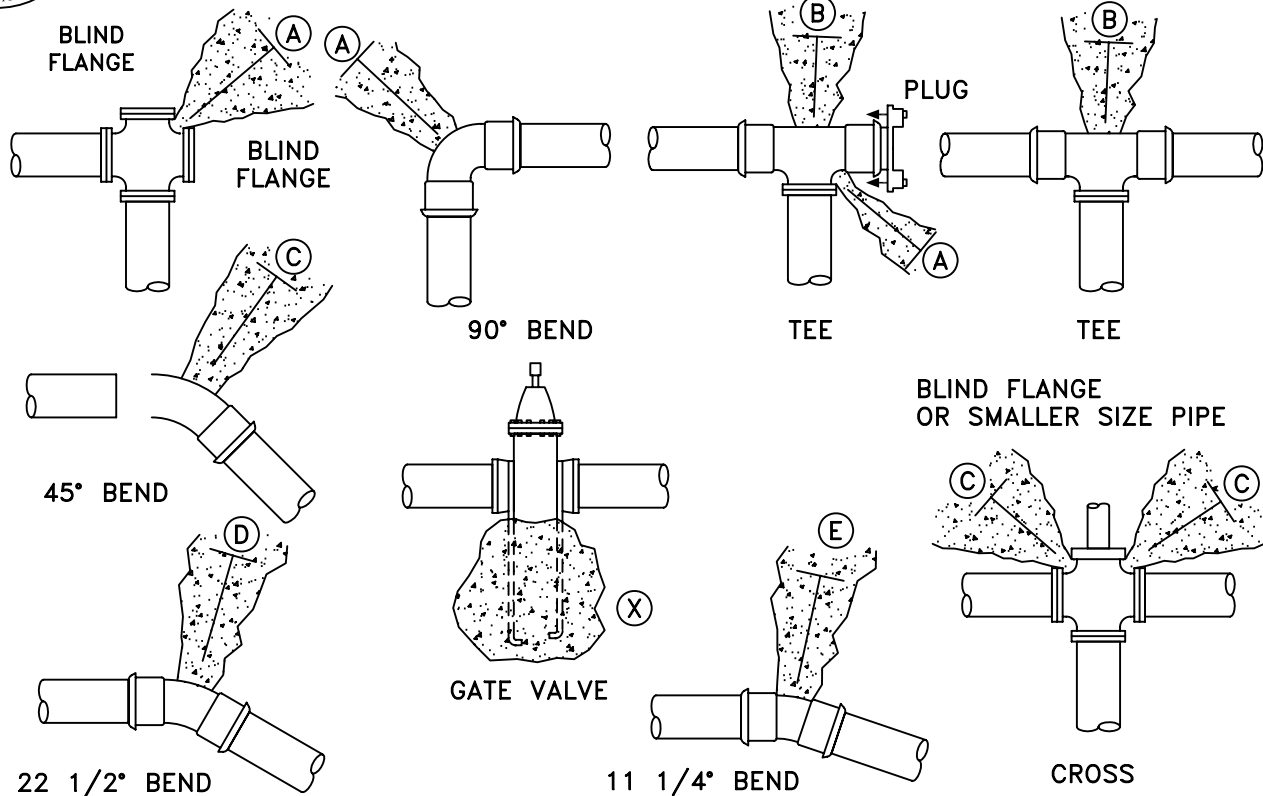


Date: April 1997	No.	Date	Revision	By	Apvd	Temporary 2" Blowoff Assembly
Approved By:						Detail:
File: E:\eng_std\standard\water						W-7B



City of Port Townsend - Public Works Department

Standard Detail



THRUST BLOCK – TABLE

MIN. BEARING AREA AGAINST UNDISTURBED SOIL
SQUARE FEET

PIPE SIZE	(A) FT ²	(B) FT ²	(C) FT ²	(D) FT ²	(E) FT ²	(X) FT ²
4"	3	1	1	1	1	NONE
6"	4	4	2	1	1	NONE
8"	7	6	4	2	1	4
10"	11	10	6	3	2	6
12"	16	14	9	5	3	9
14"	22	19	12	6	3	12
16"	29	25	16	8	4	16
18"	36	31	20	10	5	20
20"	45	39	24	13	6	24
22"	54	47	29	15	8	29
24"	64	56	35	18	9	35
28"	87	76	48	24	12	48
30"	101	87	55	28	14	55
36"	175	125	78	40	20	78
42"	197	171	107	55	27	107
48"	257	223	140	71	36	140

NOTES:

1. BEARING AREA OF CONCRETE THRUST-BLOCK BASED ON 200 PSI PRESSURE AND SAFE SOIL-BEARING LOAD OF 2,000 POUNDS PER SQUARE FOOT.
2. AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES, AND SOIL CONDITIONS.
3. CONCRETE BLOCKING (CLASS 3000) SHALL BE CAST IN PLACE AND HAVE A MINIMUM OF 1/4 SQUARE FOOT BEARING AGAINST THE FITTING.
4. BLOCK SHALL BEAR AGAINST FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP OR DISMANTLING OF JOINT.
5. CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE UNDER ALL CONDITIONS OF SERVICE.
6. MINIMUM ROD DIAMETER SHALL BE 3/4" ASTM A-307 WITH 36KSI YIELD STRENGTH.

Date: April 1997

Approved By:

File: E:\eng_std\standard\water

No.	Date	Revision	By	Apvd

Horizontal Thrust
Blocks

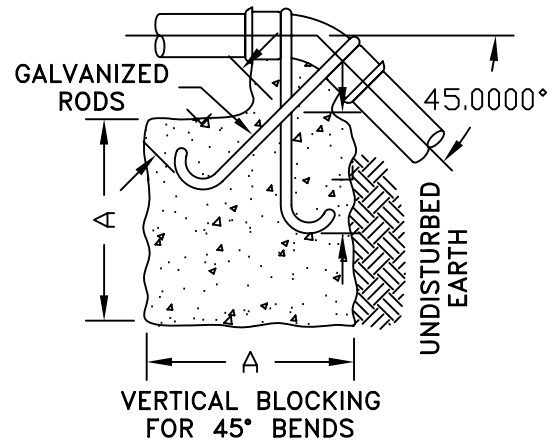
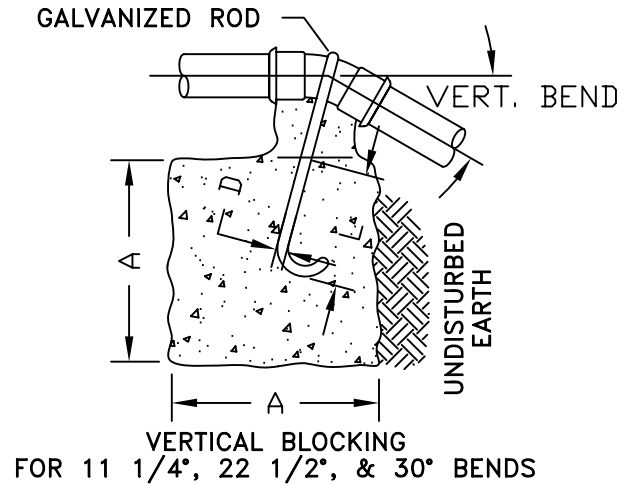
Detail: W-8



City of Port Townsend - Public Works Department

Standard Detail

VERTICAL BLOCKING					
PIPE SIZE	VB	CU.FT.	A	D	L
4"	11 1/4"	8	2.0'	3/4"	1.5'
	22 1/2"	11	2.2'		2.0'
	30°	17	2.6'		
6"	11 1/4"	11	2.2'	3/4"	2.0'
	22 1/2"	25	2.9'		
	30°	41	3.5'		
8"	11 1/4"	16	2.5'	3/4"	2.0'
	22 1/2"	47	3.6'		
	30°	70	4.1'		
12"	11 1/4"	32	3.2'	3/4"	2.0'
	22 1/2"	88	4.5'		
	30°	132	5.1'		
16"	11 1/4"	70	4.1'	7/8"	3.0'
	22 1/2"	184	5.7'		
	30°	275	6.5'		
20"	11 1/4"	91	4.5'	7/8"	3.0'
	22 1/2"	225	6.1'		
	30°	330	6.9'		
24"	11 1/4"	128	5.0'	1"	3.5'
	22 1/2"	320	6.8'		
	30°	480	7.9'		
VERTICAL BLOCKING FOR 45° BENDS					
4"	45°	30	3.1'	3/4"	2.0'
6"		68	4.1'		
8"		123	5.0'		
12"		232	6.1'	3/4"	2.5'
16"		478	7.8'	1 1/8"	4.0'
20"		560	8.2'	1 1/4"	
24"		820	9.4'	1 3/8"	4.5'



NOTE:

CONCRETE BLOCKING BASED
ON 200 P.S.I. PRESSURE
& CLASS 3000 CONCRETE

DEAD WEIGHT BLOCKING						
PIPE SIZE IN.	PIPE AREA IN ²	TYPE OF FITTING				
		22 1/2°	45°	60°	90°	
4	12.5	0.3	0.6	0.7	1.1	
6	28.3	0.5	1.1	1.4	2.1	
8	50.3	0.9	1.9	2.5	3.8	
12	113	2.1	4.2	5.6	8.4	
16	201	3.7	7.5	9.9	15	
18	254	4.9	10	13	20	
20	314	6.0	12	16	24	
24	432	7.9	16	21	32	

SIZE OF DEAD WEIGHT BLOCK, C.Y. CONCRETE

Date: April 1997

Approved By:

File: E:\eng_std\standard\water

No.	Date	Revision	By	Apvd

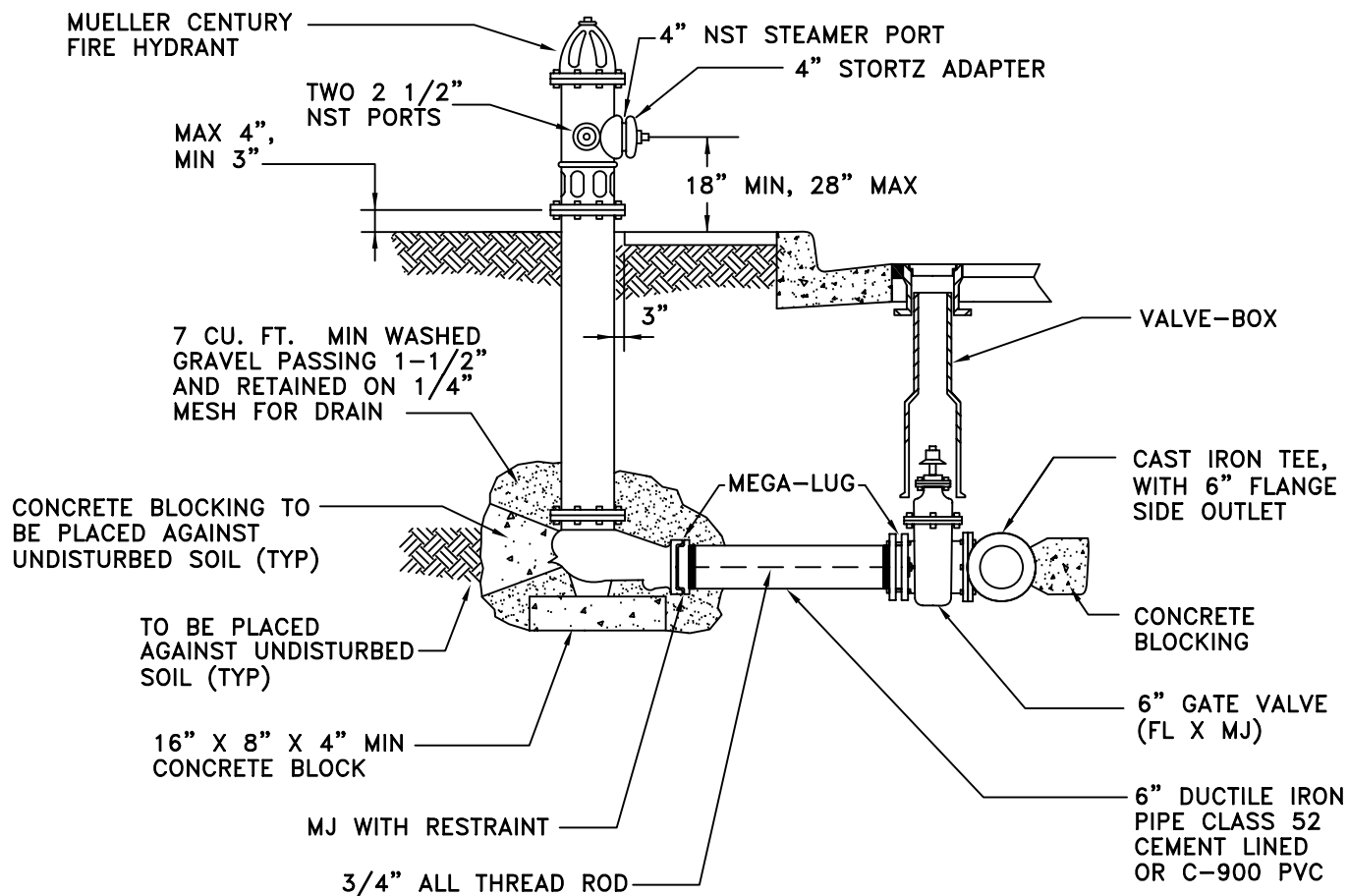
Vertical and Dead Weight
Concrete Blocking

Detail: W-9



City of Port Townsend - Public Works Department

Standard Detail

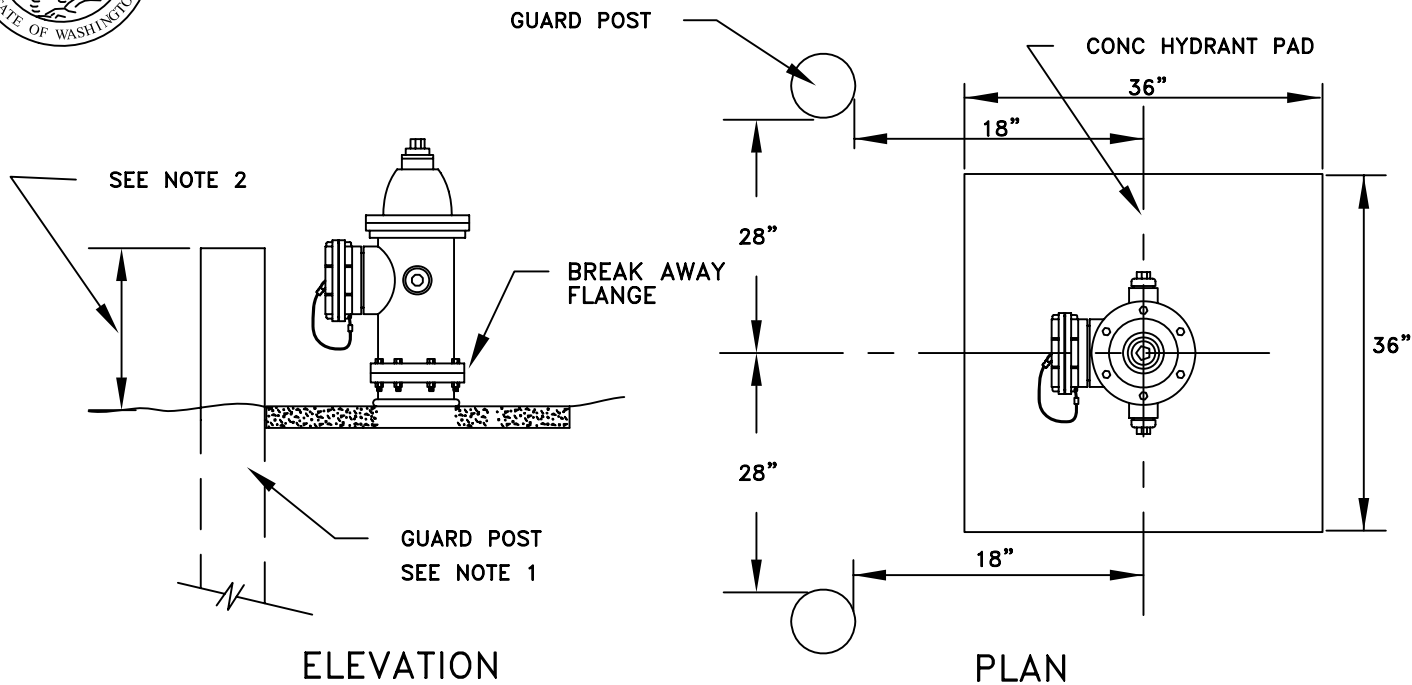


Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Fire Hydrant Assembly</h3> <p style="font-size: 1.5em; margin: 10px 0 0 0;">Detail: W-10</p>
Approved By:						
File: E:\eng_std\standard\water						



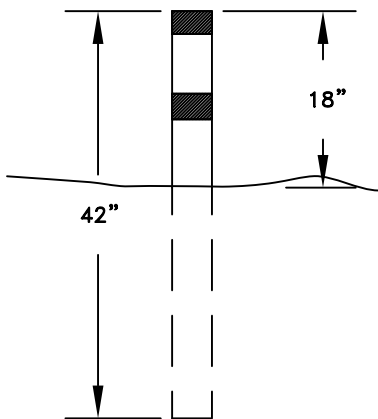
City of Port Townsend - Public Works Department

Standard Detail



FIRE HYDRANT GUARD POST

(SEE NOTES 1 AND 2)



VALVE MARKER POST

(SEE NOTES 3, 4 AND 5)

NOTES:

- 1 GUARD POSTS SHALL BE 6' LONG, 8" IN DIAMETER PRECAST CONCRETE OR 6' LONG, 6" DIAM SCH 40, CONCRETE FILLED CLASS 52 STEEL PIPE. PAINTED WITH TWO COATS OF "RUST-O-LEUM" NO. 2766, HI GLOSS YELLOW PAINT.
- 2 TOP OF GUARD POST SHALL BE LEVEL WITH TOP OF FIRE HYDRANT OR 30" IF NOT ON LEVEL GROUND.
- 3 VALVE MARKER POST SHALL BE 42" PORTABLE TRAFFIC DELINEATOR POST W/TWO REFLECTOR STRIPS. THEY SHALL BE FURNISHED NEW AND UNUSED AND BURIED 24" DEEP, TO LEAVE 18" EXPOSED AS A MARKER POST THE LETTER "V" AND THE DISTANCE TO THE VALVE SHALL BE STENCILED ON THE POST WITH 2" HIGH NUMERALS, WITH BLACK ENAMEL PAINT.
- 4 VALVE MARKER POSTS SHALL BE INSTALLED FOR ALL VALVES LOCATED IN UNIMPROVED OR UNPAVED AREAS. VALVE MARKER POSTS SHALL BE SET IN A SAFE AND REASONABLY CONSPICUOUS LOCATION.
- 5 VALVE MARKER POSTS ARE NOT REQUIRED FOR AUXILIARY HYDRANT VALVES.

Date: April 1997

Approved By:

File: E:\eng_std\standard\water

No.	Date	Revision	By	Apvd

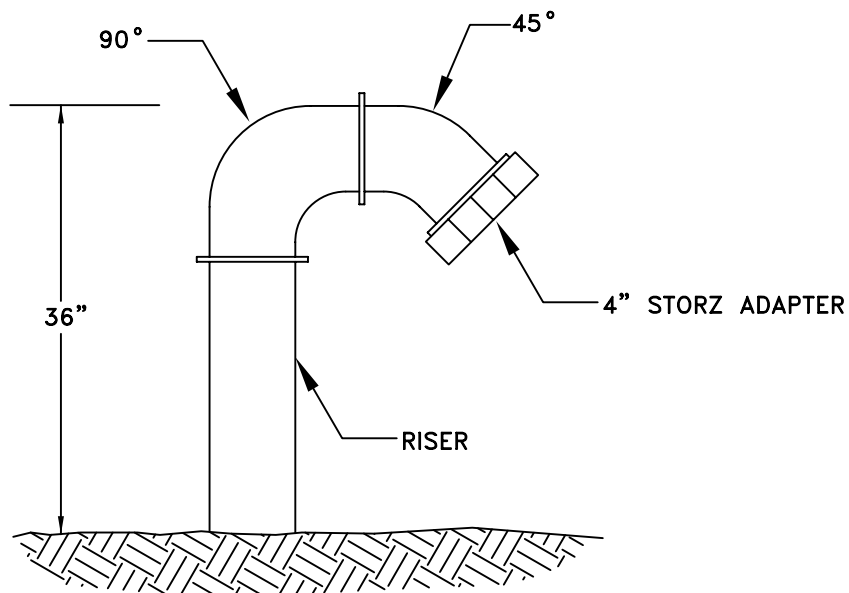
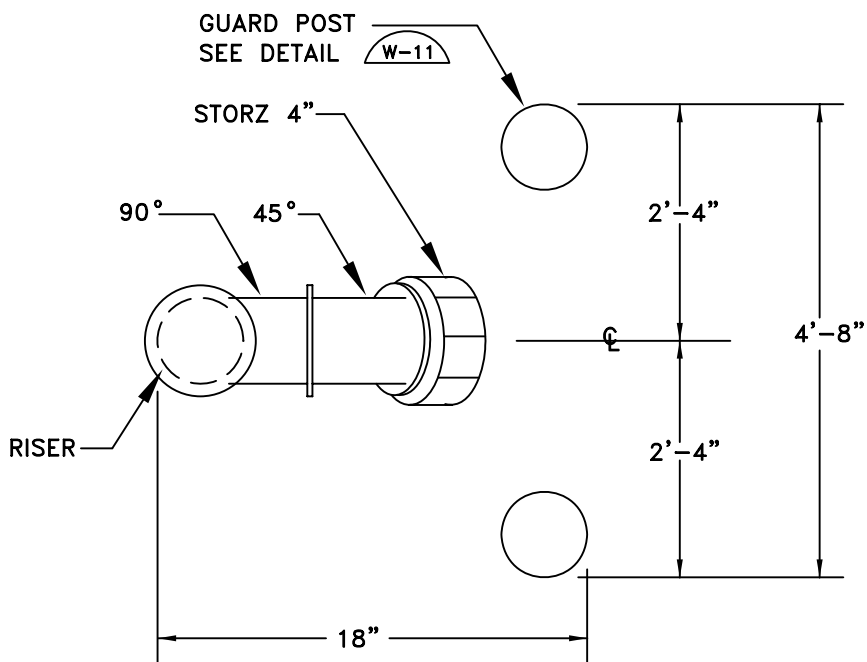
Fire Hydrant Guard Post
and Valve Marker Post

Detail: W-11



City of Port Townsend - Public Works Department

Standard Detail



Date: April 1997

Approved By:

File: E:\eng_std\standard\water

No.	Date	Revision	By	Apvd

Fire Department
Connection

Detail: W-12

Chapter 3 WASTEWATER

1. General Requirements

- a. Wastewater systems refer to the facilities that transport, treat, and discharge water-carried waste materials from domestic, commercial, and industrial sources. This chapter of the Standards addresses service connections to the existing mains as well as extensions, repairs, lift stations, and other system improvements.
- b. Any extension, replacement, or other improvement of the Port Townsend Wastewater System must be approved by the Department of Public Works and all extensions must conform to the current standards of the City of Port Townsend and to Department of Ecology regulations. The material contained in these Standards shall be used in conjunction with the Washington State Department of Ecology regulations to develop all plans and specification for construction of wastewater facilities. Where there are conflicts or differences between these standards, DOH regulations and city ordinances, the DOH regulations shall apply followed in order of precedence by city ordinances and these Standards.
- c. City sewer service shall not be extended outside the city limits.
- d. In designing and planning for any development, it is the developer's responsibility to see that adequate wastewater systems are provided. The developer must show, in the proposed plans, how the development will be served by sewers and whether the existing system can adequately handle the flows and loads. Improvements necessary to assure that the existing system will not be adversely impacted are the responsibility of the developer. A detailed analysis of the system may be required to evaluate the capacity of the existing hydraulic system to handle the new loads.
- e. Anyone that wishes to extend or connect to the city's wastewater system should contact the Department of Public Works for preliminary information and discussion of the extension proposed. The design of wastewater system improvements is the responsibility of the Developer proposing the construction and upgrading of the public wastewater system.
- f. Prior to acceptance by the city and the discharge of any wastewater, all improvements must be completed and approved, as-builts submitted, all rights-of-way or easements filed, and all applicable fees as set forth in Chapter 3.36 PTMC must be paid.
- g. Issuance of building permits for new construction of single family residences within new subdivisions shall not occur until final Public Works approval of all improvements is given unless otherwise allowed through an approved improvement methods report and/or construction bond. For commercial projects, building permits may be issued upon completion and approval by the Public Works Director of a Wastewater Discharge Plan (including pretreatment when necessary). Certificates of occupancy will not be granted until final Public Works approval and acceptance of all wastewater system improvements is given.
- h. All requests for inspections and for witnessing tests shall be scheduled with the

Public Works Department 24 hours in advance. Failure to give adequate advance notice may result in delays to the contractor for required inspections.

- i. Warranty: The developer shall warranty sewer mains and other wastewater system improvements for one year after installation, approval and acceptance by the City and shall be responsible for one year for any unanticipated settling of excavations or repairs to restored street surfaces. All necessary repairs shall be performed immediately or the city shall perform the repairs at the developer's expense.
- j. Traffic Control: For work in opened streets and rights-of-way, the contractor shall follow procedures described in Chapter 1 of these standards.
- k. Approval for Construction Outside of Business Hours: Any work performed in any street right of way at any time other than Monday through Friday 7 am to 6 pm must have the approval of the Public Works Department.
- l. Noncompliance Penalty: Utility development permits may be revoked from any contractor not complying with these specifications.
- m. Survey: See Chapter 1 of these standards.
- n. Standard Details: All construction shall comply with city Standard Details.

2. Design Standards

- a. The design, construction, and maintenance and operation of wastewater systems shall be in compliance with the city engineering design standards, the sewer code, the wastewater system master plan, the requirements of Jefferson County Environmental Health Department, Washington State Departments of Health and Ecology, any applicable federal regulations, and the WSDOT/APWA Standard Specifications.
- b. The layout and sizing of extensions shall provide for the future continuation of the existing system as determined by the Director. All sewers shall be designed as a gravity sewer whenever physically and/or economically feasible or as outlined in the Wastewater System Master Plan.
- c. The following GENERAL CONDITIONS shall apply to all work on the wastewater system, and, together with those in Chapter 1, Section 2a, shall be included on any plans dealing with the wastewater system construction:
 - i. All work and materials shall conform to the City of Port Townsend Standards and WSDOT/APWA Standard Specifications.
 - ii. The city shall be given 72 hours notice prior to scheduling a diversion of flows in the wastewater system.
 - iii. During the construction of mains and services, the contractor shall cap, plug, or secure the ends of such lines whenever the project is shut down at the end of the day so that contaminants will not enter the lines.
 - iv. All lines shall be tested in conformance with the standard specifications. Prior to final acceptance of all installations, the city reserves the right to conduct an inspection of all main lines by the use of television equipment.
 - v. The city construction inspector shall be notified a minimum of 24 hours in advance of the time that a service connection to an existing main is

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- needed so that city inspection may be scheduled for the work. The inspector shall be present at the time of the tap.
- vi. Prior to backfilling, all sewer lines and appurtenances shall be inspected and approved by the city's inspector. Approval shall not relieve the contractor for correction of any deficiencies and/or failure as determined by subsequent testing and inspections. It shall be the contractor's responsibility to notify the city for the required inspections.
 - vii. Approximate locations of existing utilities have been obtained from available records and are shown for convenience. The contractor shall be responsible for verification of locations and to avoid damage to any additional utilities not shown. If conflicts with existing utilities arise during construction, the contractor shall notify the public works inspector and any changes required shall be approved by the Public Works Director prior to commencement of related construction on the project.
 - viii. All sewer main extensions within the public right-of-way or in easements must be staked by survey for line and grade prior to starting construction.

3. Sewer Service Connections

- a. All new developments within the city limits are required to connect to the city's sewer system with the following exception:
 - i. New single-family residential development occurring on parcels equal to or greater than one acre in size: a) which is more than 500 feet from the nearest city sewer main, and b) which is not subject to review and threshold determination under the State Environmental Policy Act Implementing Ordinance, Chapter 19.04 PTMC, or c) which is not subject to the permit requirements of the Environmentally Sensitive Areas Ordinance, Chapter 19.05 PTMC.
- b. Managed individual or group on-site septic systems are allowed for new development which meets the requirements of subsection a.i, provided the following conditions are met:
 - i. The soil conditions and parcel size will support the use of an on-site septic system until connection to the city's sewer system;
 - ii. The system is designed to be efficiently converted to the city's sewer system;
 - iii. The developer enters into a no protest agreement with the City (*i.e.*, requiring connection to the city's sewer system within two year(s) of when a sewer main is within 260 feet of the property line, and/or participation in a Local Improvement District ("LID") which may include installation of sewer mains, interceptors, pump stations and/or Latecomer Agreement paybacks), filed on record title, as a condition of any building or development permit; and
 - iv. The septic system is approved by the Jefferson County Environmental Health Department.
- c. Existing parcels containing an on-site septic system are required to connect to the

- d. city's sewer system by July 2002.
- d. After July 2002, any parcel containing an on-site septic system will be required to connect to the city's sewer system unless the nearest sewer main is greater than 260 feet (*i.e.*, one city block measured along public rights-of-way) from the nearest portion of the subject parcel (in which case connection is required within two years of when the sewer is within 260 feet).
- e. Notwithstanding subsections, c and d above, if an on-site septic system fails connection is required unless the nearest portion of the subject parcel is greater than 500 feet from the nearest sewer main, in which case the septic system may be repaired to serve the subject property.

4. Sewer Main Extensions and other System Improvements

- a. When Required. A main extension, main replacement, pump station, maintenance hole, force main or other system improvement may be required for any of the following reasons to mitigate the direct impacts of the proposed development:
 - i. Whenever a customer requests service and the premises to be served does not abut a sewer main;
 - ii. Whenever the existing sewer main(s) is not adequate to provide the necessary service;
 - iii. Whenever the development cannot be served by a gravity system;
 - iv. Where other components of the sewer system are inadequate to handle the increased wastewater discharges;
 - v. Whenever necessary to handle wastewater from the development; or
 - vi. Whenever necessary to protect public health and safety.
- b. Right-of-way acquisition. When sufficient right-of-way does not exist, the customer shall provide sufficient right-of-way or utility easements where necessary to serve the needs of the development and for the maintenance and orderly growth of the system.

5. Procedural Requirements

- a. Public Works Technical Conference. Anyone wishing to connect to or extend the city's water system is encouraged to request a meeting with Public Works staff to obtain preliminary information of the location of existing facilities and to review water system extension requirements. A technical conference will generally be required for anyone proposing a main extension.
- b. Application for sewer service. Any person seeking to connect to the City's water system shall submit an application to the Public Works Department on forms provided by the city.
 - i. Information required for the sewer service application shall include:
 - (1) The name of the owner or agent and his or her mailing address, the street address or name of the premises to be served, and the legal description of the premises to be served.
 - (2) An estimate of wastewater volumes for all subdivisions, multi-family, mixed use, commercial and manufacturing proposals.

-
- (3) A site plan and details showing the proposed location for the service connection.
 - (4) Upon request by the director, a hydraulic analysis and assessment of the ability of the collection system and treatment facilities to handle the wastewater discharges and proposed mitigations if required.
 - (5) Proposed pretreatment facilities and best management practices for commercial and manufacturing facilities.
 - (6) Any other information deemed reasonably necessary by the director to review the application for compliance with Title 13 PTMC and these Standards or required by other provisions of the City's code, Department of Health requirements, SEPA, permit conditions, or city ordinance.
 - (7) The design drawings and specifications for the water system improvements required under "item d" below.
- ii. Complete Application Required. The city will not process any application unless and until the information required by this section is substantially complete. The public works director may reject an application as incomplete within a reasonable time of review, in which case the director shall return it to the applicant with an indication of the additional information needed to make the application complete.
- c. Utility Development Permit. A Utility Development Permit is required for any sewer main extension, replacement, and other system improvements:
 - i. The Utility Development Permit shall contain all design drawings and information necessary for the Public Works Department to determine compliance with these Standards and the applicable codes and standards incorporated by reference into these Standards.
 - ii. When the City receives the application, the application will first be checked for completeness. Once it is determined to be complete the City will begin its review of the application.
 - iii. Utility Development Permits are reviewed and approved by the Public Works Department. Construction shall not commence until the permit is approved by the Director.
 - d. Construction Drawings and Engineered Plans. All applicants for sewer system connections and improvements shall furnish drawings and specifications necessary to describe and illustrate the proposed sewer system improvements. If base maps prepared by a licensed land surveyor are available, the design and construction plans shall be submitted on such maps. If base maps are unavailable, the public works director may require a survey to avoid conflicts with existing facilities, to determine elevations and contours, and to determine the limits of the right-of-way.
 - i. All plans for sewer main extensions and other sewer system improvements shall be prepared, signed and stamped by a civil engineer licensed in the State of Washington.

- ii. For main extensions and replacements of 260 feet (one city block) or less in Tier 1 which do not require plans under another authority of the PTMC, the developer has the option of the city performing the engineering for the fee identified in Chapter 3.36 PTMC. Alternatively, the developer may pay for his or her own engineering with the full cost to be borne by the developer.
- iii. All design and construction plans and specifications shall be prepared in accordance with current DOT/APWA standard specifications and the city's engineering design standards. If discrepancies exist in the standards and specifications, the city engineering design standards shall take precedence.
- iv. The requirement for engineered plans may be waived in certain instances as defined by the PTMC and approved by the City Engineer for minor improvements to the sewer system that can be adequately inspected and certified by the City Engineer and that will still assure the long-term integrity of the system. As-builts must still be submitted.
- v. All plans must be reviewed and approved by the Director prior to proceeding with construction.
- vi. Plans should be prepared on plan/profile type sheets and show both plan and profile views. Other utilities are to be shown in profile view and in plan view.
- vii. Plans shall include specific city standards for such items as maintenance holes, drop connections, side sewers, etc.
- viii. Plans shall show invert elevations of the main at the outlet and all inlets of each maintenance hole, slope of the main, and surface elevations of the maintenance hole lid. In the profile view, the finish ground elevation over the pipe shall be shown as well as crossings of other existing or proposed utilities. Stationing of side sewers from the downhill maintenance hole is required. Drawings shall show mainline connection depth and distance from nearest maintenance hole, the street that mainline connection is made in and the nearest cross street shall be identified. Drawings will show and label all connections and pipe diameters.
- ix. In all cases where a line is to be placed in an easement, the easement is to be shown with measurement information to accurately lay it out prior to constructing the pipe line.
- e. Inspection: All sewer system installations shall be inspected and approved by the City. It is the responsibility of the developer or contractor to notify the city 24 hours in advance of necessary inspections at the proper point in construction. All excavations must be left open until inspection is complete.
- f. Approval, Acceptance, Conveyance and As-Builts: Certificates of occupancy will not be granted until final Public Works approval and acceptance of all improvements is given easements filed, all applicable fees paid and as-built drawings are received.

6. Gravity Sewer Mains

a. Size

- i. Sewer mains shall be sized for the ultimate development of the tributary area.
- ii. New gravity systems shall be designed on the basis of an average daily per capita flow of not less than 100 gallons per capita per day. The table “Design Basis for Sewage Works” from the DOE Manual is assumed to cover normal infiltration, but additional allowances shall be made where conditions dictate. Generally, laterals and submain sewers should be designed to carry, when running full, not less than 400 gallons daily per capita contributions of sewage. When deviations from these per capita rates are used, a description of the procedure used shall be submitted to the City Engineer for review and approval. Nothing shall preclude the city from requiring the installation of larger mains if the city determines that a larger size is needed to meet requirements for future service. The developer may be eligible for a Utility Latecomer Agreement.
- iii. The minimum pipe size for sanitary sewer mains shall be 8 inches in diameter, except that a 6-inch sewer may be approved in limited instances where the sewer has no potential to be extended to serve future customers.
- iv. The minimum size service connection lateral in the street right-of-way shall be 6 inches and the minimum size for a service lateral on private property shall be 4 inches in accordance with the Standard Details. The depth at the property line shall be 5 feet, except as approved by the City Engineer. Sewer connections to the main shall be made with a wye connection. All new main connections to existing mains shall require the installation of a new maintenance hole if not made at an existing maintenance hole.
- v. All nonferrous pipe shall be installed with metal wire and tracer tape as shown on the Standard Details and described in Chapter 1.
- vi. Gravity sewer mains shall typically have a depth of 5 feet. Actual depth will be determined by the slope, flow, velocity, and elevation of the existing system as proposed by the applicant and approved by the City.

b. Slope

- i. All sewers shall be designed and constructed to give mean velocities, when flowing full, of not less than 2.0 feet per second, based on Mannings’ formula using an “n” value of 0.013. The following are minimum slopes which should be provided; however slopes greater than these are desirable.
 - (1) 8-inch Mains: 0.40 feet per 100 feet.
 - (2) 10-inch Mains: 0.28 feet per 100 feet.
 - (3) 12-inch Mains: 0.22 feet per 100 feet.
 - (4) 15-inch mains: 0.15 feet per 100 feet.
 - (5) 18-inch mains: 0.12 feet per 100 feet.
 - (6) 21-inch mains: 0.10 feet per 100 feet.

- (7) 24-inch mains: 0.08 feet per 100 feet.
- (8) 30-inch mains: 0.06 feet per 100 feet.
- (9) 36-inch mains: 0.05 feet per 100 feet.
- ii. Under special conditions, slopes slightly less than those required for the 2.0 feet per second velocity requirement may be permitted by the City Engineer upon request by the applicant with engineering documentation.
- iii. Sewers shall be laid with a uniform slope between maintenance holes.
- iv. Sewers with slopes greater than 6.0 percent slope, or where groundwater may travel as a conduit, may require check dams. Such dams shall be noted on the drawings.
- v. Sewer mains on slopes of 20% or greater shall be securely anchored per WSDOT/APWA standards.
- c. Materials: Materials for sanitary sewer pipe shall meet the requirements of the following:
 - i. Sanitary Sewer Pipe - Preferred:
 - (1) PVC Ringtight ASTM D3034, SDR 35 or ASTM F789 with joints and gaskets conforming to ASTM D3212 and ASTM F477.
 - (2) Ductile Iron Pipe shall conform to ANSI A 21.51 or AWWA C151 and shall be cement mortar lined with push-on joint or mechanical joint. The ductile iron pipe shall be Class 52, unless otherwise approved.
 - ii. Sanitary Sewer Pipe - For repair only:
 - (1) Concrete Sewer Pipe shall meet the requirements of ASTM C14 Class 3, unless otherwise approved.
 - (2) Reinforced Concrete Sewer Pipe shall conform to ASTM Designation C76 and shall be of the class specified on the plans.
 - iii. Pipe Zone Material - see drawings
- d. Connections to Existing System
 - i. All new sewer connections to the existing system shall be physically plugged until all tests have been completed and the city approves the removal of the plug.
 - ii. Connection of the new sewer mains to existing maintenance holes shall be core drilled for connection by the contractor. The base shall be rechanneled so as to provide smooth transitions into existing flows.
 - iii. Connection of a new sewer onto an existing sewer main where a maintenance hole is not available shall be accomplished by pouring a concrete base and setting maintenance hole sections around the existing pipe. For extending onto the end of a pipe, a precast base may be used.
 - iv. Straight grades between the invert out of the new maintenance hole and the invert out of the existing maintenance are preferred over drops.
 - v. An outside drop connection shall be constructed per the Drawings for a sewer entering a maintenance hole whenever the elevation of the entering sewer is 24 inches or more above the maintenance hole invert. Where the difference is less than 24 inches a fillet shall be poured below the entering

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- pipe to prevent solids deposition.
- vi. Connections when a building sewer is the same size as the existing sewer main shall be accomplished by installation of a new maintenance hole, unless otherwise approved in writing by the City.
 - e. Taps: Taps shall be a gasketed saddle wye or wye with a couplet. Taps shall not protrude into the existing sewer main. All taps shall be by the contractor. The contractor shall notify the city inspector at least 24 hours prior to the tap. All tap installation shall be witnessed by the city inspector.
 - f. Location: Parallel water and sewer lines shall be laid at least 10 feet apart horizontally. If this is impractical, the water line shall be at least three (3) feet above the top of the sewer line. Wherever it is necessary for sewer and water lines to cross each other, the crossings shall be made at an angle of approximately 90 degrees, and the sewer shall be located three or more feet below the water line if possible. See Chapter 2 “Water and Sewer Main Separation” for additional requirements.
 - g. Installation
 - i. General
 - (1) Installation of gravity mains shall be per WSDOT/APWA Standard Specifications Section 7-17 and 7-08.3.
 - (2) For typical trench details see Standard Details.
 - (3) Excavations shall be kept free of water.
 - (4) Safety is the responsibility of the contractor. Contractor(s) must conform to WISHA standards when working in excavations.
 - (5) All crossings and patches of city streets will be made to City standards and the contractor will be held responsible for the integrity of the patch for one full year.
 - (6) All new sewer services will be equipped with backflow preventer(s) when required by the City because of the floor elevation of the house relative to the sewer, or due to sewer main surcharging.
 - ii. Pipe Bedding and Pipe Zone
 - (1) The pipe bed shall be prepared per WSDOT/APWA 7-08.3(1)C.
 - (2) Pipe bedding and pipe zone material shall be per the WSDOT/APWA Standard Specifications Section 9-03.9(3).
 - (3) Bedding and pipe zones shall be as shown on the Standard Drawings.
 - (4) Bedding and pipe zone material shall be placed in more than one lift. The first lift, to provide at least 4 inches thickness under the pipe, shall be placed before the pipe is installed and shall be spread and compacted so that the pipe is uniformly supported. Subsequent lifts of not more than 6 inches thickness shall be installed to the crown of the pipe. A further 12 inch lift of moderately compacted material shall be placed over the crown of the pipe prior to the start of backfilling the trench.

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- (5) Compact all pipe zone and bedding material to 95% density as determined by ASTM D698.
 - iii. Backfill
 - (1) Backfill material shall be per WSDOT/APWA 7-08(3) and as shown on the standard Drawings
 - (2) Backfill shall be compacted to 95% density under roadways and traveled ways. Controlled density backfill may be proposed as an alternate for road cuts. Compaction to 90% may be allowed where no roadways, driveways or vehicular travel will occur.
 - (3) Backfill to the elevation necessary to apply required surface treatment
 - iv. Surface Treatment
 - (1) Repair surface to original condition, including all driveways, culverts, curbs, gutters, sidewalks or other facilities damaged by the construction
 - (2) Street repair shall be per Chapter 6.
 - (3) Any drainage ditches damaged or disturbed during construction shall be pulled, dug, or otherwise repaired to restore storm drainage flow.
 - (4) Any disturbed vegetation shall be restored.
 - h. Laying the Sewer Pipe
 - i. Per WSDOT/APWA 7-083(2).
 - ii. All sewer main installations shall have line and grade stakes or hubs set prior to construction.
 - iii. The contractor may use any method such as “swede line and batter board” and “laser beam” etc., which would allow him to accurately transfer the control points provided by the surveyor in laying the pipe to the designated alignment and grade.
 - iv. When using the “swede line and batter board” method, the contractor shall transfer line and grade into the ditch where they shall be carried by means of a taut grade line supported on firmly set batter boards at intervals of not more than 30 feet. Not less than three batter boards shall be in use at one location. Grades shall be constantly checked and in event the batter boards do not line up, the work shall be immediately stopped and the cause remedied before proceeding with the work.
 - v. When using a “laser beam” to set pipe alignment and grade, the contractor shall constantly check the position of laser beam from surface hubs provided by the surveyor to ensure the laser beam is still on alignment and grade. In the event the laser beam is found out of position, the contractor shall stop work and make necessary corrections to the laser beam equipment and pipe installed.
 - i. Inspections
 - i. Pipe and connections shall remain exposed until inspected by the City.
 - ii. The contractor or his/her representative will be on-site at the time of the

- inspection.
- j. Plugs and Connections
 - i. All fittings shall be capped or plugged with a plug of an approved material gasketed with the same gasket material as the pipe unit; or shall be fitted with an approved mechanical stopper; or shall have an integrally cast knock-out plug. The plug shall be able to withstand all test pressures without leaking, and when later removed, shall permit continuation of piping with jointing similar to joints in the installed line.
 - k. Jointing
 - i. Where it is necessary to break out or connect to an existing sewer during construction, only new pipe having the same inside diameter will be used in reconnecting the sewer. Where joints must be made between pipes with a mismatched wall thickness, the contractor shall use flexible gasketed coupling adaptor to make a watertight joint. Couplings shall be those manufactured by “Romac,” “Smith Blair,” or approved equal for reinforced pipes and “Fernco” or approved equal for non-reinforced pipes.
 - l. Cleaning and Testing
 - i. All sanitary sewer pipe installations shall be cleaned and tested in accordance with WSDOT/APWA Standard Specifications Section 7-17.3(2). A copy of this testing procedure is included at the end of this Section. Sewers and appurtenances shall be cleaned and tested after backfilling by either the exfiltration or low pressure air method at the option of the contractor, except where the groundwater table is such that the Public Works Director may require the infiltration test.

7. Alignment Tolerance

- a. The maximum deviation from established line and grade shall not be greater than 1/32 inch per inch of pipe diameter and not to exceed 1/2 inch per pipe length.
- b. No adverse grade in any pipe length will be permitted.
- c. The difference in deviation from established line and grade between two successive joints shall not exceed 1/3 of the amounts specified above.

8. Maintenance holes

Maintenance holes shall be installed in accordance with these Standards, the Standard Details and WSDOT/APWA Standard Specifications Section 7-05. Where conflicts occur, these Standards shall have precedence over WSDOT/APWA Standard Specifications Section 7-05.

- a. Materials:
 - i. Precast maintenance holes shall meet the requirements of ASTM C478 with either a precast base or a cast-in-place base made from 3,000 psi minimum structural concrete. Maintenance holes shall be as shown on the Standard Details and WSDOT drawing B-23a. Any deviations from the Standard Details will be subject to review of a shop drawing submitted by the contractor and approved by the Public Works Director.

- ii. The minimum diameter of maintenance holes shall be 48 inches; larger diameters are preferable for large diameter sewers.
 - iii. Joints between maintenance hole elements shall be rubber gasketed conforming to ASTM C443.
 - iv. All pre-cast concrete shall be Class 4000. Maintenance hole channels shall be Class 3000 concrete. Concrete blocks or concrete (masonry) rings may be used for adjustment of the casting to final street grade.
 - v. Standard precast cones shall provide eccentric reduction from 48 inches to 24 inches with height of not less than 18 inches and 54 to 24 inches with height of not less than 24 inches. The eccentric cone shall be offset so as not to be located in the tire track or a traveled lane and shall be in line with the steps.
 - vi. Maintenance hole frames and covers shall be cast iron conforming to the requirements of ASTM A536, Grade 80-55-06, Olympic foundry Type MH 30D/T, or approved equal. The minimum clear opening in the frame shall be 24 inches. Grade rings and covers shall be machine-finished or ground-on seating surfaces so as to assure non-rocking fit in any position. The public works director may require that maintenance holes located in areas subject to inflow shall be equipped with a PRECO sewer guard watertight insert, or approved equal. All casting shall be coated with bituminous coating prior to delivery to the job site.
 - vii. Safety steps shall be fabricated of polypropylene conforming to ASTM D-4101, injection molded around a 1/2 inch ASTM A-615 grade steel bar with anti-slip tread. Steps shall project uniformly from the inside of the wall. Steps shall be installed per WSDOT/APWA Standard Plan B-24a.
- b. Spacing and location:
- i. Maintenance holes shall be provided at a maximum spacing of 300 feet. Intervals at distances greater than 300 feet require the approval of the Public Works Director.
 - ii. Maintenance holes shall be provided at intersections, and at all changes in direction, grade or pipe size.
 - iii. All maintenance holes are to be accessible to maintenance vehicles.
 - iv. Maintenance holes are not allowed in a fill section unless base is on a cut section.
 - v. A maintenance hole is required at the ends of all sewer mains, unless approved by the City.
- c. Construction Requirements:
- i. Bedding: Unless otherwise directed by the Public Works Director, maintenance holes shall be constructed with pre-cast base sections or cast-in-place to grade upon a 6 inch minimum depth of Crushed Surfacing Base Course meeting the requirements of WSDOT/APWA Standard Specifications Section 9.03.9(3). [verify ref.] The Crushed Surfacing Base Course shall be compacted to 95% maximum density.
 - ii. Joints: Shop drawings of the joint design shall be submitted to the Public

- Works Director for approval, prior to manufacture. Completed joints shall show no visible leakage and shall conform to the dimensional requirements of ASTM 478. Joints shall be grouted from the inside.
- iii. Lift holes: Shall be grouted from the outside and the inside of the maintenance hole.
 - iv. Maintenance hole channels: All maintenance holes shall be channeled unless otherwise approved in writing by the Public Works Director. Maintenance hole channels shall be made to conform accurately to the sewer grade and shall be brought together smoothly with well rounded junctions. Channel sides shall be carried up vertically to the crown elevation of the various pipes, and the concrete shelf between channels shall be smoothly finished and warped evenly with slope to drain.
 - v. Maintenance hole pipe connections:
 - (1) All pipes except PVC pipe entering or leaving the maintenance hole shall be provided with flexible joints within 1/2 of a pipe diameter or 12 inches, whichever is greater, from the outside face of the maintenance hole structure and shall be placed on firmly compacted bedding, particularly within the area of the maintenance hole excavation which normally is deeper than that of the sewer trench. Special care shall be taken to see that the openings through which pipes enter the maintenance hole are completely and firmly rammed full of non-shrink grout to ensure water tightness.
 - (2) PVC pipe connected to maintenance holes shall be provided with a maintenance hole adaptor complete with gasket and approved by the Public Works Director. No pipe joint in PVC shall be placed within 10 feet of the outside face of the maintenance hole.
 - vi. Connections to existing maintenance holes:
 - (1) The contractor shall verify invert elevations prior to construction. The crown elevation of laterals shall be the same as the crown elevation of the incoming pipe unless specified. The existing base shall be reshaped to provide a channel equivalent to that specified for a new maintenance hole.
 - (2) The maintenance hole shall be kept in operation at all times and the necessary precautions shall be taken to prevent debris or other material from entering the sewer, including a tight pipeline bypass through the exiting channel if required.
 - (3) The contractor shall core drill, line drill or wall saw an opening to match the size of pipe to be inserted. Where line drilling is the method used, the drilled holes must be interconnected. Line drilling shall be accomplished by the use of a small core drill or a rotary hammer. Jackhammer shall not be used. All openings must provide a minimum of 1 inch and a maximum of 2 inches clearance around the circumference of the pipe. Upstream pipes, except PVC pipe, penetrating the walls of maintenance holes shall

be placed with the bell facing out such that the bell is placed snug against the outside wall of the structure as the angle of penetration allows. Pipe, except PVC pipe, leaving or entering maintenance holes shall be provided with a flexible joint within 1/2 of a pipe diameter, or 12 inches, whichever is greater. After pipes have been placed to their final position, they shall be grouted tight with non-shrink grout in a workmanlike manner. PVC pipe connecting to existing maintenance hole shall be installed using gasketed inserts as approved by the Director.

- (4) The contractor shall comply with all safety requirements for confined space entry.

9. Service Connection, Side Sewer, Building Sewer

A service connection for sewer (including the side sewer and building sewer) refers to the extension from the building plumbing at a point two feet from the outside of the outside of the outer foundation wall of the structure to the public sewer main. The service connection within the public right-of-way is considered the side sewer; the building sewer connects from the building to the side sewer.

a. General

- i. Prior to construction a side sewer permit must be obtained from the City. During the permit process the City may request additional information about the type and amount of flows anticipated to the sewer system.
- ii. Drawings for side sewers shall be required on forms provided by the city during the permit process. Information to be supplied is specified on the form. If the service connection does not involve extension of a main, design of the side sewer by a licensed engineer is not required.
- iii. A separate and independent side sewer shall be constructed for every premises, except where multiple connections are approved by the Public Works Director.
- iv. All side sewer service connections shall gravity flow into the City's wastewater system unless otherwise approved.
- v. The construction of sewer service connections and side sewers shall conform to the latest edition of the Uniform Plumbing Code, WSDOT/APWA 7-18, and to the other Sections of these Standards. Where inconsistencies exist, these Standards for side sewers shall apply alike to all side sewers on public rights-of-way and private property.
- vi. Maintenance of the sewer service connection is the sole responsibility of the owner of the premises served.
- vii. Side sewer locations shown on the drawings shall be subject to relocation in the field after construction starts.
- viii. If a side sewer is to serve two houses a six-inch clean out extending to within 12 inches of the ground surface will be required at the wye where the upper-grade connections are made.
- ix. Side sewers are not permitted to cross a public right-of-way or run parallel

to the right-of-way centerline. All lots must front on a public sanitary system in order to be served.

- x. If a building sewer is to serve more than one property, by joint agreement of the owners, an approved document insuring that all properties involved shall have perpetual use of the side sewer, and having provisions for maintenance and for access for repair purposes, shall be signed by the recorded owner. This document shall be notarized and recorded with the county auditor and shall be referred to as an "easement."

b. Size

- i. The minimum size for side sewers in the public right-of-way is 6-inches in diameter.
- ii. The minimum size for a single family residential building sewer shall be 4-inch diameter.
- iii. The minimum size of a dual residential, commercial/industrial and multi-family building sewer is 6-inches in diameter. A larger size may be required as determined by projected wastewater flows from the service.

c. Slope

- i. The minimum slope on side sewers and building sewers shall be 2 percent.

d. Installation

- i. Installation of service lines shall be the same as Water Main - Installation above.
- ii. No side sewer connection shall be made to the public sewer until that section of sewer main has been approved by the city for side sewer connections.
- iii. Connections to mainline will be sanitary tee or wye; 45 and 22 degree wyes may also be used depending on the situation. Connection to mainline will be either saddled, strapped and gasketed or installed with rubber repair coupler with stainless bands. Cutting in a ringtight sanitary tee or wye is also an option. No glue joints are allowed. No 90 degree bends are allowed. All right angle bends will be made with a combination of two 45 degree bends.
- iv. In the event that there is no suitable tee or stub out, a tap to the main may be made by a licensed contractor, under the direct supervision of the Public Works Director. The tap shall be made with the approved rubber joint saddles on all types of sewer main. Grouting in a tee or wye is not permitted. Great care shall be taken in cutting a neat hole into the sewer main, and in the event of breakage of the sewer main, the broken section shall be removed and replaced at no cost to the city. [Alternate to iii]
- v. The contractor shall prevent entrance of all foreign material into the pipe.
- vi. The type of joint to be used for connecting the side sewer pipe to the tee or stub out shall be that for which the wye was designed. Rubber or plastic joint adapters shall be used as required to connect pipes and wyes of different materials or joint designs. Selected bedding material shall be hand-tamped in a moist condition under and around the wye and

connection to the wye made so as to prevent any pressure on the wye. Care shall be taken to prevent the dislodging of this hand-tamped material during the balance of the backfill and water settling operation.

- vii. A cleanout shall be provided within three (3) feet of the building or structure served. The cleanout shall be a wye from the service line with a branch installed upward. The wye connection shall be of the same size as the service run. A vertical riser shall be installed in the wye. This riser shall be brought to within 12 inches of the finish grade and capped with an approved cast iron plug or plastic plug with metal for detection. The plug shall be machined to fit the standard joint of the pipe being used, with the standard gasket.
- viii. The connection to the building sewer shall be suitable rubber gasket sleeve or adapter. Grout joints will not be allowed. In exceptional cases, the Public Works Director may allow a connection using a hot pour jointing material JC 60 or approved equal.
- ix. Where any property served by a side sewer carries industrial waste, the owner or occupant shall install a control maintenance hole in the side sewer to facilitate observation, sampling and measurement of the wastes when the same may be required by the Public Works Director. Such maintenance hole shall be accessibly and safely located and shall require plans approved prior to installation by the Public Works Director, and shall be maintained and installed by the owner or occupant at his/her sole expense.
- e. Excavation, Bedding, Backfill and Compaction:
 - i. Follow procedures for sewer mains
 - ii. It shall be the responsibility of the licensed contractor to cut the road surface, dig a trench, lay the pipe, make the connection to the sewer or wye and backfill the trench within the limits of any public thoroughfare or right-of-way.
 - iii. The contractor shall restore all roadways, drainage features, culverts, and all other disturbed features to their original condition or as shown on the drawings.
 - iv. The contractor shall prevent any damage to the sewer main, tee or stub out, and shall so conduct his/her trenching operations as to prevent the possibility of damage occurring. Undercutting of sewer main and wye is prohibited.
 - v. The bottom of the trench must be smooth and free of large rocks which may injure the side sewer pipe. Where unsuitable bedding is found, as determined by the Public Works Director, the contractor shall over-excavate and prepare a bedding.
 - vi. Minimum cover for side sewers shall be five feet in the right-of-way unless otherwise approved.
- f. Special discharge situations:
 - i. In any case where the house or building drain is too low to permit gravity

- flow to the public sewer, the same may be lifted by an individually-owned pumping facility that discharges to the side sewer or the sanitary sewer.
- ii. A backwater valve may be prescribed by the Public Works Director where elevations of the sewer require it.
 - (1) The effective operation of any backwater valve shall be the responsibility of the owner of the side sewer.
 - g. Pipe Materials: the following pipe may be used between the sewer main and the property line and shall be used between the property line and the building drain:
 - i. Preferred: PVC
 - ii. Other: Cast Iron, Concrete Pipe
 - iii. The concrete pipe shall be rubber gasket pipe using "Tylox," "Flex-Tite," "Press Seal" or other approved units. The cast iron pipe shall have mechanical joints or "o" ring rubber gasket joints Tylon or equal.
 - h. Testing:
 - i. All side sewers shall be tested before backfill but after piping is suitably anchored. Side sewers that are reconstructed or repaired to a length of 10 feet or more shall be tested for water tightness. Testing of newly reconstructed sections of side sewers consisting of a single length of pipe will not be required. Testing shall be performed in the presence of the City Inspector in accordance with WSDOT Standard Specifications. A copy of this testing procedure is included at the end of this Section.
 - ii. When a new side sewer is installed, the entire length of new pipe shall be tested. In cases where a new tap is made on the main, the first joint of pipe off the main shall be installed with a test tee, so that an inflatable rubber ball can be inserted for sealing off the side sewer installation for testing. In cases where the side sewer stub is existing to the property line, the test ball may be inserted through the clean-out wye to test the new portion of the side sewer installation.

10. Grease Traps

Grease traps shall be required for all restaurants and other food processing facilities. Grease traps shall be cleaned at least once per year. All maintenance and cleaning costs are the responsibility of the property owner/operator.

11. Pump Stations

Any pump station which is intended to be conveyed to the City for operation and maintenance shall meet the following requirements.

- a. Pump Station (General): Pump stations must be designed and installed to take into account pressure and hydraulics of distribution system, safety and aesthetics.
- b. Noise Control: The following shall be provided for noise abatement and control:
 - i. All pump stations will be provided with adequate noise control to meet state noise guidelines.
 - ii. Pumps shall be housed in a concrete or equivalent structure with sound attenuation provided.

- iii. Pump stations shall be located away from residences where feasible.
- c. Plans: The plans for lift stations shall include the following:
 - i. An overall site drawing of the lift station showing the location of all components including elevations;
 - ii. Service size, voltage and enclosure type and location in relation to the pump station;
 - iii. A list of specific materials used including quantity description and manufacturer names;
 - iv. A schematic and line diagram of the service and motor control center and lift station;
 - v. All applicable telemetry installation with schematics;
- d. Operations and Maintenance Manual: Three sets of the Operation and Maintenance manual from the lift station manufacturer shall be supplied.
- e. Design Report: A design report shall be submitted with each lift station demonstrating its conformance with the standards and shall address the following items:
 - i. Pump Data: size and type, horsepower, pump curves, head capacity, velocity
 - ii. Motor: size and type, cycle length, type of motor
 - iii. Controls: type
 - iv. Telemetry: alarm system compatible with City system
 - v. Housing: size and type, ventilation, humidity control, interior lighting, access
 - vi. Well sizing: type, storage capacity
 - vii. Maintenance: warranty, tools and equipment required
 - viii. Electrical Service: size and type, source
 - ix. Corrosion Protection: type of materials, coatings, linings, maintenance
 - x. Site Layout: location of lift station on property
 - xi. Testing: operational, pressure
 - xii. Piping and Valves: size and type
- f. Pumps are to be engineered and manufactured under a written Quality Assurance program. The Quality Assurance program is to be in effect for at least five (5) years, to include a written record of periodic internal and external audits to confirm compliance with UL Quality Assurance specifications.
- g. Lift stations must be either a wet well/dry well type or submersible type.
- h. Location:
 - i. Lift station structures and electrical and mechanical equipment shall be protected from the 100 year flood.
 - ii. Lift stations shall be readily accessible by maintenance vehicles during all weather conditions. The facility should be located off the traffic way of streets and alleys.
- i. Emergency Power:
 - i. Lift stations must be provided with an emergency power source or auxiliary pumping equipment to ensure continuous operability unless

experience has shown the frequency and duration of outage to be low and the lift station and/or sewers provide storage sufficient for expected interruptions in power service.

- ii. Provision of an emergency power supply may be accomplished by connection of the station to at least two independent public utility sources, or by provision of portable or in-place internal combustion engine equipment that will generate electrical or mechanical energy, or by the provision of portable pumping equipment.
- iii. Emergency power shall be provided that, alone or combined with storage, will prevent overflows from occurring during any power outage that is equal to the maximum outage in the immediate area during the last 10 years. If available data are less than 10 years, an evaluation of a similar area served by the power utility for 10 years would be appropriate.
- iv. In-Place Equipment:
Where in-place internal combustion equipment is utilized, the following will apply:
 - (1) The unit shall be bolted in place. Facilities shall be provided for unit removal for purposes of major repair or routine maintenance.
 - (2) Provision shall be made for automatic and manual startup and cut-in.
 - (3) Unit size shall be adequate to provide power for lighting and ventilating systems and such further systems that affect capability and safety as well as the pumps.
 - (4) The unit internal combustion engine should be located above grade, with suitable and adequate ventilation of exhaust gases.
 - (5) If diesel fuel is used there shall be a containment area for 125% of the diesel fuel tank capacity.
- v. Portable Equipment:
Where portable equipment is utilized, the following apply:
 - (1) Pumping units shall have the capability to operate between the wet well and the discharge side of the station and the station shall be provided with permanent fixtures that will facilitate rapid and easy connection of lines.
 - (2) Electrical energy generating units should be protected against burnout when normal utility services are restored, and should have sufficient capacity to provide power for lighting and ventilating systems and any other station systems affecting capability and safety, in addition to the pumping units.
- vi. Storage:
Where storage is provided in lieu of an emergency power supply, wet well and tributary main capacity above the high-level alarm should be sufficient to hold the peak flow expected during the maximum power outage duration during the last 10 years.

- j. Telemetry:

A telemetry system shall be installed at the lift station which shall be connected to and compatible with the existing city alarm system for transferring alarm conditions from the lift station to the central alarm monitor.

k. Automated Controls:

A comprehensive automation system for the lift station shall be supplied. The equipment provided shall be a completely integrated control system consisting of the required power equipment (motor starters, circuit breakers, etc.), automation and monitoring equipment in a factory wired and tested assembly. The submersible level transducer and solid-state controller shall be standard catalogued products of the system supplier to assure one source responsibility, proper system interconnections and reliable, long term operation. The city will accept a Bulletin A1000/D152/F100 Control system as manufactured by Consolidated Electric Company, or equal. Float switches shall not be used.

l. Pump Features:

- i. The following Submersible pumps are acceptable: Flight, Gorman-Rupp, Fairbanks & Morse, or equal.
- ii. Heavy duty, nonclog submersible capable of passing a minimum of 3" spheres.
- iii. Oil-filled, double mechanical shaft seals.
- iv. Integral over temperature and moisture protection.
- v. Rail mounted; stainless steel Schedule 40 pipe.
- vi. Pump Sizing: Minimum two pumps. Sized to handle peak flow with one pump out of service.
- vii. Pump Accessories: All accessories shall be constructed of Type 304 stainless steel.
- viii. Pump safety chain: Able to lift pumps from wet well. Three-eight inch (3/8") diameter 18" stainless steel chain, then stainless steel cable to top of rail. Safety chain clip; eye bolt for safety chain (304 SST)
- ix. Intermediate guide bar bracket: Provide if guide bar exceeds 20' in length
- x. Lifting lugs: Provide if equipment exceeds 70 lbs.
- xi. Anchor bolts: 316 stainless steel, at least 1" diameter
- xii. Pump Installation: Pumps shall be automatically connected to the discharge connection elbow when lowered into place.
- xiii. Spare Parts / Special Tools: Supply the following: 1 set special tools, 1 set upper and lower seal assembly per pump, 1 wear ring per pump, 1 complete O-ring set per pump, 1 set upper and lower bearings, 1 mechanical set seals.
- xiv. Pump Painting
 - (1) Preparation: Abrasive Blast or centrifugal wheel blast (SP 5)
 - (2) Paint Material: Polyamide, anti-corrosive, epoxy primer.
 - (3) Min. Coats, cover: 1 coat, 2.5 MDFT

m. Instrumentation and Control: Provide heavy-duty waterproof control and power

cable, motor temperature sensors for thermal overload detection. Stainless steel control panels required.

- n. Special Construction: Equipment suitable for Class I, Division I, Group C and D hazardous location.

12. Individual Sewage Disposal Systems

The type, capacities, location and layout of a private sewage system shall comply with all Department of Public Health of the State of Washington, or other state regulatory agency, and to the regulations of the city. No septic tank or cesspool shall be permitted to discharge to any public sewer or natural outlet or to the ground surface. The owner shall operate and maintain the private sewage disposal facilities in a sanitary manner at all times at no expense to the city. All private septic tanks shall be thoroughly pumped a minimum of one time during any three-year period.

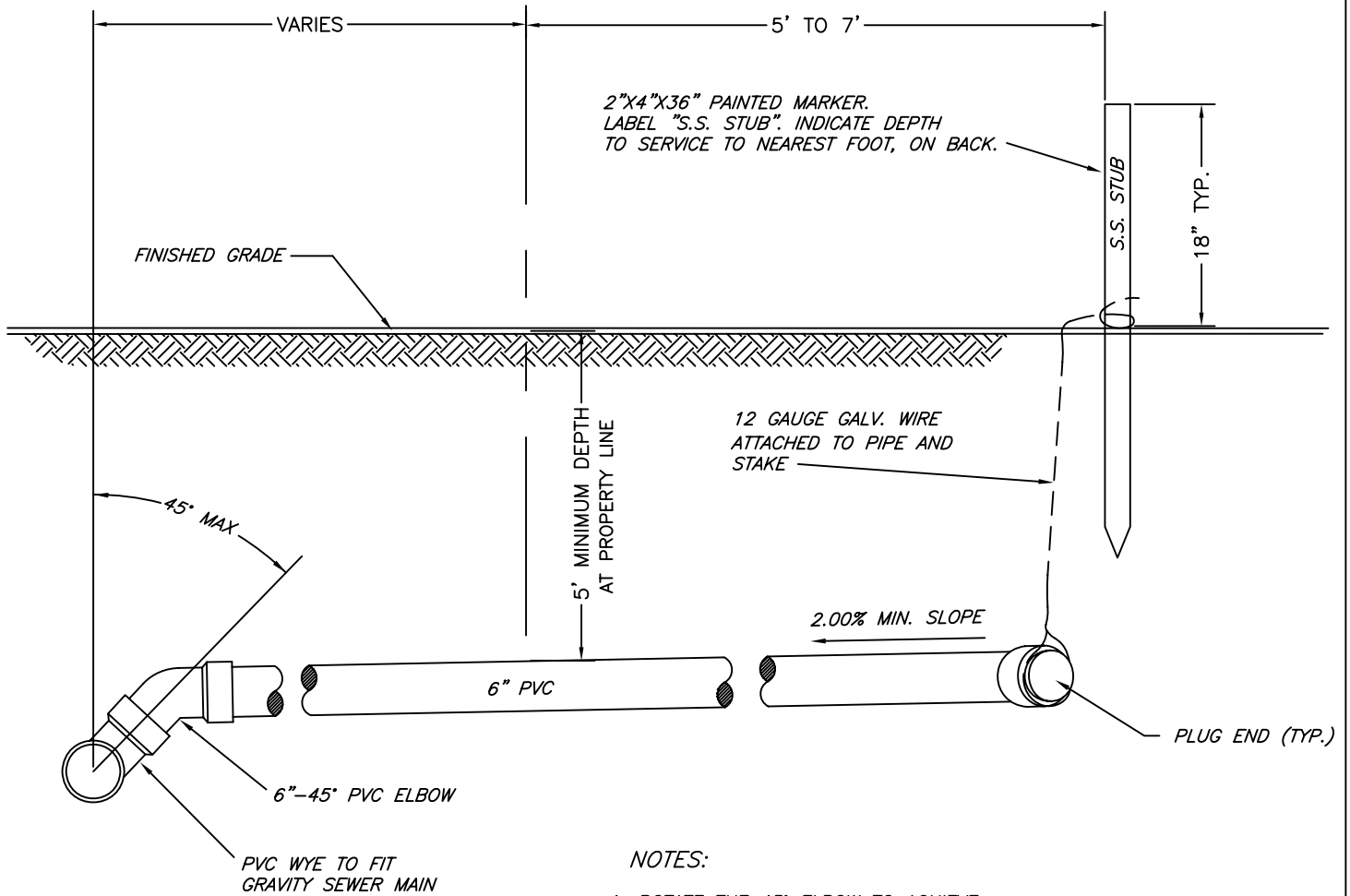
CHAPTER 3 - APPENDIX

Exhibit #	Standard Detail #	Title
1	SS- 1A	Single Sewer Service
2	SS - 1B	Dual Sewer Service
3	SS - 1C	Deep Trench Service Connection
4	SS - 2A	Trench Section Trenching Pavement Restoration
5	SS - 2B	Pipe Bedding
6	SS - 3	Standard Maintenance Hole/New Maintenance Hole on Existing Sewer
7	SS - 4	Sewer Cleanout Detail
8	SS - 5	24" Maintenance Hole Frame and Lid
9	SS - 6	Drop Connection for Sanitary Sewer
10	SS - 7	Pavement and Installation Underground Maintenance Hole
11	SS - 8	Typical Sewer Connection to Existing Sewer Mains
12	SS - 9	Pipe Anchor Detail For Slopes Greater Than 20%
13	SS - 10	Check Valve Assembly for Joint Use Side Sewer
14	SS - 11	Polypropylene Ladder and Maintenance Step
15		Cleaning and Testing (3 Pages)



City of Port Townsend - Public Works Department

Standard Detail



NOTES:

1. ROTATE THE 45° ELBOW TO ACHIEVE THE PROPER ANGLE TO REACH THE PROPERTY LINE WITH 5' OF COVER; THE MINIMUM ALLOWABLE SLOPE IS 2%.
2. 3' MINIMUM TO ADJOINING LOT LINE
3. SERVICE TO SINGLE RESIDENCE MAY BE REDUCED TO 4" BEYOND PLUG.

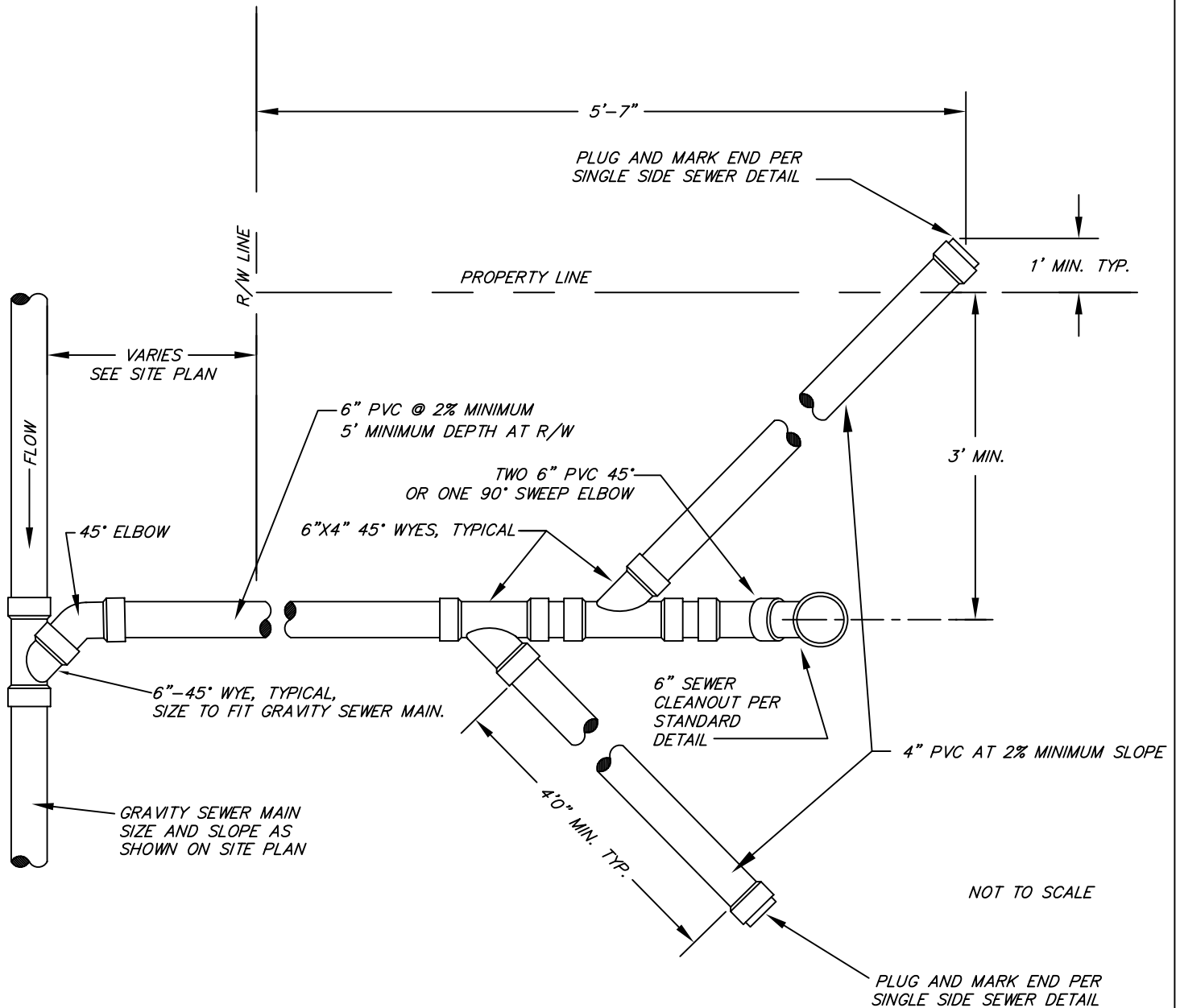
ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, AMERICAN PUBLIC WORKS ASSOCIATION.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Single Sewer Service</h3> <p style="font-size: 2em; margin: 10px 0 0 0;">Detail: SS-1A</p>
Approved By:						
File: E:\eng_std\standard\san_sew						



City of Port Townsend - Public Works Department

Standard Detail



ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, AMERICAN PUBLIC WORKS ASSOCIATION.

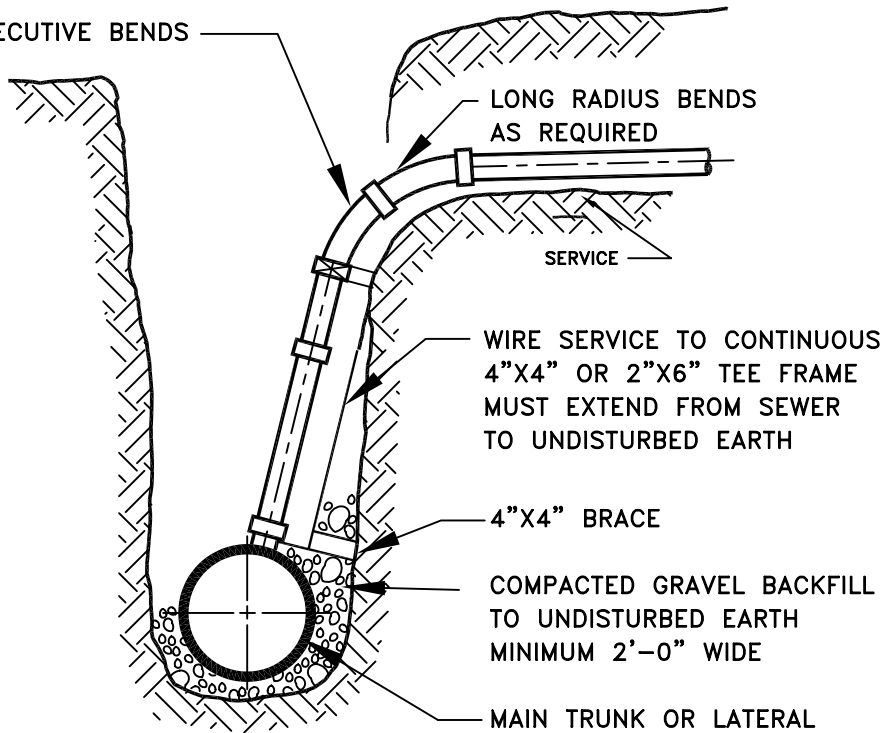
Date: April 1997	No.	Date	Revision	By	Apvd	Dual Sewer Service
Approved By:						
File: E:\eng_std\standard\san_sew						



City of Port Townsend - Public Works Department

Standard Detail

NO 90° OR CONSECUTIVE BENDS



INSPECTION REQUIRED UPON COMPLETION OF ROUGH GRADING AND DURING PLACEMENT OF STRUCTURAL SECTION.

CALL FOR FORM INSPECTION BY CITY PRIOR TO POURING CONCRETE AND PRIOR TO PAVING.

NOTE:

WOOD SUPPORT TO BE USED IN ALL CASES WHERE SERVICE CONNECTION CANNOT BE SUPPORTED FOR FULL LENGTH ON COMPACTED GRAVEL OR WHERE SEWER IS OVER 12'-0" DEEP TO FLOW LINE

ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION*, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, AMERICAN PUBLIC WORKS ASSOCIATION.

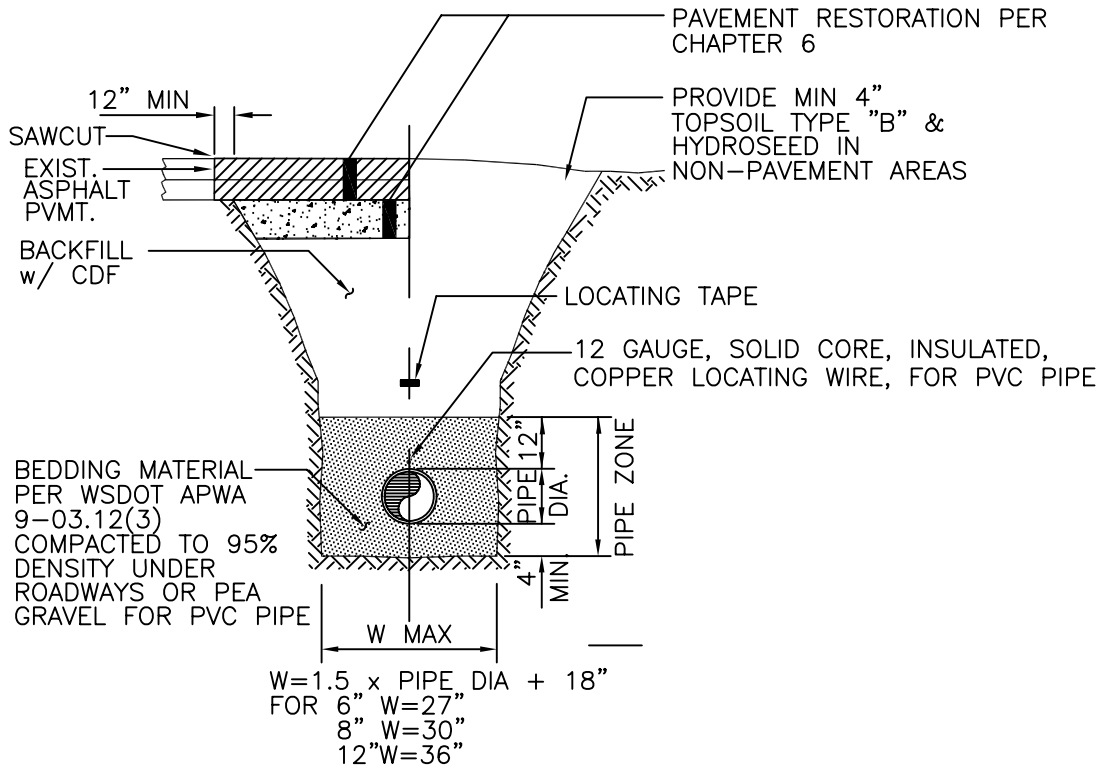
Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Deep Trench Service Connection</h3>
Approved By:						Detail: SS-1C
File: E:\eng_std\standard\san_sew						



City of Port Townsend - Public Works Department

Standard Detail

TRENCH SECTION



PEA GRAVEL SHALL BE FREE FROM ORGANIC MATTER MEET:
U.S. STD. SIEVE SIZE %PASSING

3/4"	100
3/8"	95-100
#8	0-10
#200	0-3

Date: April 1997

Approved By:

File: E:\eng_std\standard\san_sew

No.	Date	Revision	By	Apvd

**Trench Section
and Pavement Restoration**

Detail: SS-2A

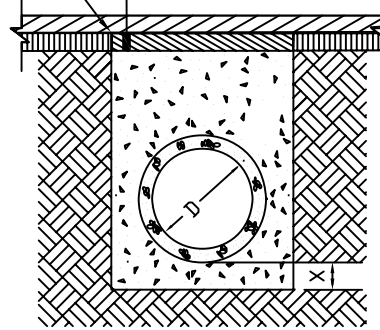


City of Port Townsend - Public Works Department

Standard Detail

SAWCUT EXIST. PAVEMENT
TACK COAT EDGE
MATCH EXIST.
TYP. BOTH SIDES

PAVEMENT RESTORATION
SEE CHAPTER 6.



LEGEND

- C.D.F. (CONTROLLED DENSITY FILL) 1/4" MAX. SIZE AGGREGATE
- SLECTED NATIVE SOIL (S.N.S.)
MAX 3/4" DIA. ROCK FOR PVC PIPE
MAX 2" DIA. ROCK FOR CONC.
DI OR CI PIPE

NOTES :

C.D.F. SPEC. PER YARD		
MATERIAL	POUNDS	ABS-VOLUME
CEMENT TYPE I	30	0.15
FLY ASH	300	2.19
SAND (SP.GR 2.68)	2550	15.25
WATER	300 (36 GAL)	4.81
AIR %	18.00	4.86

X = 2" FOR PIPE 6" & UNDER, 3" FOR PIPE 8" TO 18", 4" FOR PIPE 24" OR LARGER

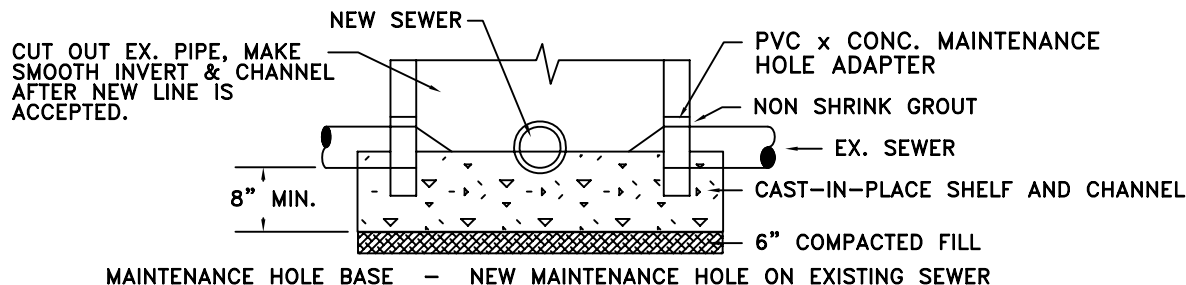
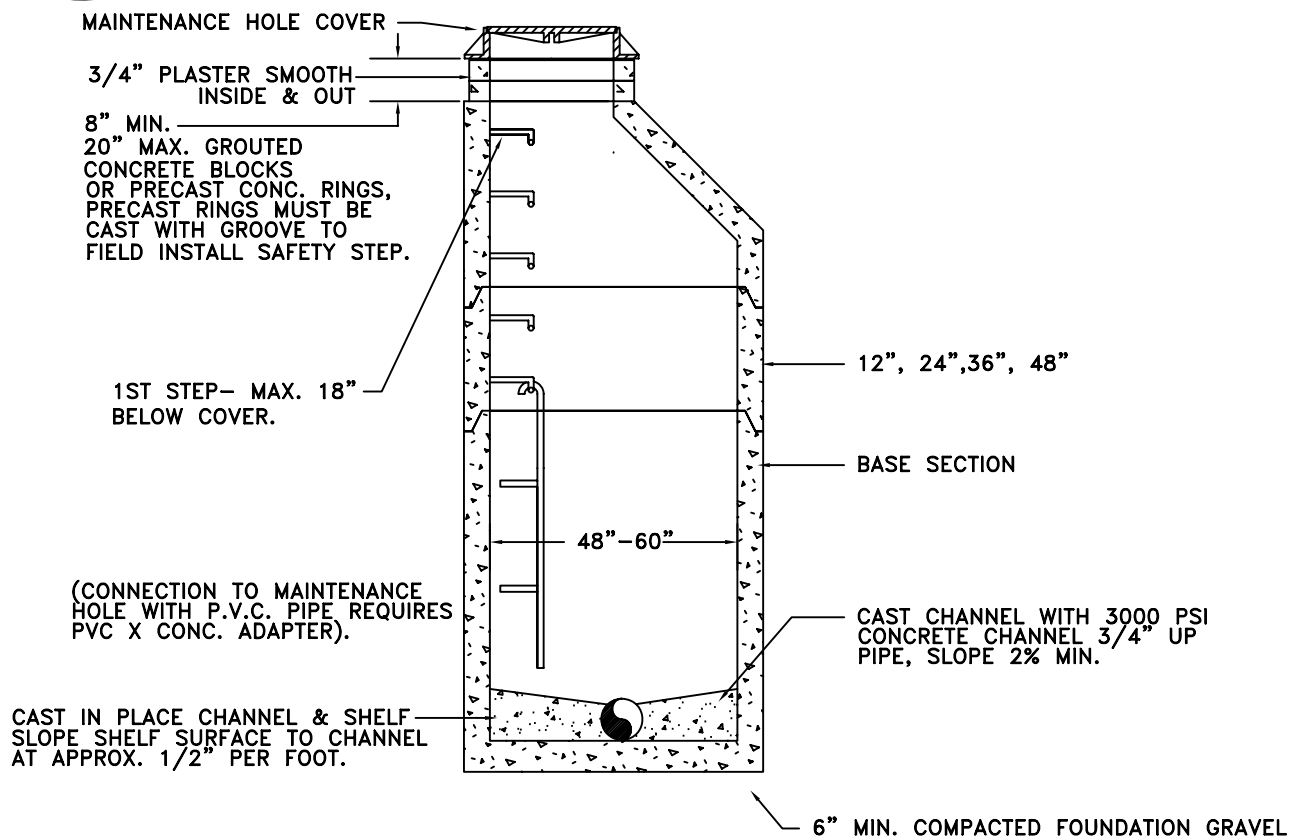
C.D.F. PIPE BEDDING

Date: April 1997	No.	Date	Revision	By	Apvd	Pipe Bedding
Approved By:						
File: E:\eng_std\standard\san_sew						Detail: SS-2B



City of Port Townsend - Public Works Department

Standard Detail



GENERAL NOTES (APPLY TO ALL MAINTENANCE HOLES)

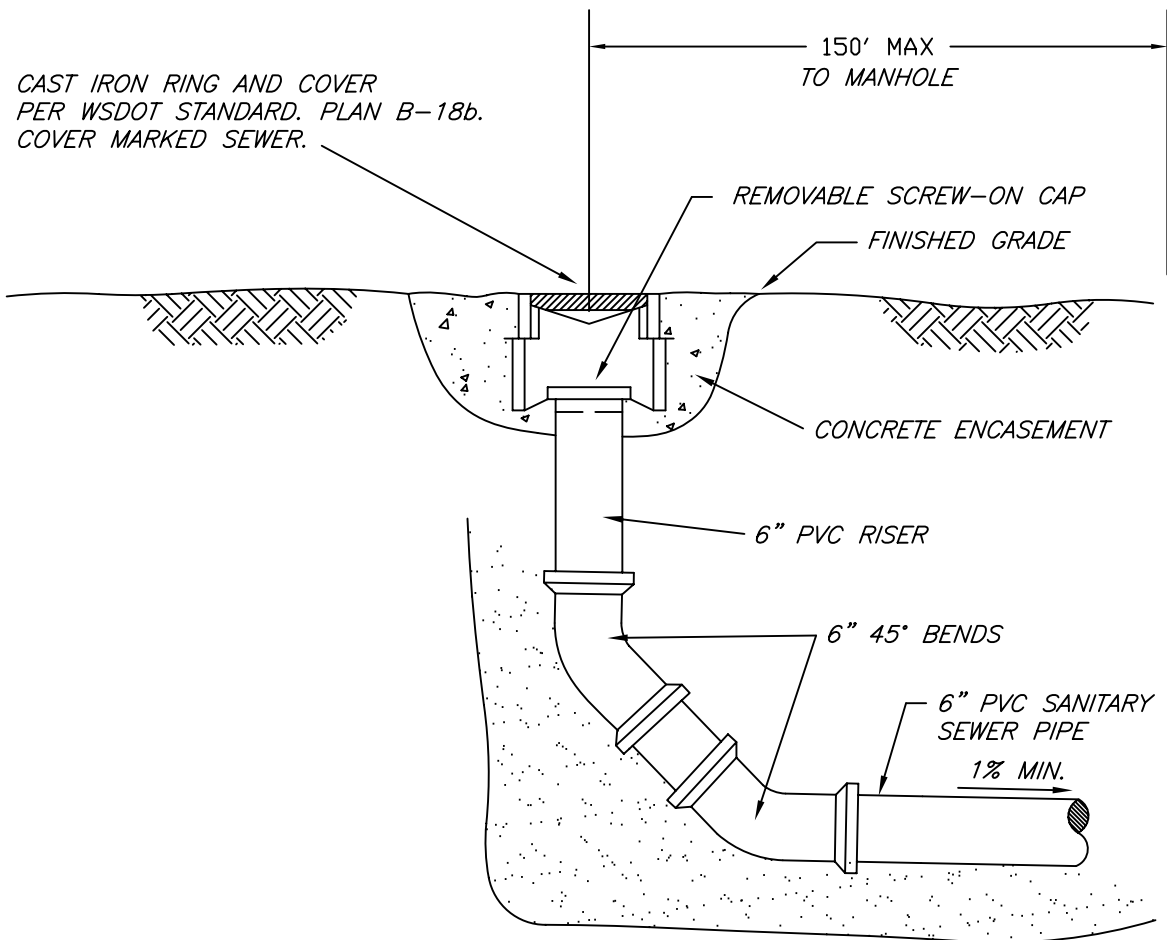
1. PRECAST SECTIONS SHALL BE REINFORCED PER ASTM SPECS FOR CORRESPONDING SEWER PIPE.
2. POLYPROPYLENE SAFETY STEPS WITH 12.0" SEPARATION BETWEEN RUNGS.
3. STEPS IN PRECAST BASE SECTION MAY BE CAST IN PLACE OR MOVABLE SAFETY LADDER GROUDED IN PLACE.
4. ALL HOLES FOR PIPE SHALL BE BLOCKED OUT AT THE TIME OF CASTING OF THE SECTION.
5. ALL RUBBER GASKETED MAINTENANCE HOLES SHALL BE FURNISHED WITH RUBBER GASKET JOINT CONFORMING TO ASTM C443.
6. MAINTENANCE HOLES OVER 10' HIGH SHALL BE FURNISHED WITH 5" MIN. WALL.
7. MINIMUM 3% SLOPE ACROSS MAINTENANCE HOLE CAHNNEL.
8. MAINTENANCE HOLES TO BE WATER TIGHT INCLUDING EXTENSIONS TO COVER CASTING

Date: April 1997	No.	Date	Revision	By	Apvd	Standard Maintenance Hole/New Maint. Hole on Existing Sewer
Approved By:						
File: E:\eng_std\standard\san_sew						Detail: SS-3



City of Port Townsend - Public Works Department

Standard Detail



NOT TO SCALE

CALL FOR FORM INSPECTION BY CITY PRIOR TO POURING CONCRETE.

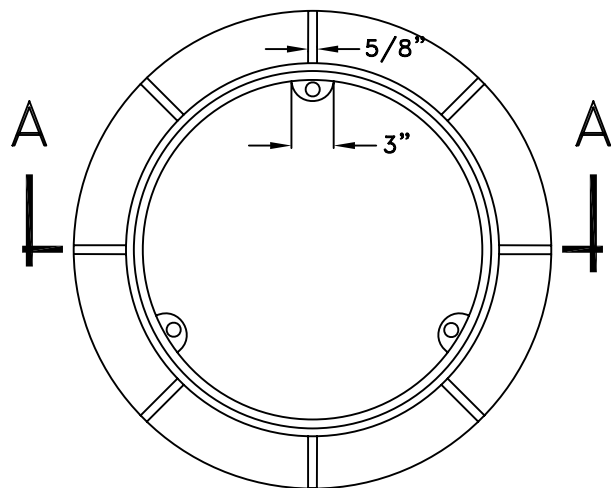
ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, AMERICAN PUBLIC WORKS ASSOCIATION.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Sewer Cleanout Detail</h3>
Approved By:						
File: E:\eng_std\standard\san_sew						

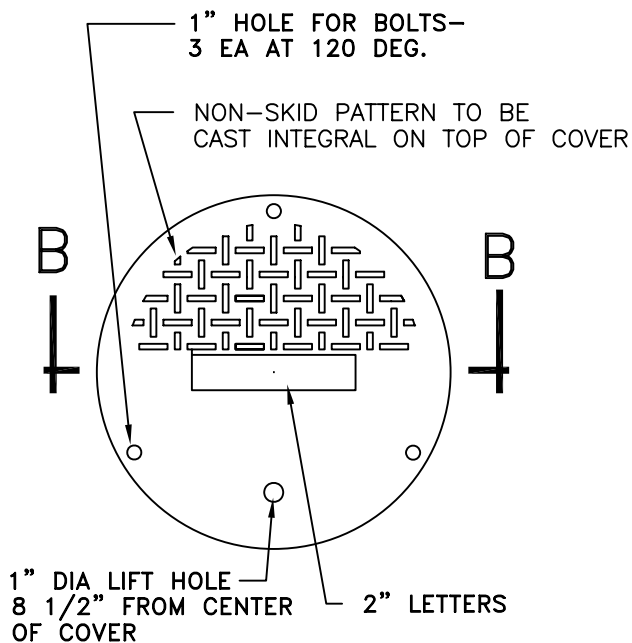


City of Port Townsend - Public Works Department

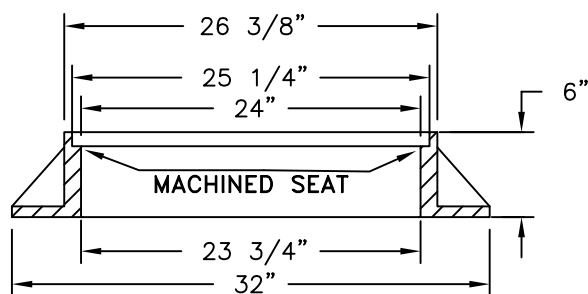
Standard Detail



PLAN
MH RING

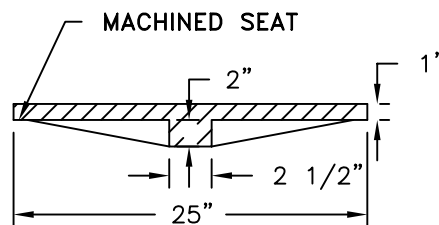


PLAN
MH COVER



SECTION A-A

DUCTILE OR CAST IRON FRAME
MINIMUM WEIGHT 210 LBS



SECTION B-B

DUCTILE OR CAST IRON NON-LOCKING OR
LOCKING COVER, MINIMUM WEIGHT 150 LBS

NOTES:

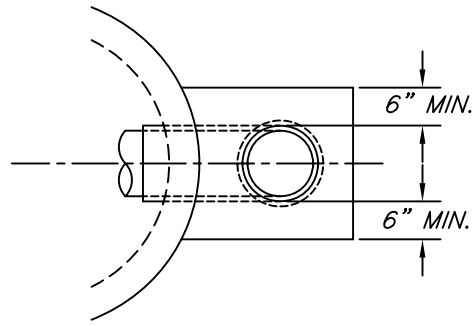
1. 3 LOCKING BOLT LUGS TO BE PROVIDED FOR EACH MAINTENANCE HOLE
2. COVER SHALL HAVE THE WORD "SEWER" IN 2" RAISED LETTERS.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">24" Maintenance Hole Frame and Lid</h3> <p style="margin: 0;">Detail: SS-5</p>
Approved By:						
File: E:\eng_std\standard\san_sew						



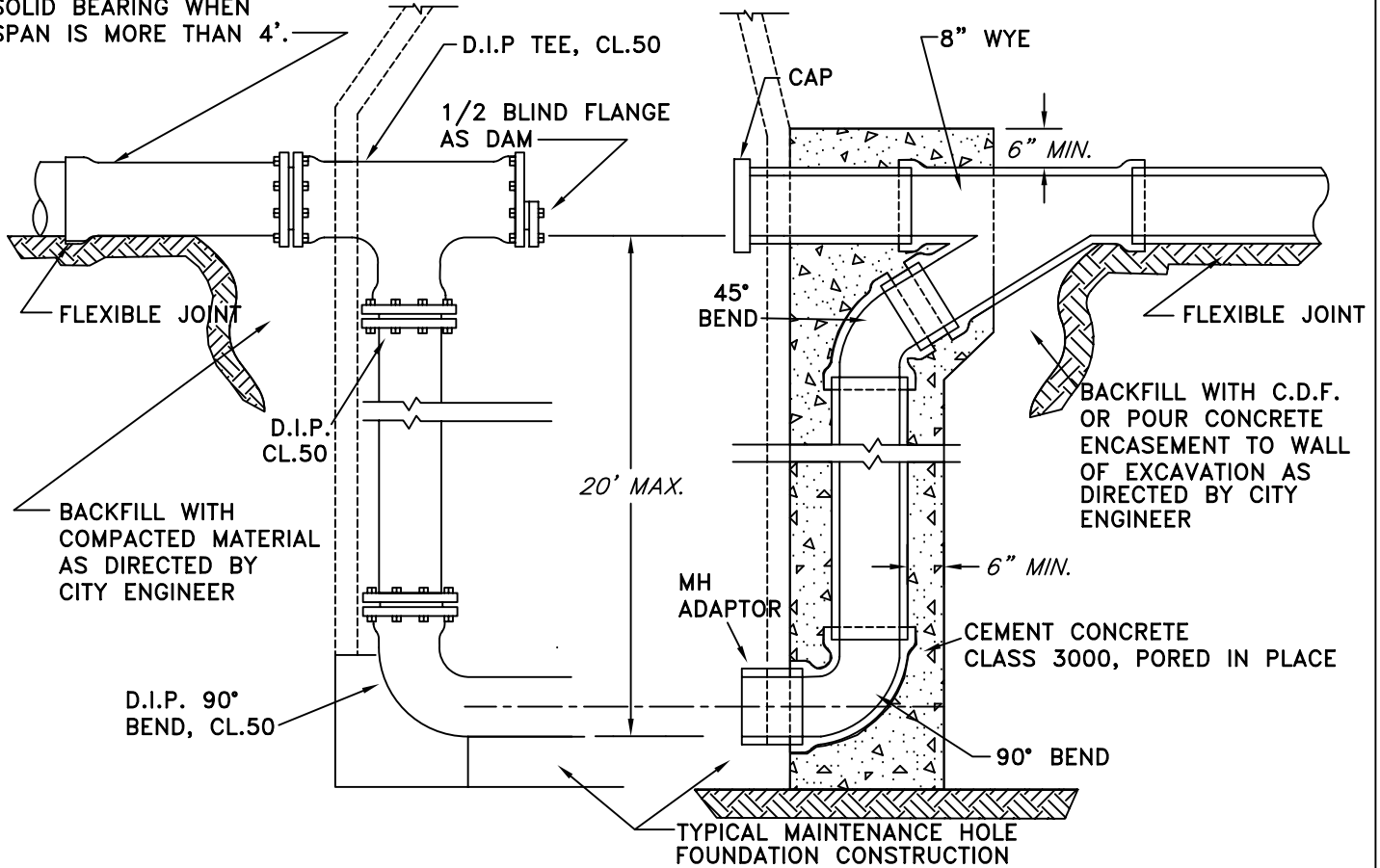
City of Port Townsend - Public Works Department

Standard Detail



ALL PIPE EXCEPT DUCTILE IRON PIPE SHALL BE CONCRETE ENCASED

ONE LENGTH OF D.I. PIPE (CLASS 50) TO SOLID BEARING WHEN SPAN IS MORE THAN 4'.



DUCTILE IRON INSIDE
DROP CONNECTION

CONCRETE ENCASED PVC OUTSIDE
DROP CONNECTION

NOTE: EXCAVATION TO BE CONDUCTED PER WISHA GUIDELINES

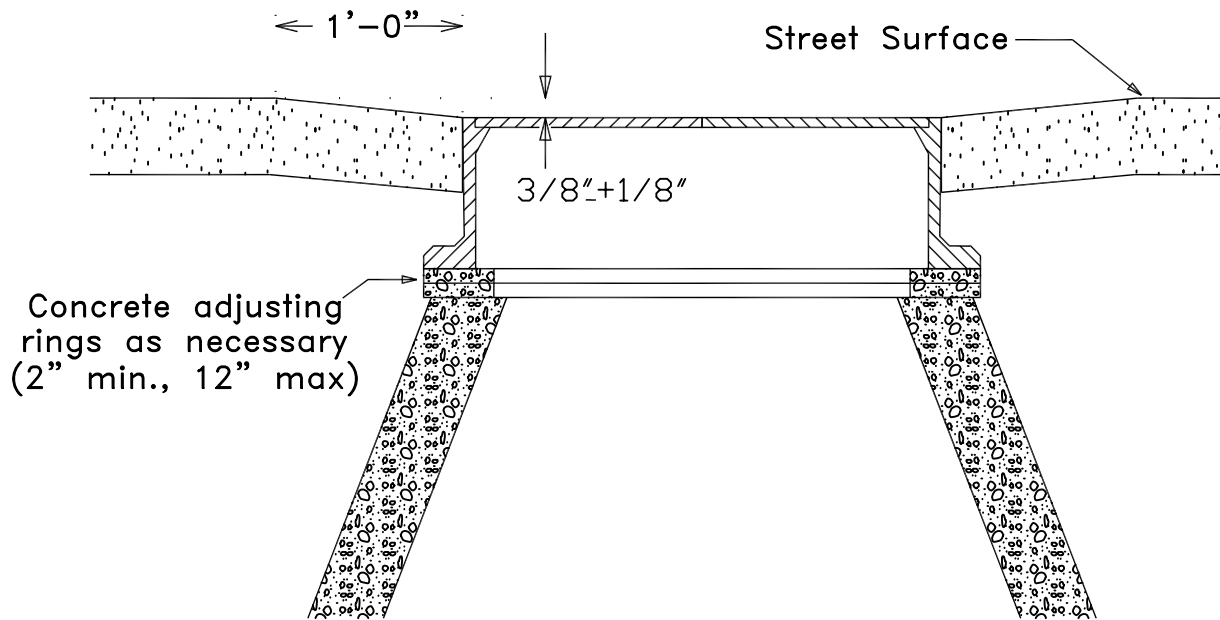
CALL FOR FORM INSPECTION BY CITY PRIOR TO POURING CONCRETE.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Drop Connection For Sanitary Sewer</h3> <p style="font-size: 1.5em; margin: 0;">Detail: SS-6</p>
Approved By:						
File: E:\eng_std\standard\san_sew						



City of Port Townsend - Public Works Department

Standard Detail



NOTES:

- 1.) Adjust manholes upward with adjusting rings under frame.
- 2.) Adjust maintenance holes downward by removing cone and barrel sections as necessary and replacing with sections of length required to match grade.
- 3.) Slope maint. hole frame as req'd to match slope of street.
- 4.) Final maint. hole adjustments shall be made before paving.

Date: April 1997

Approved By:

File: E:\eng_std\standard\san_sew

No.	Date	Revision	By	Apvd

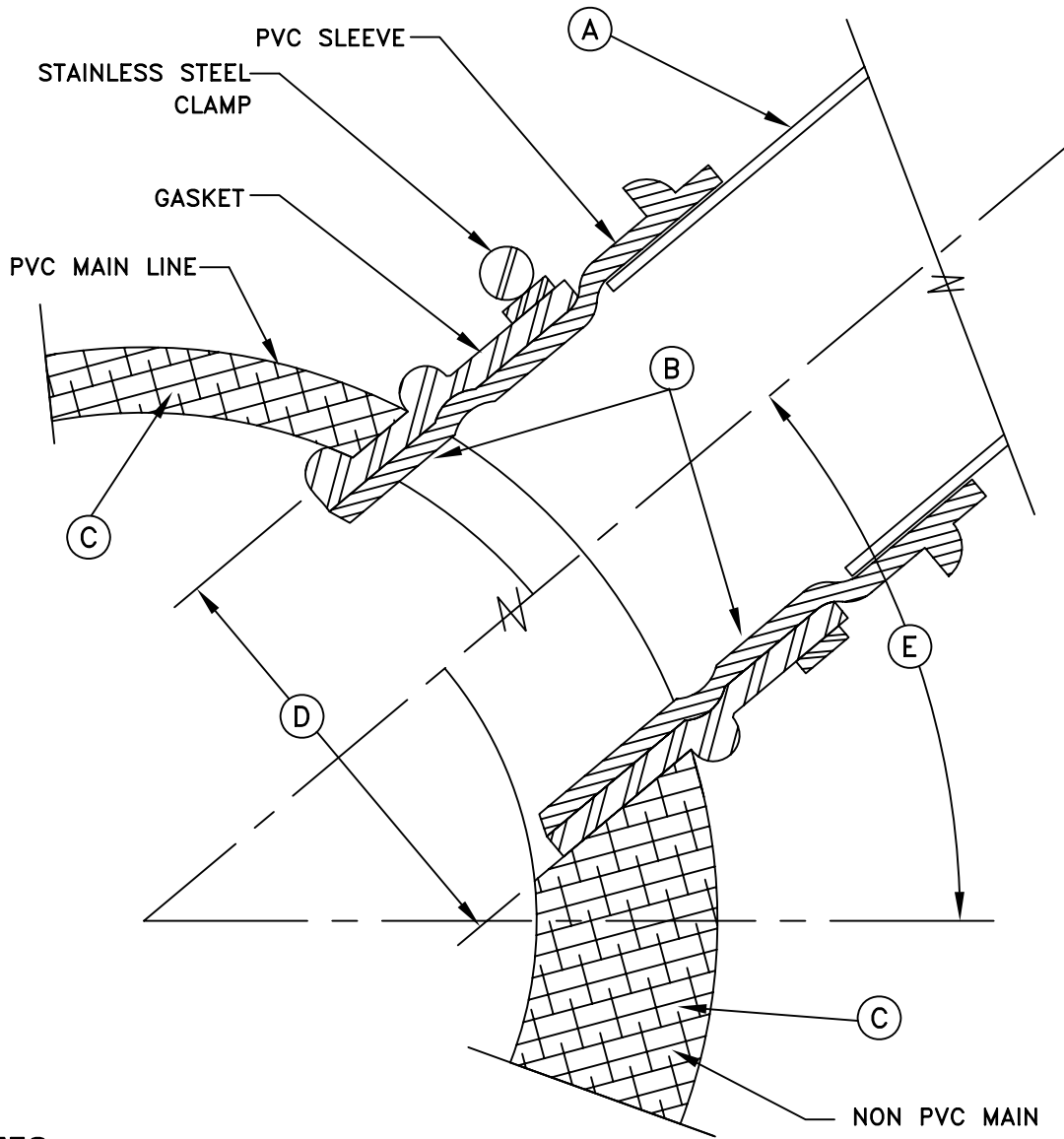
Pavement and Intallation
Underground Maintenance Hole

Detail: SS-7



City of Port Townsend - Public Works Department

Standard Detail



NOTES

- (A) PVC SIDE SEWER. FOR REMAINDER OF PVC SERVICE SEE DWG WW-1.
- (B) FOWLER MFG, CO. "INSERTA TEE" OR APPROVED EQUAL.
- (C) EXISTING SANITARY SEWER MAIN.
- (D) CORE DRILL EXISTING MAINLINE PIPE PER MFG'S SPECIFICATIONS.
- (E) 35° MIN, 45° MAX

Date: April 1997

Approved By:

File: E:\eng_std\standard\san_sew

No.	Date	Revision	By	Apvd

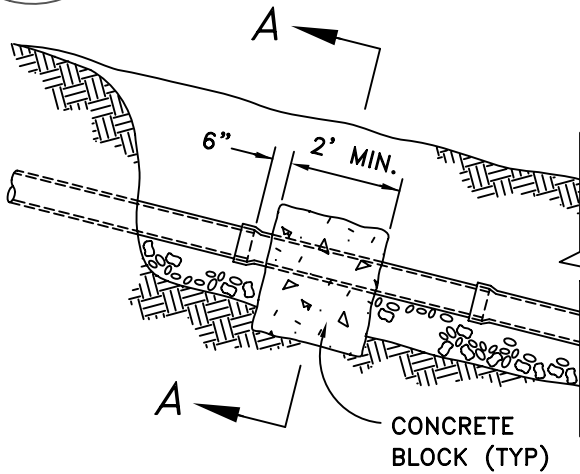
Typical Sewer Connection to
Existing Sewer Mains

Detail: SS-8



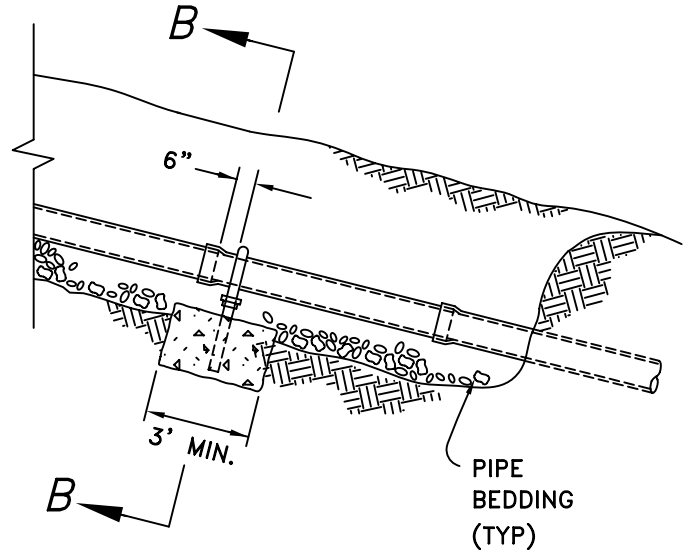
City of Port Townsend - Public Works Department

Standard Detail



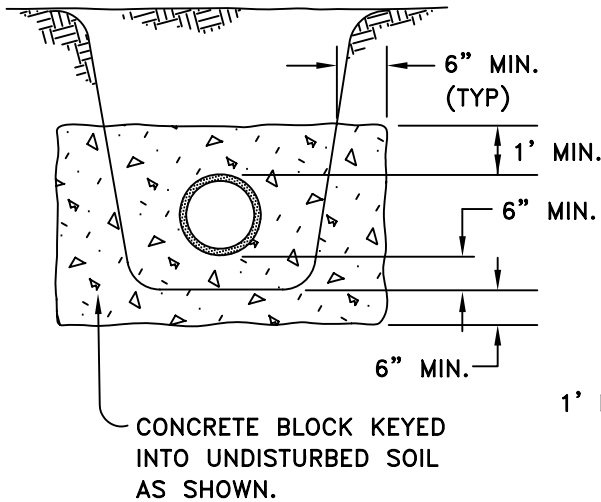
CONCRETE BLOCK ANCHOR

N.T.S.
1 ANCHOR PER JOINT OF PIPE

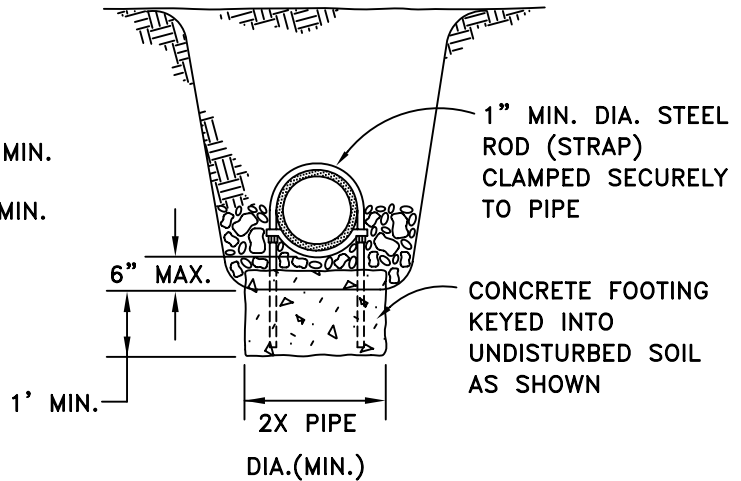


STRAP - FOOTING ANCHOR

N.T.S.
1 ANCHOR PER JOINT OF PIPE



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

Date: April 1997

Approved By:

File: E:\eng_std\standard\san_sew

No.	Date	Revision	By	Apvd

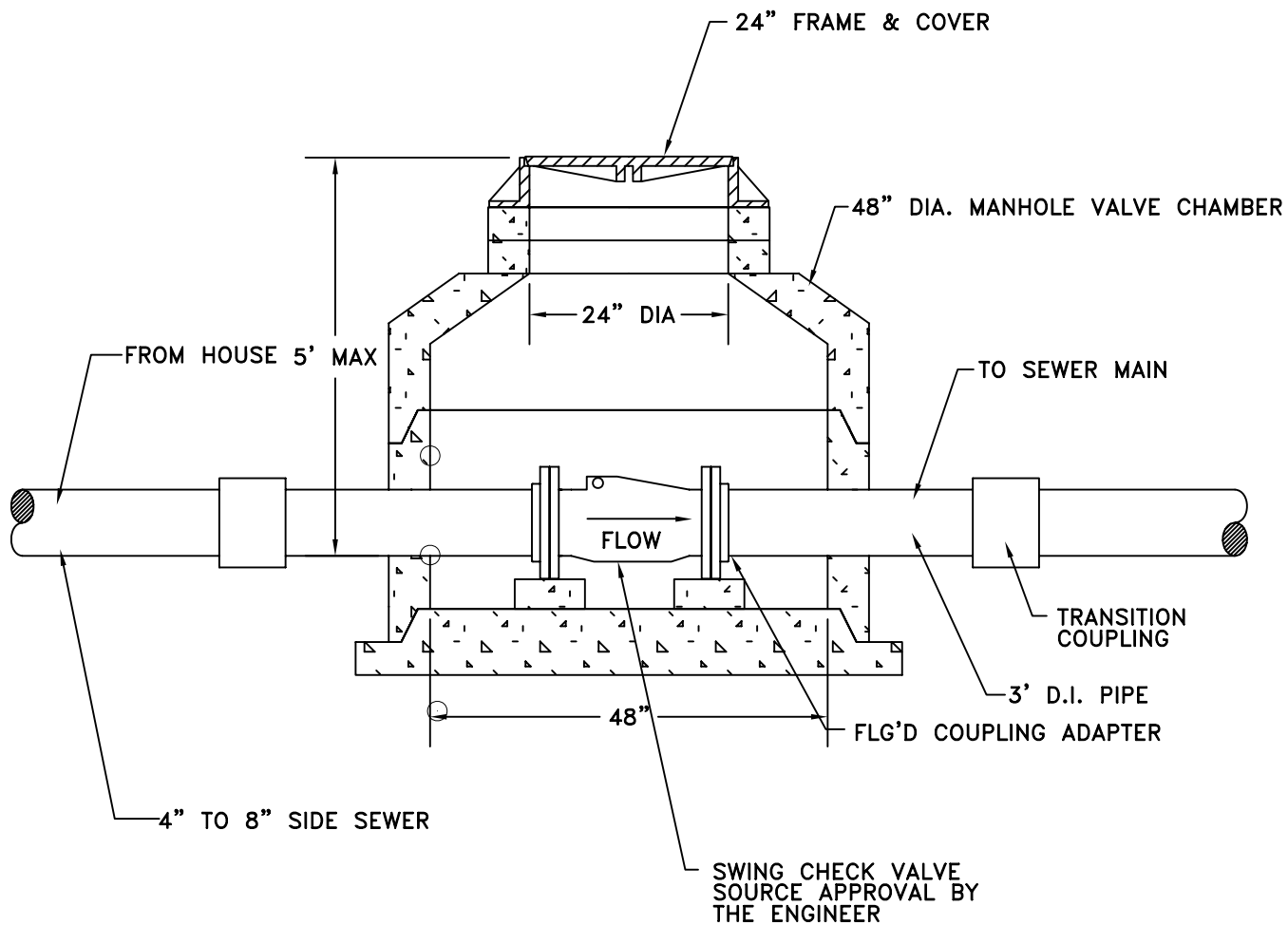
Pipe Anchor Detail
For Slopes Greater Than 20%

Detail: **SS-9**



City of Port Townsend - Public Works Department

Standard Detail



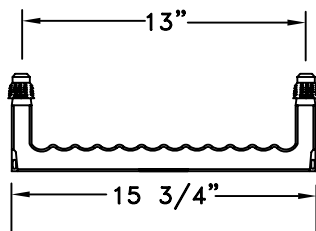
(4" to 8" Diameter)

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Check Valve Assembly for Joint Use Side Sewer</h3> <p style="font-size: 1.2em; margin-top: 20px;">Detail: SS-10</p>
Approved By:						
File: E:\eng_std\standard\san_sew						

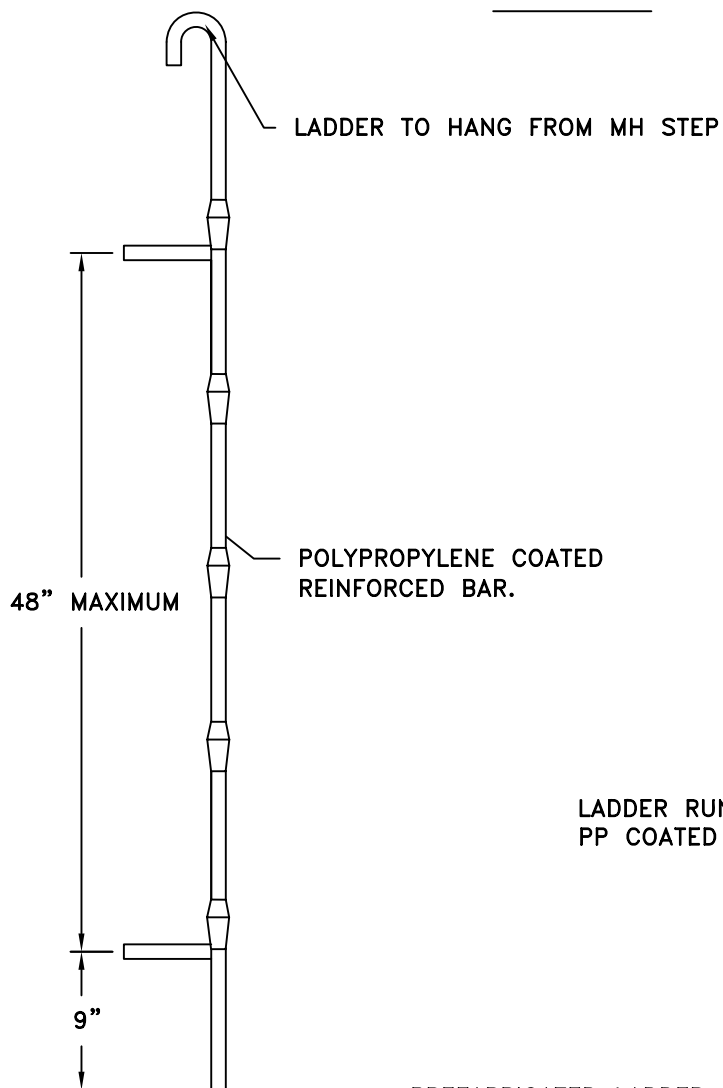


City of Port Townsend - Public Works Department

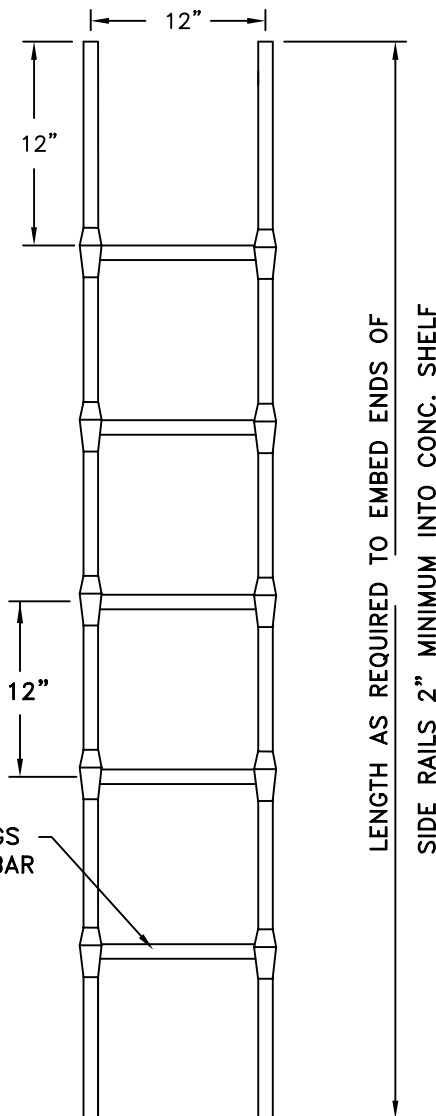
Standard Detail



SAFETY STEP



PREFABRICATED LADDER



NOTES:

1. ALL STEP SHOULD MEET ASTM C-478 AND AASHTO M-199
2. POLYPROPYLENE SHALL CONFORM TO ASTM D-4101.
3. 1/2" GRADE 60 REINFORCING BAR SHALL CONFORM TO ASTM A-615.



RAIL 9/16" ROUND BAR



RUNG 1/2" GRADE 60

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Polypropylene Ladder and Maintenance Step</h3> <p style="font-size: 1.5em; margin-top: 20px;">Detail: SS-11</p>
Approved By:						
File: E:\eng_std\standard\san_sew						

7-17.3(4) CLEANING AND TESTING

7-17.3(4)A GENERAL

Sewers and appurtenances shall be cleaned and tested after backfilling by either the exfiltration or low pressure air method at the option of the Contractor, except where the ground water table is such that the Engineer may require the infiltration test.

All work involved in cleaning and testing sewer lines between manholes or rodding inlets as required herein shall be completed within 15 working days after backfilling of sewer lines and structures. Any further delay will require the written consent of the Engineer. The Contractor shall furnish all labor, materials, tools, and equipment necessary to make the test, clean the lines, and perform all work incidental thereto. The Contractor shall perform the tests under the direction and in the presence of the Engineer. Precautions shall be taken to prevent joints from drawing during tests, and any damage resulting from these tests shall be repaired by the Contractor. The manner and time of testing shall be subject to approval by the Engineer.

All wyes, tees, and stubs shall be plugged with flexible jointed caps, or acceptable alternate, securely fastened to withstand the internal test pressure. Such plugs or caps shall be readily removable, and their removal shall provide a socket suitable for making a flexible jointed lateral connection or extension.

If the Contractor elects to test large diameter pipe one joint at a time, leakage allowances shall be converted from GPM per 100 feet to GPM per joint by dividing by the number of joints occurring in 100 feet. If leakage exceeds the allowable amount, corrective measures shall be taken and the line then retested to the satisfaction of the Engineer.

Testing side sanitary sewers shall be for their entire length from the public sewer in the street to the connection with the building's plumbing. Their testing shall be as required by the local sanitary agency but in no case shall it be less thorough than that of filling the pipe with water before backfilling and visually inspecting the exterior for leakage. The decision of the Engineer as to acceptance of the side sanitary sewer shall be final.

If any sewer installation fails to meet the requirements of the test method used, the Contractor shall determine the source or sources of leakage and shall replace all defective pipe. The complete pipe installation shall meet the requirements of the test method used before being considered acceptable. Replacement of defective pipe shall not commence until the Contractor has received approval of his plan from the Engineer.

7-17.3(4)B EXFILTRATION TEST

Prior to making exfiltration leakage tests, the Contractor may fill the pipe with clear water to permit normal absorption into the pipe walls provided, however, that after so filling the pipe he shall complete the leakage test within twenty-four hours after filling. When under test, the allowable leakage shall be limited according to the provisions that follow. Specified allowances assume pre-wetted pipe.

Leakage shall be no more than 0.28 gph per inch diameter per 100 feet of sewer, with a hydrostatic head of 6 feet above the crown at the upper end of the test section, or above the natural groundwater table at the time of test, whichever is higher. The length of pipe tested shall be limited so that the pressure at the lower end of the section tested does not exceed 16 feet of head above the invert, and in no case shall be greater than 700 feet or the distance between manholes when greater than 700 feet.

Where the test head is other than 6 feet, the measured leakage shall not exceed 0.28 gph per inch diameter per 100 feet times the ratio of the square root of the test head to the square root of 6.

$$\text{Leakage maximum} = 0.28 \times \frac{\sqrt{H} - 0.114 \sqrt{H}}{\sqrt{6}} \text{ gph/inch dia./100ft.}$$

When the test is to be made one joint at a time, the leakage per joint shall not exceed the computed allowable leakage per length of pipe.

7-17.3(4)C INFILTRATION TEST

Infiltration test leakage shall not exceed 0.16 gph per inch diameter per 100 feet, when the natural groundwater head over the pipe is 2 feet or less above the crown of the pipe at the upper end of the test section. The length of pipe tested shall not exceed 700 feet or the distance between manholes when greater than 700 feet.

Where the natural groundwater head is more than 2 feet, the measured leakage shall not exceed 0.16 gph per inch diameter per 100 feet times the ratio of the square root of the natural groundwater head to the square root of 2.

$$\text{Leakage maximum} = 0.16 \times \frac{\sqrt{H} - 0.114 \sqrt{H}}{\sqrt{2}} \text{ gph/inch dia./100ft.}$$

When a suitable head of groundwater exists above the crown of the pipe and when the pipe is large enough to work inside, acceptance may be based on the repair of visible leakage by means satisfactory to the Engineer.

7-17.3(4)D AIR PRESSURE TEST FOR SANITARY SEWERS CONSTRUCTED OF AIR PERMEABLE MATERIALS

(a) Pipelines may be tested with low pressure air by the pressure drop method, in lieu of water infiltration or exfiltration. The pressure drop shall be from 3-1/2 to 2-1/2 psig greater than the average back pressure of groundwater above the centerline of the pipe. At the Contractor's option, pipe may be tested without pre-wetting; however, the test allowances herein assume pre-wetted pipe.

(b) The allowable rate of air loss shall be .003 cfm per square foot of internal pipe surface, but the total air loss shall be not less than 2 cfm nor more than 3.50 cfm.

(c) The test equipment to be used shall be furnished by the Contractor and shall be inspected and approved by the Engineer prior to use. The Engineer may at any time require a calibration test of gauges or other instrumentation that is incorporated in the test equipment.

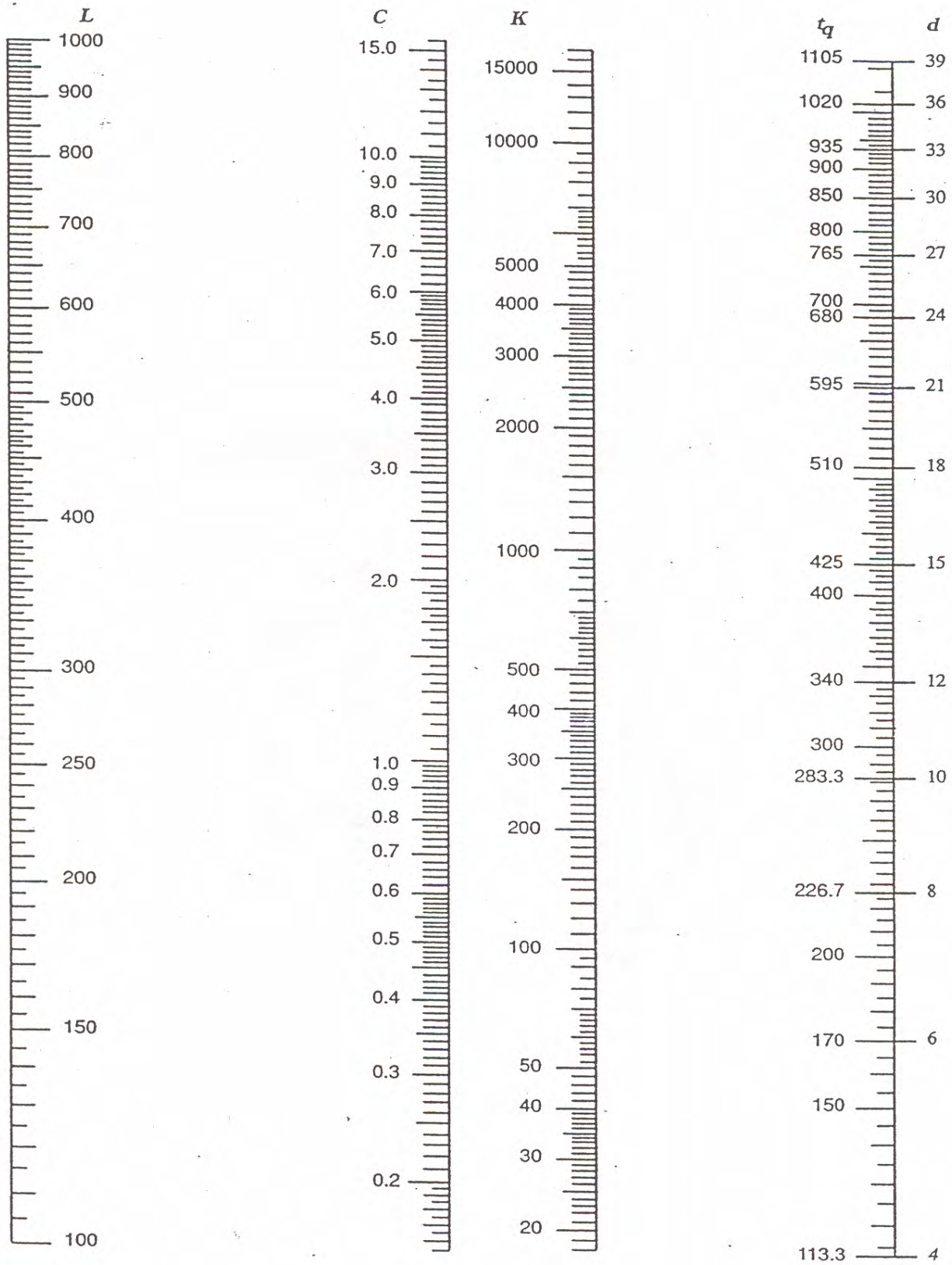
(d) Safety Provisions. Plugs used to close the sewer pipe for the air test must be securely braced to prevent the unintentional release of a plug which can become a high-velocity projectile. Gauges, air piping manifolds, and valves shall be located at the top of the ground. No one shall be permitted to enter a manhole where a plugged pipe is under pressure. (Four psig air pressure develops a force against the plug in a 12 inch diameter pipe of approximately 450 pounds.) Air testing apparatus shall be equipped with a pressure release device such as a rupture disk or a pressure relief valve designed to relieve pressure in the pipe under test at 6 psi.

(e) Pipe under 36 inches in diameter may be tested from manhole to manhole or such shorter lengths determined by the Contractor. Pipe 36 inches in diameter and over shall be tested one joint at a time. Each joint must show no appreciable loss of pressure when held for 30 seconds.

7-17.3(4)E AIR PRESSURE TEST FOR SANITARY SEWERS CONSTRUCTED OF NON AIR PERMEABLE MATERIALS

7-17.3(4)E1 GENERAL

When non air-permeable pipelines are subjected to the low pressure air test, all of the provisions of Section 7-17.3(4)D shall apply except that the pressure drop shall be from 3.5 to 3.0 psig greater than the average back pressure above the center of the pipe, and the minimum time shall be twice that computed as specified under Section 7-17.3(4)D.



NOMOGRAPH FOR THE SOLUTION OF $K = .011d^2L$, $C = .0003882dL$, $t_q = K/C$

Chapter 4
STORMWATER

1. General

- a. The standards established by this chapter are intended to represent the minimum standards for the design and construction of storm drainage facilities
- b. Drainage control and stormwater quality enhancement shall be provided on all developed property within the City of Port Townsend per these standards, the city's Drainage Ordinance, Stormwater Management Plan and the Environmentally Sensitive Areas Ordinance.
- c. The developer is responsible for obtaining all required local, state and federal permits related to stormwater.
- d. Erosion control requirements covered under Chapter 5 of these standards shall also be required and should be considered in conjunction with this section in designing drainage control.
- e. Every effort shall be made for surface water entering the subject property to be received at the naturally occurring location and surface water exiting the subject property shall be discharged at the naturally occurring location with adequate energy dissipaters to prevent erosion. The discharge rate of flow after development shall not exceed the rate of flow prior to development for the design storm(s).
- f. Surface water exiting the subject property shall be conveyed to the nearest established, stable drainage course by pipe or an approved swale in a manner that will not result in erosion or flooding. Sufficient downstream information and analysis shall be provided to enable the city to determine that this requirement is being met. Private easements will be required if conveyance must occur across private property.
- g. Rooftop drainage shall be addressed for all development projects. In all cases, the method selected will be subject to approval by the Public Works Department, with considerations given to site, soil types, slope conditions, and the nature of the development. The acceptable methods for disposal of rooftop drainage are:
 - i. Discharge to the site's storm drain system (private or public).
 - ii. Discharge to a suitable residential roof downspout on site disposal system.

2. Minimum Requirements

- a. All developments shall comply with the DOE *Stormwater Management Manual*, city engineering design standards, city stormwater master plan and adopted drainage basin plans for all clearing and grading activities, for erosion control during construction and for permanent drainage system improvements.
- b. Surface water entering the subject property shall be received at the naturally occurring locations and surface water exiting the subject property shall be discharged at the natural locations with adequate energy dissipaters within the subject property to minimize downstream damage.
- c. All developers shall do the necessary analysis and install the necessary mitigation

measures to insure that stormwater exiting their property is discharged at a safe location which will not impact other property owners.

- d. All structures shall be built such that finished floor elevations are in conformance with Section 1806.4.5 (Foundation elevation) of the Uniform Building Code.
- e. Building plans shall clearly show locations of drainage system and stormwater controls within property limits and any off-site drainage improvements.
- f. Waivers from the requirements of this section may be permitted only after a determination by the public works director, using the stormwater master plan and/or using the following criteria:
 - i. Sufficient capacity of downstream facilities under design conditions;
 - ii. Maintenance of the integrity of the receiving waters;
 - iii. Possibility of adverse effects of retention/detention
 - iv. Utility of regional retention/detention facilities
 - v. Capability of maintenance of the system; and
 - vi. Structural integrity of abutting foundations and structures.

Requests for waivers shall be filed in writing to the Director and shall adequately detail the basis for the request. All developers not providing permanent stormwater control facilities will be required to sign a no-protest agreement for future participation in a stormwater-related LID.

3. Drainage Plans - When Required and Content Required

- a. All persons applying for any of the following permits and/or approvals shall provide a drainage plan for surface and pertinent subsurface water flows entering, flowing within and leaving the subject property both during and after construction:
 - i. Grading permits;
 - ii. Street development permits
 - iii. Substantial development permit required under Chapter 90.58 RCW (Shoreline Management Act);
 - iv. Subdivision approval;
 - v. Short subdivision approval;
 - vi. Construction upon or development of more than one lot of record;
 - vii. Commercial, industrial or multifamily site plan approval;
 - viii. Rezones;
 - ix. Conditional Use Permits;
 - x. Planned unit developments;
 - xi. Building permits, where the permit either: a) authorizes or is for new construction of 40 percent or more square feet of impervious developmental coverage within the property; or b) authorizes or is for new construction which, together with preexisting developmental coverage, would result in 40 percent or more square feet of impervious developmental coverage within the property, or c) is for development within an environmentally sensitive area or which has the possibility of adversely impacting an environmentally sensitive area;

- xii. All construction permits for development in critical flood, drainage, or erosion areas as specified in the ESA ordinance or as determined by the Public Works Director;
- xiii. All projects that involve roadway construction.
- b. All building permits will require that drainage be addressed in the building plans. There are four thresholds for submittals and plan requirements:
 - i. Low Impact Projects - impervious developmental coverage of less than 40 percent within the property not exceeding 5000 square feet impervious surface area,
 - ii. Medium Impact Projects - impervious developmental coverage greater than 40 percent within the property not exceeding 5000 square feet,
 - iii. High Impact Projects - impervious developmental coverage exceeding 5000 square feet or land disturbing activities exceeding one acre, and
 - iv. High Risk Land Uses, as defined below.
- c. Requirements for Submittals and Plans
 - i. Construction plans shall be submitted for review and approval for all storm drain work proposed. There are four categories as described above.
 - (1) Low Impact Projects (less than 40 percent impervious and less than 5000 sq. ft impervious) the following requirements apply:
 - (a) As part of the building permit application, include a scaled drawing showing discharge of roof downspouts, locations of on-site disposal facilities (if proposed), soil infiltration test results (if performed) description of soil amendments or landscaping where proposed for runoff mitigation. If roof downspout tightline discharge is proposed into the public right-of-way or into a public conveyance system, the drawing must clearly indicate outlet locations (from development into public system) and proposed outlet protection or connection.
 - (2) Medium Impact Projects (greater than 40 percent impervious and less than 5000 sq. ft.) the plan submittal requirements as described below in Section 5 Drainage Plans - Contents and Standard Procedures for Medium Impact Projects apply.
 - (3) High Impact Projects (greater than 5000 sq.ft. impervious or greater than one acre land disturbing activities) the following storm drain plan requirements apply:
 - (a) A topographical map shall be submitted by the developer which will indicate the natural drainage patterns of the proposed land development along with the surrounding area. Sufficient adjoining areas shall be included on the map to determine the existing stormwater inflow into the proposed development as well as the areas downstream that will be impacted by the development. The map shall indicate direction of flow, site acreage, tributary acreage,

- the outline of the development, the length of travel and grade of the drainage courses.
- (b) Plans shall be on 24" x 36" sheets with a minimum scale of 1 inch equals 40 feet and may be combined on the plan sheet showing roadway or street improvements.
 - (c) Both plan and profile views of all storm drains must be included.
 - (d) All other utilities existing, or to be constructed, must be shown on plans in a lighter tone.
 - (e) All utility crossings are to be indicated in profile views.
 - (f) Notes must be provided that refer to specific city Standards for such things as catch basins, maintenance holes, grates, restrictors, etc.
 - (g) Plans must indicate elevations for all flow lines, tops of grates or lids, restrictor overflows, orifice sizes, etc.
 - (h) All easements must be shown on plans.
 - (i) General notes required on plans - The following maintenance statement and notes shall be included on site storm drainage plans:
 - (i) All work and materials shall conform to City of Port Townsend Standards and/or WSDOT/APWA Standard Specifications as applicable.
 - (ii) No part of the drainage system shall be covered, concealed or put into use until it has been tested, inspected and accepted by the city.
 - (iii) Approximate locations of existing utilities have been obtained from available records and are shown for convenience. The contractor shall be responsible for verification of locations and to avoid damage to any additional utilities not shown. If conflicts with existing utilities arise during construction, the contractor shall notify the Public Works inspector and any changes required shall be approved by the Public Works Director prior to commencement of related construction on the project.
 - (j) All storm drain work must be staked by survey for line and grade prior to starting construction.
- (4) High Risk Land Uses High risk land uses include practices that may have a significant concentrated effect on water quality. These land uses include but are not limited to fueling stations, auto stores, maintenance shops, car washes, car washes, auto dealerships and businesses that generate soapy or contaminated water as a result of business practices. Additional requirements for

on site treatment and control of stormwater as well as source control practices may apply and shall be determined on a case by case basis. All regulated activities and required designs shall be per the DOE Stormwater Management Manual.

4. Sites Containing or Adjacent to Environmentally Sensitive Areas

- a. Environmentally sensitive areas shall be protected and impact mitigated in accordance with Chapter 19 of the PTMC, the ESA manual, these standards, the conditions of final SEPA approval (if applicable), and the following specific requirements:
 - i. On-site stormwater runoff shall be treated by an approved method prior to discharging into a wetland, stream, river, lake, pond, or the Puget Sound.
 - ii. Surface drainage facilities, such as detention ponds, wetponds, vegetated swales, and infiltration basins, shall be located outside of the associated buffers of all wetlands, streams, rivers, lakes or ponds unless the applicant demonstrates (1) no practicable alternative exists and (2) the functions of the buffer or wetland are not adversely impacted.
 - iii. Naturally occurring or mitigation wetlands may not be used for detention of stormwater, greater than pre-development levels, unless the applicant demonstrates that such detention will have no significant effect on the functions and values of the wetland.
 - iv. Development of a site must not adversely affect the hydrology of wetlands located on or adjacent to the site. The quantity and rate of water entering wetlands must be determined for pre-development conditions. After the site is developed, a similar rate and quantity of roof drainage or treated runoff must continue to be discharged to the wetland(s). A characterization of the hydrology of the wetland(s) on or adjacent to this project that may be affected by the development of this site must be submitted to the Public Works Department for review.
 - v. Discharge of water to wetlands should mimic natural discharges as much as is feasible. Where point source discharges do not occur, this type of discharge should be avoided. Techniques that result in dispersed discharge, such as dispersion trenches or buried perforated pipe located at wetland buffer edges, can be used to mimic naturally occurring sheet flow into wetlands.
 - vi. The applicant may be required to submit a hydrologic study completed by a qualified professional demonstrating conformance with the above standards. The applicant may choose to have the City (or agent thereof) perform such a study and reimburse the City for such costs.
 - vii. Delineation of Environmentally Sensitive Areas shall be conducted so as to represent wet season conditions. Determinations where hydrology is the limiting factor may not occur in the dry season.

5. Drainage Plan - Contents and Standard Procedures for Medium Impact Projects

- a. Developments less than 5000 square feet impervious area may use the standard plans referenced in this section. If the project is located in a critical drainage area, in an environmentally sensitive area, or within a site presenting special problems, the plan must address the special circumstances and may require preparation by a licensed civil engineer.
- b. On slopes over 15%, use of infiltration trenches or runoff spreaders are prohibited. Saturation caused by infiltration of stormwater can cause instability and accelerated soil creep.
- c. Two alternative approaches to on site drainage control are available with the standard plans. One alternative uses an infiltration trench system, requiring an on-site perc test. (This perc test as described may be used to fulfill the requirements for Small Parcel submittals as well.) The other alternative uses an enclosed, subsurface detention system, discharging at an acceptable outfall location. Both approaches have several basic requirements in common.
 - i. Basic Requirements: For both approaches, the following requirements must be satisfied:
 - (1) Prepare a dimensioned site plan sketch of the entire property to scale; show north arrow and note scale.
 - (2) Show all locations where concentrated surface water enters the property, the present drainage route through the property, and present discharge from the property. A description of the type and magnitude of flow should be noted on the plan (for example, "intermittent flow during storms in shallow grass swale"). Show all other surface waters.
 - (3) Show locations of all existing and proposed buildings and other impervious surfaces and show their dimensions.
 - (4) For any route of concentrated flow which is to be changed, show the revised route and the type of channel to be provided. Structures are to be set back at least 10 feet from any closed drainage facility and 15 feet from the edge of any channel or pond. Note, also, that structures must be at least one-foot above the maximum water level in the channel. Stream changes require a State Hydraulic permit.
- d. Infiltration System
 - (1) Conduct at least one field perc test where each infiltration trench is to be located (see perc test instructions below). Show the location of the perc test(s) on the site plan, number each location, and note the design perc rate on the plans "Design Data" table.
 - (2) Use the following Table 1, to determine the required trench length(s) for each 1000 square feet of impervious surface and enter the length(s) in the "Design Data" table.
 - (3) Compute the impervious surface area which will drain to each infiltration trench and enter in the plan's "Design Data" table.

- (4) Compute the actual trench length required for the actual amount of impervious area draining to each infiltration trench and enter the numbers in the “Design Data” table.
 - (5) Add the proposed locations of infiltration trench(es) to the site plan. Dimension the trench(es) on the plan and draw them to scale and in the proper locations. The trenches are to be at least 10 feet from buildings and property lines. The trenches must be level, so they must generally follow the land contours. Trenches should generally be placed downslope from any existing or proposed buildings. Please consult Public Works if you have any questions regarding locations of trenches.
 - (6) Complete the plan by
 - (a) Show tight lines: from roof drains to the system catch basin(s); from the footing drains; and from any driveway drains. Roof drains may not be piped into footing drains.
 - (b) Adding any additional notes you want the builder to know.
 - (c) Filling in the title block with required information.
 - (7) Copy the plan and submit 3 copies with your application.
- i. Perc Test Procedure for Infiltration Systems
- (1) Dig a hole with an approximate diameter of 6 inches to a depth equivalent with the bottom of the proposed trench. The standard tool to use is the post-hole digger.
 - (2) After digging the hole, it is important to carefully scratch the bottom and sides of the hole to eliminate any smeared or sealed surfaces. Remove all loose material from the hole, and place two inches of course sand or fine gravel in the bottom. This is to prevent the bottom surface of the hole from being scoured when water is poured into it.
 - (3) Many soils will tend to swell and lose percolation capacity after being wetted for a period of time. The tendency for a soil to swell is dependent on the quantities of clays having a shrink-swell potential. Therefore, it is important that those soils be allowed to swell prior to performing the percolation test.
 - (4) If a soil is comprised almost entirely of sand (the majority of individual grains visible without magnification), soaking is not required.
 - (5) If the soil contains a significant amount of fine material, the hole must be soaked a minimum of 4 hours (continuous soaking for 24 hours is preferred). The soaking may require periodic addition of water. Percolation measurements are made 24 hours after the start of the soaking period.
 - (6) After soaking, the percolation rate is to be measured by one of the following methods:
 - (a) If water remains in the test hole, add or remove water so

- the water level is six inches above the gravel. Carefully measure the drop in water level over a 30 minute period. Use this data to calculate the perc rate in minutes per inch.
- (b) If no water remains in the hole after the soaking period, add water to six inches above the gravel. Measure the drop in water over a 30 minute period. Use this data to calculate the percolation rate in minutes per inch.
 - (c) If more than 2.5 inches of water drains out within 30 minutes, disregard the previous results. Retest by adding water to six inches above the gravel. Then measure the time it takes for the water to drop 2 inches and calculate the perc rate in minutes per inch.
- (7) It is important to use a six inch diameter hole for the perc tests. Other sizes need to be mathematically adjusted.

TABLE 1 INFILTRATION TRENCH LENGTH	
Perc Rate (minutes per inch)	Trench Length (feet) (Per 1000 square feet of contributing area)
1	15 (minimum)
2	18
3	21
4	24
5	26
6	28
7	29
8	30
9	31
10	32
11	33
12	34
13	34
14	35
15	35

e. Detention System

- (1) Add the proposed location of the underground detention pipe to the site plan (must be downhill from the impermeable surfaces which are to drain to it).
- (2) Select the outflow location (must be downhill from the detention pipe outlet):
 - (a) Where a well defined drainage channel drains the area to be developed, direct the outflow pipe to that channel provided the pipe and the channel at the discharge location are within the property.

- (b) Where a public storm drain or public drainage ditch is within or adjacent to the property, direct the outflow pipe to these facilities. Note that a catch basin is normally required where pipes connect.
 - (c) Where neither of the previous situations exists, perc tests must be performed to assess the feasibility of using the infiltration system. The infiltration system should be used where feasible. If this system is not feasible the detention system outflow must be dispersed over the natural discharge area(s) using runoff spreader(s).
- (3) Compute the impermeable surface area which will drain to the detention system and enter on the “Design Data” table.
 - (4) Choose a detention pipe diameter and find the required detention pipe length for impermeable surface area using Table 2. Enter the pipe diameter and length on the “Design Data” table.
 - (5) Find the required outlet orifice size for the impermeable surface area using Table 3. Enter the outlet orifice size on the “Design Data” table.
 - (6) Complete the plans by:
 - (a) Showing tight lines from roof drains to the system catch basin(s); from the footing drains; and from any driveway drains. Roof drains may not be piped into footing drains.
 - (b) Adding any additional notes you want the builder to know.
 - (c) Add either the runoff spreader detail or the system outlet detail, depending on which one is planned for use.
 - (d) Filling in the title block with required information.
 - (7) Copy the plan and submit 3 copies with your application.

Table 2 Detention Pipe Lengths (in feet)						
Impermeable Area (sq. ft.)	Required Volume (cu. ft.)	Pipe Diameter				
		12"	15"	18"	24"	30"
2000	50		40	28	16	10
2500	62		50	35	20	13
3000	75		60	42	24	15
3500	87		70	49	28	18
4000	100		80	56	32	21
4500	112		90	63	36	23
5000	125		100	70	40	25

Outlet Orifice Sizes	
Impermeable Area (sq. ft.)	Outlet Orifice Diameter (inches)
2000	5/8
2500	5/8
3000	3/4
3500	3/4
4000	7/8
4500	7/8
5000	7/8

6. Drainage Plan Contents for High Impact Projects

- a. For development creating more than 5000 sq. ft. of impervious surface area, or greater than one acre of disturbance, the minimum requirements as outlined in the DOE Stormwater Management Manual apply. Thresholds for new and redevelopment as described in the SWMM will be used to determine plan requirements. In general, the two major components of a large parcel drainage plan are an erosion and sediment control plan (see Chapter 5) and a Permanent Stormwater Quality Control Plan. All large parcels must conform to the DOE SWMM Minimum Requirements 2-11 (SWMM Chap I-2) for submittal of PSQAs.
- b. Stormwater Quantity Control Requirements for plan submittal. The City of Port Townsend will use the runoff control requirements as described in the DOE SWMM Minimum Requirement #5 Chap I-2.9 limiting discharge from the site for all large parcels. These requirements are discussed in the next section Design Standards for Large Parcels. In general, the following computations and information are required for submittal of a Large Parcel Drainage Plan.
 - i. Background computations for sizing drainage facilities:
 - (1) Depiction of the drainage area on a topographical map of approved scale and contour interval, with acreage of the site, development, and developmental coverage indicated.
 - (2) Indications of the peak discharge and volume of surface water currently entering and leaving the subject property due to the design storm.
 - (3) Indication of the peak discharge and volume of runoff which will be generated due to the design storm within the subject property if the development or proposed activity is allowed to proceed.
 - (4) Determination of the peak discharge and volume of water that will be generated by the design storm at various points on the subject property.
 - ii. Proposed measures for handling the computed runoff:
 - (1) The design storm peak discharge from the subject property may not be increased by the proposed development.
 - (2) Retention/detention facilities must be provided in order to maintain surface water discharge rates at or below the existing design storm peak discharge.
 - iii. Proposed measures for controlling runoff during construction:
 - (1) See Chapter 5 - Clearing, Grading and Erosion Control, for requirements.
- c. The following General Conditions and those in Chapter 1- Section 8 shall be included on any plans dealing with stormwater/storm drainage systems when a permit is required.
 - (1) All storm drain mains shall be high velocity cleaned and low pressure tested in accordance with WSDOT/APWA Specifications

- prior to final paving.
- (2) Prior to backfilling, all storm drains and appurtenances shall be inspected and approved by the city's inspector. Approval shall not relieve the owner and contractor for correction of any deficiencies and/or failure as determined by subsequent testing and inspections. It shall be the contractor's responsibility to notify the city for the required inspections.
 - (3) Special structures, oil/water separators and outlet controls shall be installed per plans and manufacturer's recommendations.
 - (4) The city construction inspector shall be notified a minimum of 48 hours in advance of a tap connection to an existing storm main. The inspector shall be present at the time of the tap.
- d. Common detention, water quality treatment and conveyance standards are included in the following section General Design Standards. This section is not meant to replace or supersede those requirements of the DOE SWMM. It is meant to aide the designer in completion of plans for the more common facilities. Should any of these standards conflict with those of the DOE SWMM, the Director of Public Works or his/her designee shall use their professional judgment in determining which standard shall prevail.

7. General Design Standards for High Impact Projects

- a. Design Storm Criteria
 - i. Stormwater Discharge Rates: The water runoff from the site shall be limited to the peak rate of runoff from the individual development sites to 50 percent of the existing 2-year, 24-hour design storm while maintaining the existing conditions peak runoff rate for the 10-year, 24-hour and 100-year, 24-hour design storms.
 - ii. Retention/Detention Facilities:
 - (1) Retention/detention facilities will be required as needed to achieve the discharge standards as described above.
 - (2) No retention/detention facility shall be located in an area that is used to satisfy an open space requirement, without prior approval. Facilities that enhance a recreational amenity or are located underground may be acceptable.
 - (3) Retention/detention facility design and volume calculation shall be in accordance with Chapter III-4 of the DOE Stormwater Management Manual. Retention/detention discussed in this chapter will be applied by the City Engineer on a case by case basis where water quantity control is required for streambank erosion control or inadequate downstream facilities.
 - iii. Stormwater Conveyance Systems: Stormwater or storm drainage conveyance systems shall be designed for a 25-year design storm event. (See DOE Stormwater Management Manual, Chapter III-2, for guidance)
 - (1) While the method of calculation and the responsibility for adequate

sizing of the facility rests with the engineer involved, the criteria that the city will use to judge the adequacy of the facility are based upon the minimum computational standards contained in Chapter III-1, Hydrologic Analysis, of the DOE Stormwater Management Manual.

- (2) The infiltration rate shall be based upon soils investigation and analysis for the proposed infiltration area. Any testing shall be conducted so as to represent antecedent saturated soil conditions. Test results shall accompany storm calculations. Such testing shall be performed by a qualified engineer or septic system designed certified by Jefferson County. (See DOE Stormwater Management Manual Chapter III-3, for guidance)

iv. Closed Depression Analysis:

- (1) The analysis of closed depressions requires careful assessment of the existing hydrologic performance in order to evaluate the impacts a project may have. The design of facilities within a closed depression shall conform to the DOE SWMM III-1.5
- (2) More stringent standards for conveyance, retention/detention and off-site analysis may be required on a case by case basis.
- (3) Typical event simulation models used in hydrologic analysis may not be adequate to assess the impacts of development within a closed depression. The Director may determine that a continuous simulation model is required to fully assess the impacts of the development. The applicant may employ the option of having the City (or an agent thereof) complete the study and reimburse the City for such costs.

8. Easements

- a. When a closed system is used to handle drainage within the subject property, all structures must be a minimum of 10 feet from the system.
- b. There shall be a minimum drainage easement of 15 feet in width for publicly maintained open channel or closed system installations.
- c. No structures shall be erected within any drainage easement. Construction of a fence across an easement is allowed provided a 15-foot wide access gate is provided.
- d. All easements, except for special circumstances, shall be located to run within single lots rather than being split by a lot line.
- e. The minimum width of an access way from an established city street to a drainage facility shall be 15 feet.

9. Drainage Facilities

- a. General Requirements
 - i. Drainage facilities include those facilities designed to provide stormwater conveyance, quantity control, and/or water quality enhancement. These

- facilities can be surface facilities, or underground facilities.
 - ii. All surface drainage and stormwater quality enhancement facilities (including detention ponds, wetponds, vegetated swales, and infiltration basins) shall be landscaped so as to provide slope stability and a pleasant appearance by utilizing sodding and/or seeding. Under no circumstances shall the use of materials that may be eroded or floated easily (such as beauty bark) be permitted in surface ponds or basins, or vegetated swale interiors. Trees and/or shrubbery shall not be planted on detention or wetpond raised berms, but are acceptable for the upper slopes of excavated ponds (below ground level).
- b. Topsoil Requirements
- i. Topsoil used in constructing drainage facilities such as vegetated swales and wetponds shall meet the Standard for Topsoil A, as specified in WSDOT/APWA Standard Specifications Section 9-14.1(1) with the following modifications: 100% of the topsoil shall pass through a 1/2 inch sieve.
 - ii. The following are important excerpts from WSDOT/APWA Standard Specifications Section 9-14.1(1), with city modification.
 - iii. Topsoil shall be free from materials toxic to plant growth, noxious weeds, rhizomes, roots, subsoil, stones, and other debris.
 - iv. Topsoil Type A shall consist of a sandy clay loam, sandy loam, loam, clay loam, silty clay loam, or silt loam soil. The mix may not be more than 50% sand or 20% clay. Total organic matter shall be 1% to 10%. A maximum of 20% of the mix volume may be retained on a 1/4" sieve.
- c. Fencing Requirements
- i. The City of Port Townsend prefers designs which minimize the need for fencing around stormwater facilities. Ponds and basins with a maximum design depth of water greater than three feet will not require perimeter fencing if one of the following conditions is met:
 - (1) The facility is designed and constructed with a 10 foot wide safety bench for every three feet of depth, the interior side slopes are no greater than 3 horizontal to 1 vertical and the perimeter is planted with rosebush or another natural hedge to discourage entry into the pond; or
 - (2) The facility is designed and constructed so that the maximum water depth of the facility does not exceed 3 feet during a 2 year, twenty-four hour storm nor exceed 3 feet during a twenty-five year, twenty-four hour storm for a maximum of 4 hours; the maximum side slope of the facility does not exceed three horizontal to one vertical; and the perimeter is planted with rosebush or another natural hedge to discourage entry into the pond; or
 - (3) The city council reviews a proposed facility designed and approved by a licensed engineer or architect which meets neither

the requirements of the above two conditions herein and exercising its discretion makes a policy determination that either no fencing will be required or fencing less than 6 feet in height will be required. Issues considered by the council when making this determination include but are not limited to: (1) reasons why the proponent does not want to construct a fence 6 feet in height; (2) purpose(s) the facility is to serve; (3) design considerations of the facility; (4) safety considerations of the facility without the fencing or with fencing reduced in height; and (5) such additional issues as the council feels are appropriate.

- ii. Surface ponds and infiltration basins with a maximum depth of 3 feet or less will not require fencing provided the maximum interior side slope of the pond does not exceed three horizontal to one vertical. A natural hedge of rosebushes or other shrub should be planted to discourage entry into the pond.
 - iii. All ponds or basins determined not to require fencing will require signage warning the public against swimming and ice skating as well as flood conditions.
 - iv. All ponds or basins with a maximum depth of water greater than three feet that do not meet one of the above conditions will require a six foot high perimeter fence. When fencing is required around a facility to be dedicated to and/or maintained by the city, the fence shall be a 6 foot high chain link fence with thermally bonded, not sprayed or dipped on, polyvinyl chloride (PVC) coating. The PVC coating shall not be subject to fading, cracking, peeling, or shrinkage and shall be brown, black, or some shade of natural green (such as pine, forest, or olive). The fence manufacturer shall provide a 15 year (minimum) warranty on the chainlink fence and the PVC coating.
 - v. Fencing slats will be allowed, subject to the same color restrictions as the PVC coating, if the slats proposed are non-brittle, crack-resistant, locked in place in a bottom retaining channel, and non-fading.
 - vi. The chainlink fence shall meet all applicable specifications set forth in the WSDOT/APWA Standard Specifications.
- d. Berm Requirements
- i. All berms or embankments constructed for surface ponds and basins shall be compacted to at least 95% of the maximum relative density in lifts not to exceed 6 inches in depth.
 - ii. Berm soils shall consist of material conforming to the following gradation:

<u>Sieve Size</u>	<u>% Passing</u>
3"	100
#4	65-90
#200	12-20

10. Wetponds

- a. General
 - i. The City of Port Townsend prefers wetponds to dryponds as they provide both detention and water quality treatment. The term “wet” pond comes from the fact that the bottom of the pond of standing water in a wetpond. In addition to this permanent storage volume in the wetpond, the outlet from the pond is typically restricted to provide additional live storage for shorter term treatment during storms.
 - ii. Wetponds shall be designed in accordance with these standards and the DOE Stormwater Management Manual, and shall be prepared by a licensed engineer.
 - iii. Wetponds shall be designed to have at least two cells. At the inlet to the wetpond, a deep water area, called the open water cell, is provided to encourage settling of sediments associated with stormwater. From the open water cell, the water flows to a shallow area planted with wetland vegetation called the wetland treatment cell. See Standard Details for illustration. As an alternative to providing an open water cell, an equivalent volume of water may be provided as dead storage in a wet vault. This alternative has the advantage of requiring less surface area, results in a more pleasing pond appearance, and often eliminates the need for fencing.
- b. Design Criteria
 - i. Wetponds shall be sized in accordance with the DOE SWMM requirements.
 - ii. A flow restricting device at the wetpond outlet shall be provided so that the discharge rate from the pond is at a rate no higher than predevelopment levels.
 - iii. Pretreatment shall be provided upstream of the wet pond.
 - iv. A planting schedule for the wetland treatment cell shall be provided for approval by the city.
- c. Construction requirements
 - (1) Over-excavate the wetland treatment cell by a minimum of 6 inches as compared to final grade. After the treatment cell area has been graded, roughen the bottom and sides of the treatment cell by raking and place topsoil (a minimum of 6 inches) to bring the bottom elevation to final design grade.
 - (2) Sod or hydroseed the treatment cell banks immediately after the topsoil has been placed. If sod is used, lay sod to a minimum of 1 foot of vertical depth above the bottom of the treatment cell. Lay the sod pieces with their long axis perpendicular to the direction of flow in the cell and stagger the pieces to avoid a continuous longitudinal seam in the bottom of the cell.
 - (3) To plant the required wetland vegetation, punch holes in the sod with a bar or stake approximately equivalent to the diameter of the

plants' root wads. Insert the plants in the holes and tamp the sod and earth down around the plants. Locate the plants in the bottom of the treatment cell only and in a staggered pattern - not in a straight line.

- d. Approval of Wetpond Design Calculations
 - i. The following information shall be submitted for review and approval of wetpond design:
 - (1) Wetpond sizing calculations, including calculation of wetpond design volume, wetpond permanent volume, and design volumes for the wetland treatment cell and open water cell.
 - (2) Orifice sizing calculations.
 - (3) Stage-storage relationship of the pond.
 - (4) Results of routing the design storm through the pond, showing at a minimum the inflow hydrograph, outflow hydrograph, and the storage volume required.
 - (5) The wetland treatment cell planting schedule.
 - (6) The type of vegetation to be planted in the wetland treatment cell, the planting locations of different species, the density of the plantings, and the total number of plants needed.
 - (7) Location of fence, if required, and gates for access to the pond.
 - ii. Restrictor Design
 - (1) Restrictors for detention systems shall be constructed and installed per the Standard Details. Multiple orifice restrictors will be required where the detention system is designed based on a pre-development storm return frequency of 5 years or greater, or on large sites.

11. Vegetated Swales

- a. General
 - i. Vegetated swales may be used for treatment and conveyance.
 - ii. Two classes of vegetated swale shall be defined according to the slope of the swale. A swale with a slope of 2-4% is designated a grass swale. A swale with a slope of less than 2% is designated an emergent swale.
 - iii. Vegetated swales shall not be located where they will be subject to heavy and prolonged shading.
 - iv. Swale design shall be in conformance with the DOE Stormwater Management Manual or Biofiltration Swale Performance, Recommendations, and Design Considerations (Municipality of Metropolitan Seattle, 1992) and plans shall be prepared by a licensed engineer and submitted to the City for review and approval.
- b. Design Criteria
 - i. Vegetated swales shall be designed to provide a minimum hydraulic residence time of 9 minutes for the peak runoff flow rate from the 2 year, 24-hour storm.

- ii. Swales shall be designed and constructed with a trapezoidal cross section. Bottom widths shall range from 1 to 8 feet, and the sides of the swale shall have a maximum slope of 3:1 (horizontal:vertical).
 - iii. The maximum allowable velocity in vegetated swales shall be 0.9 feet per second.
 - iv. The maximum allowable longitudinal slope for vegetated swales shall be 4%.
 - v. The swale inlet shall be designed to provide energy dissipation and to uniformly distribute flow at the head of the swale.
 - vi. Swales located in the public right-of-way, parallel to roadways, shall have a minimum bottom width of 2 feet and shall have side slopes no steeper than 5:1 (horizontal:vertical).
 - vii. Vegetated swales shall be designed and constructed with a minimum of 0.5 feet of free-board above the maximum design depth.
 - viii. The entire associated side slope of the swale, from the bottom of the swale to the top of the adjacent bank, shall have a maximum slope of 3:1 (horizontal:vertical) unless rockeries or retaining walls are used.
 - ix. Neither rockeries nor retaining walls shall be designed to provide the required swale free-board depth. Therefore, for a swale with 3:1 side slopes, a retaining wall or the base of a rockery must be a minimum of 1.5 feet (horizontal distance) beyond the high water mark in the swale.
- c. Planting Requirements for Vegetated Swales
- i. A cover material shall be established in both grass and emergent swales and shall be over-seeded with the seed mix as recommended in the DOE SWMM or Metro Study. Five pounds of seed shall be applied per every 1,000 square feet of swale bottom.
 - ii. Emergent swales shall be planted with wetland vegetation. The species to be used are recommended in the DOE SWMM or the Metro study. Four separate species shall be planted, at a frequency of 25 plants of each species per every 100 square feet of swale (for an overall density of one plant per square foot of swale bottom). Weedy and invasive species such as cattail, purple loosestrife, reed canarygrass and giant reed should be avoided.

Seed Mix for Grass and Emergent Swales

<u>Grass Species</u>	<u>Percentage by Weight</u>
----------------------	-----------------------------

Option 1

Meadow Foxtail (<i>Alopecurus pratensis</i>)	40%
Alta Fescue (<i>Festuca pratensis</i>)	25%
Redtop Bent Grass	20%

(<i>Agrostis alba</i>)	
Red Fescue	10%
(<i>Festuca rubra</i>)	
Birdsfoot Trefoil	5%
(<i>Lotus corniculatus</i>)	

Option 2 (from Municipality of Metropolitan Seattle, Biofiltration Swale Performance, Recommendations, and Design Considerations, Publication 657, October 5, 1992)

Tall fescue	67%
Seaside bentgrass	16%
Meadow foxtail	9%
Alsike clover	6%
Marshfield bit trefoil	1%
Inert matter	1.5%
Weed seed	0.5%

d. Vegetated Swale Construction

i. General Considerations

- (1) Vegetated swales should be constructed early in the construction sequence in order to give vegetation a chance to establish before the swales are necessary as a part of the permanent storm drainage system. As a general rule, silt-laden construction runoff should not be routed through completed vegetated swales.
- (2) If vegetated swales are used as a component of the temporary erosion control plan, they shall be graded to final specification and sodded before receiving construction runoff. After construction on the site has been completed, all dead or dying sod, or sod covered with silt, shall be removed and replaced. If construction ends in the winter, when newly planted sod would not be expected to survive, accumulated sediment can be hand removed from the swale and dead and dying sod replaced at the beginning of the growing season. Wetland plants required for emergent swales should not be planted in the swale until the swale has been re-sodded after construction ends.
- (3) To prevent the swale from becoming a sediment source, it must be stabilized immediately after it has been graded. The recommended method for providing immediate swale stabilization and pollutant removal ability is to sod the swale per the construction requirements below. Alternatively, swales may be seeded during the summer months, May 15 to September 15. The proponent will be responsible for establishment of sufficient cover vegetation to provide for erosion control.

- (4) Wetland plants ideally should be planted between October 15 and March 15. A bond may be required from the contractor to ensure the viability of the plants.
 - (5) Provide irrigation as necessary to assure establishment of planting.
- e. Maintenance Requirements
 - i. Swales may require irrigation during dry summer months and during establishment of vegetation, especially emergent swales.
 - ii. Viable vegetation is important to the function of the swale and dead or unhealthy vegetation shall be replaced as necessary. Appropriate maintenance shall be performed to ensure healthy vegetation. Accumulations of sediment in the bottom of swales that cover vegetation or reduce the swale's capacity shall be removed. Accumulated sediments shall be removed by hand, with a flat bottom shovel, during summer months. Bare areas shall be re-seeded immediately.
 - iii. Regular mowing for grass lined swales is important for both the viability of the vegetation and for water quality treatment. Grass height should be maintained above the design flow level. Grass clippings shall be removed from the swale.
- f. Approval of Vegetated Swale Design Calculations
 - i. The following information shall be submitted for review and approval of vegetated swale design calculations and plans:
 - (1) Design flow calculations
 - (2) Velocity and flow depth calculations
 - (3) The hydraulic residence time in each vegetated swale.
 - (4) Bypass sizing calculations
 - (5) A copy of site plan showing the contributing area
 - (6) The proposed seed mix and wetland plant list.
 - (7) The vegetated swale construction.
 - (8) Elevations in the bottom of the swale at the head of the swale, at the swale outlet, and at approximately 50-foot intervals along the length of the swale.

12. Piping

- a. General
 - i. All pipe joints shall be rubber gasketed. Culverts which flow under driveways from one open ditch to another, with a maximum length of 100 lineal feet may be mortar joint pipe.
 - ii. The minimum velocity in any pipe or culvert carrying the design storm flow shall be 2 feet per second, except for pipe installed as equalizers or a direct part of the detention system.
 - iii. The maximum allowable velocity in concrete pipe shall be 30 feet per second.
 - iv. A catch basin or maintenance hole will be required at all changes in storm drain diameters and changes in grade or alignment.

- v. Storm drain pipes installed in easements shall be constructed as nearly as possible in the center of the easement, but in no case shall the pipe be within 5 feet of any structure or property line.
 - vi. Any closed storm drain system collecting runoff from paved areas in the public right-of-way or private property shall provide for floatable material separation prior to discharge to the main storm drain system in the public right-of-way unless otherwise approved by the Public Works Director.
- b. Pipe Materials
- i. Pipe materials, joints and protective treatments shall conform to the requirements set forth in WSDOT/APWA Standard Specifications Section 9-05. The pipe materials and specifications included below are for conveyance systems installed for development and construction in the City of Port Townsend. The use of other pipe materials on private property that are not part of the drainage system requirements are not excluded from use provided they are installed and maintained by the private property owner.
 - ii. Pipe materials that are allowed for use in storm drainage systems in the City of Port Townsend are as follows:
 - (1) Plain concrete pipe (12 inches diameter only and used only for driveway culvert).
 - (2) Reinforced concrete pipe.
 - (3) Ductile iron pipe.
 - (4) Galvanized corrugated iron or steel pipe, treatment 1 through 6.
 - (5) PVC pipe (SDR35, ASTM D3034 with minimum 3 feet of cover).
 - (6) Corrugated high density polyethylene pipe, with smooth interior.
 - iii. Coupling bands shall be of the same material as the pipe. Gaskets will be required for all underground detention systems.
- c. Sizing
- i. No storm drain pipe between catch basins or maintenance holes in the public right-of-way shall be less than 12 inch diameter, with the exception that an 8 inch culvert may be used between inlets and catch basins in runs of 50 feet or less. Storm drainage pipe in the public right-of-way will be sized for a 10 year storm. In areas of high potential for flooding on private property, a 25 year design storm shall be used.
 - ii. Debris barriers (trash racks) may be required on culvert inlets, when in the opinion of the Public Works Director circumstances warrant the elimination of miscellaneous flowing debris.

13. Maintenance Holes, Inlets, and Catch Basins

- a. Description
- i. This work shall consist of constructing maintenance holes, inlets and catch basins of the types and sizes designated in accordance with the plans, these specifications, the Standard Plans, and WSDOT/APWA Standard Specifications Section 7-05.

b. Materials

i. Materials shall meet the requirements of the following sections of the WSDOT/APWA Standard Specifications:

<u>Item</u>	<u>Section</u>
Concrete	6-02
Rubber Gaskets	9-04.4
Metal Castings	9-05.15
Reinforcing Steel	9-07
Masonry Units	9-12

ii. Maintenance holes, catch basins and inlets shall be constructed of pre-cast units in accordance with the Standard Details.

iii. Construction Requirements

- (1) The cover or grating of a maintenance hole or catch basin shall not be grouted to final grade until the final elevation of the pavement, gutter, ditch, or sidewalk in which it is to be placed has been established, and until permission thereafter is given by the engineer to grout the cover or grating in place. Covers shall be seated properly to prevent rocking.
- (2) The maximum spacing between catch basins shall not exceed 300 feet. For roadways wider than 48 feet, the spacing shall not exceed 200 feet. Catch basin spacing based on percent of roadway grade is as follows:

<u>Percent Grade</u>	<u>Maximum Spacing</u>
0.5-1.5	150 feet
1.5-3.0	200 feet
3.0-8.0	300 feet
8.0-12.0	200 feet
12.0-20.0	150 feet

- (3) Concrete inlets shall not be used where discharge pipe goes directly into main storm drain system. In cases where direct discharge into storm drain system is called for, a floatable material separator will be required.
- (4) Except as otherwise approved, all manholes, catch basins, or inlets more than 5-1/2 feet of depth from the pipe invert to the grate shall be provided with a ladder.
- (5) Storm drain maintenance holes and Type 2 catch basins functioning exclusively as access structures shall be equipped with round 24 inch covers and frames. Round lids on all storm drain structures shall have "Drain" cast into the lid.
- (6) All catch basins and maintenance holes not in a paved area shall be equipped with locking frames and lids or grates.
- (7) All PVC connections to catch basins or maintenance holes shall be made by grouting in an approved maintenance hole adapter into

- which the PVC pipe is inserted.
- (8) In conditions when the effectiveness of a normal grate installation would be limited, an open grate face inlet frame and grate shall be furnished and installed. These conditions usually occur due to high likelihood of clogging from leaf fall, especially in sag vertical curves; when the inlet is a surface drainage end point, such as a cul-de-sac and when the road grade is such that normal inlet grates are passed over during storms. The use of open curb face frame and grates must be approved by the Public Works Director.
 - (9) All Type 2 catch basins and all maintenance holes with catches shall be supplied with locking lids or grates.
- iv. Maintenance
- (1) Accumulated sediments shall be removed from maintenance holes and catch basins when accumulated sediment reaches a depth of 6 inches or more.

14. Trash Racks

- a. General
 - i. Trash racks are provided on pipe inlets and outlets to and from surface drainage facilities to prevent plugging of the opening with debris and to provide safety to the public. In the City of Port Townsend, all such pipes 12 inches in diameter or larger shall be equipped with a trash rack for public safety. Smaller pipes shall be equipped with trash racks when plugging with debris is perceived to be a potential problem.
- b. Design Criteria
 - i. A net area of trash rack not less than 20 to 40 times the area of the outlet shall be provided for outlets with a 6 inch or less diameter.
 - ii. For outlets 24 inches in diameter or larger, a net area of trash rack not less than four times the area of the outlet shall be provided.
 - iii. The spacing between the openings of the trash rack shall be 6 inches or less, or smaller than the smallest dimension of the outlet.
 - iv. All trash racks shall be sloped at 30 to 50 degrees above the horizontal.
 - v. A 4 to 6 inch horizontal opening at the bottom of the trash rack may be provided on larger outlets to allow smaller debris to flush straight through.

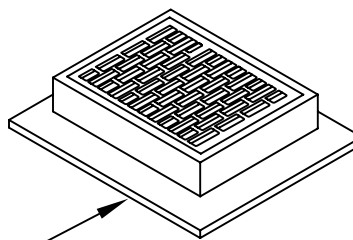
CHAPTER 4 - APPENDIX

Exhibit #	Standard Detail #	Title
1	SW- 1	Stormwater Precast Concrete Inlet
2	SW- 2	Standard Drainage Plan Infiltration System
3	SW- 3	Stormwater Catch Basin Type 1
4	SW- 4A	Stormwater Catch Basin Type 2
5	SW- 4B	Stormwater Catch Basin Type 2 (48" or 54")
6	SW- 5	Floatable Material Separator or Gas Trap (12" and Larger)
7	SW - 6	Open Curb Face Frame and Grate Installation
8	SW - 7A	Grate Detail for Catch Basin of Inlet
9	SW- 7B	Frame for Grate of Solid Cover
10	SW- 7C	Grate for Catch Basin or Inlet
11	SW - 8	Polypropylene Ladder and Maintenance Step
12	SW - 9	Pipe Outfall
13	SW - 10	450 Gallon Bottle Type Oil/Water Separator
14	SW - 11	Floatable Material Separator and/or Gas Trap (6" or 8")
15	SW -12B	Restrictor Unit and Lift Gate Assembly
16	SW - 12A	Lift Gate Assembly and Secondary Orifice Detail
17	SW - 13	Typical Frame and Grate Installation
18	SW - 14	Typical Dry Detention Pond
19	SW - 15	Vegetated Swale
20	SW - 16	Standard Drainage Plan Detention System

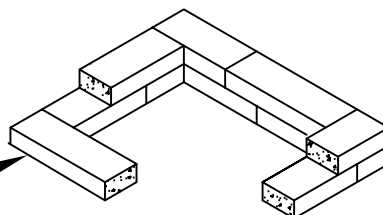


City of Port Townsend - Public Works Department

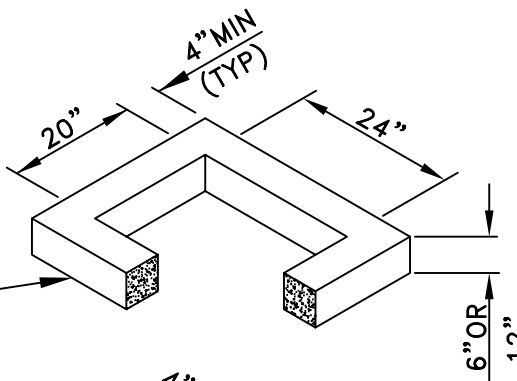
Standard Detail



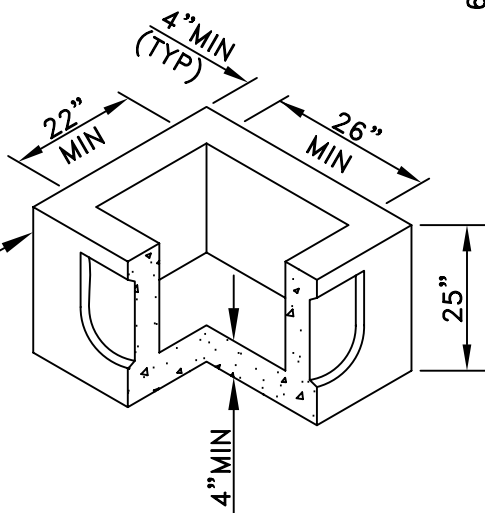
FRAME AND OPEN GRATE



2"x4"x8" SOLID BRICK
USED FOR FINAL ADJUSTMENT
TO GRADE. 6" HIGH MAX



6" OR 12" CONCRETE
RISER SECTION
CLASS 4000 CONC



PRECAST CONC BASE SECTION
W/MAX OF ONE 17"Ø KNOCKOUT
PER SIDE. ENTRANCE ANGLE
TO BE LIMITED BY KNOCKOUTS
CLASS 4000 CONC
PIPE OUTER DIA PLUS
INLET WALL THICKNESS
SHALL NOT EXCEED 17".

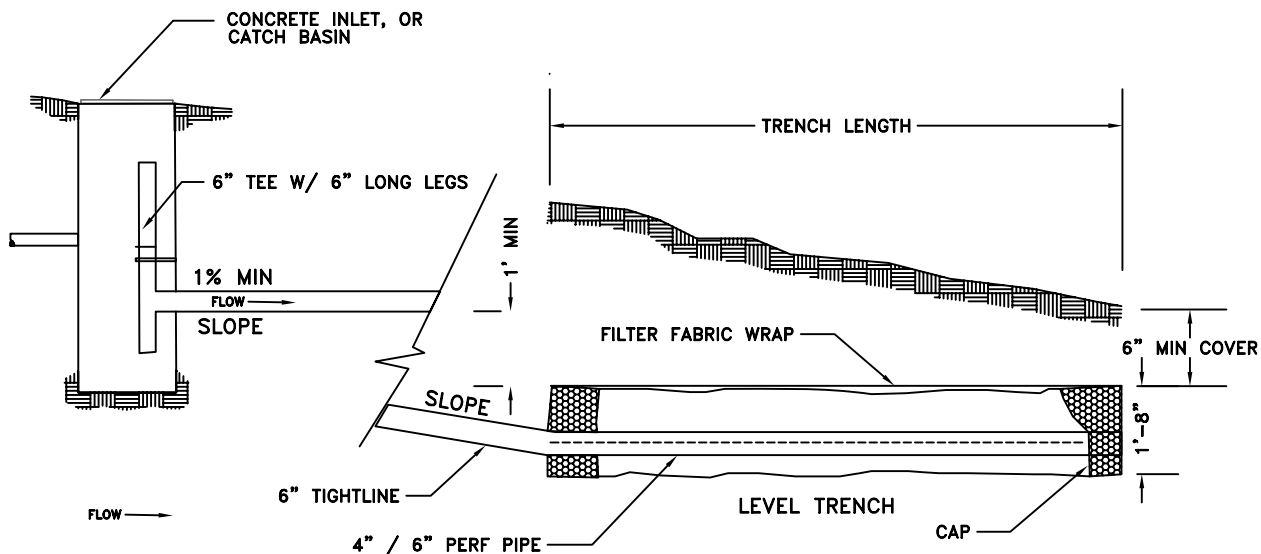
INLET TO CONFORM TO WSDOT STANDARD PLAN B-26

Date: April 1997	No.	Date	Revision	By	Apvd	Stormwater Precast Concrete Inlet Detail: SW-1
Approved By:						
File: E:\eng_std\standard\storm						

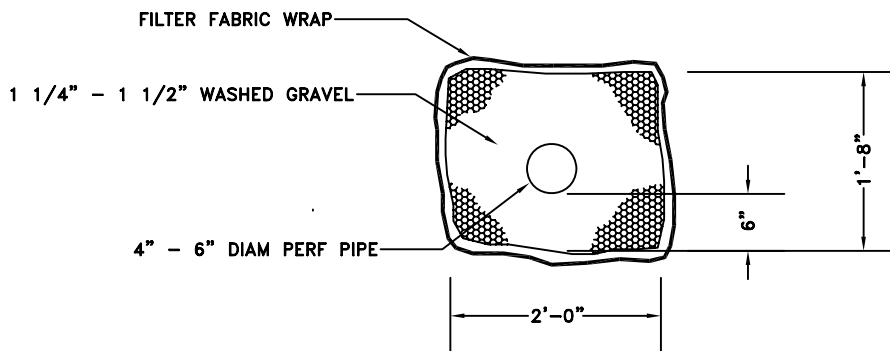


City of Port Townsend - Public Works Department

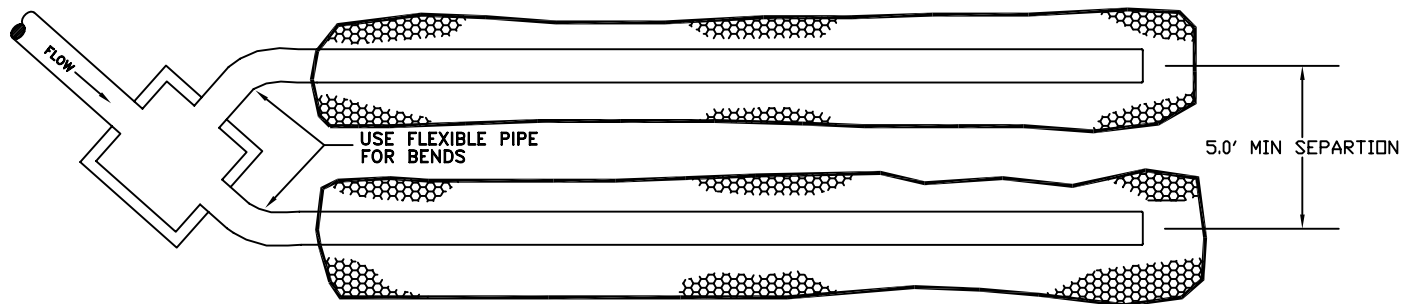
Standard Detail



SYSTEM CROSS-SECTION



TRENCH CROSS-SECTION



DOUBLE TRENCH SYSTEM

Date: April 1997

Approved By:

File: E:\eng_std\standard\storm

No.	Date	Revision	By	Apvd

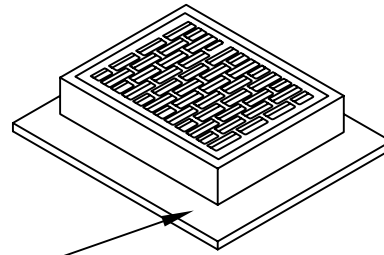
Standard Drainage Plan
Infiltration System

Detail: SW-2

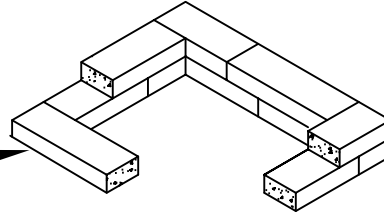


City of Port Townsend - Public Works Department

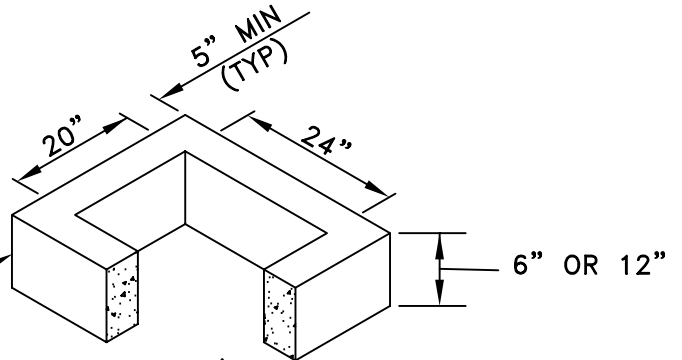
Standard Detail



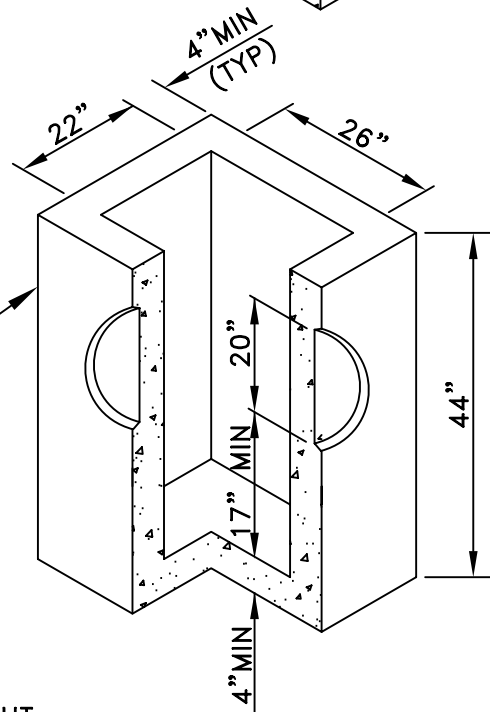
VANED GRATE PER STD SW-7A
SOLID COVER PER STD SW-7B



2"x4"x8" SOLID BRICK
USED FOR FINAL ADJUSTMENT
TO GRADE. 6" HIGH MAX



6" OR 12" CONCRETE
RISER SECTION
CLASS 4000 CONC



PRECAST CONC BASE SECTION
W/MAX OF ONE 20"Ø KNOCKOUT
PER SIDE, ENTRANCE ANGLE
TO BE LIMITED BY KNOCKOUTS
CLASS 4000 CONC
PIPE OUTER DIA PLUS CB
WALL THICKNESS SHALL
NOT EXCEED 20".

NOTES:

1. ALL JOINTS WILL BE MOTARED IN AND OUT.
2. CATCH BASIN TO CONFORM TO WSDOT STANDARD PLAN B-1

Date: April 1997

Approved By:

File: E:\eng_std\standard\storm

No.	Date	Revision	By	Apvd

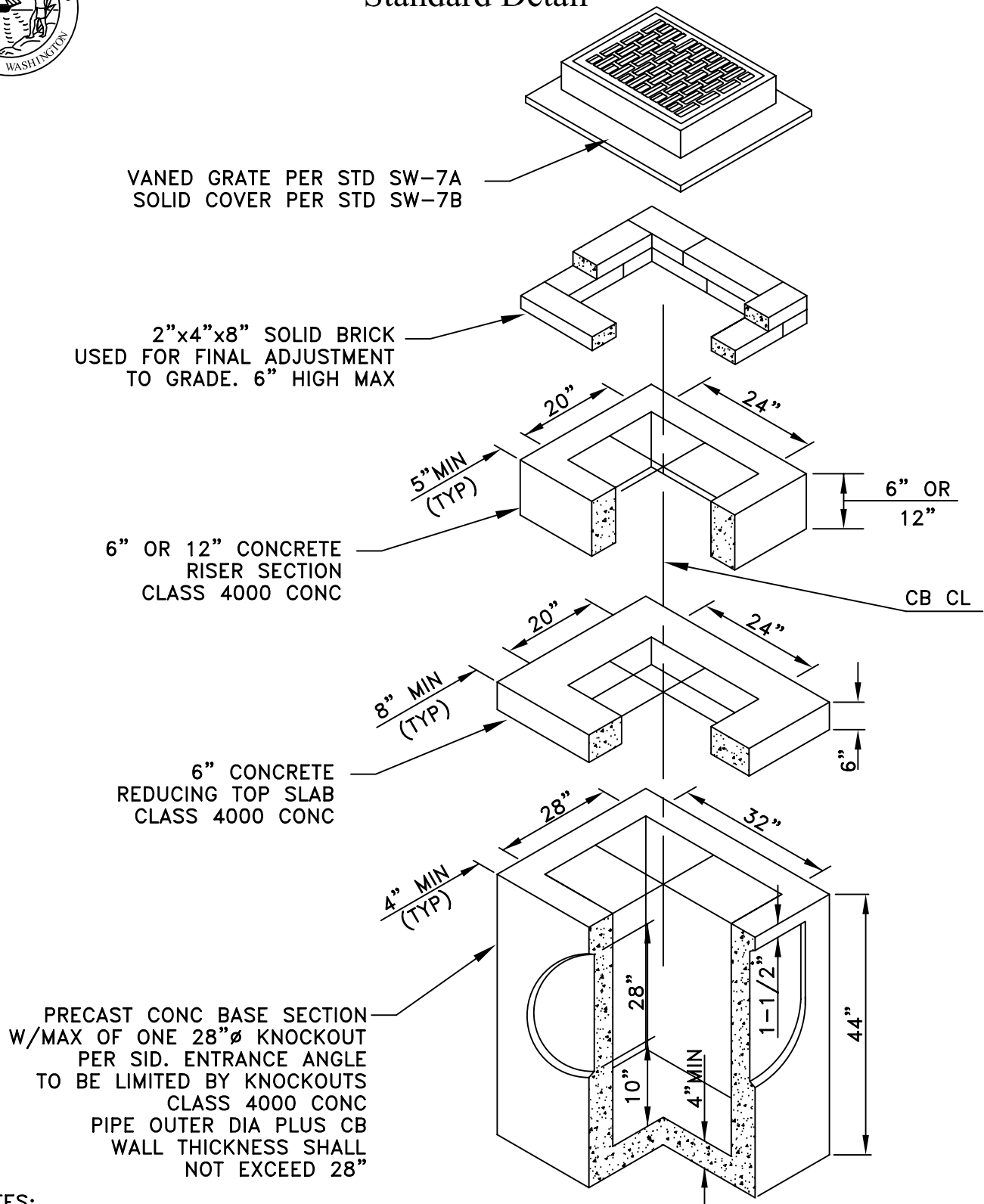
Stormwater
Catch Basin Type 1

Detail: SW-3



City of Port Townsend - Public Works Department

Standard Detail



NOTES:

1. ALL JOINTS WILL BE MOTARED IN AND OUT.
2. CATCH BASIN TO CONFORM TO WSDOT STANDARD PLAN B-1A

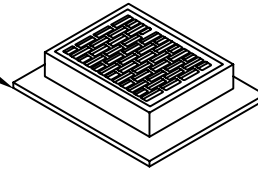
Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Stormwater Catch Basin Type 2</h3>
Approved By:						Detail: SW-4A
File: E:\eng_std\standard\storm						



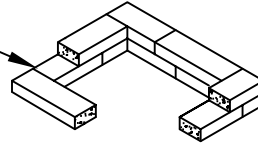
City of Port Townsend - Public Works Department

Standard Detail

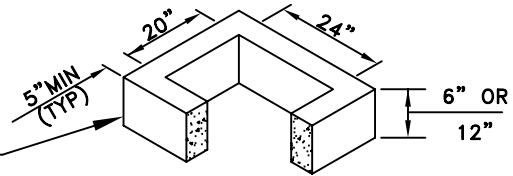
VANED GRATE PER STD SW-7A
SOLID COVER PER STD SW-7B



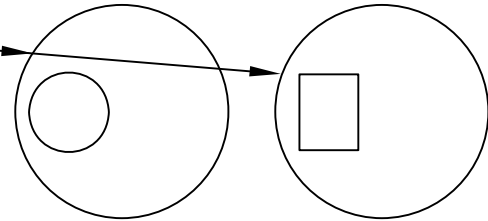
2"x4"x8" SOLID BRICK
USED FOR FINAL ADJUSTMENT
TO GRADE. 6" HIGH MAX



6" OR 12" CONCRETE
RISER SECTION
CLASS 4000 CONC

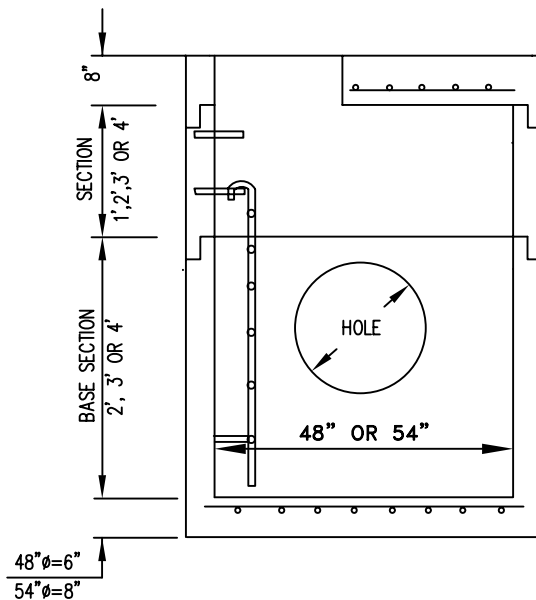


TOP SLAP WITH
24" ROUND ACCESS OR
20"x24" RECTANGULAR ACCESS



NOTES:

- 1 ALL TYPE 2 CB'S EQUIPPED WITH OPEN GRATES SHALL BE LOCKING TYPE.
- 2 ALL TYPE 2 CB'S NOT IN PAVED AREAS SHALL BE EQUIPPED WITH LOCKING LIDS,
- 3 CB'S SHALL BE SET SO THAT STEPS ARE DIRECTLY UNDER OPENING.
- 4 ALL TYPE 2 CB'S SHALL BE EQUIPPED WITH STEPS AND LADDER PER STD SW-8
- 5 CONCRETE SHALL BE CLASS 4000.
- 6 MIN DISTANCE FROM INVERT TO CB BOTTOM SHALL BE 2.0'.
- 7 CB SECTIONS AND LID WILL BE HS20 TRAFFIC LOAD CERTIFIED BY MFG.
- 8 HOLE SIZE = PIPE OD + 5". MAX
MAX HOLE SIZE = 36" (48" CB)
MAX HOLE SIZE = 42" (54" CB)



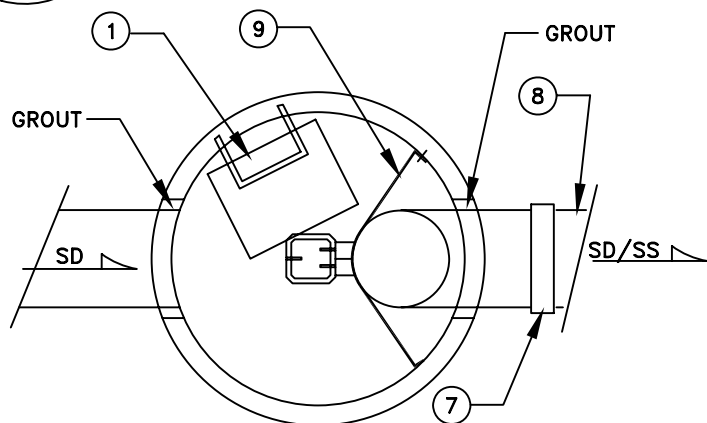
CATCH BASIN TO CONFORM TO WSDOT STANDARD PLAN B-1E

Date: April 1997	No.	Date	Revision	By	Apvd	Stormwater Catch Basin Type 2 (48" or 54")
Approved By:						Detail: SW-4B
File: E:\eng_std\standard\storm						

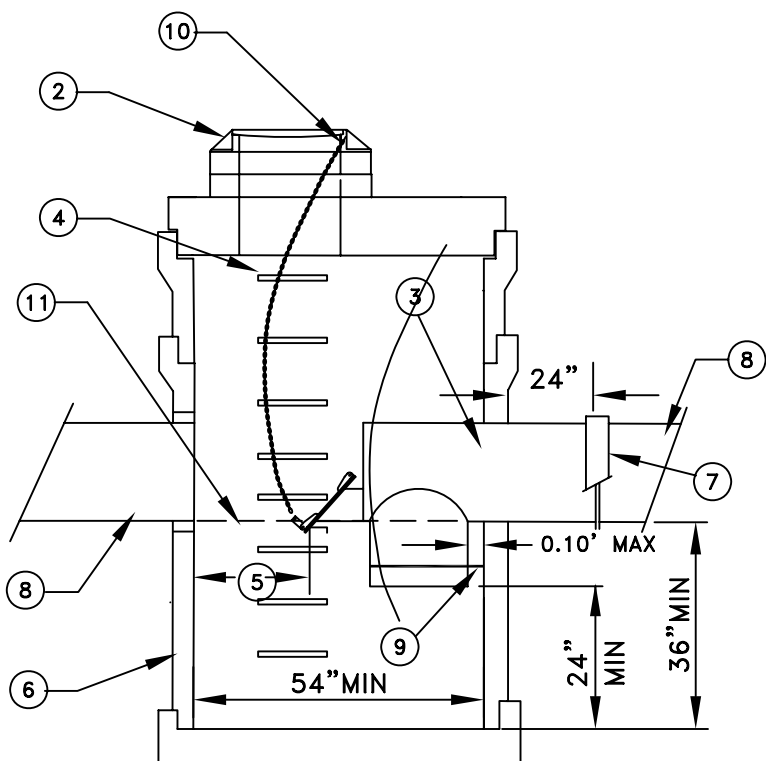


City of Port Townsend - Public Works Department

Standard Detail



PLAN



ELEVATION

NOTES:

- ① INSTALL CB TOP, FRAME, GRATE AND SECTIONS SO THAT LIFT GATE IS VISIBLE THROUGH OPENING AND STEPS CLEAR INLET AND RESTRICTOR UNIT.
- ② INSTALL LOCKING FRAME & GRATE OR LID PER STD DWG SW-7A.
- ③ SEPARATOR ASSEMBLY.
- ④ STEPS PER STD DWG SW-8.
- ⑤ MIN CLEARANCE:
36" FOR OUTLETS OF 24" AND LARGER
18" FOR OUTLETS OF 18" AND SMALLER
- ⑥ 54" TYPE 2 CB OR LARGER.
- ⑦ BAND STRAP WITH GASKET.
- ⑧ SEE PLAN AND SPECIFICATIONS FOR SIZE AND TYPE OF PIPE ENTERING AND EXITING CB.
- ⑨ SECURE SEPARATOR TO CB WITH 8 GA ALUMINUM STRAP. BOLT TO CB WALL WITH STAINLESS STEEL ANCHOR BOLTS AND TACK WELD TO SEPARATOR UNIT.
- ⑩ BOLT OR WELD CHAIN TO FRAME.
- ⑪ INVERT ELEVATION: SEE PLANS AND SPECIFICATIONS.

Date: April 1997

Approved By:

File: E:\eng_std\standard\storm

No.	Date	Revision	By	Apvd

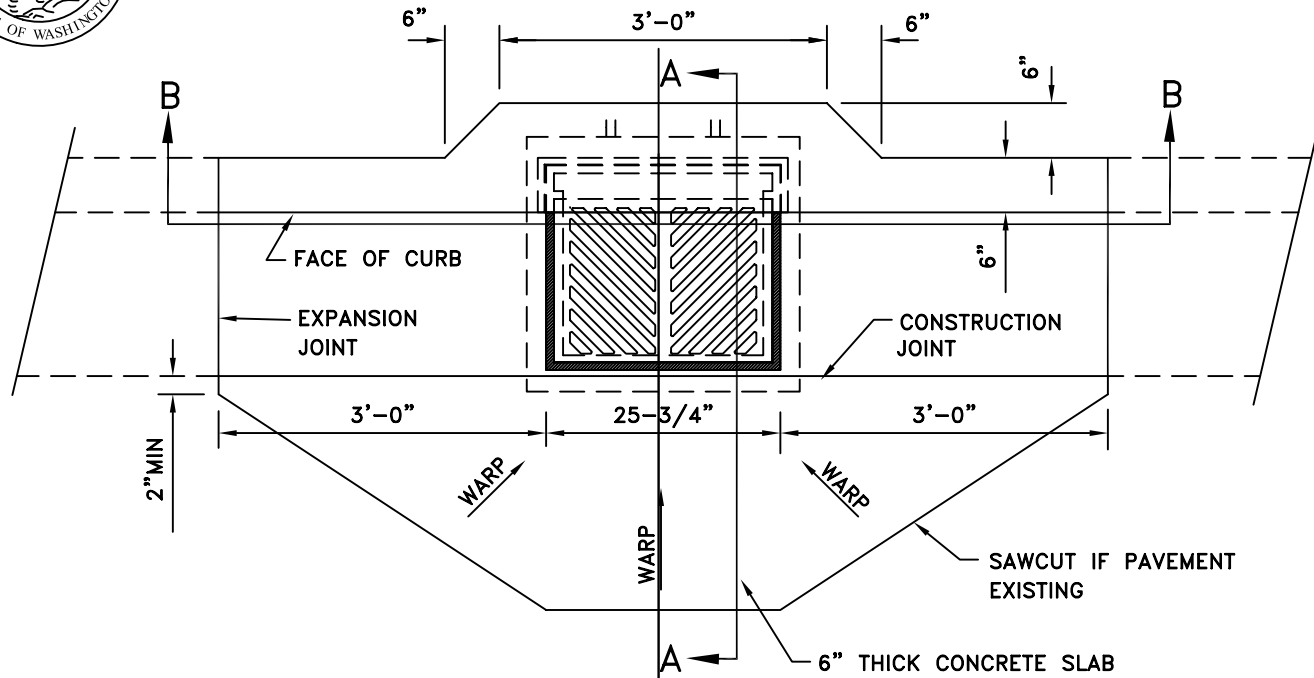
Floatable Material Separator
or Gas Trap (12" and Larger)

Detail: SW-5

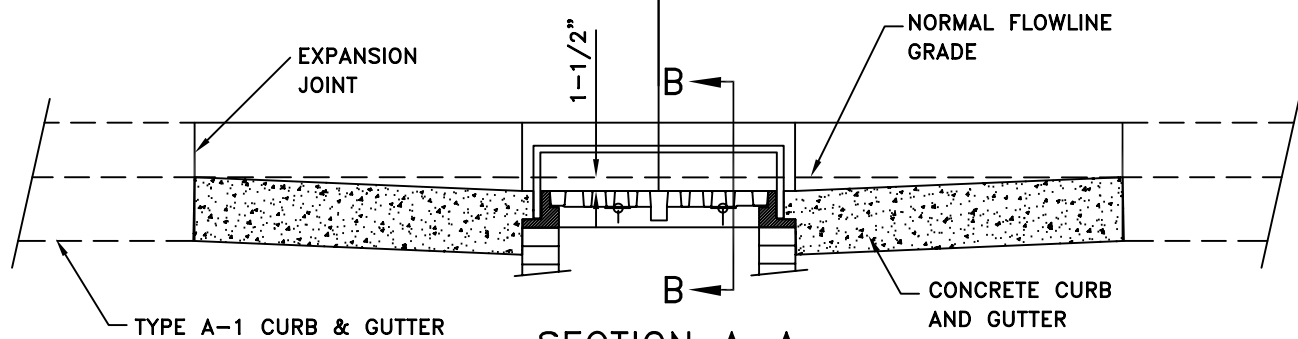


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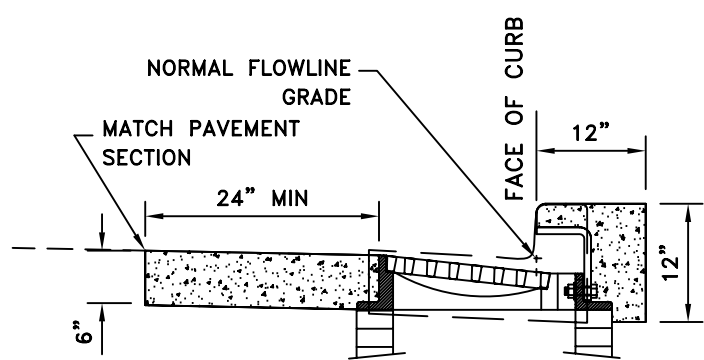
Standard Detail



TOP VIEW



SECTION A-A



SECTION B-B

NOTES:

1. INSTALLATION OF OPEN CURB FACE FRAME AND GRATE MUST BE APPROVED BY CITY ENGINEER ON A CASE BY CASE BASIS.

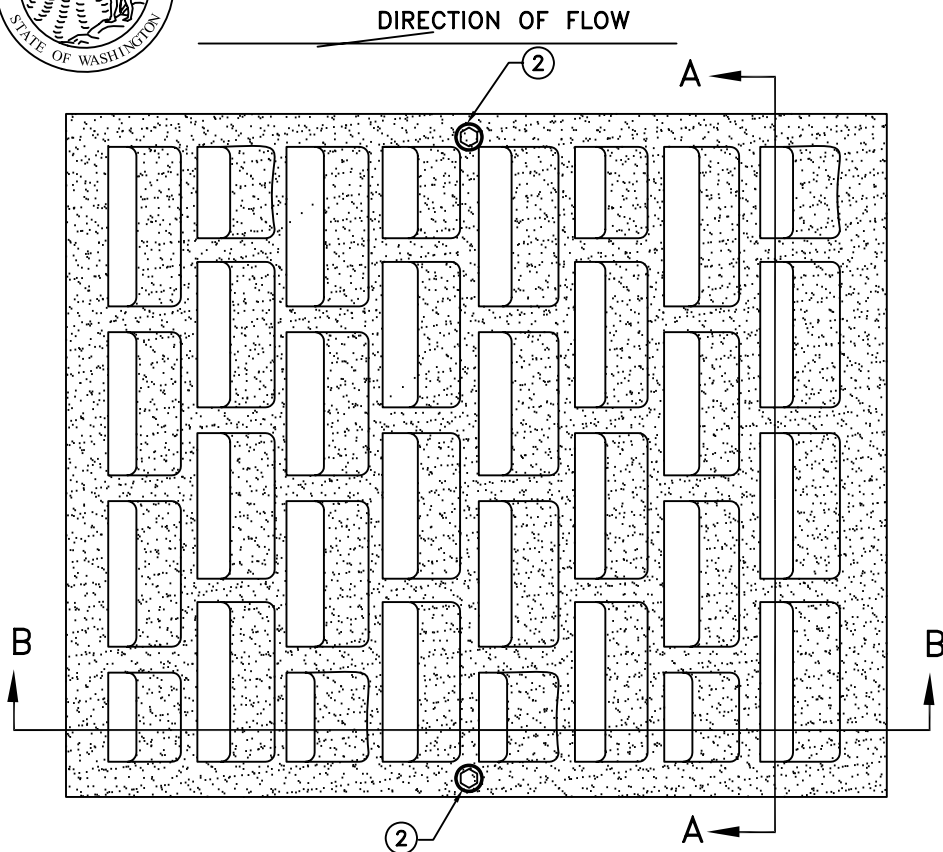
PROBLEMS OF FLOATABLE MATERIAL ENTERING STORM DRAINAGE SYSTEM BY USE OF THIS INSTALLATION MUST BE ADDRESSED.
2. SEE STD DWG SW-7A FOR FRAME AND GRATE DETAILS.

Date: April 1997	No.	Date	Revision	By	Apvd	Open Curb Face Frame and Grate Installation
Approved By:						
File: E:\eng_std\standard\storm						

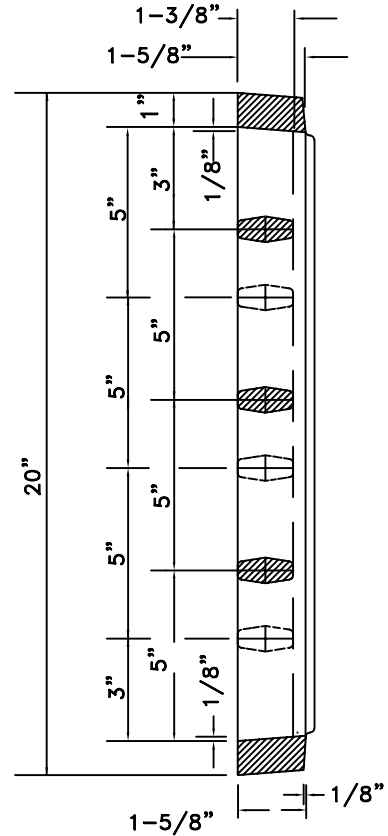


City of Port Townsend - Public Works Department

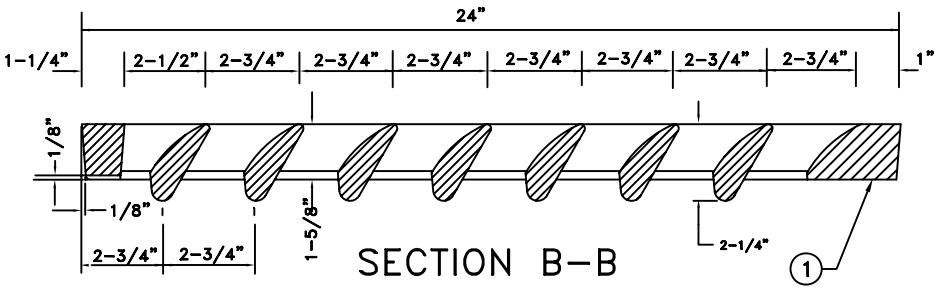
Standard Detail



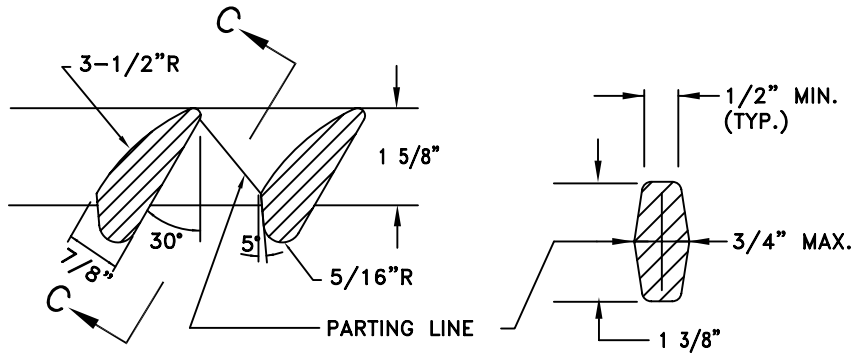
TOP VIEW



SECTION A-A



SECTION B-B



VANE DETAIL

SECTION C-C

NOTE:

- ① MATERIAL USED SHALL BE DUCTILE IRON PER ASTM-A536, GRADE 80-55-06, WITH BITUMINOUS COATING.
- ② WHEN LOCKING GRATE REQUIRED HOLES WILL BE PROVIDED IN CASTING TO ALLOW FOR TWO 5/8" DIA STAINLESS STEEL, SOCKET HEAD CAP SCREWS. NO PART OF SCREW WILL PROTRUDE ABOVE GRATE.
- ③ "DUMP NO WASTEDRAINS TO SOUND" SHALL BE STENCILED ON GRATE

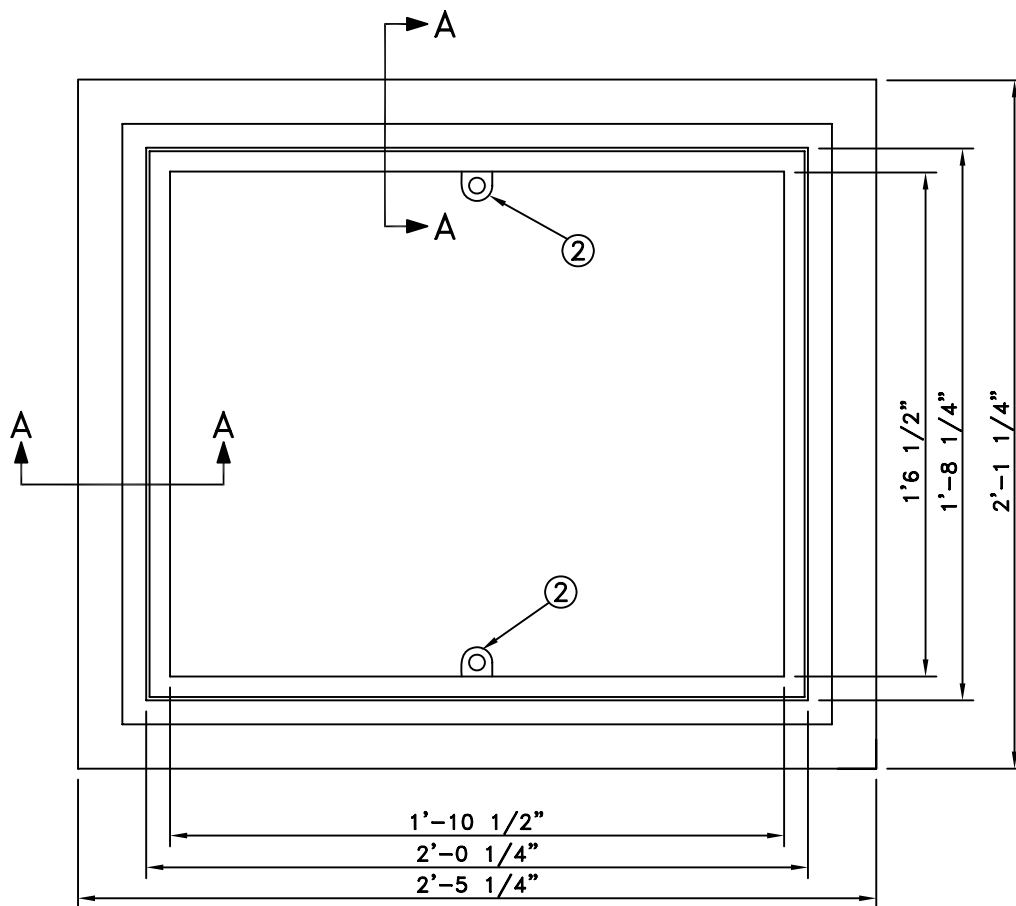
W.S.D.O.T. STD PLAN B-2B

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Grate Detail For Catch Basin of Inlet</h3> <p style="font-size: 1.2em; margin: 10px 0 0 0;">Detail: SW-7A</p>
Approved By:						
File: E:\eng_std\standard\storm						

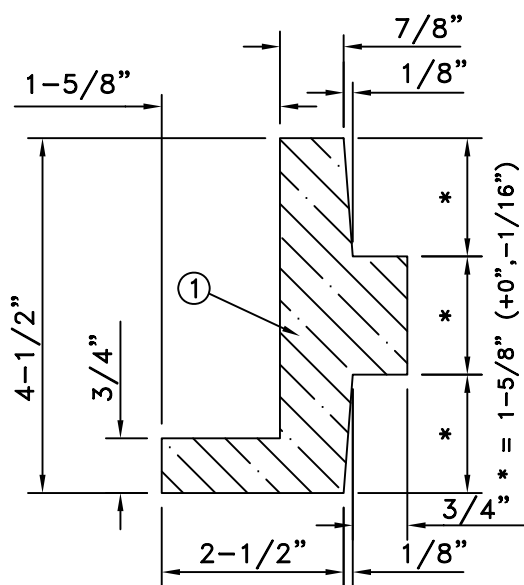


City of Port Townsend - Public Works Department

Standard Detail



TOP VIEW



SECTION A-A

NOTES:

- ① MATERIAL USED SHALL BE CAST IRON PER ASTM-A48, CLASS 30. FRAME SHALL HAVE A BITUMINOUS COATING APPLIED.
- ② WHEN A LOCKING GRATE OR COVER IS REQUIRED THE FRAME SHALL BE FABRICATED SO AS TO ACCEPT TWO (2) 5/8" STAINLESS STEEL SOCKET HEAD CAP SCREWS OF GRATE OR COVER.

Date: April 1997

Approved By:

File: E:\eng_std\standard\storm

No.	Date	Revision	By	Apvd

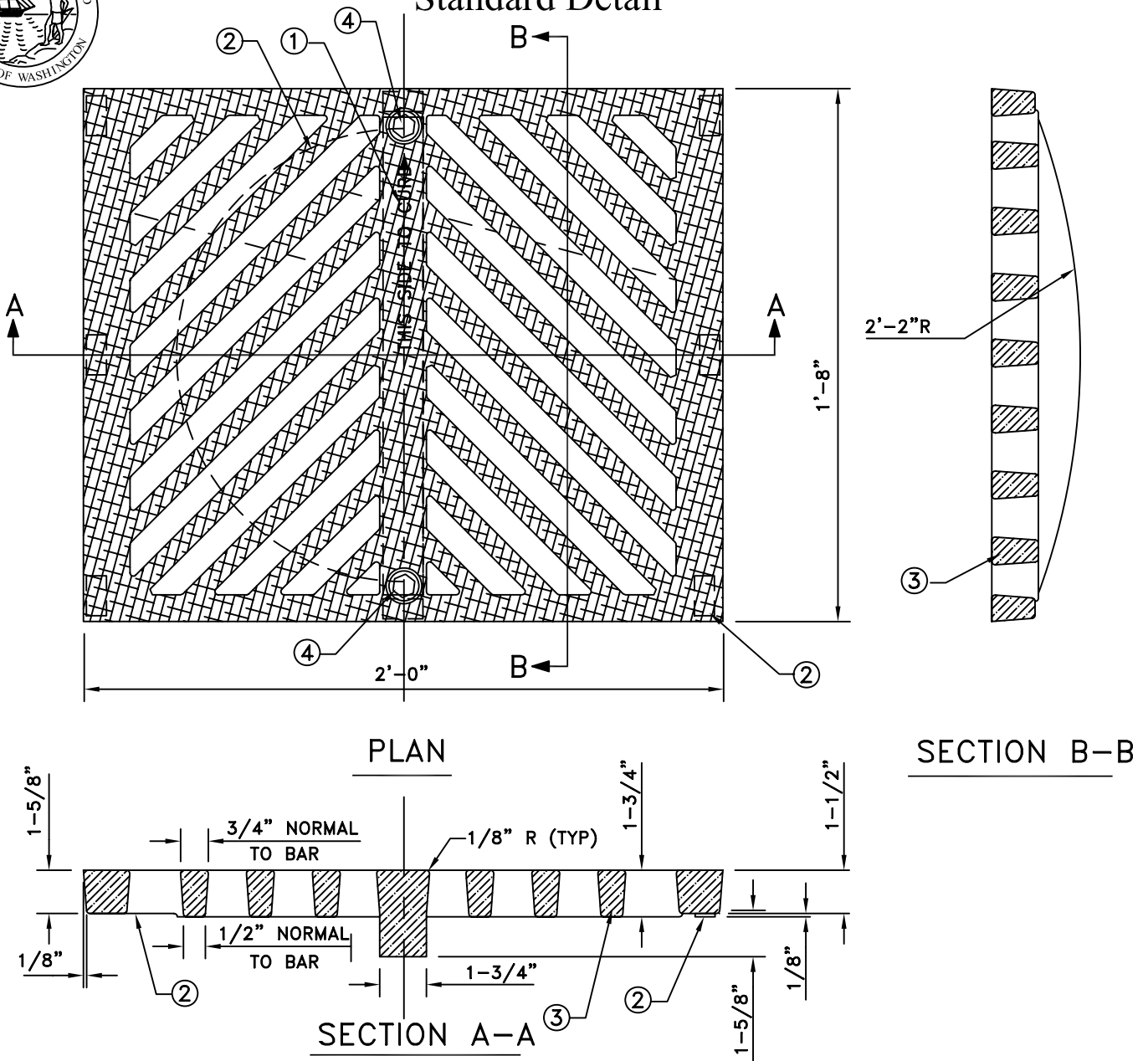
Frame for Grate
of Solid Cover

Detail: SW-7B



City of Port Townsend - Public Works Department

Standard Detail



NOTES:

- ① FOUNDRY NAME, THIS SIDE TO CURB W/ARROW AND (DI) FOR DUCTILE IRON SHALL BE EMBOSSED ON TOP OF GRATE WITH 1/16" RECESSED LETTERS.
- ② SEATING OF GRATE SHALL BE ACCOMPLISHED BY ONE OF THE FOLLOWING:
A. 8 INTEGRALLY CAST PADS (1-1/2"x3/4"x1/8").
B. MACHINE BOTTOM SURFACE OUTSIDE A 17" DIA
- ③ MATERIAL USED SHALL BE DUCTILE IRON PER ASTM-A536, GRADE 80-55-06. ALL CASTINGS SHALL HAVE A BITUMINOUS COATING.
- ④ WHEN LOCKING GRATE REQUIRED HOLES WILL BE PROVIDED IN CASTING TO ALLOW FOR TWO 5/8" DIA STAINLESS STEEL SOCKET HEAD CAP SCREWS SO THAT NO PART OF HEAD PROTRUDES ABOVE TOP OF CASTING.

Date: April 1997

Approved By:

File: E:\eng_std\standard\storm

No.	Date	Revision	By	Apvd

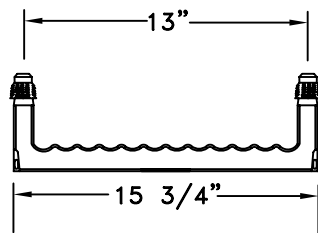
Grate for Catch
Basin or Inlet

Detail: SW-7C

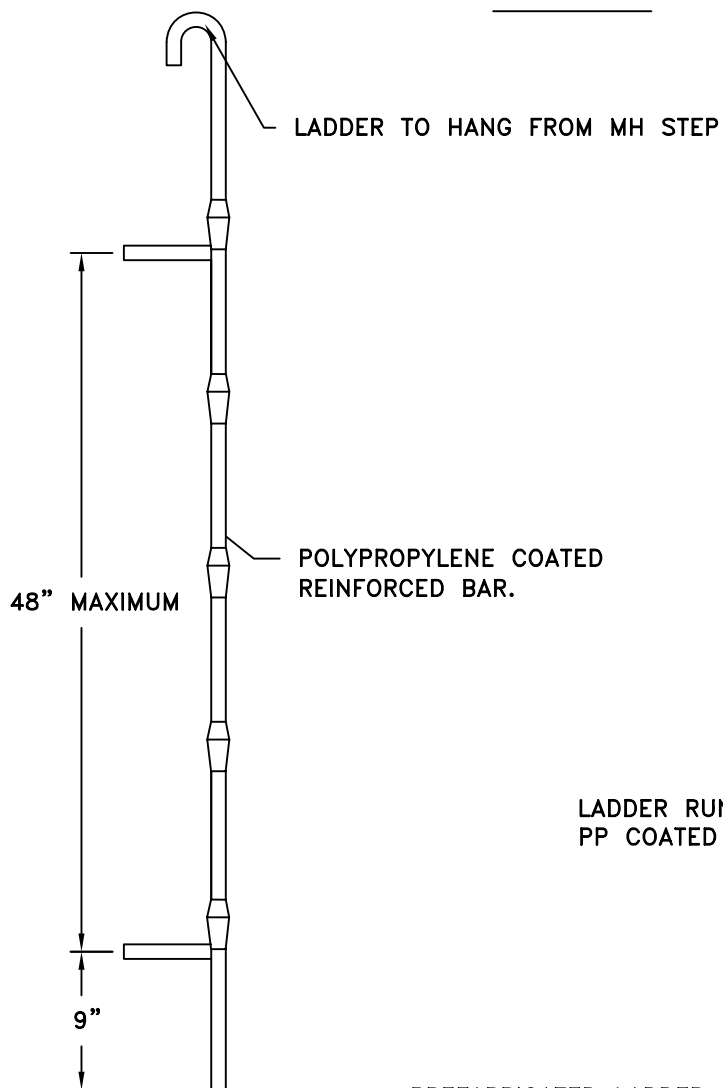


City of Port Townsend - Public Works Department

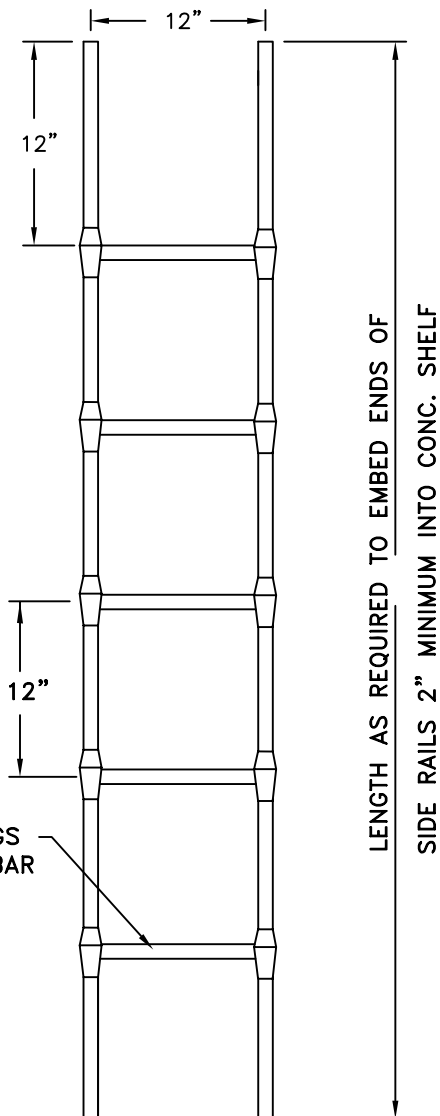
Standard Detail



SAFETY STEP



PREFABRICATED LADDER



NOTES:

1. ALL STEP SHOULD MEET ASTM C-478 AND AASHTO M-199
2. POLYPROPYLENE SHALL CONFORM TO ASTM D-4101.
3. 1/2" GRADE 60 REINFORCING BAR SHALL CONFORM TO ASTM A-615.



RAIL 9/16" ROUND BAR



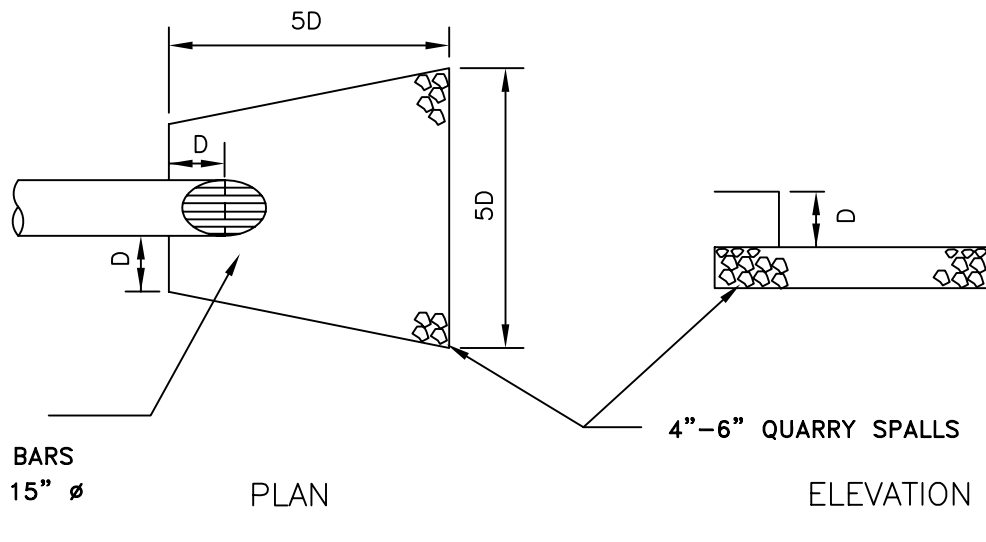
RUNG 1/2" GRADE 60

Date: April 1997	No.	Date	Revision	By	Apvd	<h3>Polypropylene Ladder and Maintenance Step</h3> <p style="font-size: 1.2em; margin-top: 20px;">Detail: SW-8</p>
Approved By:						
File: E:\eng_std\standard\storm						



City of Port Townsend - Public Works Department

Standard Detail



TAPERED END
 TYPE 4 SAFETY BARS
 FOR ALL PIPES 15" Ø
 OR LARGER

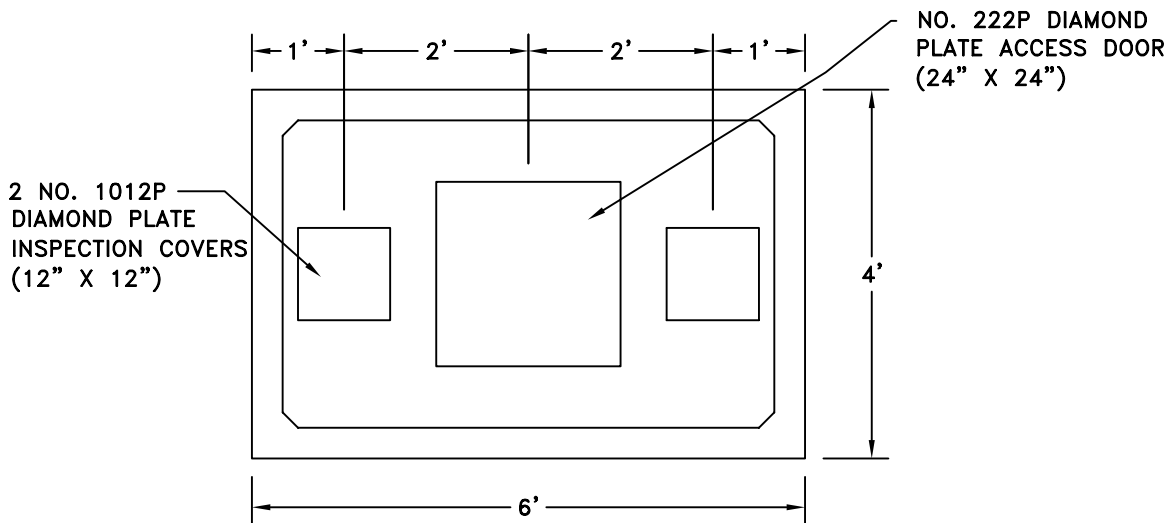
SPECIAL QUARRY SPALLS

Date: April 1997	No.	Date	Revision	By	Apvd	Pipe Outfall
Approved By:						
File: E:\eng_std\standard\storm						Detail:

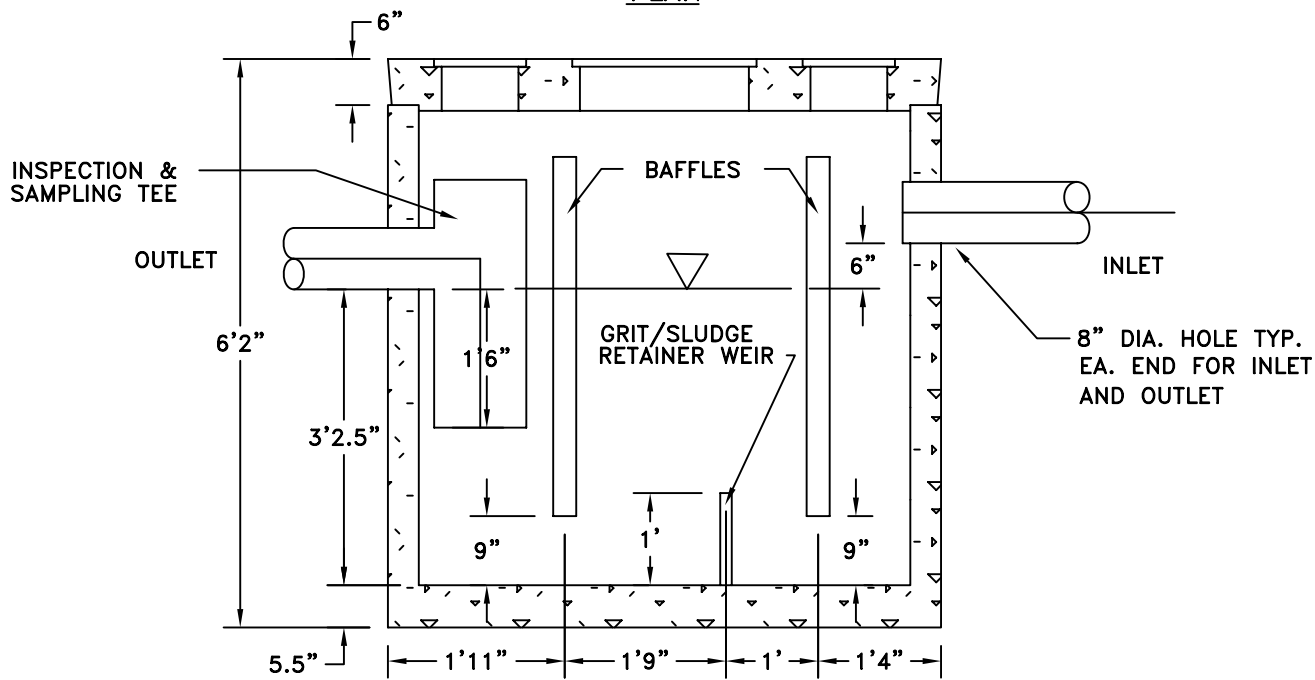


City of Port Townsend - Public Works Department

Standard Detail



PLAN



ELEVATION

NOTE:

1. UTILITY VAULT COMPANY, INC., #660-SA, OR EQUAL
2. LOCATE WITHIN 20 FEET OF DRIVE FOR ACCESS BY MAINTENANCE VEHICLE.
3. INSPECTION AND SAMPLING TEE TO BE INSTALLED BY CONTRACTOR. LINE-SIZED P.V.C. PIPE SHALL BE USED.
4. FILL WITH CLEAN WATER PRIOR TO START-UP OF SYSTEM.
5. GRAY AND BLACK WATER SHALL BE CARRIED BY SEPARATE SIDE SEWER.

Date: April 1997

Approved By:

File: E:\eng_std\standard\storm

No.	Date	Revision	By	Apvd

450 Gallon Bottle Type
Oil / Water Separator

Detail: SW-10



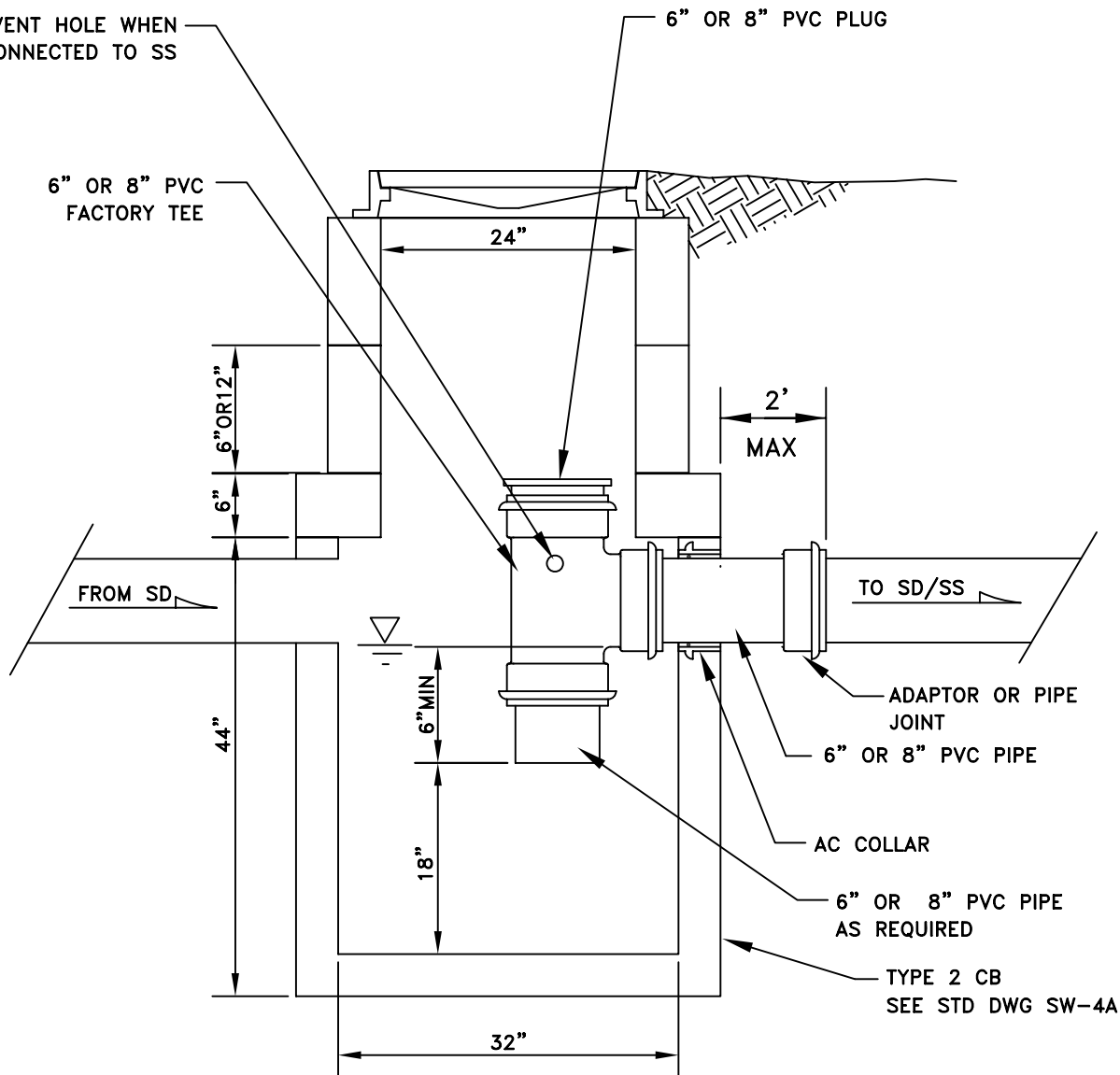
City of Port Townsend - Public Works Department

Standard Detail

1" VENT HOLE WHEN NOT CONNECTED TO SS

6" OR 8" PVC PLUG

6" OR 8" PVC FACTORY TEE



FROM SD

TO SD/SS

2'

MAX

ADAPTOR OR PIPE JOINT

6" OR 8" PVC PIPE

AC COLLAR

6" OR 8" PVC PIPE AS REQUIRED

TYPE 2 CB
SEE STD DWG SW-4A

32"

6" MIN

18"

44"

6"

6" OR 12"

24"

Date: April 1997

Approved By:

File: E:\eng_std\standard\storm

No.	Date	Revision	By	Apvd

Floatable Material Separator and / or Gas Trap (6" or 8")

Detail: SW-11

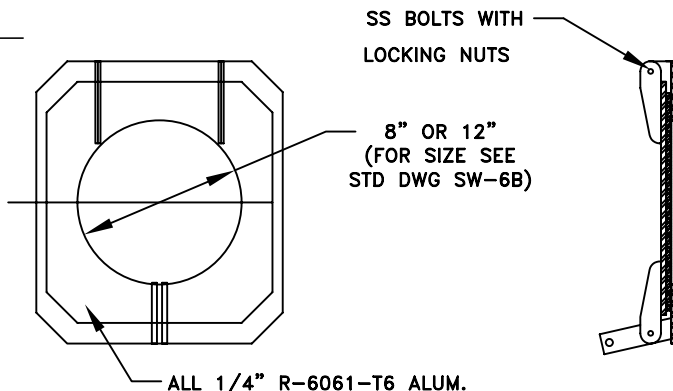


City of Port Townsend - Public Works Department

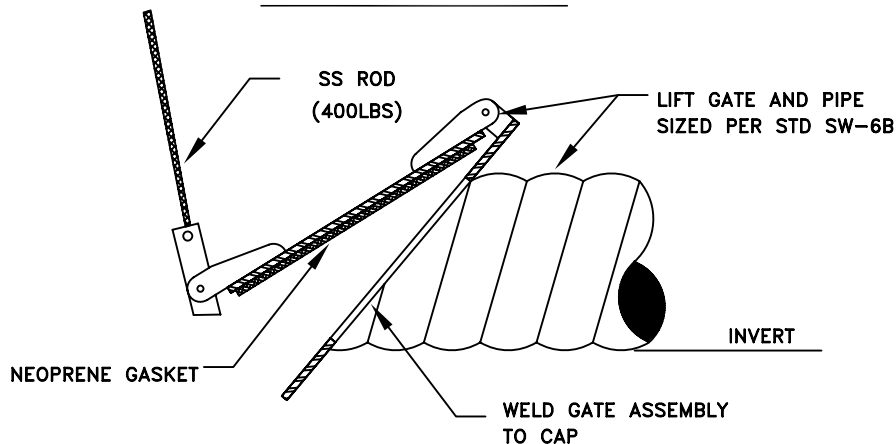
Standard Detail

NOTES:

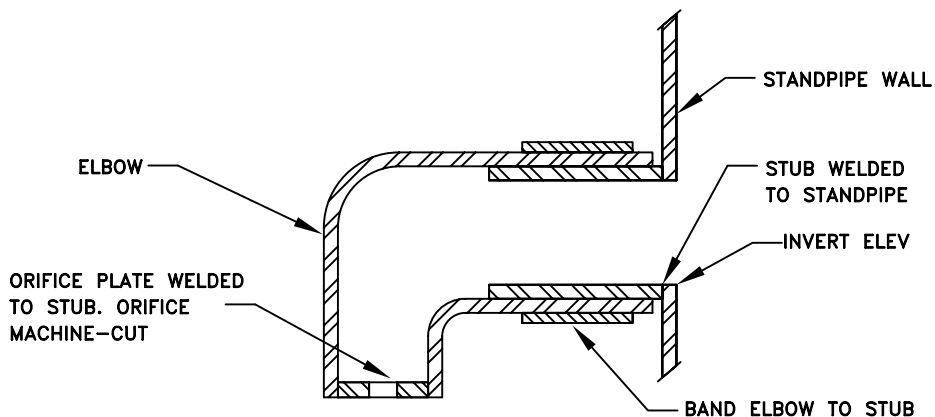
LIFT GATE SHALL BE CONSTRUCTED OF: 1/4" R-6061-T6 ALUM. W/CLOSED CELL NEOPRENE PER ASTM 1056-67 CHEMICAL RESISTANT (OIL & GREASE), OZONE RESISTANT, 67° TO +250° F SERVICE TEMP.



LIFT GATE DETAIL



LIFT GATE ASSEMBLY



ALL PARTS TO BE R-6061-T6 ALUM

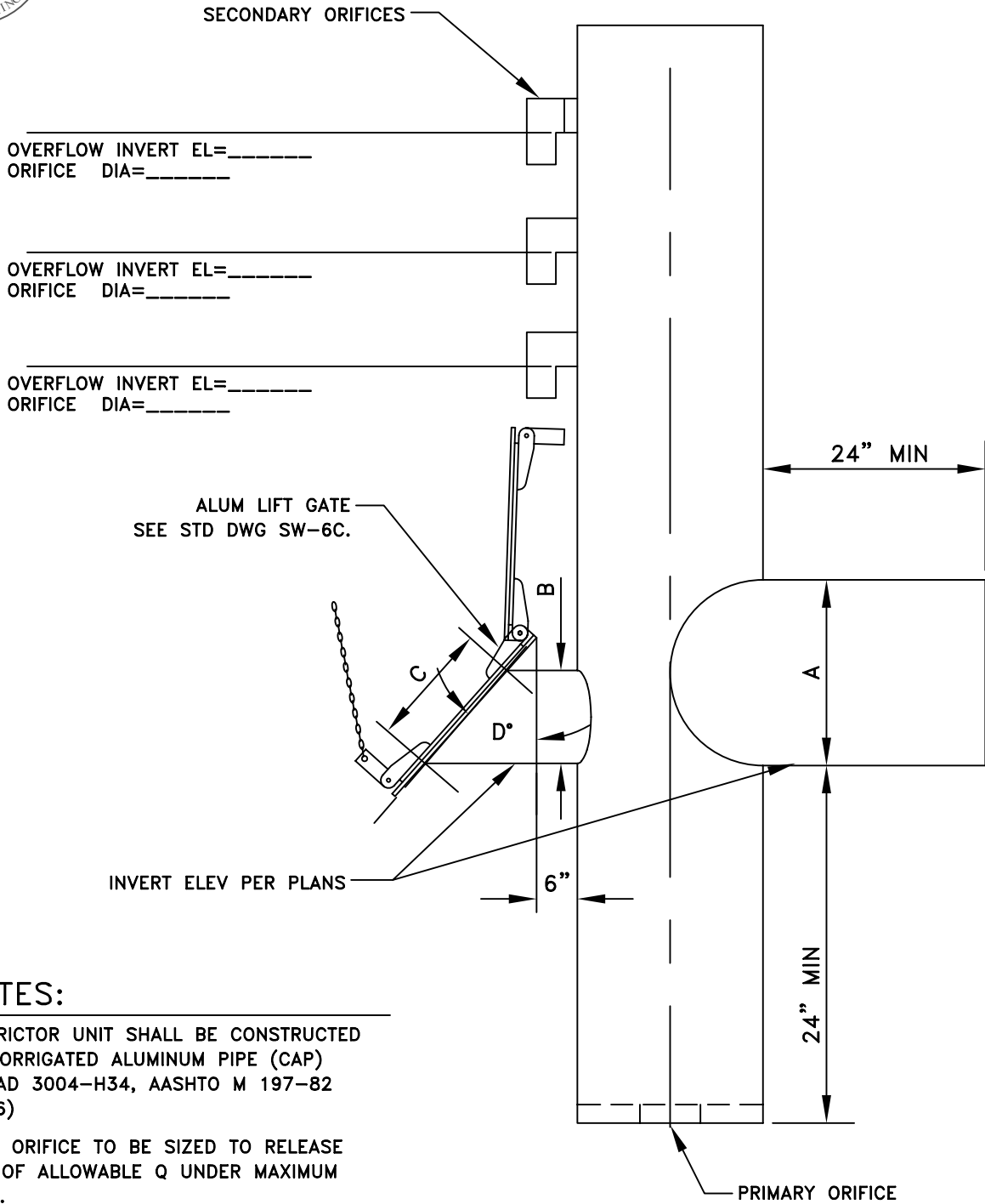
SECONDARY ORIFICE DETAIL

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Lift Gate Assembly and Secondary Orifice Detail</h3> <p style="font-size: 1.2em; margin: 10px 0 0 0;">Detail: SW-12A</p>
Approved By:						
File: E:\eng_std\standard\storm						



City of Port Townsend - Public Works Department

Standard Detail



NOTES:

- 1 RESTRICTOR UNIT SHALL BE CONSTRUCTED OF CORRUGATED ALUMINUM PIPE (CAP) ALCLAD 3004-H34, AASHTO M 197-82 (1986)
- 2 EACH ORIFICE TO BE SIZED TO RELEASE 25% OF ALLOWABLE Q UNDER MAXIMUM HEAD.

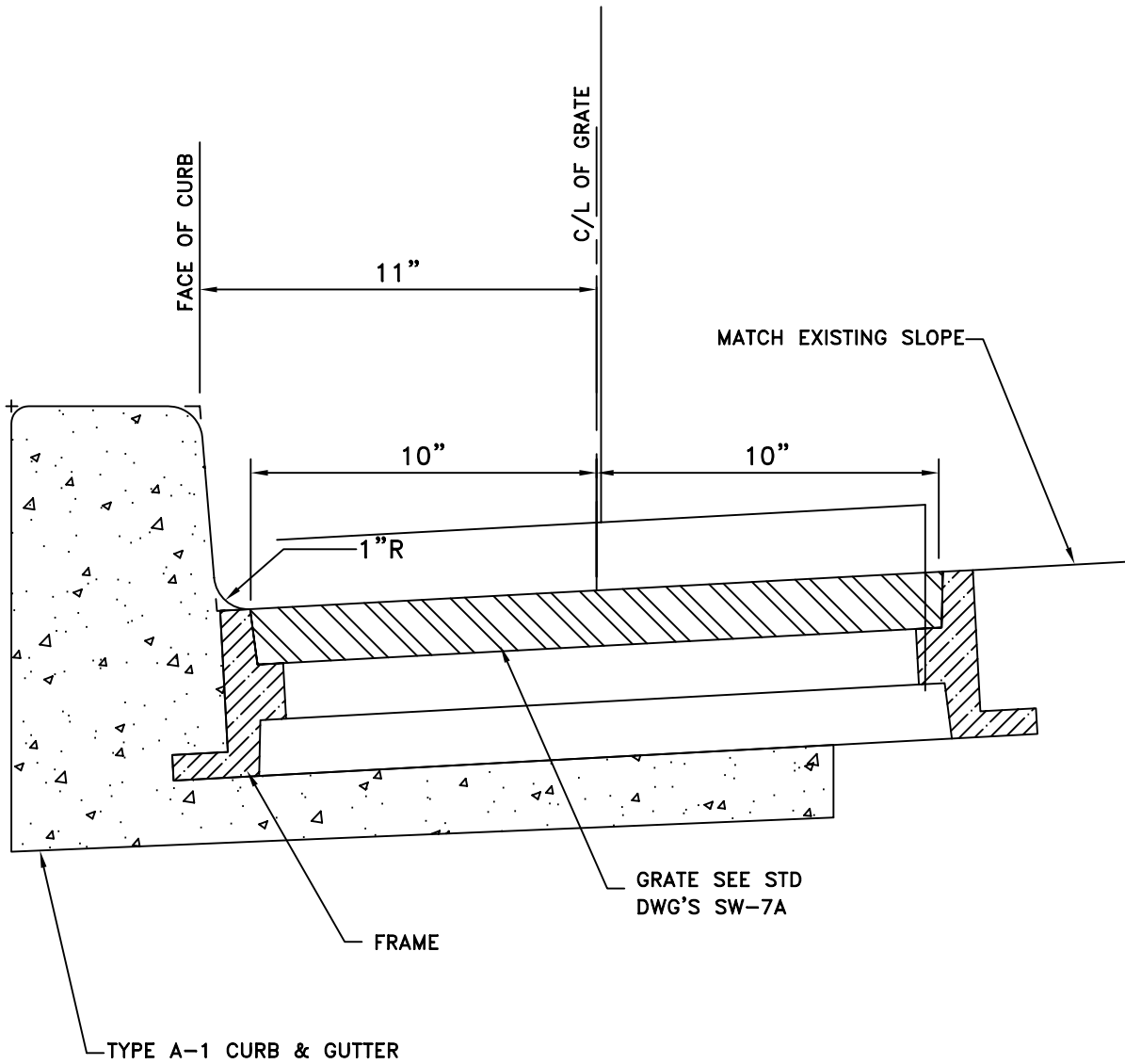
ITEM	DESCRIPTION	SIZE	
		18" AND SMALLER	24" AND LARGER
A	OUTLET	18" AND SMALLER	24" AND LARGER
B	CLEANING	6" ID	10" ID
C	GATE SIZE	8" OPENING	12" OPENING
D	ANGLE	42°±	34°±

Date: April 1997	No.	Date	Revision	By	Apvd	<h3>Restrictor Unit and Lift Gate Assembly</h3> <p>Detail: SW-12B</p>
Approved By:						
File: E:\eng_std\standard\storm						



City of Port Townsend - Public Works Department

Standard Detail

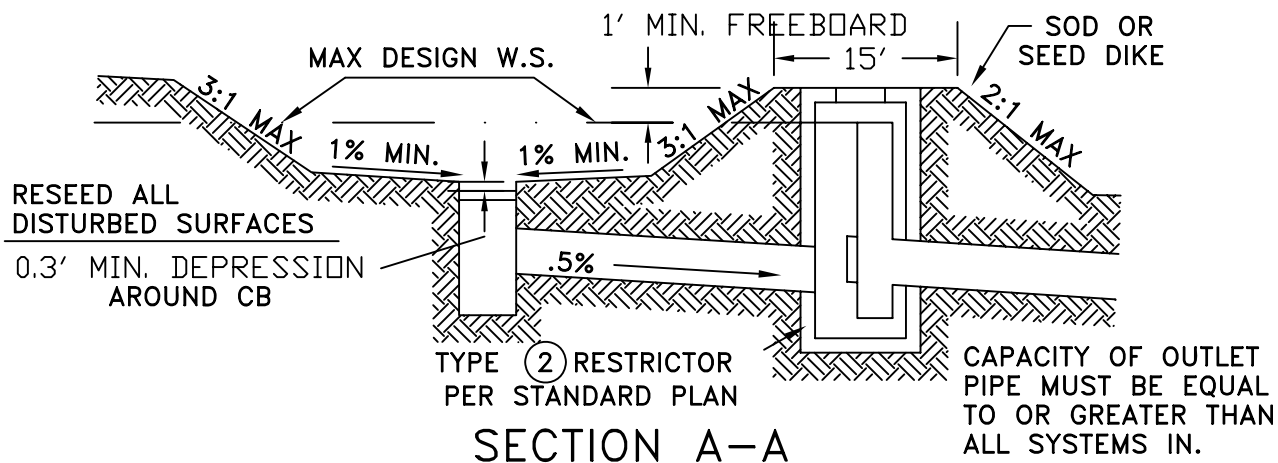
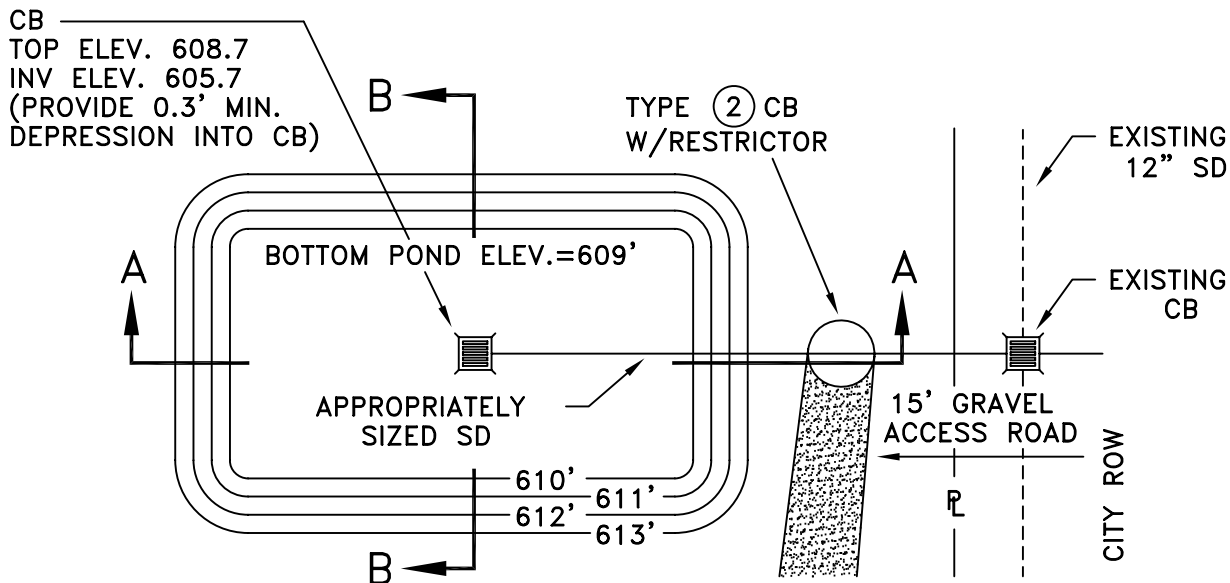


Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Typical Frame and Grate Installation</h3> <p style="font-size: 1.5em; margin: 10px 0 0 0;">Detail: SW-13</p>
Approved By:						
File: E:\eng-std\standard\storm						

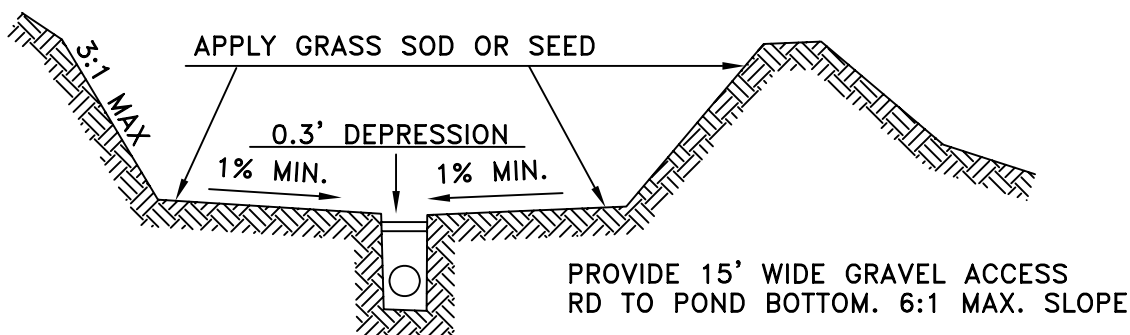


City of Port Townsend - Public Works Department

Standard Detail



SECTION A-A



SECTION B-B

Date: April 1997

No.	Date	Revision	By	Apvd

Typical Dry Detention Pond

Approved By:

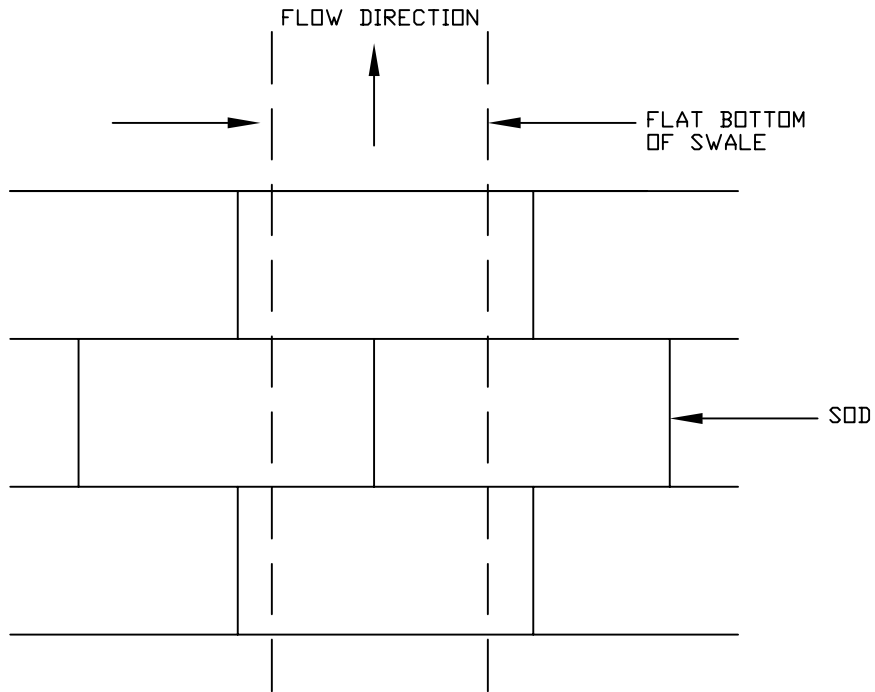
File: E:\eng_std\standard\storm

Detail: SW-14



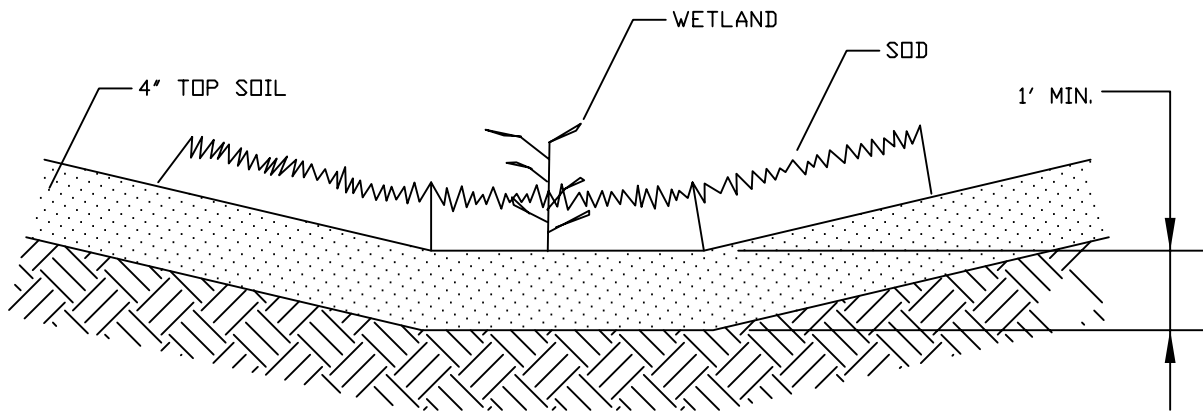
City of Port Townsend - Public Works Department

Standard Detail



VEGETATED SWALE PLAN VIEW

NTS



VEGETATED SWALE CROSS SECTION

NTS

Date: April 1997

No.	Date	Revision	By	Apvd

Vegetated Swale

Approved By:

File: E:\eng_std\standard\storm

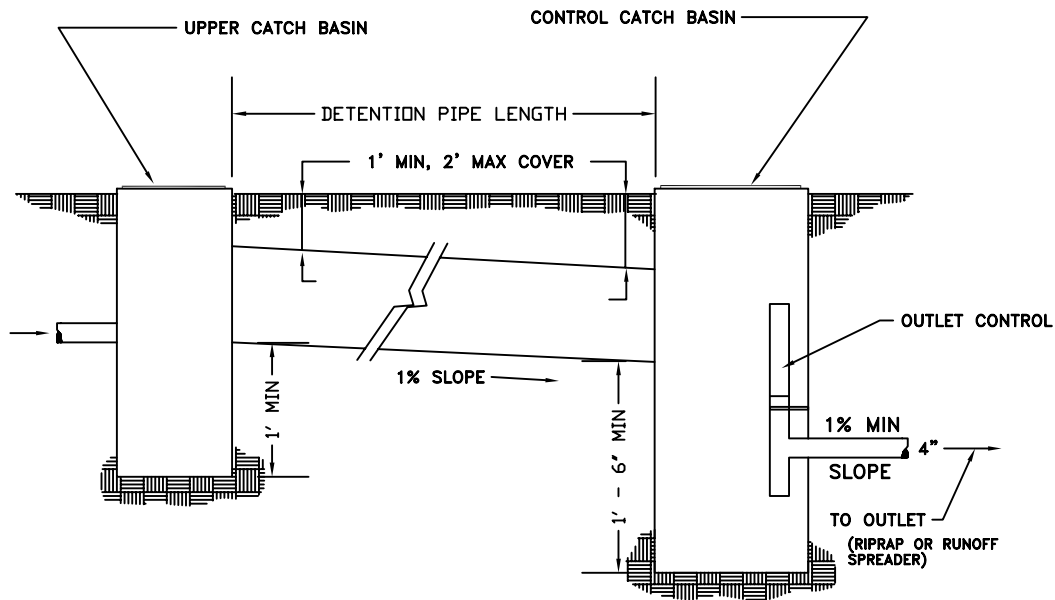
Detail:

SW-15

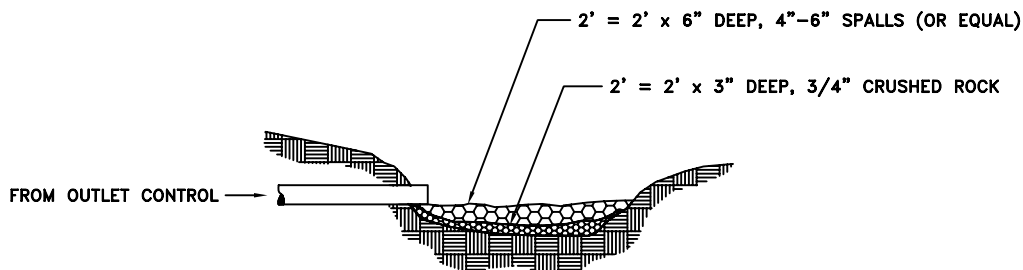


City of Port Townsend - Public Works Department

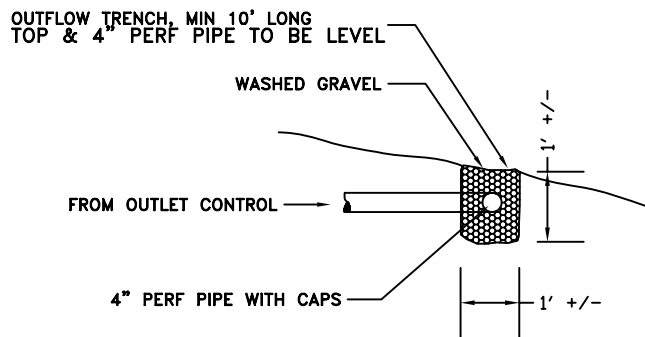
Standard Detail



SYSTEM CROSS SECTION



RIPRAP OUTLET



RUNOFF SPREADER OUTLET

Date: April 1997

Approved By:

File: E:\eng_std\standard\storm

No.	Date	Revision	By	Apvd

Standard Drainage Plan
Detention System

Detail: SW-16

Chapter 5
CLEARING, GRADING AND EROSION CONTROL

1. General

- a. Applicability
 - i. The standards contained in this chapter shall be the minimum standards for the protection of earth and soil during any changes being made to the surface of land through clearing, grading, filling, and/or drainage activities in the city.
 - ii. Land alteration activities which are subject to these standards include: clearing (the act of vegetation removal from the land surface, often referred to as land clearing); grubbing (the act of root vegetation removal from beneath the surface of the earth, usually in conjunction with clearing); excavation (the mechanical removal of earth material); filling (deposition of earth material placed by artificial means); grading (excavation of filling or combination thereof) and stockpiling (temporary deposition of earth material placed by artificial means).
- b. Purpose
 - i. The purpose of these standards is to ensure that all construction in the City of Port Townsend is undertaken with facilities and measures as necessary to minimize the clearing of lots and public rights-of-way to prevent the erosion of soils and siltation of water bodies and public/private drainage facilities. The goal of the erosion control practices specified herein is for no sediment to leave the construction site or impact downstream or adjacent properties or the environment in general.

2. Clearing and Grading Permit

- a. A Clearing and Grading Permit is required prior to any land-disturbing activity that involves clearing, grading, filling of 50 cubic yards or more per the UBC unless a written exemption is issued by the public works director in one of the following circumstances:
 - i. Land clearing, grading, filling, sandbagging, diking, ditching, or similar work during or after periods of extreme weather or other emergency conditions that present immediate danger to life or property.
 - ii. Land clearing order by the City Council for abatement of a public nuisance.
 - iii. Removal of dead trees or of diseased or damaged trees which constitute a hazard to life or property.
 - iv. Maintenance work by city crews.
 - v. Cemetery graves.
 - vi. If a building permit is issued, no additional clearing, grading, or filling permit or associated fee will be required; provided that the standards established in this manual and by city ordinance shall be applied to the issuance of said building permit.
 - vii.

NOTE: Exceptions vi through ix do not apply in environmentally sensitive areas.

- b. The Clearing and Grading Permit shall be effective for one year but may, with cause shown, be extended for an additional one year period. The fee for the permit will be per the UBC.
- c. Permittees shall comply with the following conditions, which shall apply to all clearing and grading permits:
 - i. Notify the city twenty-four (24) hours before commencing any land disturbing activity.
 - ii. Notify the city of completion of any control measures within twenty-four (24) hours after their completion.
 - iii. Obtain permission in writing from the city prior to modifying any of the plans.
 - iv. Install all control measures as identified in the approved plans.
 - v. Maintain all road drainage systems, stormwater drainage systems, control measures, and other facilities identified in the plans.
 - vi. Repair siltation or erosion damage to adjoining surfaces and drainage ways resulting from land developing or disturbing activities.
 - vii. Inspect the erosion construction control measures at least once each week during construction after each rain of 0.5 inches or more (over a 24-hour period), and immediately make any needed repairs.
 - viii. Allow the city to enter the site for the purpose of inspecting compliance with the plans or for performing any work necessary to bring the site into compliance with the plans.
 - ix. Keep an up-to-date, approved copy of the plans on the site.
 - x. Ensure that all construction is in accordance with City of Port Townsend standards the most current edition of the State of Washington Standard Specifications for Road, Bridge and Municipal Construction and the DOE Stormwater Management Manual.
- d. Construction within environmentally sensitive areas shall be in compliance with Chapter 19.05 PTMC.
 - i. Flagging or demarcation will be placed at the edge of any wetland, stream or lake buffers prior to the initiation of any land alteration activity on site. Only selective cutting of trees and removal of brush, as determined necessary for construction of the fence by the inspector, will be allowed.
 - ii. All erosion and sedimentation controls shall be constructed and operational prior to initiation of clearing and grubbing operations.
 - iii. Clearing and grading permits will not be issued for projects that are in SEPA review.

3. Erosion/Sedimentation Control Requirements

- a. All clearing and grading and other land alterations require that erosion and sediment control best management practices (“BMPs”) be employed. These BMPs shall be as required by the Stormwater Management Manual (“SWMM”).
- b. For sites not located in a critical drainage area, but larger than one acre, erosion control requirements may also include sedimentation ponds, check dams, filter fabric fence, jute matting or plastic sheeting, and a temporary construction

entrance. Sites in a critical drainage area require the preparation and implementation of a stormwater control plan which includes an erosion and sedimentation control plan and a permanent stormwater quality control plan per the SWMM.

- c. Developments located on steep slopes (15% or greater) shall require the following: gradient terraces, immediate hydroseeding and mulching, phasing of construction so as to minimize the amount of exposed soils at any given time and seasonal limitation restrictions. Depending upon soil and slope conditions, the proximity to a waterway and the size of the site, additional requirements may include flexible down drains, filter fabric fences, jute matting or other approved means to secure seed and mulch in place, temporary level spreaders and stabilized channels to convey off-site runoff through or around site.
- d. Development adjacent to waterways may require: a vegetative buffer between the waterway and the development and seasonal limitation restriction. Any work within the waterway will require a hydraulics permit from the Department of Fisheries and/or Game. The city may make additional requirements.

4. Methods of Control

- a. The types of controls as noted in this section and the related Standard Plans for Erosion and Sedimentation Facilities are a minimum requirement. In certain conditions more extensive facilities may be required. Erosion control facilities shall be periodically inspected and maintained by the developer or contractor to ensure continued intended operation. The contractor shall designate one point of contact for the city for ESC until the work is complete and cover is reestablished.
- b. Check Dams and Berms
 - i. Check dams and/or berms shall be incorporated into erosion control facilities as needed.
 - ii. Straw bales (staked in place) may be used as energy dissipating drop structures, flow direction control structures and/or dams to create ponding.
 - iii. Rock berms can be used for all uses stated for straw bales and may be used as filtering devices.
 - iv. Earth berms may be used to control flow direction and prevent silt laden water from discharging into adjacent properties and /or the public rights-of-way.
- c. Cut-Off Trenches
 - i. Cut-off trenches are recommended to dissipate drainage into the natural on-site vegetation.
- d. Filtering Devices
 - i. Filtering devices, such as filter fabric fences, shall be used to filter runoff prior to discharge from site. Approved filter fabrics are Celanese fiber, polyvinyl chloride woven cloth, reinforced chlorosulfinated polyethylene woven cloth, chlorinated polyethylene woven cloth, such as Mirafi 100X, Typar 3401, Stabilenka 100, or approved equal.
- e. Flexible Down Drains

- i. Flexible down drains may be utilized as temporary structures to protect open slopes and shall be constructed of flared end sections connected by plastic sheet tubing, heavy duty fabric, or non-perforated corrugated plastic pipe.

- f. Gradient Terrace
 - i. A gradient terrace is an earth embankment or ridge designed so that the top of the constructed ridge is no lower at any point than the design elevation of the water surface at the outlet under design flow and is installed so as to intercept surface runoff and convey it to a stable outlet at a non-erosive velocity. Gradient terraces may be useful both as a temporary and/or permanent erosion control measure.

- g. Interceptor Ditches
 - i. Interceptor ditches are constructed to channel water away from unprotected slopes or easily eroded soils, or to convey silt laden water to sedimentation facilities.
 - ii. If the location of the ditch may result in erosion of the ditch itself, stabilization of the ditch may be required. Rip rap, temporary sodding, or a combination of filter fabric and rip rap, are methods of ditch stabilization that may be required to prevent erosion.

- h. Sediment Traps
 - (1) Sediment traps are structures of limited capacity designed to create a temporary siltation pond filter around storm drain inlets or at points where silt laden stormwater is discharged. Periodic maintenance by the contractor or developer is crucial to the proper functioning of sediment traps. Placement of filter fabric under the grate of a catch basin is not an acceptable method of inlet protection.

- i. Interceptor Dikes
 - (1) Interceptor dikes are temporary berms of compacted soil or gravel constructed across disturbed construction areas. Interceptor dikes shall be designed and constructed so as to reduce erosion by intercepting stormwater and diverting it to stabilized outlets such as siltation/sedimentation ponds or areas of well established vegetation.

- j. Temporary Construction Entrance
 - (1) A temporary construction entrance is a rock stabilized temporary entrance pad and shall be constructed at points where traffic will be entering or leaving a construction site from or onto public right-of-way. The pad shall be of sufficient length and width to eliminate transportation of mud and sediment from the construction area onto the public right-of-way by motor vehicles or by runoff, but under no circumstances shall it be less wide than the ingress/egress at the right-of-way or less than 50 feet long. The

stabilized construction entrance shall be a minimum thickness of 8 inches and constructed of material approved by the Public Works Director. The entrance shall be maintained to the satisfaction of the public works inspector. When site conditions are such that the temporary entrance pad fails to perform as required, all vehicles exiting the site shall have their tires and wheels cleaned by sweeping, brushing, or washing prior to entering public right-of-way. All washing shall be done on an area draining to an approved erosion control facility.

i. Temporary Soil Stabilization Measures

- (1) Soil stabilization measures protect soil from the erosive forces of raindrop impact and flowing water. Acceptable measures include establishing vegetation by sodding or seeding, mulching with 2 tons of straw per acre or approved equal, plastic or other impervious covering staked to the ground or anchored with rocks or sandbags, the early application of gravel base on areas to be paved.
- (2) The most appropriate measure should be chosen given the time of the year and the site conditions. Seeding alone is acceptable only on flat areas and slopes less than 15%, and only during the periods from March 1 to May 15 and August 15 to October 1 or as otherwise required or approved. Seeding during the summer months may require watering to establish vegetation. Mulch may need to be held in place by utility mesh or netting.

ii. Temporary Siltation/Sedimentation Ponds

- (1) Temporary siltation\sedimentation ponds detain runoff waters and trap sediment from easily eroded areas thus protecting properties, drainage ways and streams below the installation from damage by excessive sedimentation and debris deposition. The dam or barrier forming the pond shall be located to provide for maximum volume capacity for trapping sediment behind the structure as well as for greatest ease of clean out.
- (2) Temporary siltation\sedimentation ponds are basins created by construction of a barrier or by excavation or by combination of both.
- (3) Interior surfaces of the sedimentation pond shall be stabilized where required to prevent erosion of the pond bottom and \or sides.
- (4) Interior sides of the pond shall be no steeper than 3 feet horizontal to 1 foot vertical.
- (5) Siltation/sedimentation ponds shall provide a minimum of 2 feet of dead storage below the outflow elevation and will be sized to provide a minimum of 1 cubic foot of live storage per 100 square feet of channel area.
- (6) A stabilized access will be provided to the siltation\sedimentation

pond for sediment removal and other maintenance.

5. Seasonal Limitations

- a. Land alteration operations are restricted to seasonal limitations. The restrictions are site specific and are based on, but not limited to, steepness of slopes on site, distance from sediment\erosion sensitive areas, soil type, etc. Contact the city's Public Works Department for site specific seasonal limitations.
- b. In addition, these operations shall be governed by the following seasonal limitations:
 - i. No fill material shall be placed, spread, or rolled while either the fill material or the site surface is frozen or thawing, or during other unfavorable conditions.
 - ii. All land alteration work is subject to stoppage by the Public Works Director or her/his designee due to heavy rain.
 - iii. When land alteration activities are interrupted by heavy rain, operations shall not be resumed until the Public Works Department determines that erosion control facilities are operating satisfactorily.
 - iv. Underground utilities and foundation installation are allowed with seasonal limitations under the following conditions:
 - (1) Every effort is made to close utility trenches by the end of the day.
 - (2) If unavoidable circumstances result in the inability to close a utility trench, all open areas and side spoils are covered with plastic sheeting that is staked in place or anchored by rocks, sand bags, tires, or by approved methods at the end of the day.
 - (3) Discharge from dewatering of utility trenches or foundation areas is directed to the nearest sedimentation pond, or to a specially created sump area, in a non-erosive fashion. Large quantities of silt in the discharge water may result in the dewatering activity being stopped by the City Inspector until the source of the sediment is identified and attempts made to minimize the quantity in the discharge.
 - (4) Utility corridors are re-stabilized by temporary soil stabilization measures immediately following the completion of utility work or if the earth is to be left exposed for 7 days or more on flat ground or for 3 days or more on slopes greater than 15%.
 - (5) Water is prevented from entering foundation work areas from surface runoff by creating small, compacted earth berms around the perimeter of the building site to divert runoff away from the working area.
 - (6) In general, removal of existing vegetation within the buffer zone of any wetland or perennial stream will not be allowed. If allowed, it will be required that approved vegetation is replaced within 30 days of beginning work in stream area.

6. Temporary Erosion/Sediment Control Plans

- a. A temporary erosion/sedimentation plan is required in conformance with the DOE Stormwater Management Manual, including for the following land alteration activities:
 - i. On slopes 15% or greater
 - ii. Where cut and /or fill slopes 15% or greater will be created by the proposed work
 - iii. Where work done may impact on environmentally sensitive areas (stream, wetland, etc.)
- b. The plan shall clearly indicate the construction sequence for establishment of all erosion control work both temporary and permanent and shall be on a separate sheet.
- c. Emergency management plans are to be submitted for all clearing and grading permit applications. To include at a minimum:
 - i. Name, address, and 24 hour telephone number(s) for the person(s) responsible for regular observation and repair or replacement of all erosion and sedimentation control measures.
 - ii. Schedule for regular inspection, maintenance and replacement of erosion and sedimentation control measures.
 - iii. Location and inventory of materials required to be stockpiled on the site for emergency repair of the approved erosion and sedimentation control system.
 - iv. Contingency plans in case of failure of the erosion and sedimentation control system, including how individual erosion control measures would be accessed during undesirable site conditions.
- d. Required Notes on Plans
 - i. The following are the minimum notes required on all Temporary Erosion\Sedimentation Control Plans:
 - (1) The temporary erosion control system shall be installed and inspected by the public works inspector prior to all other construction.
 - (2) Where possible natural vegetation will be maintained for silt control.
 - (3) As construction progresses and seasonal conditions dictate, the erosion control facilities shall be maintained and/or altered as required by the Public Works Director to ensure continuing erosion\sedimentation control.
 - (4) Temporary siltation ponds and all temporary siltation controls shall be maintained in a satisfactory condition until such time that clearing and \or construction is completed, permanent drainage facilities are operational, and the potential for erosion has passed.
 - (5) All disturbed land areas that will be left for 30 days or more during the period of May to October 1 shall be immediately seeded with a mix and by a method approved by the Public Works Department

and maintained until seed germination is assured. In addition to seeding, slopes of 15% or greater will be mulched with 2 tons of straw per acre, or with an approved equal. During the rest of the year, temporary soil stabilization must be applied immediately to disturbed areas that will be left exposed for 7 days or more, and immediately to slopes greater than 15% that will be left exposed for 2 days or more.

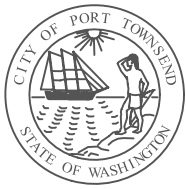
- (6) Approval of this plan does not constitute an approval of design, size, or location of pipes, restrictors, or detention facilities, but is an approval of the grading and sedimentation control plan only.
- (7) The public right-of-way shall be kept clean. Tracking of mud and debris from the site will not be allowed. Failure to comply with this condition will result in all work on the site being stopped.

7. Vegetation Restoration

- a. Areas disturbed by construction activity which are not to be covered by permanent impervious surfaces shall be landscaped or reseeded at the earliest possible time, not to exceed 30 days after final grade is reached during the period from May 1 to October 1. During the rest of the year, reseeded or landscaping is required within 7 days of reaching final grade.
- b. If wet weather prohibits reseeded or landscaping during the given period, temporary soil stabilization measures must be used until conditions are suitable for permanent measures.
- c. When the area to be seeded is hard, compacted, or encrusted, the top layer of soil shall be loosened by disking, raking or other acceptable means before seeding.
- d. Specifications for seed, fertilizer and mulch will depend upon the slope, soil conditions, and the planned use of the site.

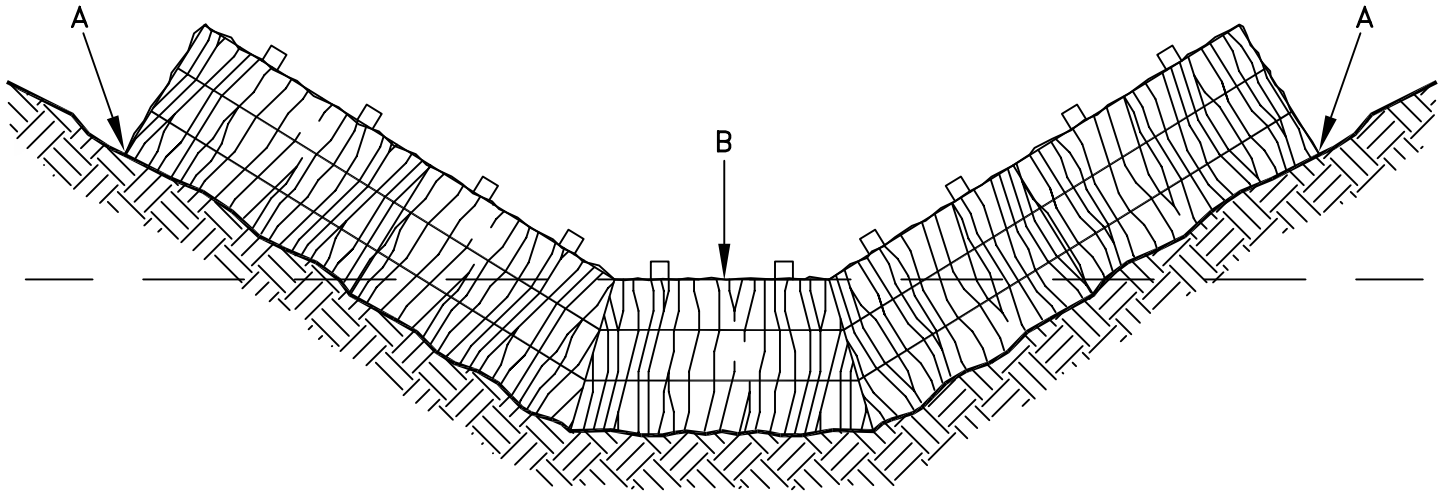
CHAPTER 5 - APPENDIX

<u>Exhibit #</u>	<u>Standard Detail #</u>	<u>Title</u>
1	EC - 1	Erosion Control - Straw Bale Barrier
2	EC - 2	Erosion Control - Sediment Trap
3	EC - 3	Erosion Control - Filter Fabric Inlet Fence
4	EC - 4	Erosion Control - Typical Sediment Basin
5	EC - 5	Erosion Control - Typical Temporary Erosion Control
6	EC - 6	Erosion Control - Construction Entrance
7	EC - 7	Erosion Control - Filter Fabric Fence



City of Port Townsend - Public Works Department

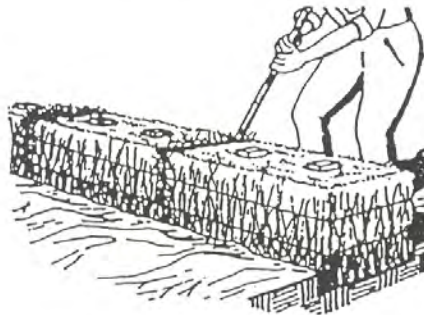
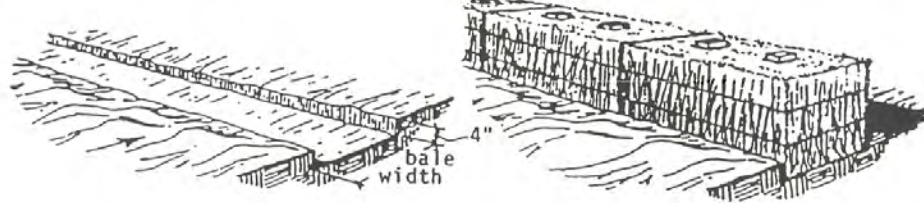
Standard Detail



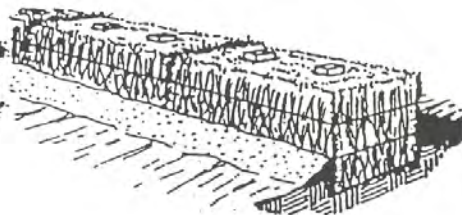
POINTS A SHALL BE HIGHER THAN POINT B
 PROPER PLACEMENT OF STRAW BALE DAM IN DRAINAGE WAY

1. Excavate the trench.

2. Place and stake straw bales.



3. Wedge loose straw between bales.



4. Backfill and compact the excavated soil.

CONSTRUCTION OF A STRAW BALE BARRIER

Date: April 1997

Approved By:

File: E:\eng_std\standard\erosion

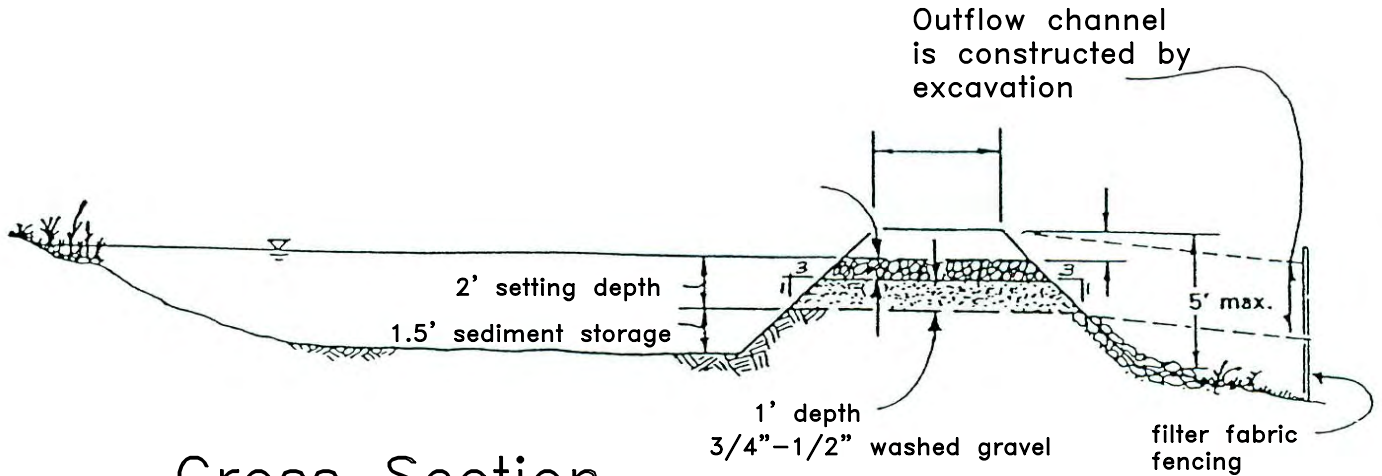
No.	Date	Revision	By	Apvd

Erosion Control
 Straw Bale Barrier

Detail: EC-1



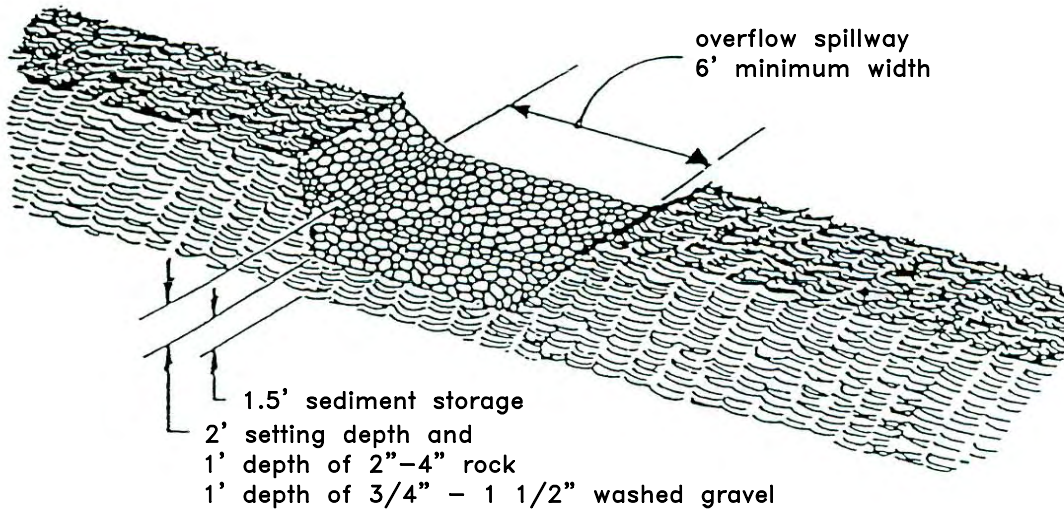
City of Port Townsend - Public Works Department
Standard Detail



Cross Section

No Scale

note: may be constructed by excavation or by building a berm



Date: April 1997

No.	Date	Revision	By	Apvd

Approved By:

File: E:\eng_std\standard\erosion

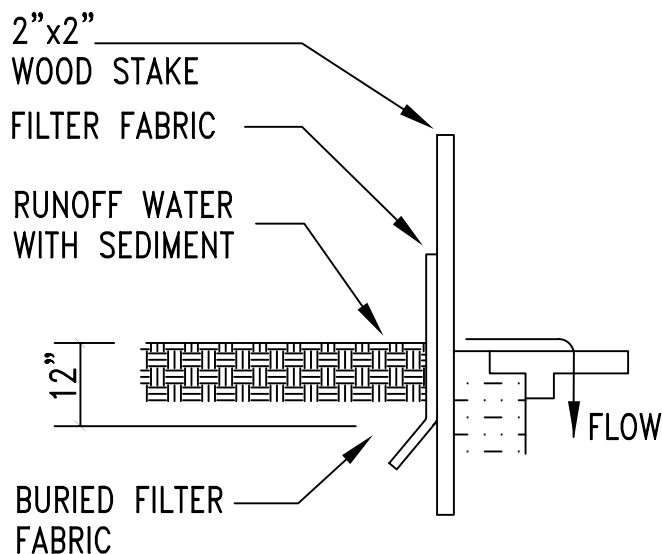
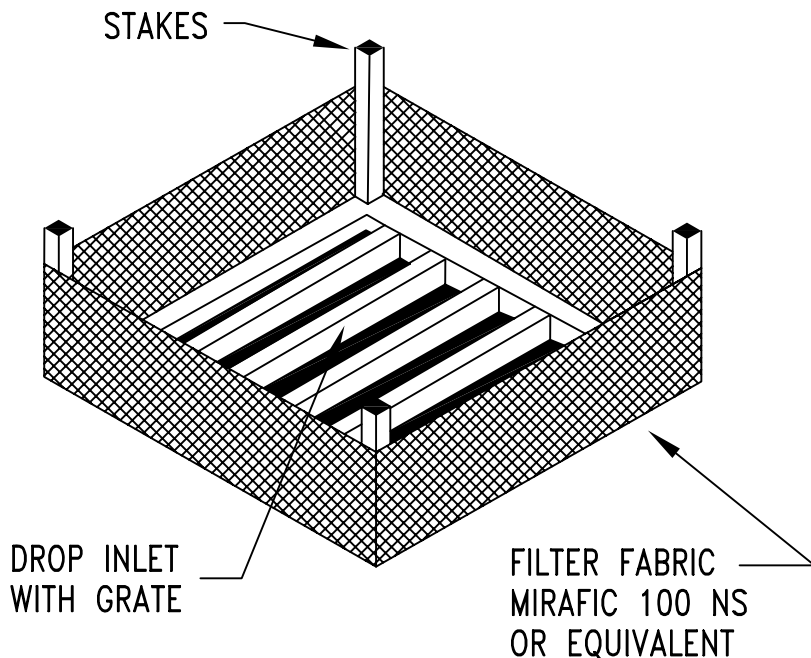
Erosion Control
Sediment Trap

Detail: EC-2



City of Port Townsend - Public Works Department

Standard Detail



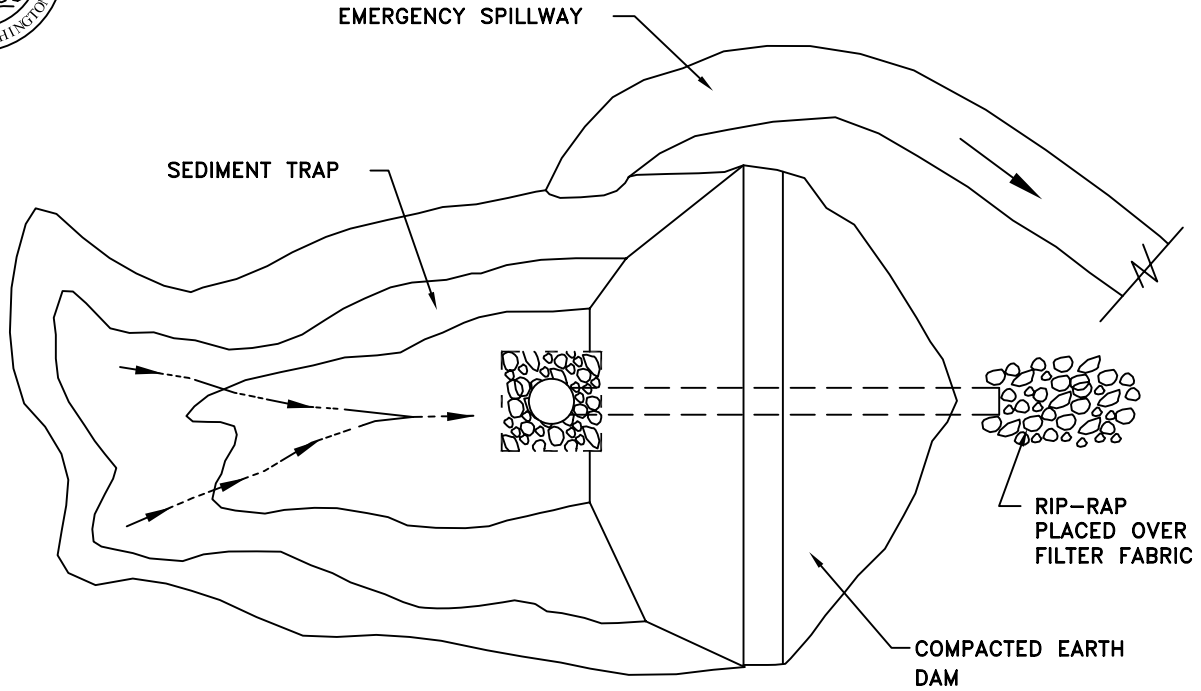
NOTE:
 SAND BAGS MAY BE USED IN PLACE OF FILTER FENCE
 WHEN FILTER FABRIC IS IMPRACTICAL.

Date: April 1997	No.	Date	Revision	By	Apvd	Erosion Control Filter Fabric Inlet Fence
Approved By:						Detail: EC-3
File: E:\eng_std\standard\erosion						

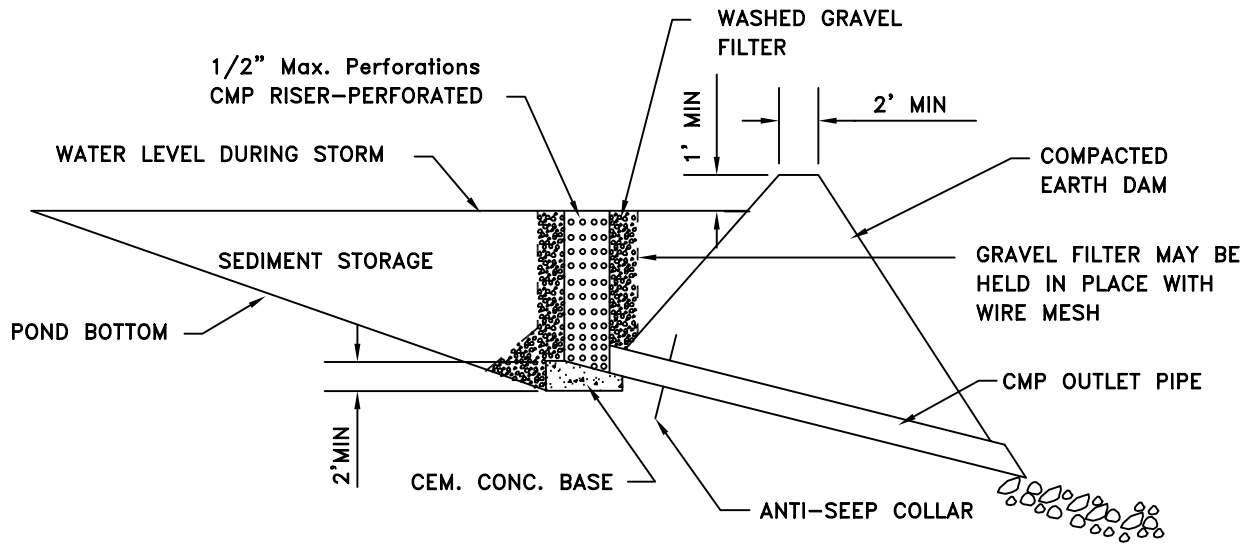


City of Port Townsend - Public Works Department

Standard Detail



PLAN



PROFILE

NOTES:

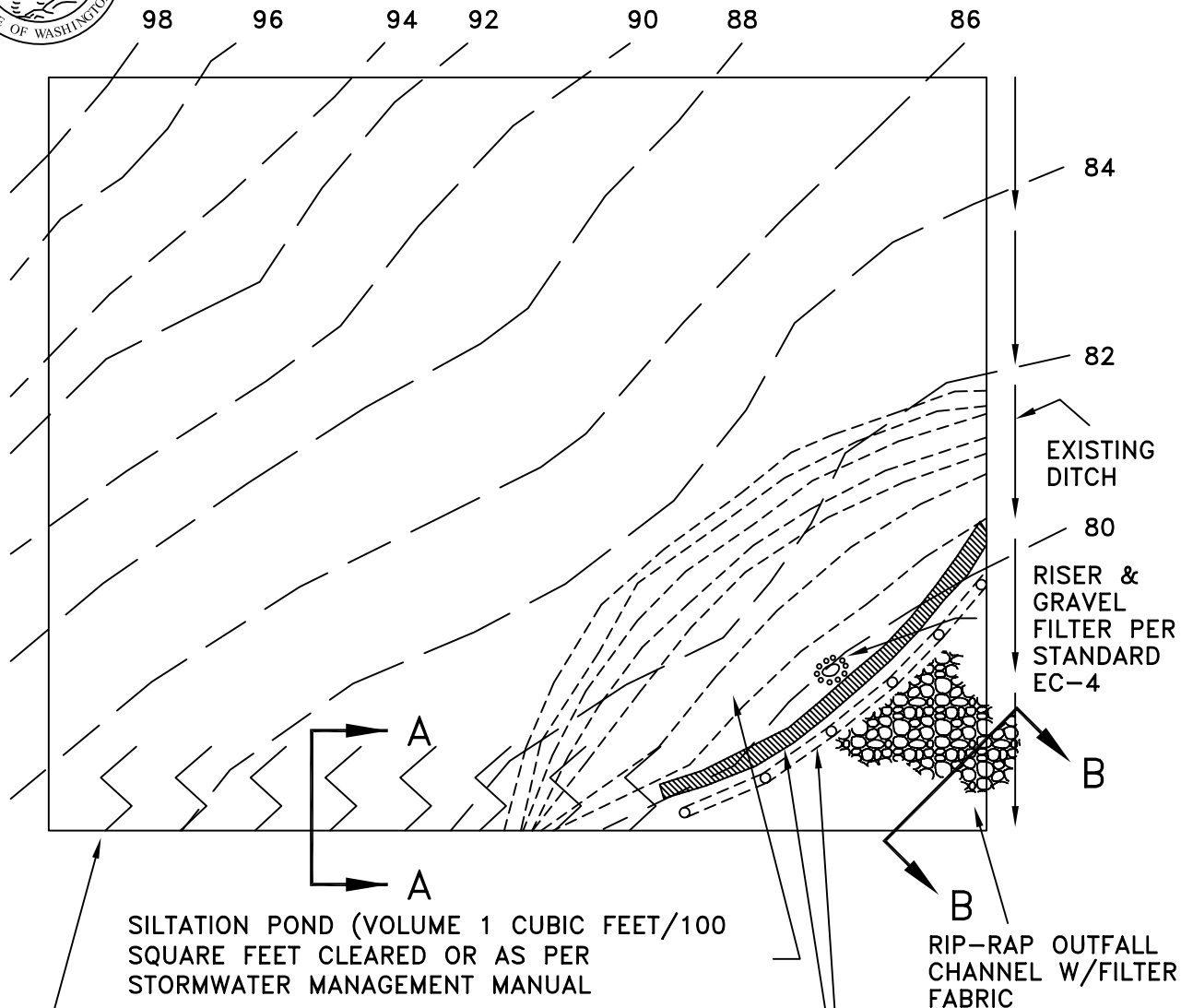
1. LENGTH OF BASIN MUST BE AT LEAST 3 TIMES THE WIDTH.
2. ALL INLETS AT THE UPSTREAM END OF THE BASIN.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Erosion Control</h3> <h3 style="margin: 0;">Typical Sediment Basin</h3> <h2 style="margin: 0;">Detail: EC-4</h2>
Approved By:						
File: E:\eng_std\standard\erosion						



City of Port Townsend - Public Works Department

Standard Detail



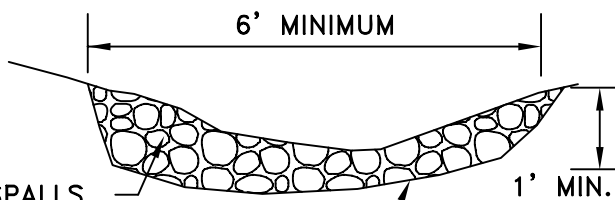
SILTATION POND (VOLUME 1 CUBIC FEET/100 SQUARE FEET CLEARED OR AS PER STORMWATER MANAGEMENT MANUAL)

CONSTRUCT RUNOFF INTERCEPTOR SWALE WITH BERM

CONSTRUCT STRAW BALE DAM AND / OR FILTER FABRIC FENCE (In critical drainage areas) (both are required)



**INTERCEPTOR SWALE
DETAIL SEC. A-A**



RIP-RAP OUTFALL CHANNEL SEC. B-B

Date: April 1997

Approved By:

File: E:\eng_std\standard\erosion

No.	Date	Revision	By	Apvd

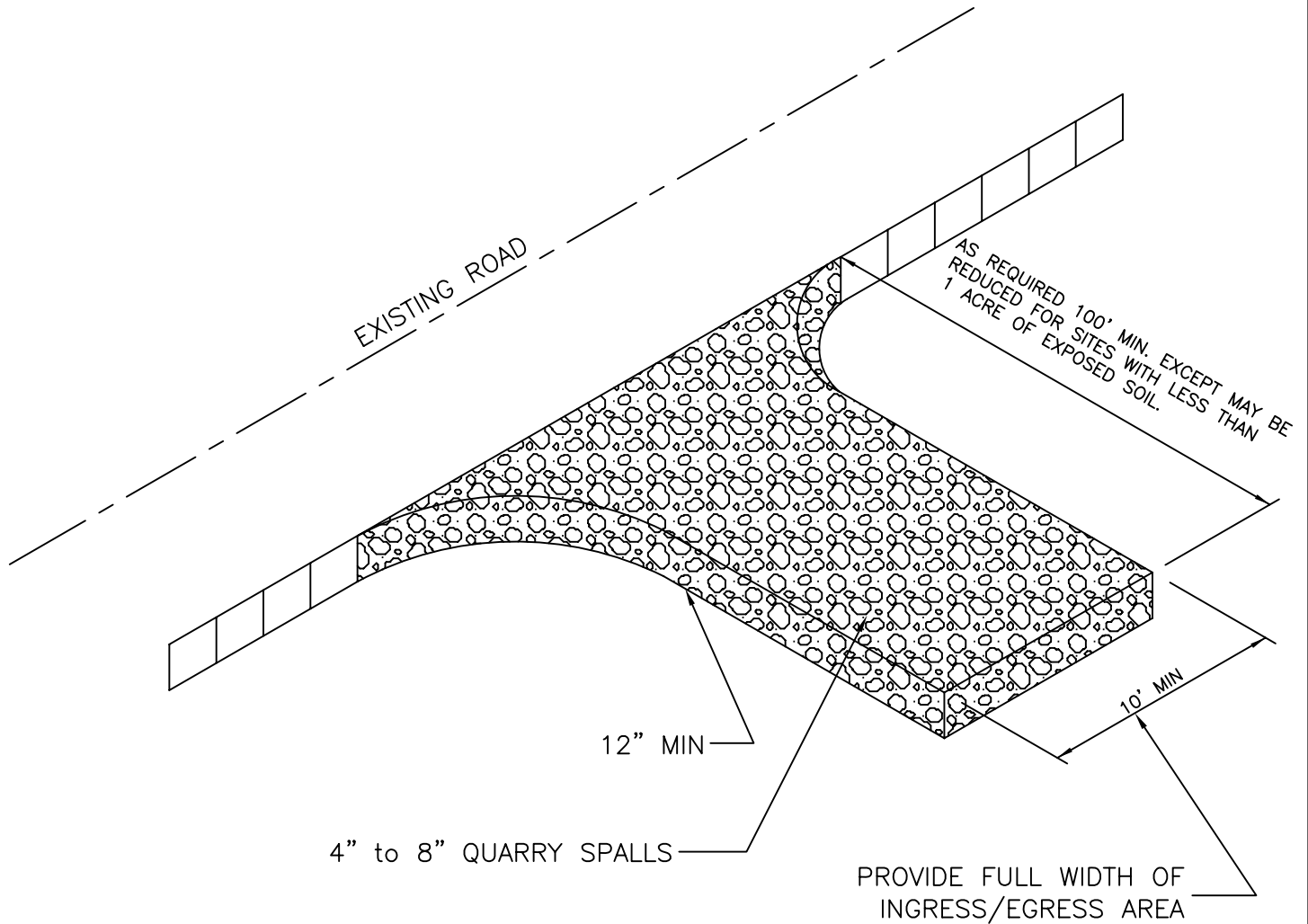
Erosion Control
Typical Temp. Erosion Control

Detail: EC-5



City of Port Townsend - Public Works Department

Standard Detail



Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Erosion Control Construction Entrance</h3> <p style="font-size: 1.2em; margin: 10px 0 0 0;">Detail: EC-6</p>
Approved By:						
File: E:\eng_std\standard\erosion						



City of Port Townsend - Public Works Department

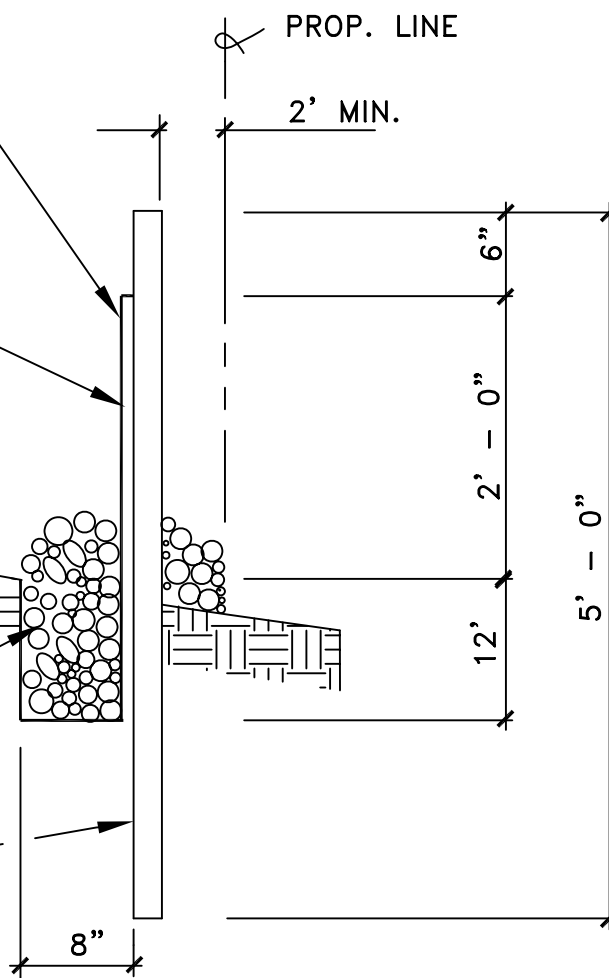
Standard Detail

MIRAFI 100 NS
OR EQUIVALENT
FILTER FABRIC MATERIAL

2" X 2" BY 14 GA. WIRE
FABRIC OR EQUIVALENT

PROVIDE 3/4" - 1 1/2" WASHED
GRAVEL BACKFILL IN TRENCH AND
ON BOTH SIDES OF FILTER FABRIC
FABRIC ON THE SURFACE

2" X 2" WOOD POST
OR STEEL FENCE POST
AT 6 FEET ON CENTER



Date: April 1997

Approved By:

File: E:\eng_std\standard\erosion

No.	Date	Revision	By	Apvd

Erosion Control
Filter Fabric Fence

Detail: EC-7

Chapter 6
TRANSPORTATION

1. General Considerations

- a. The standards and guidelines established by this chapter are intended to represent minimum standards for the planning, design and construction of transportation facilities in conformance with Title 12 of the PTMC, and the goals and policies of the Port Townsend Comprehensive Plan.
- b. The overall goal for the City’s transportation system as outlined in the Transportation Element of the Port Townsend Comprehensive Plan, is “to encourage the uniform development of an integrated, fully accessible, multi-modal, cost-effective public transportation system that will facilitate present and future demand with minimal environmental impact.” Specific goals and policies defined in the Transportation Element include developing transportation standards that:
 - Promote transportation improvements compatible with adjacent land uses
 - Preserve the “small town character”
 - Create a pedestrian- and bicycle-friendly city
 - Encourage narrow streets
 - Encourage safe neighborhood streets with limited access and multiple uses
 - Build an interconnected non-motorized system
 - Promote facilities for transit users
 - Preserve options for uses of public rights-of-way
- c. In conformance with the goals and policies of the Comprehensive Plan, the term “transportation system” and the standards in this chapter apply broadly to vehicular travel, non-motorized travel including bicycle and pedestrian ways, facilities to promote and provide access to transit and other public transportation, telecommunications and private utilities in the right-of-way, and the preservation of public rights-of-way for other public uses.
- d. The standard street sections generally apply for all new streets. For existing streets, each street must be designed on a case by case basis considering the potential impacts of current and future development and the neighborhood scale and design preferences.

2. Definitions

See Chapter 1

3. General Requirements

- a. Whenever new lots are proposed to be created or whenever any type of development is proposed on a parcel or lot, the City may require that streets, alleys, pathways, easements, or rights-of-way be improved and/or constructed to these Standards as a condition to further property development. Such improvements may include pavement, curb and gutter installation, storm drainage control and treatment, design of improvements to future right-of-way grade,

walkways, bikeways, landscaping, driveways, street widening, street lighting/illumination, cul-de-sacs/hammerheads, on-street parking, utilities, signs and/or other traffic control devices, all in conformance with these Standards and the PTMC. No protest agreements for LID formation and/or maintenance agreements may also be required.

- b. For new construction on existing opened streets, improvements in the right-of-way in accordance with these Standards may be required if the street section does not meet current standards. Alternatively, the Public Work's Director may require the property owner to enter into a "no protest" agreement waiving the property owner's rights under RCW 35.43 *et seq* to protest formation of a local improvement district for future street and frontage improvements in accordance with Title 12.
- c. In some cases, the City may allow opening and installation of streets which are not fully developed to the City's street standards. In such instances, the property owner shall sign a no protest agreement to formation of an LID to bring the street up to full standards. The City approves and maintains only those streets which are fully developed to the minimum street standards.
- d. Payback Agreements. The developer of a street may be eligible for partial reimbursement of costs through a Street Latecomer Agreement as defined under Chapter 12.26 PTMC. In certain limited instances, the City may join in the financing of these improvements as described under Alternative Financing Methods Chapter 12.26 PTMC.
- e. Street and Pathway Continuity. The layout of streets and pathways shall provide for the continuation of existing collector and arterial streets and bicycle and pedestrian connections in adjoining subdivisions or of their proper projection when adjoining property is not subdivided. Local access shall be designed to discourage through vehicular traffic; however, pedestrian and bicyclist through-access shall be provided.
- f. Fire Access. Fire access shall be provided in accordance with the local street standards defined by this chapter.
- g. Waivers and Variances. Waivers or variances from these Standards shall be governed by Chapter 12.04 PTMC.
- h. Any design guidelines from the Gateway Plan and the Urban Waterfront Plan shall supersede these Standards.

4. Permitting, Design, Construction and Approval

- a. SEPA. A SEPA review may be required by the City for some projects. The Building and Community Development Department will provide information on the applicability of SEPA.
- b. Traffic Impact Study. A traffic impact study may be required to assess the impacts of the proposed project on the City's transportation system. The traffic impact study will assist the City in identifying measures necessary to mitigate the impacts created by the development and to assess concurrency requirements for the development. The traffic impact study is described in Appendix 6F to this

- chapter.
- c. Street Development Permit. A Street Development Permit is required for any improvements to or any work performed within the public right-of-way including clearing, grading, and land alteration.
 - i. Street Development Permit applications shall be submitted on forms provided by the City. When an application is requested, the City will assist the applicant in identifying whether other regulations such as the Environmentally Sensitive Areas (ESA) Ordinance or the State Environmental Policy Act (SEPA) apply.
 - ii. The application shall contain the following information:
 - (1) The name of the owner or agent and mailing address, the street address or name of the premises to be developed, and the legal description of the premises to be developed;
 - (2) The type of development proposed and the building lots, living units and/or the type of activity that will occur within the premises to be developed;
 - (3) A site plan showing the location of the right-of-way and the proposed transportation system improvements;
 - (4) The design drawings and specifications required under Item “g” below in sufficient detail to show that the right-of-way and proposed transportation system improvements will be constructed in conformance with the requirements of these Standards.
 - (5) Any other information deemed reasonably necessary by the director for action upon the application, or as required by SEPA (Chapter 20.04 PTMC), the Subdivision Code (Title 18 PTMC), the ESA Ordinance (Chapter 19.05 PTMC), other city ordinances, and/or subdivision, PUD or other project approval conditions.
 - iii. When the City receives the application, the application will first be checked for completeness. Once the applicant is notified that the application is complete the City will begin its review.
 - iv. Street Development Permit applications and all required submittals and designs are reviewed and approved by the Public Works Director. **The final permit must be approved by the Director prior to any work being performed within the right-of-way.**
 - d. Street Development- Minor Activities Permit. A reduced-fee Minor Activities Permit may be used as an alternative to a full Street Development Permit for the following types of improvements within the right-of-way on an existing street:
 - i. Driveways and paved residential parking areas
 - ii. Drainage improvements
 - iii. Building drain connections
 - iv. Sidewalks and pathways
 - v. Minor clearing and grading activities
 - vi. Street and trail lighting
 - e. Public Works Technical Conference. A technical conference with Public Works

staff is encouraged, and may be required, for anyone planning to open a new street, construct a new street, or make significant improvements in the right-of-way. The applicant must submit a request for the conference, along with a conceptual plan of the development proposal, 14 days in advance of the conference. The submittal shall include the general location of the right-of-way, the development proposal and the proposed transportation system improvements. The public works technical conference will function as a conceptual design review and conceptual level drawings are encouraged. After the request for the conference is received, Public Works will sponsor an internal development review of the proposal and then meet with the applicant to review the proposed site plan and to further define the City's development requirements. Whenever possible, the review by the City and the discussion at the technical conference will be combined with water, sewer, and other utility issues.

- f. Subdivisions and Type II and Type III Permits. The preapplication conference required under Chapter 20.01 PTMC for land use actions is considered to be a separate process from the Public Works technical conference; however, a representative of Public Works will attend the preapplication conference so that the applicant can be informed early on in the development process of applicable standards, regulations and policies so that the application may proceed without delay. The applicant will be notified at the preapplication conference if a subsequent Public Works technical conference will be required.
- g. Construction Drawings and Engineered Plans. All applicants for a Street Development Permit shall submit drawings and specifications as necessary to describe and illustrate the proposed improvements in the right-of-way. If base maps prepared by a licensed land surveyor are available, the design and construction plans shall be submitted on such maps.
 - i. If base maps are unavailable and the public works director determines that a survey is necessary to adequately define the limits of the right-of-way for the purposes of transportation system design and construction, the applicant shall have the right-of-way surveyed by a licensed land surveyor and the plans shall be prepared and submitted on such surveyed base maps.
 - ii. All design and construction plans involving the construction of a new street, or the paving of an existing street, must be prepared, signed and stamped by a Washington State licensed civil engineer. Where paving is required, the engineering design shall be to the next intersection, even if the developer is required to pave only a portion of the street.
 - (1) For new streets in Tier 1 for street construction of one city block (approximately 260 feet) or less, which do not require licensed plans under other authority of other sections of the Port Townsend Municipal Code, the developer has the option of the city performing the engineering for the project at a cost to the developer as set forth in Chapter 3.36 PTMC. Alternatively, the developer may pay for his or her own engineering with the full

cost to be borne by the developer. All other plans shall be prepared at the developer's sole cost.

- (2) The engineered plans shall be prepared on surveyed base maps and shall meet the requirements for plan contents described in Chapter 1.

- h. Inspections, As-Builts, Final Approval and Acceptance. Inspections, as-built submittals, and final acceptance of the improvements by the City shall be as described in Chapter 1.

5. Street Openings and Uses of Existing Public Rights-of-Way

As outlined in the Comprehensive Plan, [Chapter VI, page VI-6 and policies 9.1 to 9.8] it is the City's policy that the currently platted street rights-of-way should be used not only for motor vehicle travel, but should also be preserved and utilized for a variety of other public uses including:

- Non-motorized pathways and connections
- Greenways and open space connections
- Neighborhood stormwater retention facilities
- Preserving environmentally sensitive areas
- Wildlife corridors
- Traffic calming and diversion
- Utility lines

To that end the following items will be considered in determining the opening, use, and design for a public right-of-way:

- a. Public rights-of-way shall be opened for vehicular travel only to the extent necessary to:
 - i. provide access to lots for development
 - ii. provide for a logical street network
 - iii. minimize traffic on any one particular neighborhood street
 - iv. Meet fire access needs
- b. Local access streets should not be opened straight through for several blocks unless traffic calming is provided to slow, discourage, or divert through-traffic. Traffic on local access streets should be directed to neighborhood collector streets.
- c. Rights-of-way designated as "not-to-be-opened" on the City's Street Map due to actual or planned use for non-motorized connections, traffic calming, or other public use such as greenways, open space, wildlife corridor, or stormwater controls or other treatment, shall not be opened for vehicular travel, unless no other access exists for the lot.
- d. Unopened streets should serve in a primary role as pedestrian or bicycle pathways between parallel streets to facilitate non-motorized travel between neighborhoods and street blocks. These pathways should also connect, where possible, to an integrated network linking to other public lands, open space, trails and pathways.
- e. The number of streets opened as through-streets crossing designated primary and secondary pathways for pedestrian and bicycle use shall be minimized.

- f. Rights-of-way shall be preserved as open space when located in the “potential open space connections” overlay from the Port Townsend Comprehensive Plan Land Use Map.
- g. Unopened street ends abutting shorelines (as defined by the Shoreline Master Program) and bluffs shall be preserved for public access (i.e., shall not be vacated). Access by the public to these rights-of-way shall not be restricted, unless special restrictions are requested and approved by the City for reasons of safety.
- h. Street Vacations. Street vacations are discouraged.
 - i. Street vacations will be considered:
 - (1) When the public benefits identified above can still be met or when they are not considered to be applicable to the right-of-way in question in the future.
 - (2) When included as part of a reorientation or replatting of lots and rights-of-way that provides equivalent public benefits for these alternative uses.
 - ii. If a street vacation is approved, the City will generally require that a minimum of a 20-foot easement be preserved for utility and non-motorized uses.
- i. Private Driveways in Public Rights-of-Way
 - i. Private driveways may be allowed in a public right-of-way in certain instances when it can be demonstrated to be in the general public interest. Examples of when a driveway may be allowed, and/or encouraged, include:
 - (1) Minimizing access and intersections onto arterials and collectors
 - (2) Steep slopes that prohibit a through street.
 - (3) When developed in conjunction with a pedestrian throughway.
 - (4) Reducing the amount of impervious surface that would otherwise be created by a fully developed public street.
 - ii. Private driveways in the public right-of-way need not be developed to City street standards; however, a 20-foot minimum paved apron is required where such driveways meet paved streets.
 - iii. Private driveways may serve multiple residences.
 - iv. For private driveways in the public right-of-way:
 - (1) A street use agreement will be required when the City develops this program, and
 - (2) A pedestrian pathway connector shall be provided through the street right-of-way to the next intersection, unless it can be shown this pathway provides no public benefit, and
 - (3) A sign shall be posted indicating this is a public throughway, and
 - (4) Maintenance of the driveway is the sole responsibility of the property owner(s).
 - v. Private driveways are for access only. On-site parking requirements must still be met.

- j. Significant Vegetation.
 - i. All significant trees shall be preserved where possible in the right-of-way outside of the clear Zone needed to construct the street improvements as defined on the Standard Details, unless their removal is approved by the public works director.
 - ii. Unique vegetation, hedgerows, and vegetation providing wildlife habitat shall be preserved in the right-of-way where possible.

6. Existing Streets

- a. Any street that does not meet the current design standards is considered a substandard street.
- b. Gravel and Substandard Paved Streets. A new development on an existing substandard street will generally not be required to make pavement improvements except when necessary to mitigate the direct impacts of the proposed development and/or meet safety requirements.
- c. The level of service standard (LOS) for a gravel street is 70 vehicle trips per day.
- d. Substandard Connecting Streets.
 - i. If the street to be opened and improved to serve the proposed development connects to a substandard street(s) and such substandard street(s) is the only connection to the street network, paving or upgrading of such connecting street(s) may be required. Whether such connecting street(s) must be upgraded or paved shall be based on an individualized analysis of whether such off-site improvements are reasonably necessary to ensure public safety (including but not limited to emergency vehicle access) and/or to mitigate the direct impacts of the development.
- e. No Protest Agreement. Any developer that is not required to construct improvements to minimum (paved) standards shall be required to sign a “no protest agreement” pursuant to Chapter 12.04 PTMC.
- f. Latecomer Agreement. To the extent that the particular proposed development creates the need for upgrading or paving of substandard streets, the developer will be required to pay the full costs of upgrading or paving in order to mitigate the direct impacts of the development and/or to meet safety requirements. The developer may be eligible for a latecomer agreement.

7. New Streets in Previously Platted Rights-of-Way

- a. All unopened street rights-of-way to serve a proposed development shall be graded and paved in conformance with these standards to and through the lot frontage.
- b. The alignment of new streets shall generally be in the center of the right-of-way except as may be necessary to avoid Significant Vegetation and as provided under Section 9 Local Access Streets.
- c. New streets must be designed through to the end of the block to ensure continuity of centerline elevations and drainage.
- d. Construction phasing may be allowed through an approved improvement method

report.

8. Subdivisions and PUDs - General Layout of the Street and Pathway System

For all new subdivisions under Title 18 PTMC (including short plats, long plats and binding site plans), the applicant must consider both motorized and non-motorized travel as an integrated transportation network both within the subdivision and in its connections to the City system. The applicant is encouraged to seek City review of a conceptual site plan early on in the development of a project.

The preliminary plat must consider and include the following:

- a. The street and trail design should reflect the natural character of the area and relate to adjacent sections of the City. Special features of a site shall be preserved where possible.
- b. Street Network. The street network shall:
 - i. Be based on a grid or modified grid pattern [ref Comprehensive Plan Chapter VI, policy 4.8]. A modified grid system is generally intended to provide bicycle and pedestrian access to the same extent as a grid system but limit vehicle through traffic.
 - ii. If cul-de-sacs are used, through access (easement or right-of-way) shall be provided at the end of each cul-de-sac to connect the cul-de-sacs and adjoining open space with a pedestrian and bicycle pathway.
- c. Pedestrians and Bicycle (Non-motorized) Network. A system of sidewalks, trails, walkways, and bicycle paths shall be provided which accomplish the following:
 - i. Promote non-motorized travel as an alternative to motorized travel by providing direct links to neighborhoods, mixed use and commercial districts, and transit pullouts.
 - ii. Maximize the use of off-road trails and pathways.
 - iii. Provide direct through-access with minimal crossings of streets.
 - iv. Cross streets at safe locations and provide signage for the crossings.
 - v. Provide direct connections to the City-wide pedestrian and bicycle network.
 - vi. Build on and enhance the safe-route-to school network.
 - vii. Provide connections to the City's trail and open space system.
 - viii. Preserve existing trails to the maximum extent possible.
- d. Adequate buffering (landscaping and/or setbacks) along arterials and major collectors shall be provided to screen residences from dust, noise and other traffic impacts.

9. Local Access (Neighborhood) Streets

It is the vision of the Port Townsend Comprehensive Plan that neighborhood streets shall be shared for motorized, non-motorized, and neighborhood scale use and that they be designed to be safe for pedestrians. Practices and designs to control speeds and assure safe streets are encouraged. Some examples of traffic calming and neighborhood streetscapes are included in Appendix 6B.

- a. The following shall be considered in the layout and design of neighborhood

streets:

- i. Maintain neighborhood scale
- ii. Preserve vegetation
- iii. Use narrow streets to reduce stormwater runoff and reduce costs
- iv. Discourage through traffic
- v. Provide separate pedestrian access through and between blocks
- b. Neighborhood street design shall focus not only on the needs of the automobile, but also on the needs of children, pedestrians, residents, and bicyclists.
- c. Neighborhood streets shall provide vehicle access for residents on the street, and allow traffic movement but should discourage through access for motor vehicles. Traffic calming and other methods to slow traffic speeds and enhance pedestrian and bicycle safety should be considered and include:
 - i. Traffic circles at intersections
 - ii. Not opening streets all the way through to the next intersection
 - iii. Circuitous routes for through-traffic, for example a broken street grid
 - iv. Closing existing street ends
 - v. Textured pavement
 - vi. Medians at intersections
 - vii. Speed tables
 - viii. Chicanes
 - ix. Curved streets
 - x. Bulb-outs, pinch points, pavement narrowing, and pocket parking
- d. Innovative street designs and access control methods to meet the goals for neighborhood streets are encouraged by the City.

10. Multi-family (RIII or RIV), Mixed Use, Commercial Development

- a. A separated, internal pedestrian circulation system shall be provided in all new developments in all RIII, RIV, M and C zones (Policy 5.3b)
- b. Through access or connectors to the non-motorized network shall be provided.
- c. Driveways and entrances onto collectors and arterials should be minimized and shared where possible.

11. Level of Service Standards

- a. Any new development proposal may be required to perform a traffic impact analysis and assess the impact on traffic for the existing streets.
- b. Where a project is served by a street system of arterials and collectors that is below level of service D or will fall below LOS D as a result of the development, the GMA concurrency requirements must be met.

12. General Design Standards

- a. Street pavement design must provide for the maximum vehicle weight loading conditions anticipated.
- b. The design of streets and other improvements shall depend upon their type and usage. The design shall conform in functionality and overall design concept

to the standard sections of the various classifications of streets as shown on Standard Details T-3 to T-12 and as described in Table 6-1. The standard roadway sections establish the general construction requirements. The actual design of each street must consider the intensity of adjacent development, localized drainage and soil characteristics, slope, existing vegetation, safety, traffic calming, and other conditions. Innovative street design is encouraged.

- c. Alignment. Alignment of arterials and collectors shall conform as nearly as possible with that shown in the Arterial Street Plan as amended by the Comprehensive Plan.
- d. Grade. Street grade shall conform to the natural contour of the land as closely as possible. In some cases a different grade may be required by the Public Works Director. The minimum allowable grade shall be 0.5 percent and the maximum allowable grade shall vary, depending upon the street classification, surrounding soils, pavement type, and fire access.
- e. Cross slope. The crown of the street shall slope at a minimum of 2% grade to the street edge.
- f. Width. The pavement and right-of-way width depend upon the street classification. Table 6-1 and the Standard Details define the minimum widths allowed. Street widths shall be measured from face of curb to face of curb on streets with cement concrete curb and gutter or asphalt curbs, or from the inside edge of the shoulder. Streets constructed less than 26 feet wide may be required to be posted with no parking if access for emergency vehicles becomes restricted. Street widths may be reduced by providing pocket parking, bulb-outs, pinch points and other traffic calming features.

13. Functional Classification

- a. City streets are designated as Principal Arterials, Minor Arterials, Major Collectors, Minor (Neighborhood) Collectors, Boulevards, Scenic Collectors, or Local Access Streets. The classification of existing and proposed streets is shown on Figure 6-1, and is listed below. These classifications are based on existing use patterns and may be reviewed periodically and adjusted. Future use patterns may change these designations. New streets shall be classified by, and existing Streets may be reclassified by, the Public Works Department.
 - i. Principal Arterials:
 - (1) “Forest Corridor” - Sims: City Limits to Howard Street
 - (2) “Upper Commercial District” - Sims: Howard Street to Sheridan
 - (3) “S - Curve Corridor” - Sims: Sheridan to 10th
 - (4) “The ‘Flats’ Commercial District” - Sims: 10th to Kearney
 - (5) “Bluff Corridor” - Water Street: Kearney to Ferry Terminal
 - ii. Minor Arterials
 - (1) Hastings: City Limits to Discovery Road
 - (2) Sheridan: Sims to Hastings
 - (3) F: San Juan to Tyler
 - (4) Tyler: F St. to Lawrence

- (5) 19th: Sheridan to Kearney
- (6) San Juan: 19th to Admiralty
- (7) Kearney: Sims to Blaine
- (8) Lawrence: Kearney to Monroe
- (9) Water: Ferry Terminal to Monroe
- (10) Monroe: Lawrence to Water
- (11) Discovery Road: Hastings to F St.
- (12) New Street: Howard St general alignment: Sims Way to Hastings Ave.
- iii. Major Collectors:
 - (1) McPherson: Sims to Discovery Bay
 - (2) 12th: Sheridan to Sims
 - (3) 14th: Discovery Bay Rd. to Sheridan
 - (4) Landes: 12th to 19th
 - (5) 9th: McPherson to Sheridan
 - (6) Redwood: Cherry to Admiralty
 - (7) Cherry: Redwood to Walker
 - (8) Walker: Cherry to Washington
 - (9) Monroe: Roosevelt to Lawrence
 - (10) Washington: Sims to Monroe
 - (11) Quincy: Water to Jefferson
 - (12) Jefferson: Quincy to Tyler
 - (13) Tyler: Jefferson to Lawrence
 - (14) Fir: F to Benton
 - (15) Harrison: Washington to F
 - (16) Benton: Washington to Blaine
 - (17) Discovery Road: 19th to Hastings
- iv. Minor (or Neighborhood) Collector
 - (1) Cherry: Redwood to W
 - (2) Fir: F to U
 - (3) U: Cherry to Fir
 - (4) Grant: South of Sims Way
 - (5) Silver: Hastings to Umatilla
 - (6) Sheridan: Hastings to Silver
 - (7) Center: San Juan to Cherry
 - (8) Jackman: 43rd to 49th
 - (9) Hendricks Street: North of 49th
- v. Boulevards - none designated to date
- vi. Scenic Collectors
 - (1) Cook Avenue: City Limits to 49th
 - (2) 49th: Hendricks to San Juan
 - (3) San Juan: 49th to Admiralty
 - (4) Admiralty: San Juan to W
 - (5) W: Admiralty to Walnut
 - (6) Walnut: W St to Q

- (7) Q: Walnut to Jackson
- (8) Jackson: Q to Roosevelt
- (9) Discovery Road: City Limits to Sheridan
- vii. Local Access Streets - all other streets not identified above

14. Naming and Addresses

Street numbers are provided by the City and are assigned with the building permit. Street names for existing platted rights-of-way shall be as shown on the plat maps. Names for new streets shall be submitted for approval with the preliminary plat.

15. Signage

- a. Street Name Signs. Street signs shall be provided by the developer at all intersections. The design shall be per the U.S. Department of Transportation Manual on Uniform Traffic Control Devices (MUTCD).
- b. Construction Traffic Control. The developer is responsible for providing all construction traffic control signs, devices and flagging. Traffic control signing and devices shall comply with the provisions as established by the WSDOT Standard Plans.

16. Right-of-Way Width and Dedications

- a. As further set forth in Chapter 12.04 PTMC, right-of-way widths deeded to the city for streets and other improvements shall be as required for each functional clarification of streets to accommodate motorized and non-motorized transportation, landscaping, drainage, utility and buffer requirements. Right-of-way width is generally determined by the functional classification of the street. The typical right-of-way for each classification is shown on the Standard Details and in Table 6-1.
- b. Right-of-way requirements may be increased if additional travel lanes, turn lanes, transit lanes, bus loading zones, operational speed, bike lanes, utilities, drainage, schools, or other factors require greater width as determined by the Public Works Director. A reduction in the minimum right-of-way requirement may be granted by the Public Works Director where it can be demonstrated that sufficient area has been provided for current and future functions within the right-of-way and/or alternate locations.
- c. Easements for other public systems shall be provided as required. Particular design features of a road may necessitate slope, retaining wall, or drainage easements. Examples of other cases where easements may be required by the Public Works Director include temporary construction, right of entry, walkway, pedestrian, street lighting, traffic control devices, and to implement the city's Non-Motorized Plan.
- d. All development may be required to deed additional right-of-way, as a condition of approval of the development if the development abuts an existing substandard public street and the additional right-of-way is necessary to incorporate future street improvements necessary for public safety. All right-of-way shall be

conveyed to the City on a recorded plat or by right-of-way dedication deed.

17. Private Streets or Access Easements

- a. Private streets may be allowed under the following conditions:
 - i. Permanently established by plat or easement providing legal access to serve dwelling units or businesses on separate parcels, or dwelling units or businesses situated on one parcel sufficient to accommodate required improvements, to include provisions for future use by adjacent property owners when applicable, and;
 - ii. Meet city minimum design standards except for right-of-way requirements and approved waivers, and;
 - iii. Accessible at all times for emergency and public service vehicle use, and;
 - iv. An agreement is signed indicating that the city will not be responsible for roadway maintenance costs associated with use of the road by emergency vehicles and service vehicles, and;
 - v. Will not result in land locking of present or future parcels nor obstruct public street circulation, and;
 - vi. Covenants have been approved, recorded, and verified which provide for maintenance of the private street by the owner or homeowners association or other legal entity and allows the use of the street by service vehicles at no cost for maintenance to the city.
- b. Acceptance as Public Streets. Acceptance of private streets as public streets will be considered only if the street(s) meet all applicable public street standards, including right-of-way.

18. Street Frontage Improvements

- a. All new development shall install street frontage improvements required by these Standards as a condition of development. Such improvements may include pavement, curb and gutter; walkways; bikeways; storm drainage; lighting; traffic control devices and signal; utility relocation and/or undergrounding; and street widening all per Chapter 12 PTMC and these Standards.
- b. All frontage improvements shall be made across the full frontage of the property and shall match the adjacent street improvements and meet the required minimum street section.
- c. Disturbances in the right-of-way shall be limited to those necessary to construct the improvements described in the approved street development permit. Any street or street frontage damaged as a result of the development shall be returned to its original condition or better. Vegetation and existing contours shall be preserved to the extent possible. Revegetation and slope stabilization methods shall be employed to prevent safety and drainage and erosion problems during and after completion of construction.
- d. Waiver: Frontage improvements may be waived per the criteria under Title 12. If frontage requirements are waived, the applicant may be required to sign a no-protest agreement to the formation of a future Local Improvement District (LID)

to install the improvements.

19. Street Ends

- a. Fire apparatus turnarounds shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 260 (one city block) feet from fire department vehicle access. In such case, cul-de-sacs or other fire apparatus turnaround complying with these standards shall be provided at all public and private dead-end streets, including street ends in subdivisions.
- b. Motor vehicle turn-arounds in conformance with these standards shall be provided when more than three houses are located on a dead-end street or where topography or other constraints merit the need for a turn-around that does not require a fire apparatus turnaround.
- c. Cul-de-sacs. A minimum easement of 20 feet shall be provided at a street end or Cul-de-sac for through-passage of non-motorized pathways and for utilities.

20. Intersections

- a. Traffic control will be as specified in the Manual of Uniform Traffic Control Devices (MUTCD) or as modified by the Public Works Director as a result of appropriate traffic engineering studies.
- b. Angle of Intersection: 75 to 105
- c. Minimum Centerline Radius: See Table 6-1.
- d. Typical Curb or Curve Radius: See Table 6-1. Radius depends on design vehicle.
- e. Reverse curves: Separated by tangents of at least 100 feet may be reduced in business districts where bulb-type intersections are desired length.
- f. Minimum Street Centerline Separation of Intersections:
 - i. Local access,
 - (1) When new right-of-way is being dedicated: 150 feet
 - (2) At all other times 150 feet is the goal; street opening will be reviewed to achieve this.
 - ii. Local access or Collectors intersecting arterials: 300 feet
 - iii. Local access or Collectors on Sims Way in the Gateway Corridor: Shall be in conformance with the Gateway Plan.
- g. Sloping approaches: Landings are not to exceed two feet difference in elevation for a distance of 30 feet approaching an arterial or 20 feet approaching a neighborhood collector or local access street, measured from the back of a walkway or the edge of the pavement if no walkway exists.
- h. Street Grades
 - i. All changes in street grades shall be connected by vertical curves of a minimum length of 200 feet, unless otherwise specified by the Public Works Director.
 - ii. The surface of all streets in the city, when graded, shall have a slope or incline from the crown in the center to the sides of the street of two

percent.

21. Street Sections

- a. For typical sections for minor arterials, collectors and local access streets, see Standard Details T-3 to T-12. For Sims Way see Gateway Plan.
- b. The requirements for facilities within the street rights-of-way and required street cross-sections for each functional classification are also described in Table 6-1. Facility requirements include travel lane widths, shoulders, surfacing requirements, bikeways, and walkways.
- c. Travel Lane Width:
 - i. Travel lane widths depend on the street classification. Minimum travel lane widths shall be as shown on the Standard Details.
- d. Surfacing Requirements:
 - i. All new streets shall be paved, except as provided under Chapter 12.04 PTMC.
 - ii. The following are minimum requirements for travel lane surfacing for the various roadway classifications.
 - (1) Principal Arterials: as per Standard Specifications of WSDOT for SR 20
 - (2) Minor Arterials and Collectors: See Standard Detail T-2.
 - (3) Local Access Streets: Standard Detail T-2.
 - iii. All minimum surfacing and base material requirements assume an acceptable, well drained, stable, compacted subgrade. Additional requirements may be required by the Public Works Director if suitable subgrade conditions are not met.
- e. Drainage. The streets section and street edge shall be designed to adequately handle stormwater runoff from the street, adjacent properties, and upstream flow coming onto the street.
 - i. Street edge and curb design must consider local drainage, soils conditions, drainage quantities coming from offsite, slope, and other local factors
 - ii. Street edge types include curb and gutter, asphalt wedge curb, and shoulder with swale or ditch.

22. On-Street Parking

- a. Arterials and Collectors: Parking shall generally not be provided or allowed on arterials and collectors except in mixed use zones or other areas where the street cross section has been designed to allow for it with travel and bike lanes free for vehicular travel. Special parking lane requirements and widths shall be as shown on the Standard Details and Table 6-1.
- b. Local Access Streets: Parking needs must be met off the paved surface as needed by the development.

23. Pedestrian Walkways (including Sidewalks) and Multi-Use Pathways

- a. Walkways and pathways shall be provided for the following locations and types

of development:

- i. Along both sides of all arterials and major collectors
 - ii. Along one side of minor collectors and scenic arterials and collectors
 - iii. Along designated current and future safe-routes-to-school
 - iv. Frontage for all Multifamily (RIII, RIV), Mixed Use, Commercial and Manufacturing developments
 - v. For all new subdivisions and PUDs per Section 8.
 - vi. For unopened streets per Section 5
 - vii. To fill gaps in the existing sidewalk network
 - viii. Where designated by the Non-Motorized Plan.
- b. A waiver to the walkway requirement may be granted by the Public Works Director
- i. When an equivalent pathway or other safe route is available for pedestrians and bicycles,
 - ii. Where the area is built out to densities such that installation of a single sidewalk section will serve little public benefit, or
 - iii. As otherwise provided in the waivers under Title 12.
- c. Accessibility. All walkways in the public right-of-way shall be constructed to comply with the Washington State Barrier-free Design (WAC 51.30). In accordance with State law (WAC 51.30), if walkways are required to be installed, wheelchair access ramps shall be provided at all pedestrian crossings with curb sections. Form and subgrade inspection by the City is required before a concrete sidewalk is poured.
- d. Width and Surface Material
- i. See Standard Details (Appendix 6A) and Appendix 6-C for general layout and construction details of pathways and sidewalks.
 - ii. All sidewalks on Water Street from Jackson to Walker Street, on Washington Street from Jackson to Taylor, on Tyler Street, Adams Street, Quincy Street, Madison Street and Monroe Street at all points between Water Street and Jefferson Street hereafter constructed, or reconstructed on either side of the streets named shall be designed in conformance with the Port Townsend Streetscape Design Workbook, dated December 16, 1987, which is adopted herein by reference.
 - iii. Principal Arterials (SR20): provide walkways in accordance with the Gateway Plan and Standard Details T-1A through T-1F.
 - iv. Minor Arterial and Collector Streets: Minimum widths are shown on the Standard Details. Concrete sidewalks (Standard Detail T-15) are required in multi-family, commercial, and other non-residential zones. Asphalt or alternative surfacing materials may be considered in residential zones.
 - v. Multi-Use Pathways: Multi-use pathways as defined in the Non-motorized Plan and where required in new subdivisions, shall be asphalt paved unless otherwise approved by the Public Works Director.
 - vi. Local Access Streets: concrete sidewalks are required along the street frontage where necessary to fill gaps in existing sidewalk network, on

designated school walk routes and where shown in the Non-Motorized Plan. Otherwise, local access shall be designed for pedestrian and bicycle safety per Section 9.

- vii. Other Pathways: The minimum construction standard for new unpaved walkways and pathways is four (4) inches in depth of compacted 1/4 minus crushed rock.

24. Transit and School Bus Connections

- a. Transit serviceable site plans and transit supportive features are required for all new developments, when appropriate and feasible.
- b. New developments may be required to construct transit pullouts and/or shelters when necessary to mitigate the impacts of the development and provide for transportation demand management.
- c. Pedestrian connections shall be provided through developments to transit shelters and transit pullouts.
- d. The Jefferson Transit Comprehensive Plan, when complete, shall serve as the basis for establishing transit routes and required facilities.
- e. Public transit passenger shelters adjacent to bus zones may be placed within the curbside obstruction-free zones established by the Port Townsend Streetscape Design Workbook, dated December 16, 1987, which is adopted herein by reference.
- f. Transit pullouts and shelters, where appropriate, shall be provided on all new arterials and major collectors and on existing arterials and major collectors when these streets are upgraded. Crosswalks shall be included in the design
- g. School Bus needs shall be considered in concert with public transit in site plans and street design. The City and Port Townsend School District will use the following criteria in placement and design of school bus stops:
 - i. A school bus stop shall be required for each new residential subdivision or apartment complex where school children are to be boarding or deboarding unless it is determined by the School District that a new bus stop is not required because adjacent facilities already exist for the site.
 - ii. Placement shall be determined by the School District and the City.
 - iii. Location of school bus stops shall be designed with safety as a paramount concern.
 - iv. School bus stops shall be designed to compliment the residential environment and provide convenient location and access for neighborhood children including sidewalk access.
 - v. Every effort shall be made to make school bus stops and sidewalk access to school bus stops a safe and friendly pedestrian environment.

25. Bikeways

- a. Bikeway: Any trail, path, part of a highway or shoulder, sidewalk, or any other travel way s designated, signed, marked or used for bicycles. Bikeways are categorized as follows:

- i. Class I Bikeway (Bike Path): A separate trail for the principal use of bicycles that may be shared with pedestrians.
 - ii. Class II Bikeway (Bike Lanes): A portion of a street designated by signs and/or pavement markings for preferential bicycle use
 - iii. Class III Bikeway (Bike Route): A street designated with signs as a bicycle route and is shared with other transportation modes
 - iv. Class IV Bikeway (Shared Roadway with no Designation): A publicly maintained street that is not designated with signs and/or pavement markings as a bikeway but is accessible to bicyclists.
- b. Requirements for Class II bikeways on arterials and collector streets are as shown on Table 6-1 and on the Standard Details. Other classes of bikeways may be required based on the Non-Motorized Plan.

26. Driveways

- a. Driveway access onto arterials and collectors shall be avoided wherever possible. Driveway access shall not be allowed where other lot access methods exist and/or where access onto the street is considered to be unsafe.
- b. All driveways on lots which abut any arterial or collector street within the city shall either loop within the lot and provide separate points of access and egress to the street, or shall have an adequate turnaround within the lot so that vehicular traffic onto the street from such lot may enter the street by forward rather than backward movement. Joint use at property lines is encouraged.
- c. Width
 - i. The maximum driveway width shall be 20 feet for residential uses and 30 feet for commercial uses. A wider commercial driveway width may be approved by the Public Works Director, where a substantial percentage of oversized vehicle traffic exists. In this case, the driveway should be sized to accommodate the largest vehicles. Where intersection openings are approved, the width shall be as determined by the Public Works Director.
 - ii. Maximum one-way driveway width shall be 12 feet for residential and 22 feet for commercial driveways. Parking lot circulation needs shall be met on site. The public right-of-way shall not be utilized as part of a one way parking lot flow.
- d. Surface - All driveways shall be paved within the right-of-way except when fronting on an existing gravel street, in which case paving of driveways shall be included in the no-protest agreement to a LID. Semi-pervious pavement surfaces may be considered as an alternative to paving.
- e. Conditions of Approval
 - i. All abandoned driveway areas on the street frontage to be improved shall be removed and necessary drainage and walkway shall be installed.
 - ii. Left turns from and to a driveway may be restricted as a development condition or in the future if such maneuvers are found to be unduly hazardous.
 - iii. Driveways shall be aligned wherever possible with existing driveways on

- the opposite side of the street.
 - iv. Design of access points along SR 20 within the Gateway Corridor shall be consistent with the “Detailed Access Management Plan” in the **Gateway Development Plan** (Dated August 2, 1992).
 - v. All driveways shall be angled ninety-degrees to the street, unless designated as right turn only with the approval of the Public Works Director.
 - vi. In commercial areas driveways should be consolidated at the property line for adjoining businesses.
- f. Location and Number of Driveways
 - i. Location of driveways shall be in the safest location available and shall be generally as shown on the Standard Details.
 - ii. When measuring distances to or between driveways, the nearside edge of the driveways line shall be used as a reference.
 - iii. Back edge of driveway shall be at the same elevation as the back of the walkway or shoulder adjacent to the driveway approach.
 - iv. No object (including fire hydrants, light or power poles, street trees) shall be placed within five (5) feet of the driveway edge.
 - v. On sloping approaches, a landing shall be provided per Section Intersections.
 - vi. Approach grades and configuration shall accommodate future street improvements to prevent major driveway reconstruction.

27. Sight Obstruction Requirements

- a. An unobstructed view shall be maintained at all driveways, building or garage entrances.
- b. Sight lines to traffic control devices (signs, signals, etc.) should not be obscured by landscaping, street furniture, marquees, awnings or other obstructions. Refer to Manual of Uniform Traffic Control Devices and WSDOT Design Manual for required sight lines.
- c. Clear vision area: The clear vision area is a clear view triangle formed at the intersection of two streets as shown on the Standard Details. The clear vision area shall be subject to the following restrictions to maintain a clear view at intersection approaches:
 - i. The vertical clearance within the clear vision area shall be free from obstructions to a motor vehicle operator’s or bicyclist’s view between a height of 3 feet and 8 feet above the surface of the street.
 - ii. Exclusions. Sight obstructions that may be excluded from these requirements include: conforming fences, utility poles, regulatory signs, trees trimmed from the base to a height of 8 feet, places where the contour of the ground prevents cross visibility, saplings or plant species of open growth habits and not in the form of a hedge which are so planted and trimmed as to leave at all seasons a clear and unobstructed cross view, buildings constructed in conformance with the provisions of the zoning

regulations, and preexisting buildings.

- d. Any trees within 10 feet of the edge of the roadway or parking must have a visual and physical vertical clearance of 13 feet 6 inches over traveled roadway.

28. Surveying and Monumentation

- a. All street grades, curb and gutter, sidewalks and other improvements shall be staked by a surveyor or engineer prior to construction.
- b. Surveying of land corners shall be required to establish right-of-way lines for all new streets, unless waived by the Public Works Director. Such waiver may be given when right-of-way can be clearly determined without a survey.
- c. Street monumentation: See Chapter 1.
- d. Monumentation details are shown on the Standard Details.
- e. Whenever surveying or monumentation is required it shall be performed in accordance with Chapter 1, Section 1.18 of these Standards.

29. Delivery Boxes (Mail and Newspaper)

- a. Delivery boxes shall be clustered together when practical and when reasonably convenient to the houses served.
- b. When delivery boxes are located in the walkway, individually or in clusters, the walkway shall be widened or offset to provide the full design width around the mail boxes.
- c. In the case of new road construction, or reconstruction requiring mail boxes to be moved back or rearranged, the designer and builder shall coordinate the location with the U.S. Postal Service.
- d. Mail boxes, in the general case, shall be set:
 - i. Bottom or base of box 44 inches above road surface.
 - ii. In relation to curb or sidewalk: front of mailbox one foot back of vertical curb face or outside edge of shoulder.
 - iii. Delivery boxes shall be located so that destruction of the roadside or shoulder shall not occur as a result of delivery of newspapers or mail. If damage occurs, the mailbox shall be relocated or a paved shoulder or pocket pull-out provided.

30. Street and Trail Illumination

- a. The City's overall policy is to minimize street lighting except as needed for safety.
- b. If a resident or group of residents or property owners, desire the installation of a new street light, they must apply to the Public Works Director with a Street Development Minor Activities Permit. The Director may contact impacted neighbors or businesses to determine the general public desire for the light. The Public Works Director will review the application in view of the City's overall lighting policy and must balance safety with O&M costs and will consider neighborhood support or opposition. All street lighting shall be reviewed and approved by the Public Works Director prior to installation. All lighting design

- and installation costs shall be paid for by the applicant(s).
- c. Street illumination shall typically be provided on all new arterials and collectors to address safety and pedestrian concerns. Typical distance is 260 feet apart and/or at intersections.
- d. For new developments, provide street lights commensurate with the neighborhood characteristics and density considering:
 - i. The City’s policy to minimize lighting
 - ii. Aesthetics
 - iii. Pedestrian and vehicular safety
 - iv. Existing and projected traffic volumes
 - v. Location of schools and transit stops
 - vi. High density or intensity land uses
 - vii. Proximity to the intersection
 - viii. Relevant state, federal, local or utility design requirements
- e. General Considerations
 - i. All public street light designs shall be prepared and approved by the power company with jurisdiction in the area or by a licensed engineer experienced in lighting design. The design calculations should indicate luminaire spacing, illumination levels, line losses and the electrical and physical layout of the system, including its connection to the existing system.
 - ii. All street lights are to be equipped with high pressure sodium vapor lighting and lighting shields to control “light pollution.”
 - iii. All street light installations including wiring, conduit, and power connections shall be located underground. Exception: existing residential areas with existing above ground utilities, in which case street lighting may be installed on the existing power poles.
 - iv. On-site lighting shall be hooded and shielded so that it is directed on the project site and does not impact adjacent property.
- f. Trails. Lighting of trails may be required where necessary for safety.

31. Temporary Street Patching

- a. Temporary restoration of trenches shall be accomplished by using 2” Class B Asphalt Concrete Pavement when available, 2” medium-curing (MC-250) Liquid Asphalt (cold mix), 2” Asphalt Treated Base (ATB), or steel plates.
- b. ATB used for temporary restoration may be dumped directly into the trench, bladed, and rolled. After rolling, the trench must be filled flush with asphalt concrete pavement to provide a smooth riding surface.
- c. All temporary patches shall be maintained by the contractor until such time as the permanent pavement patch is in place.

32. Trench Backfill and Restoration

Trench restoration shall be either by a patch or patch plus overlay as required by the City. Restoration shall be as described below unless the existing condition of the street does

not justify full restoration per these standards.

- a. All trench and pavement cuts shall be made by spade bladed jackhammer or sawcuts. The cuts shall be a minimum of one (1) foot outside the trench width.
- b. All trenching shall be backfilled with crushed surfacing materials conforming to Section 4-04 of the WSDOT/APWA Standard Specifications. The trench shall be compacted to 95 percent maximum density, as described in Section 2-03 of the WSDOT/APWA Standard Specifications.
 - i. If the existing material is determined by the City to be suitable for backfill, the contractor may use the native material except that the top of the trench shall meet the pavement section requirements of Standard Detail T-2. All trench backfill materials shall be compacted to 95% density.
 - ii. Backfill compaction shall be performed in six (6) inch lifts.
 - iii. Controlled density backfill (CDF) may be used or required by the City as an alternative for trench backfill.
- c. Replacement of the asphalt concrete or Portland concrete cement shall be of existing depth plus one (1) inch or three (3) inches, whichever is greater.
- d. Tack shall be applied to the existing pavement and edge of cut and shall be emulsified asphalt grade CSS-1 as specified in Section 9-02.1(6) of the WSDOT/APWA Standard Specifications. Tack coat shall be applied as specified in Section 5-04 of the WSDOT/APWA Standard Specifications.
- e. For pavement cuts less than 8 feet wide, asphalt concrete Class B shall be laid by hand and compacted using an asphalt roller. For pavement cuts greater than 8 feet wide the asphalt shall be placed on the prepared surface by an approved paving machine in accordance with the applicable requirements of Section 5-04 of the WSDOT/APWA Standard Specifications. Longitudinal joints between successive layers of asphalt concrete shall be displaced laterally a minimum of twelve (12) inches unless otherwise approved by the City Engineer. Fine and coarse aggregate shall be in accordance with Section 9-03.8 of the WSDOT/APWA Standard Specifications. Asphalt concrete over two (2) inches thick shall be placed in equal lifts not to exceed two (2) inches each.
 - i. All street surfaces, walks, or driveways within the street trenching areas affected by the trenching shall be feathered and shimmed to an extent that provides a smooth-riding connection and expeditious drainage flow for the newly paved surface. Shimming and feathering as required by the City Engineer shall be accomplished by raking out the oversized aggregates from the Class B mix as appropriate.
 - ii. Surface smoothness shall be per Section 5-04.3(13) of the WSDOT/APWA Standard Specifications. The paving shall be corrected by removal and repaving of the trench only.
- f. All joints shall be sealed using paving asphalt AR4000W.
- g. When trenching within the roadway shoulder(s), the shoulder shall be restored to its original or better condition.
- h. The final patch shall be completed as soon as possible and shall be completed

within thirty (30) days after first opening the trench. This time frame may be adjusted if delays are due to inclement paving weather or other adverse conditions that may exist. However, delaying of final patch of overlay work is allowable only subject to the City Engineer's approval.

- i. For any new asphalt streets, no cuts will be allowed for five (5) years. Direction drilling or boring will be required in these situations.

33. Traffic Control

- a. Traffic control is required whenever work occurs that may obstruct traffic flow in the right-of-way.
- b. Signing: The developer shall install all traffic control signs in accordance with MUTCD standards which shall include but not be limited to street name, parking, stop, dead end, and pedestrian signing.
- c. Traffic Signal Modification: Traffic signal modification designs shall be prepared by a licensed engineer experienced in traffic signal design.
- d. For new arterials and collectors, pavement markings, including buttons, paint, thermoplastics and delineators are required for roadway safety. Bicycle safety must be considered in material selection.
- e. Such markings shall be provided and installed by the developer/applicant.
- f. All markings shall be approved by the Public Works Director prior to installation.
- g. All materials shall conform to the WSDOT/APWA Standard Specifications.
- h. All markings shall conform to the current MUTCD as adopted by the WSDOT.

34. Street Trees

- a. Existing native vegetation in the public right-of-way shall be preserved to the extent possible.
- b. The establishment of planting strips and planting of street trees is encouraged by the City, provided proximity to the street, ultimate size of the tree, utility lines, and other public safety and infrastructure protection issues are considered.
- c. Only trees listed in the City of Port Townsend Street Tree List (Exhibit 2, Appendix D) may be planted within City right-of-way, unless otherwise approved by the Public Works Department.
- d. At intersections and at vehicular access points, no plant material with a mature height greater than 30 inches shall be planted within the clear vision area, except where engineering standards indicate otherwise.
- e. No tree planting is permitted where the planting area between a curb and a detached sidewalk is less than four feet. In addition, a minimum planting area defined by two curbs, curb and fence, or sidewalk and fence must be four feet wide if street trees are to be planted.
- f. When the distance between the curb and detached sidewalk is less than eight feet, trees should be centered in the planting strip.
- g. Where the sidewalk is attached to the curb as a contiguous element, street trees should be planted between three and seven feet back from the walk.
- h. No tree is to be planted closer to the street than 30 inches back from the face of

the curb. The face of the curb is the street side of the curb, or as shown on the standard street sections.

- i. Larger maturing trees should generally be spaced 35 feet apart and smaller maturing trees 20 feet apart. The Public Works Director may require wider spacing if it is necessary for development of the tree or for safe use of the street or sidewalk. When space is limited or to achieve certain design effect, closer spacing may be considered.
- j. No tree shall be planted closer than five feet from any driveway or alley nor shall a tree or shrub be planted in such a manner that its eventual growth cannot be reasonably controlled so as to avert interference with or obstruction to any improvements installed for public benefit.
- k. Tree plantings made in a sidewalk must have a minimum of 10 square feet cutout area. The tree must be set back from the street a minimum of 30 inches from the face of the curb.
- l. No vegetation other than low-growing species that do not exceed a mature height of 20 feet may be planted under or within 10 feet of any overhead utility line.

35. Signalization

- a. All new traffic signals shall be provided with walk lights and bicycle activated signal detection.
- b. Signal controls shall meet ADA requirements.

36. Appurtenances

- a. An appurtenance is any fixed object located adjacent to the roadway and deemed to be a possible safety hazard.
- b. All appurtenances shall be located a minimum of three feet behind the face of the curb to the face of the object. Where no curb exists the distance from the edge of the travel way to the face of the object shall be at least six feet.
- c. All breakaway objects shall be located a minimum of two feet behind the face of curb to the face of the object. All objects having properties up to that of a four inch by four inch wooden post shall be considered breakaway.
- d. Appurtenances shall be located outside of the walkway area except when the walkway is widened around the appurtenance to the satisfaction of the Public Works Director.

37. Franchise Utilities

- a. All franchise utilities including power, cable T.V., and telephone shall be installed underground on all new streets. Overhead utilities will be allowed only when overhead service already exists along the frontage of the existing street.
- b. Utilities shall be placed underground at the expense of the utility with the franchise whenever improvements to arterials and collectors are made or whenever lines are being replaced or upgraded on any existing street with overhead service.
- c. Franchise utilities shall relocate existing facilities at their own expense when a

- conflict results between their facilities and public street improvements. The improvement work must be required by the city or be a component of a public works project in order for the relocation work to be the financial responsibility of the utility, otherwise all costs shall be the responsibility of the developer.
- d. When private utility lines are installed in the public right-of-way, the utility shall comply with the following:
 - i. A Street Development Permit must be submitted and approved prior to the start of any new installations.
 - ii. The location, depth and marking of utility lines shall be as shown on the Standard Details, or as otherwise approved by the City Engineer.
 - iii. The street frontage (including drainage, vegetation, driveways, and street surface) shall be returned to as good and safe condition as it was before the commencement of the work.
 - iv. Temporary erosion control practices described in Chapter 5 shall be followed. All disturbed areas shall be revegetated following installation and the utility is responsible for the establishment of the vegetation.
 - v. A franchisee shall leave all streets, avenues, highways or public places in as good and safe condition in all respects as they were before the commencement of such work by a franchisee and in accordance with all city regulations and street standards. The public works director shall have final approval of the condition of such streets and public places after completion of construction. A franchisee's responsibility under this section shall extend for 12 months after completion of construction, installation, maintenance or repair of such facilities for inadequate restoration of streets that was not apparent at the time of any such final approval.
 - e. When telecommunications and fiber optics lines are installed, the City may require that a spare conduit be installed for use by the City to connect public facilities at no expense to the City and as a condition of City approval for installation of the service lines, provided this is allowed under the franchise agreement.

38. Warranty/Guarantee

- a. All work done under a Street Development Permit shall be guaranteed for one year as to materials and workmanship.

**TABLE 6-1
MINIMUM STREET STANDARD SUMMARY**

Transportation Facility Type	Minimum Right-of-Way (3)	Pavement Width	Radius of Curvature of Centerline	Maximum Allowable Grade	Curb Radius (2)	Curb and Gutter (1)	Parking	Walkway(s)	Bikeway(s)	Standard Detail
Principal Arterial (SR20) - see Gateway Plan	80-100 feet	36-60 feet	300 feet	8%	35 feet	Required	none	Required both sides except for the Bluff Corridor	required both sides (except in Bluff Corridor bikeway shared with ferry holding lane)	
Minor Arterial	80 feet	34 feet	200 feet	8%	28 feet	Required	No on street parking except, required in multi-use zones	Required both sides:	Required both sides	T-3 through T-5A
Collector - Major	60 to 80 feet	32 feet	150 feet	10%	25 feet	Required	on street parking except multi-use zones	both sides	Required both sides	
Collector - Neighborhood or Minor	60 feet	32 feet	150 feet	10%	15 feet	Asphalt rolled curb or concrete	none	Required one side min.	Required both sides	T-7
Scenic Collector/Arterial	60 feet	22 feet	150 feet	12%	25 feet	Asphalt wedge curb	none	Required one side and separated from the roadway	not required	T-6
Local Access- High Density	50 feet	26 feet (4)		12%	15 feet	Required	on-street	Required on both sides		T-8
Local Access- Minimum Standard	50	16 feet		12%	10 feet	concrete rolled curb	none on paved surface	none	none	T-9

(1) Alternative pavement edge may be considered depending on topography, local drainage, adjacent land uses, and width of right-of-way.

(2) For an intersection with the next lowest street hierarchy. May be modified depending on bus and truck traffic in the route.

(3) For guidance. Right-of-way width depends on project traffic volume, turn lanes, intersection needs, stormwater control methods, topography, and other features that dictate the needed street-section width.

(4) Pinch points, bulbs, pocket parking, etc., may be used to reduce pavement width.

**TABLE 6-2
LOCAL ACCESS (NEIGHBORHOOD) STREET STANDARD SUMMARY**

Local Access Street Type	General Location	Housing density (units/acre)	Lot Frontage - At average Buildout	Typical Paved Width	Curb Radius	Curb and Gutter - Typical (1)	Parking	Walkways		Standard Detail
High Intensity	New subdivisions developed at greater than 6 units per acre	6+ per acre	less than 75 feet	26 feet (2)		Concrete		?		
Medium Intensity	Typical buildout of existing platted lots	3 to 5 per acre	70 feet to 130 feet	20 feet		asphalt				
Low intensity	- Houses/lots on one side of road. - One to two houses per block	1 to 2 per acre	130 to 200 feet	18 feet		crushed gravel shoulder allowed, depending on slope and drainage				
Side street, connectors, rural lanes	Access roads, side streets	- no direct frontage - no current houses		16 feet		shoulder with drainage swale or ditch				

(1) Edge requirement and ditch/swale designs depends on topography, soils, and other site conditions.

(2) Pinch points, bulbs, pocket parking, etc., may be used to reduce pavement width.

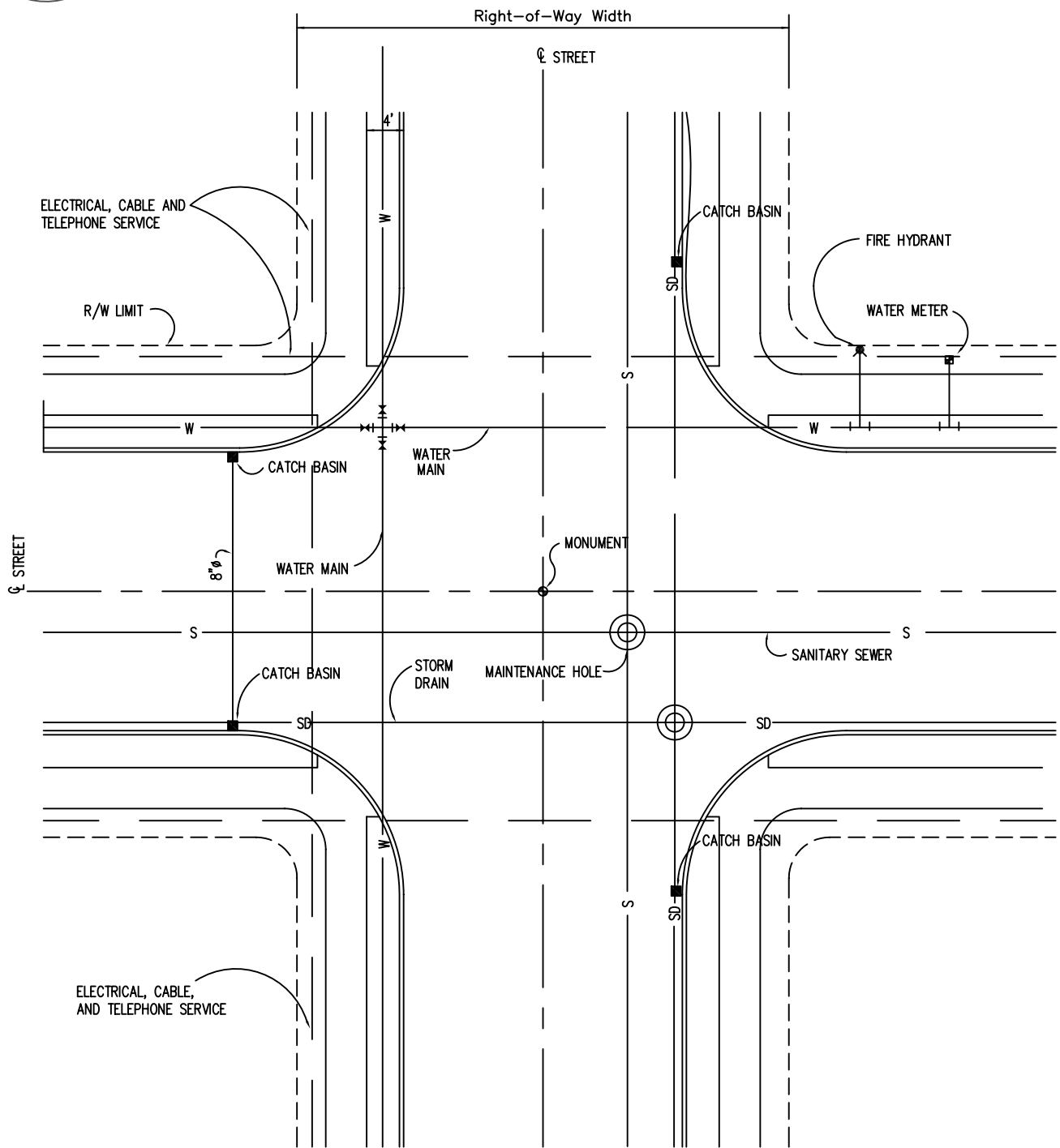
CHAPTER 6 - APPENDIX A

Exhibit #	Standard Detail #	Title
1	T - 1	Typical Utility Location
2	T - 2	Pavement Sections
3	T - 3	Arterial and Collector Mixed Use Zones
4	T - 4	Arterial Collector Multi-Family and Commercial
Areas		
5	T - 5A	Arterial and Major Collector RI & RII Zones
6	T - 5B	Major Collector RI & RII Zones
7	T - 6	Scenic Collector
8	T - 7	Minor (Neighborhood) Collector
9	T - 8	Local Access Street High Intensity/Density
10	T - 9	Local Access Street Minimum Standard
11	T - 11	Sight Obstruction
12	T - 12	Street Tree Spacing and Location Requirements
13	T - 13	Cement Concrete Curb and Gutter, Type A-1"
14	T - 14	Rolled Curb Detail
15	T - 15	Sidewalk Installation
16	T - 16	Curb Ramps
17	T - 17	Driveway Installation
18	T - 19	Residential Driveway Approach with Culvert
19	T - 20	Driveway Location
20	T - 21	Bicycle Lane Striping General Guide
21	T - 22	Survey Monument
22	T - 23	Survey Control Monument
23	T - 24	Survey Control Monument 3" Brass Disc
24	T - 25	Joint Utility Trench Section for Secondary/Service
Lines		
25	T - 26	Traffic Sign Installation
26	T - 27	Traffic Control Plan



City of Port Townsend - Public Works Department

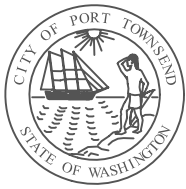
Standard Detail



NOTE:

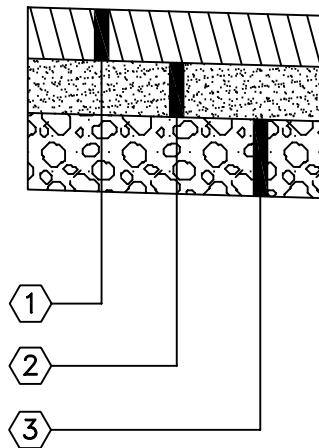
THIS DRAWING IS INTENDED ONLY TO ILLUSTRATE GENERAL LOCATION OF UTILITIES WITHIN THE RIGHT OF WAY.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Typical Utility Location</h3> <p style="font-size: 24px; margin: 20px 0 0 0;">Detail: T-1</p>
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail



	MINOR ARTERIAL	COLLECTOR	LOCAL ACCESS
① ASPHALT CLASS B	4.0"	3.0"	2.0"
② CRUSHED SURFACING TOP COURSE	4.0"	2.0"	2.0"
③ GRAVEL BASE (1)	10.0"	10.0"	8.0"

NOTES:

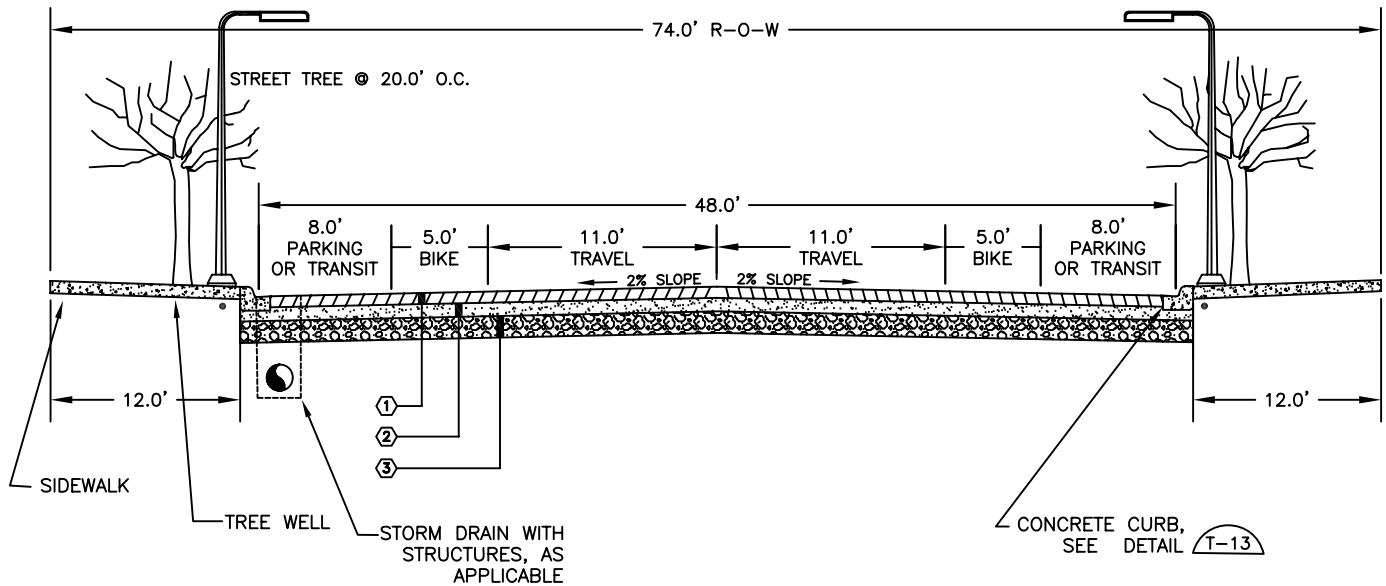
(1) BASE MAY NEED TO BE INCREASED DEPENDING ON SUITABILITY OF NATIVE MATERIAL.

Date: April 1997	No.	Date	Revision	By	Apvd	Pavement Sections
Approved By:						
File: E:\eng_std\standard\transpo						Detail: T-2



City of Port Townsend - Public Works Department

Standard Detail



ROADWAY SECTION

MIXED USE ZONES (C-I/MU, C-II/MU)

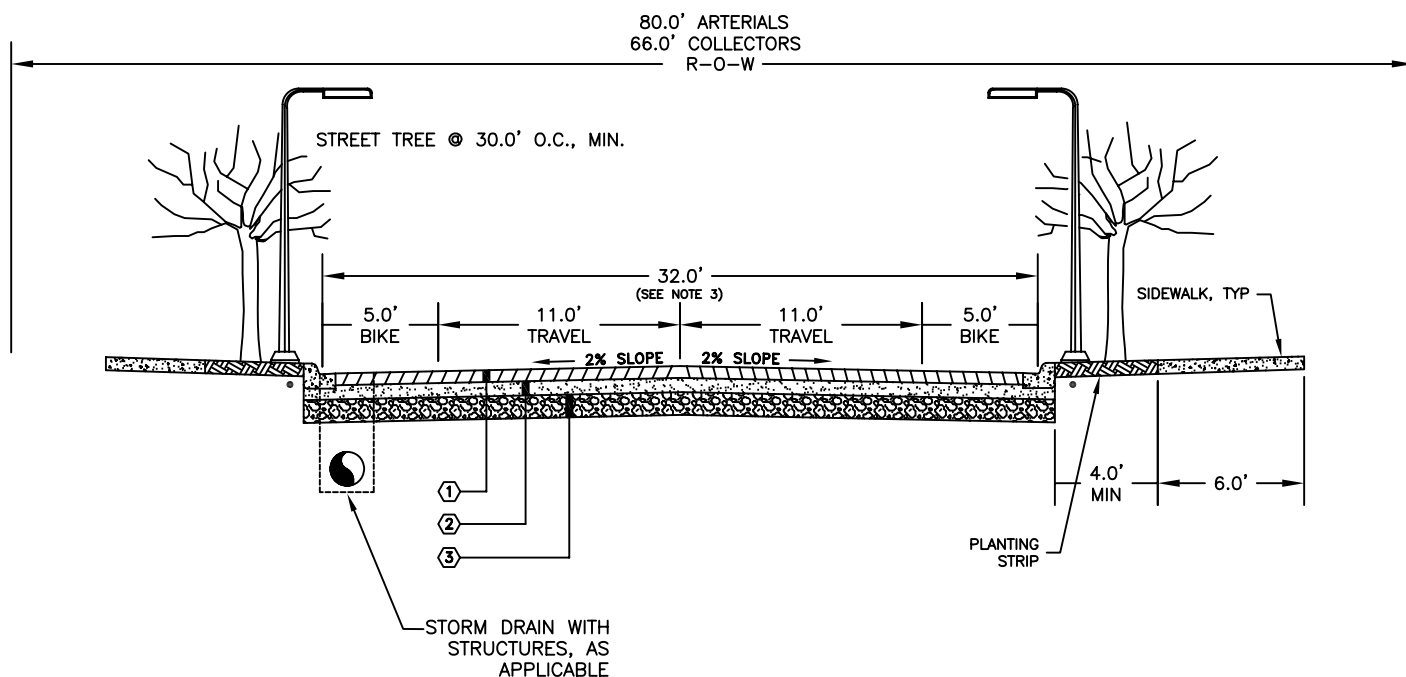
OR OTHER AREAS WHERE ON-STREET PARKING IS ALLOWED OR REQUIRED.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Arterial and Collector</h3> <p style="margin: 0;">Mixed Use Zones</p>
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail



ROADWAY SECTION

RIII, RIV, COMMERCIAL AND MARINE/MANUFACTURING AREAS

NOTE:

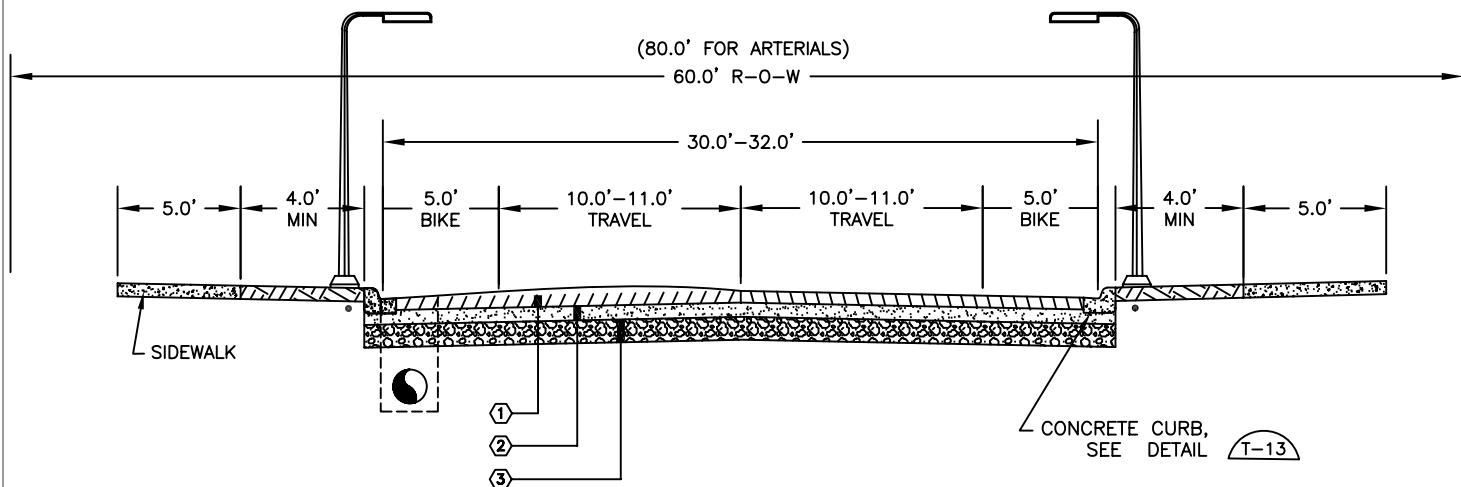
- (1) POWER AND UTILITIES SHALL BE UNDERGROUND.
- (2) PROVIDE STREET LIGHTS IN ACCORDANCE WITH SPECIFICATIONS.
- (3) TURN LANES, TRANSIT PULLOUTS, AND OTHER IMPROVEMENTS MAY BE REQUIRED DEPENDING ON THE ADJACENT DEVELOPMENT, TRAFFIC VOLUME, AND INTERSECTION NEEDS.
- (4) USE DETAIL T-3 WHERE ON-STREET PARKING IS TO BE PROVIDED.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Arterial and Collector</h3> <p style="margin: 0;">Multi-Family and Commercial Areas</p> <h2 style="margin: 0;">Detail: T-4</h2>
Approved By:						
File: E:\eng_std\standard\transpo						

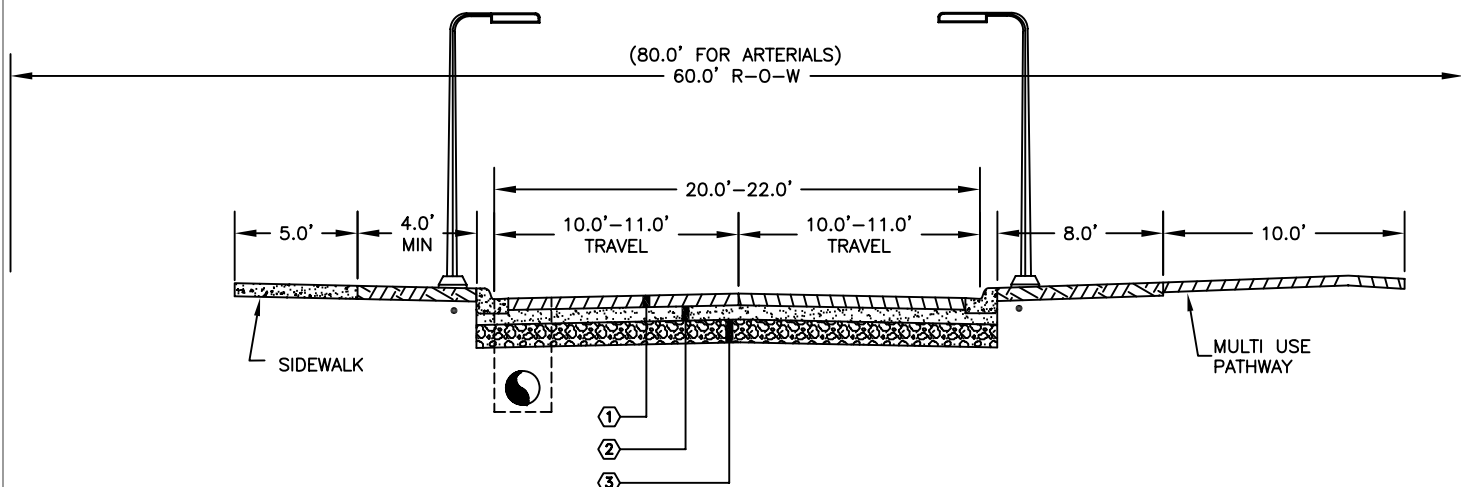


City of Port Townsend - Public Works Department

Standard Detail



ALTERNATIVE A



ALTERNATIVE B

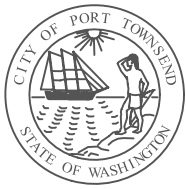
TRAVEL LANES:

ARTERIALS 11.0' TRAVEL LANE
 COLLECTORS 10.0' TRAVEL LANE

NOTE:

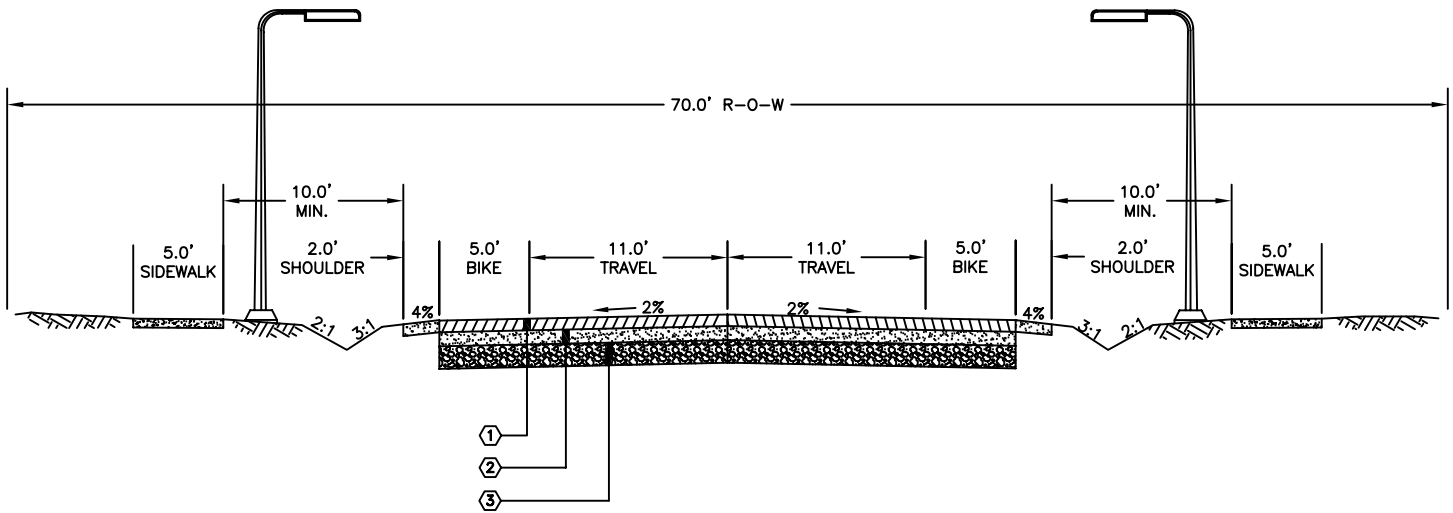
- 1) POWER AND UTILITIES SHALL BE UNDERGROUND.
- 2) STREET LIGHTS PER SPECIFICATION.
- 3) ASPHALT WEDGE CURB OR SHOULDER WITH DRAINAGE MAY BE USED DEPENDING ON RIGHT-OF-WAY WIDTH, STORM DRAINAGE DESIGN, OR OTHER FACTORS AS APPROVED BY THE P.W.D.

Date: April 1997	No.	Date	Revision	By	Apvd	Arterial and Major Collector RI & RII Zones Detail: T-5A
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail



ALTERNATIVE C

3.) LOCATE SIDEWALK TO PRESERVE EXISTING VEGETATION.

Date: April 1997

Approved By:

File: E:\eng_std\standard\transpo

No.	Date	Revision	By	Apvd

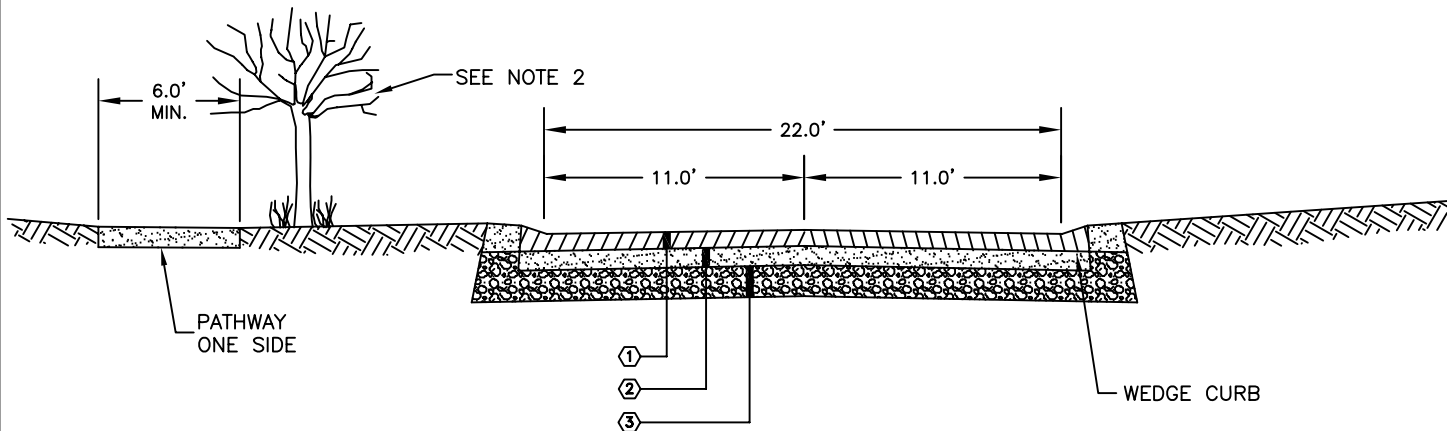
Major Collector
RI & RII Zones

Detail: T-5B

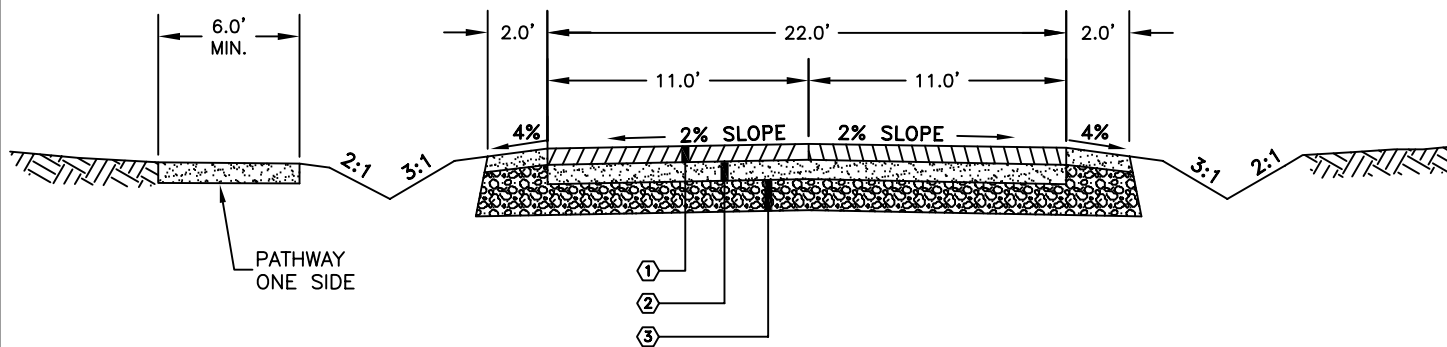


City of Port Townsend - Public Works Department

Standard Detail



ALTERNATIVE A



ALTERNATIVE B

NOTE:

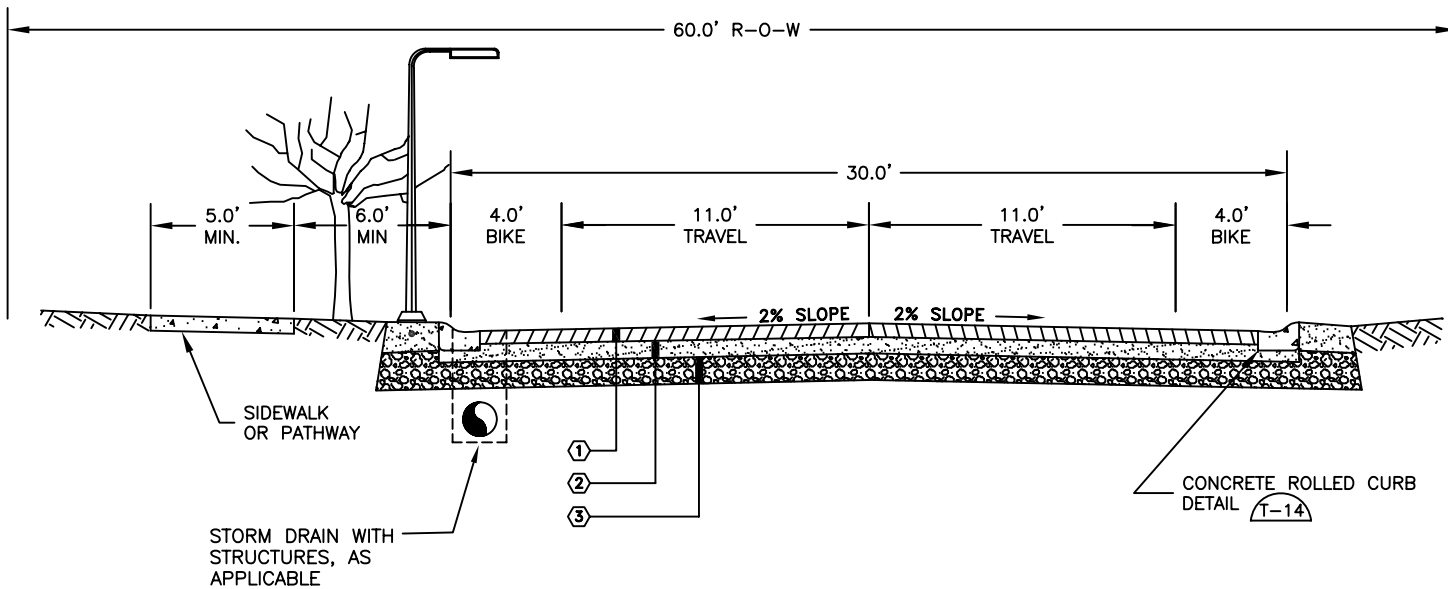
- 1) ROAD EDGE: DITCH OR ASPHALT CURB, DEPENDING ON DRAINAGE REQUIREMENTS, TOPOGRAPHY, VEGETATION, ETC.
- 2) PRESERVE EXISTING ROADSIDE VEGETATION AND TREE CANOPY TO MAXIMUM EXTENT POSSIBLE.
- 3) LOCATE PATHWAY AS TO PRESERVE VEGETATION.

Date: April 1997	No.	Date	Revision	By	Apvd	Scenic Collector
Approved By:						
File: E:\eng_std\standard\transpo						Detail: T-6

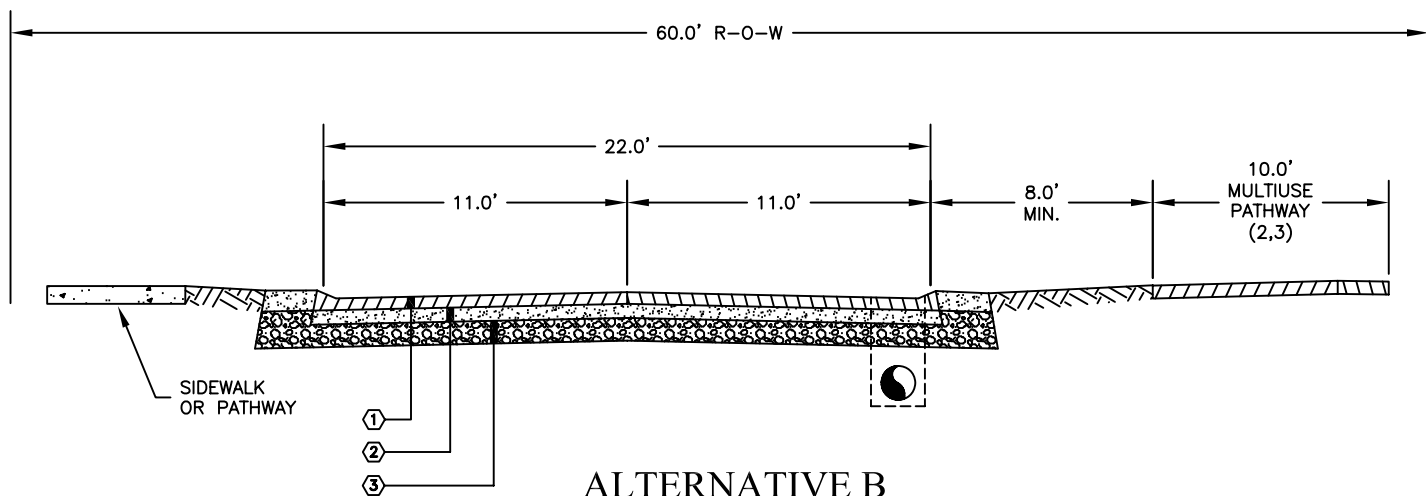


City of Port Townsend - Public Works Department

Standard Detail



ALTERNATIVE A



ALTERNATIVE B

NOTES:

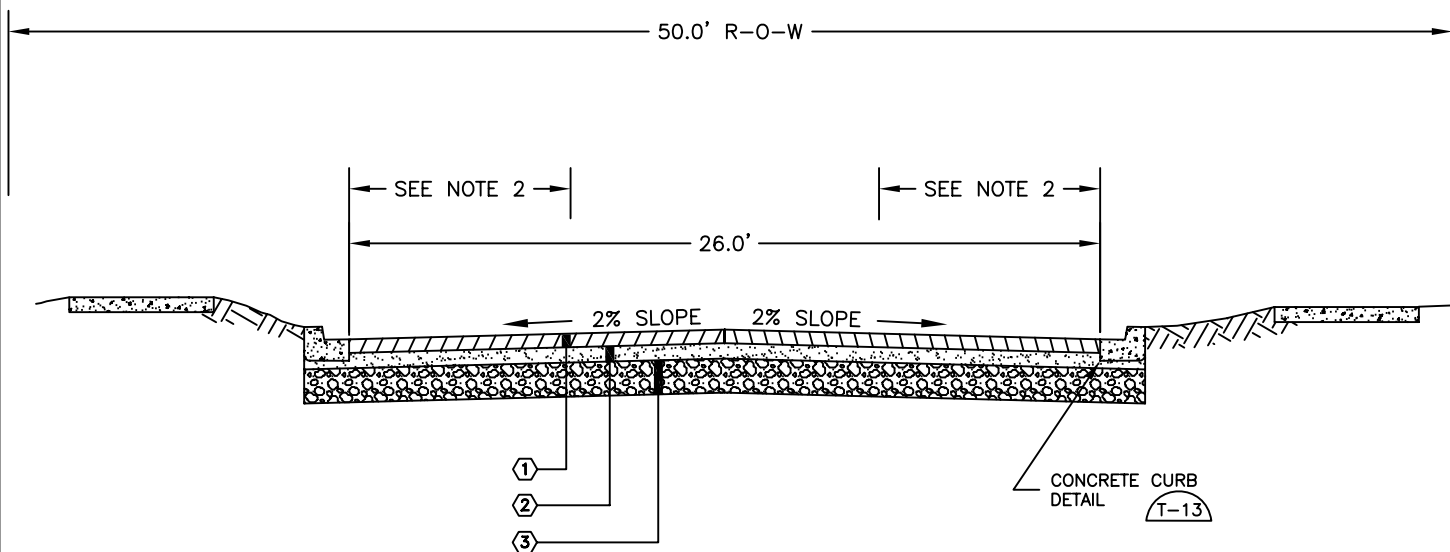
- (1) BIKE LANES MAY BE ELIMINATED WHEN A MULTI-USE PATHWAY IS NEARBY AND PERFORMS A SIMILAR FUNCTION.
- (2) PATHWAY MAY NOT BE NECESSARILY ADJACENT TO THE ROADWAY, LOCATE PATHWAY TO PRESERVE VEGETATION.

Date: April 1997	No.	Date	Revision	By	Apvd	Minor (Neighborhood) Collector
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail



NOTE:

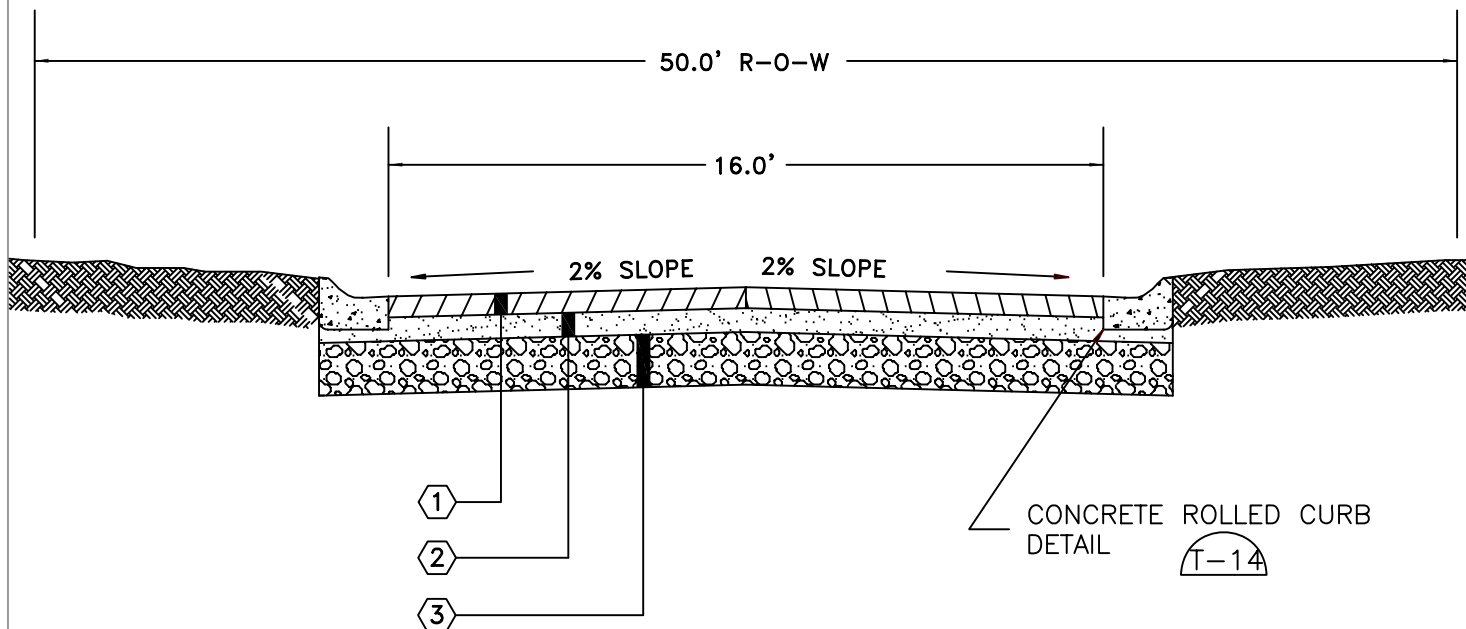
- (1) MAY BE REQUIRED OR SUBMITTED FOR CONSIDERATION FOR ONE OR MORE OF THE FOLLOWING SITUATIONS
 - NON-GRID STREET PATTERN OF > 20 HOMES SERVED.
 - STREETS WITH NO DRIVEWAYS OR ON-SITE PARKING.
 - DEVELOPED LOT FRONTAGE LESS THAN 60 FEET
- (2) PROVIDE TRAFFIC CALMING SUCH AS, PINCH POINTS, BULBS, POCKET PARKING OR TRAFFIC CIRCLES AT INTERSECTIONS.
 - SEE EXAMPLES IN APPENDIX 6E

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Local Access Street</h3> <h3 style="margin: 0;">High Intensity / Density</h3>
Approved By:						<h2 style="margin: 0;">Detail: T-8</h2>
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail



Notes:

(1) Use for:

- *Grid or modified grid street patterns
- *Where driveways and on-site parking are provided

(2) Traffic circles and diverters are encouraged to breakup the grid.

(3) Alternative curb options and drainage design may be considered depending on specific site conditions.

(4) Design may need to be modified for steep slopes.

Date: 7/18/95

City of Port Townsend
181 Quincy Street, Suite 301
Port Townsend, WA 98368

No.	Date	Revision	By	Apvd

Local Access Street
Minimum Standard

Detail: T-9

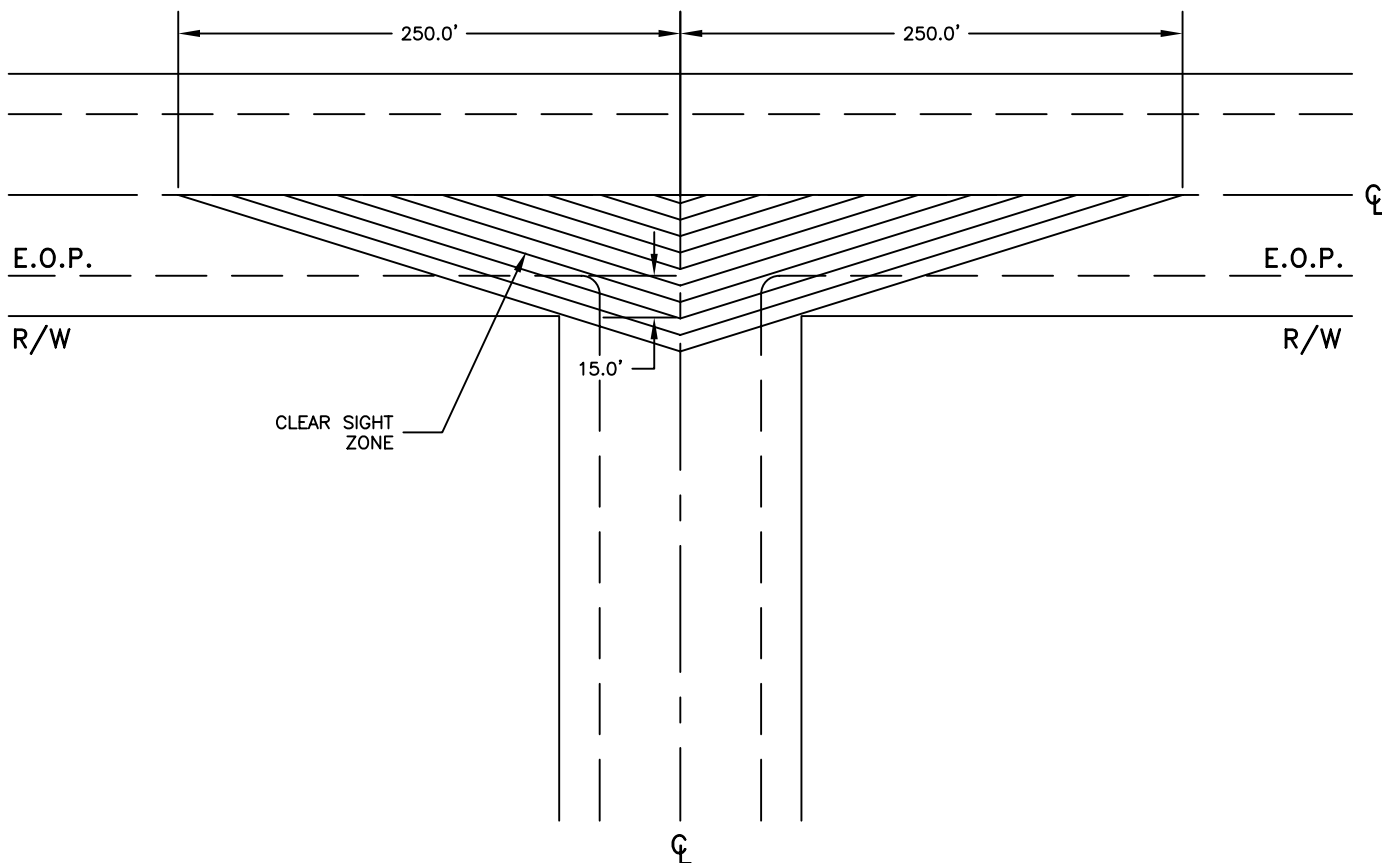


City of Port Townsend - Public Works Department

Standard Detail

STOP OR YIELD CONTROLLED INTERSECTIONS

EXAMPLE: MAJOR STREET SPEED LIMIT = 25 M.P.H



Date: April 1997

No.	Date	Revision	By	Apvd

Sight Obstruction

Approved By:

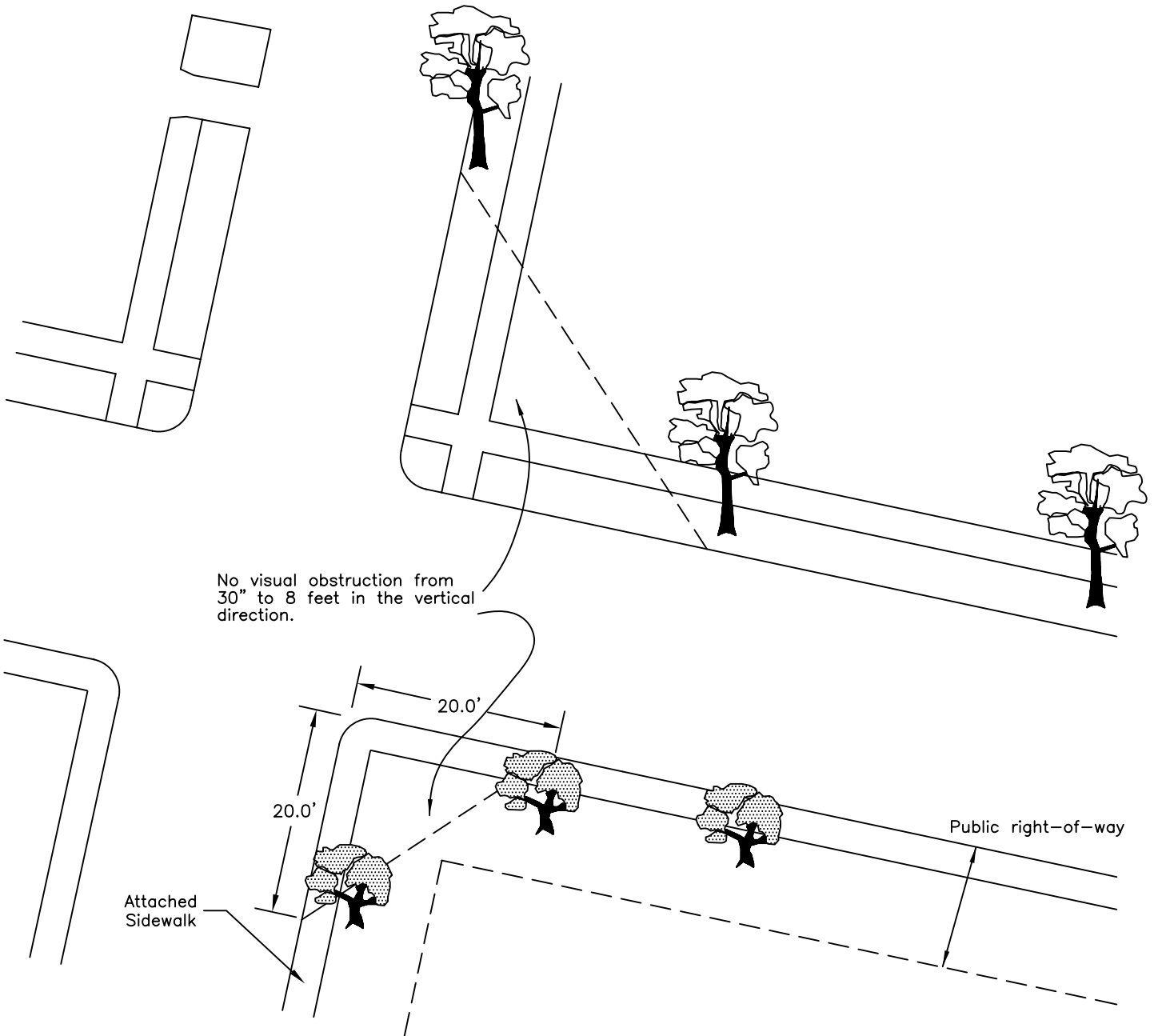
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Detail: T-11



City of Port Townsend - Public Works Department

Standard Detail



Date: April 1997

Approved By:

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No.	Date	Revision	By	Apvd

Street Tree Spacing
and Location Requirements

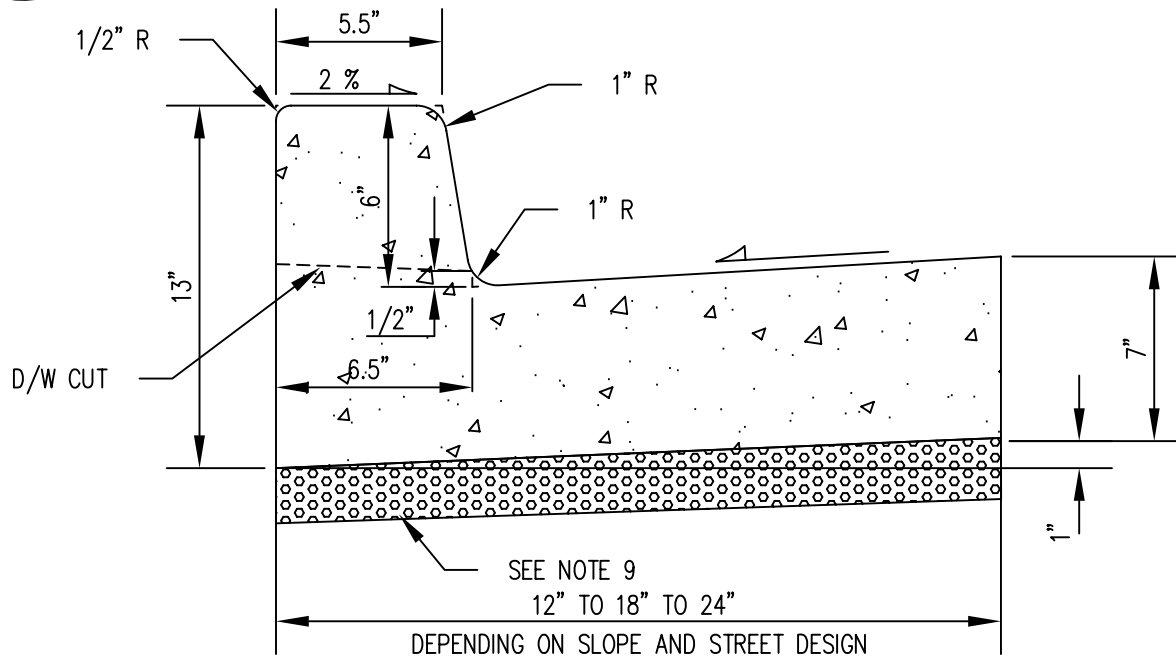
Detail:

T-12



City of Port Townsend - Public Works Department

Standard Detail

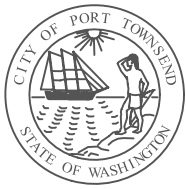


TYPICAL SECTION

NOTES

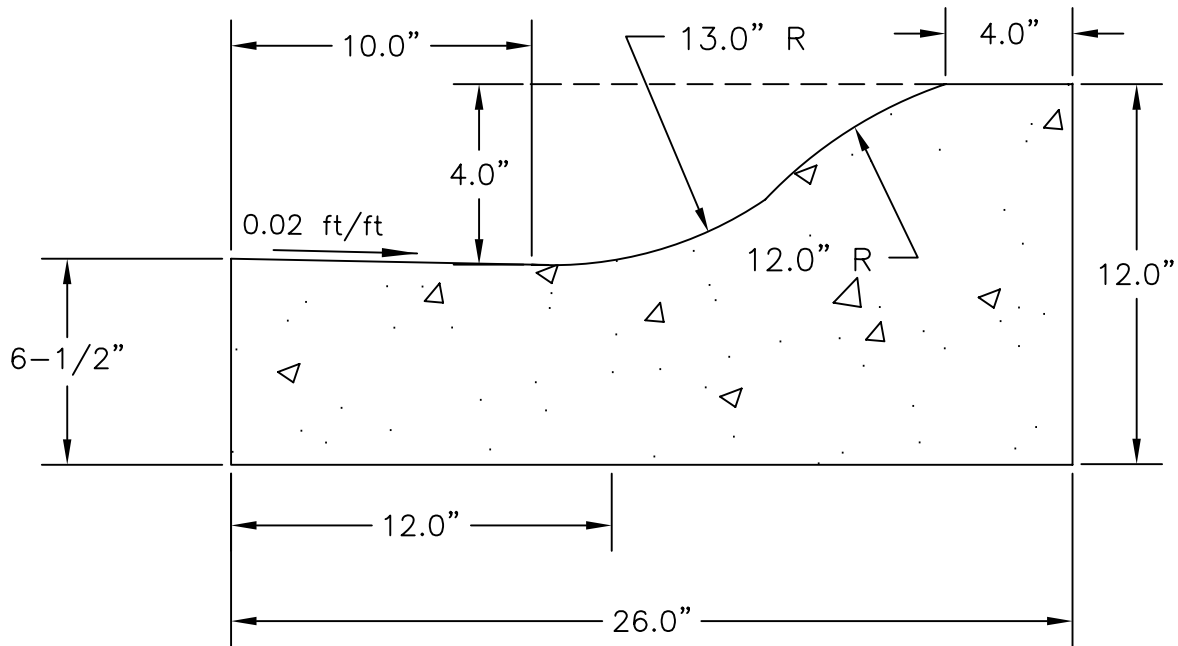
- 1 FORMS SHALL BE TRUE TO LINE AND GRADE AND SECURELY STAKED.
- 2 DUMMY JOINTS SHALL BE PLACED ON 15 FOOT CENTERS. DUMMY JOINTS SHALL BE 1/2" x 1-1/2".
- 3 THRU JOINTS SHALL BE PLACED ADJACENT TO CATCH BASINS, INLETS AND AT POINTS OF TANGENCY ON STREETS, ALLEY AND DRIVEWAY RETURNS. MAXIMUM SPACING SHALL BE 30 FT. PRE-MOLDED JOINT FILLER SHALL BE 1/2" WIDE AND CONFORM TO AASHTO DESIGN M213.
- 4 ALL JOINTS SHALL BE CLEAN AND EDGED.
- 5 CONCRETE SHALL BE CEMENT CONCRETE, CLASS 3000.
- 6 STEEL FORMS ONLY SHALL BE USED ON TANGENT SECTIONS. WOOD FORMS MAY BE USED ON CURVED SECTIONS.
- 7 FINISH SHALL BE LIGHT BROOM FINISH.
- 8 THE FINISHED CURB SHALL BE SPRAYED WITH A TRANSPARENT CURING COMPOUND AND COVERED BY WATERPROOF PAPER OR PLASTIC MEMBRANE IN THE EVENT OF RAIN OR OTHER UNSUITABLE WEATHER. CURING TIME SHALL BE A MINIMUM OF 72 HOURS.
- 9 ALL CURB AND GUTTER SHALL BE PLACED ON A MINIMUM OF 2" OF CRUSHED SURFACING TOP COURSE.
- 10 DUMMY JOINT 1/2" x 1-1/2" BETWEEN A-1 CURB AND GUTTER AND THE SIDEWALK.

Date: April 1996	No.	Date	Revision	By	Apvd	Cement Concrete Curb and Gutter, Type "A-1" Detail: T-13
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail



ROLLED CURB AND GUTTER

NOTES:

- 1) CONCRETE SHALL BE WSDOT CLASS 3000.

Date: April 1997

No.	Date	Revision	By	Apvd

Rolled Curb Detail

Approved By:

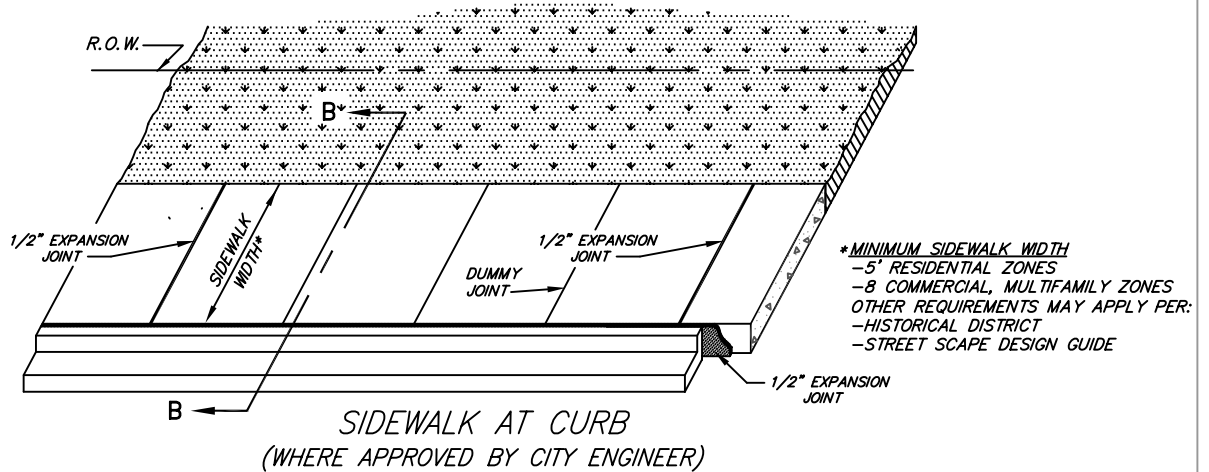
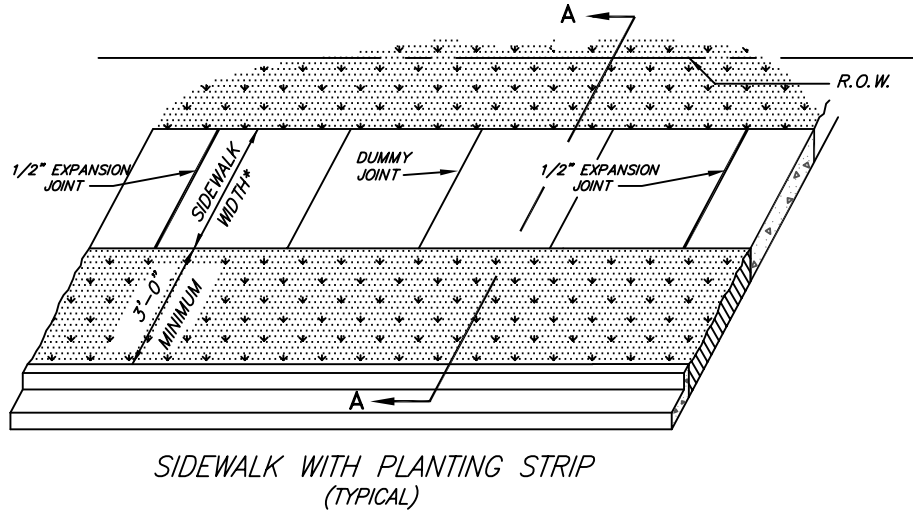
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Detail: T-14

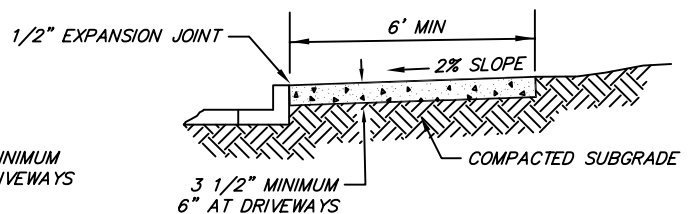
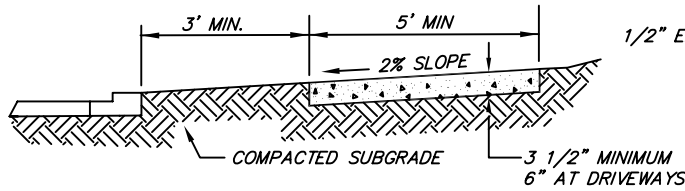


City of Port Townsend - Public Works Department

Standard Detail



***MINIMUM SIDEWALK WIDTH**
 -5' RESIDENTIAL ZONES
 -8' COMMERCIAL, MULTIFAMILY ZONES
 OTHER REQUIREMENTS MAY APPLY PER:
 -HISTORICAL DISTRICT
 -STREET SCAPE DESIGN GUIDE



NOTES:

1. EXPANSION JOINTS SHALL BE ASPHALT IMPREGNATED JOINT MATERIAL.
2. EXPANSION JOINTS SHALL BE 1/2" THICK AND AT 20'-0" INTERVALS.
3. DUMMY JOINTS SHALL BE AT 5'-0" INTERVALS.
4. ALL UTILITY POLES, METER BOXES, ETC. IN SIDEWALK AREA SHALL HAVE 1/2" JOINT MATERIAL (FULL DEPTH) PLACED AROUND THEM BEFORE PLACING CONCRETE.
5. ALL JOINTS SHALL BE CLEAN AND EDGED.
6. NO EXPOSED AGGREGATE WORK SHALL BE DONE.
7. DRIVEWAY AND SIDEWALK SHALL BE SEPARATED FROM OTHER CONCRETE WORK USING EXPANSION MATERIAL.
8. CURB AND GUTTER SHALL NOT BE POURED INTEGRAL WITH DRIVEWAY.
9. CONCRETE SHALL BE CLASS 3000.

CALL FOR FORM INSPECTION BY CITY PRIOR TO POURING CONCRETE.

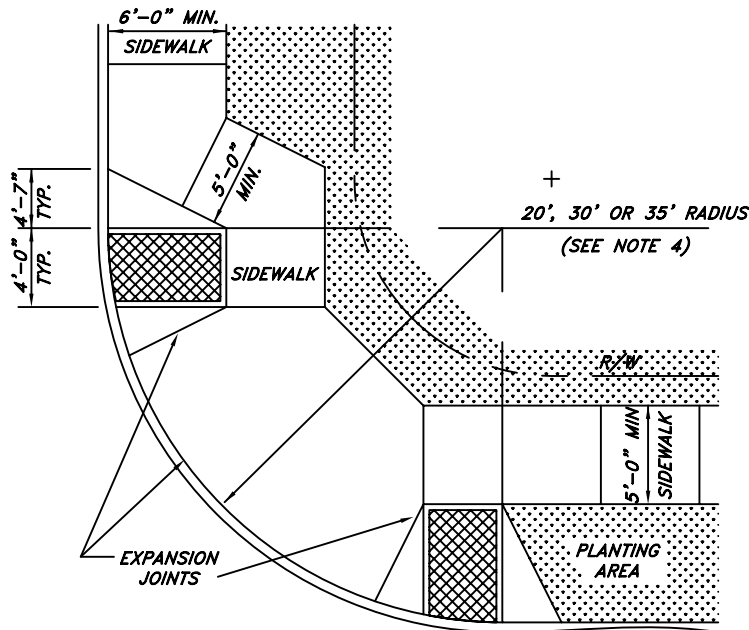
ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, AMERICAN PUBLIC WORKS ASSOCIATION.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3>Sidewalk Installation</h3>
Approved By:						
File: E:\eng_std\standard\transpo						

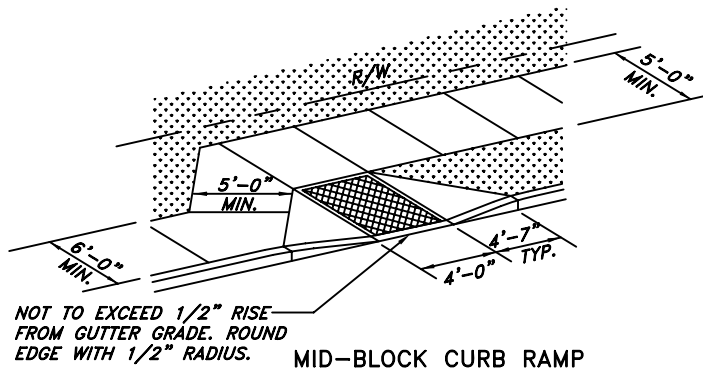


City of Port Townsend - Public Works Department

Standard Detail



CORNER CURB RAMPS



MID-BLOCK CURB RAMP

NOTES:

1. TEXTURING OF CENTER RAMP REQUIRED USING METAL GRID PLACED IN WET CONCRETE AND THEN REMOVED TO LEAVE RIDGED SURFACE PATTERN. PATTERN NOT TO EXCEED 1/2" GRID.
2. CURB RAMP CEMENT CONCRETE SHALL BE CLASS 3000, 3-1/2" THICK MINIMUM.
3. EXPANSION JOINTS SHALL BE 1/4" THICK, FULL DEPTH, ASPHALT IMPREGNATED JOINT MATERIAL.
4. STEEP STREET GRADES AND/OR CURVE RETURN RADII OF LESS THAN 20 FEET OR GREATER THAN 35 FEET, REQUIRE SPECIAL DESIGN CURB RAMPS TO BE APPROVED BY CITY ENGINEER.
5. SIDEWALK CROSS SLOPES NOT TO EXCEED 2%. CURB RAMP SLOPE TO BE 1:12 OR FLATTER.
6. SIDEWALK WIDTHS SHOWN ARE FOR RESIDENTIAL AREAS.

ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, AMERICAN PUBLIC WORKS ASSOCIATION.

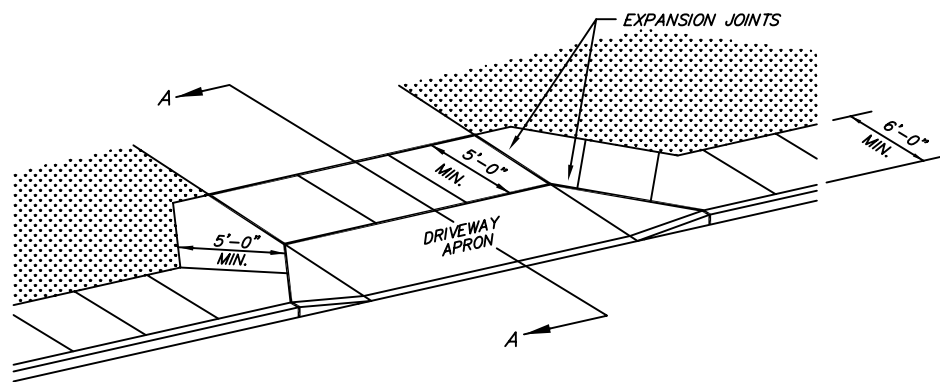
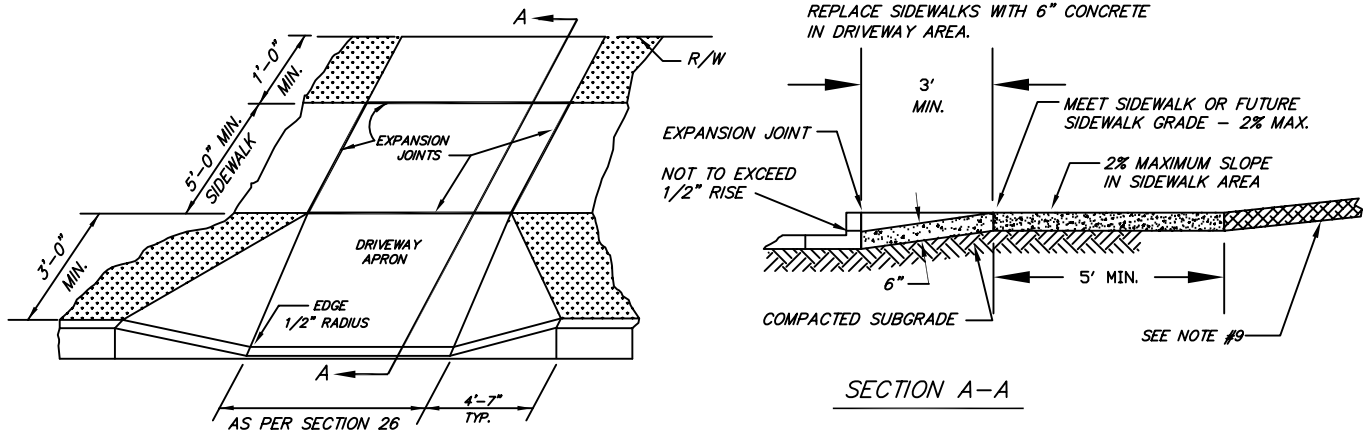
CALL FOR FORM INSPECTION BY CITY PRIOR TO POURING CONCRETE.

Date: April 1997	No.	Date	Revision	By	Apvd	Curb Ramps
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail



DRIVEWAY BYPASS REQUIRED WHEN
SIDEWALK IS AT CURB

NOTES:

1. DRIVEWAY LOCATION TO BE APPROVED BY CITY ENGINEER.
2. WHEN SIDEWALK IS NOT PRESENT, DRIVEWAY APPROACH SHALL BE CONSTRUCTED TO MEET FUTURE SIDEWALK GRADE.
3. SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% IN DRIVEWAY AND BYPASS AREAS.
4. DRIVEWAY APRON AND SIDEWALK SHALL BE CONCRETE AND SEPARATED FROM OTHER CONCRETE WORK USING EXPANSION JOINTS.
5. SIDEWALKS, CURB AND GUTTER PER CITY STANDARD PLANS.
6. EXPOSED AGGREGATE WORK OR SPECIAL SURFACE TREATMENT NOT ALLOWED IN RIGHT-OF-WAY WITHOUT APPROVAL.
7. LONGITUDINAL DUMMY JOINTS, 1/8" THICK AND 1" DEEP, SHALL BE AT INTERVALS NOT TO EXCEED 15 FEET AND BE EQUALLY SPACED IN DRIVEWAY APRONS.
8. CONCRETE SHALL BE CLASS 3000.
9. DRIVEWAY PAVING MATERIALS, OTHER THAN CONCRETE, MAY BE USED BETWEEN THE SIDEWALK AND THE R/W WITH CITY ENGINEER APPROVAL.
10. EXPANSION JOINTS SHALL BE 1/4" THICK, FULL DEPTH, ASPHALT IMPREGNATED JOINT MATERIAL.
11. SIDEWALK WIDTHS SHOWN ARE FOR RESIDENTIAL AREAS.

ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, AMERICAN PUBLIC WORKS ASSOCIATION.

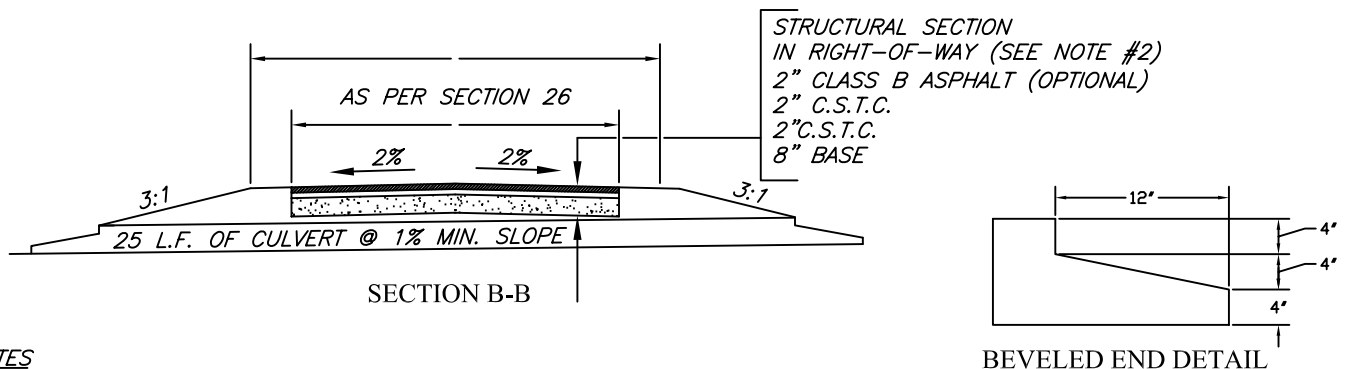
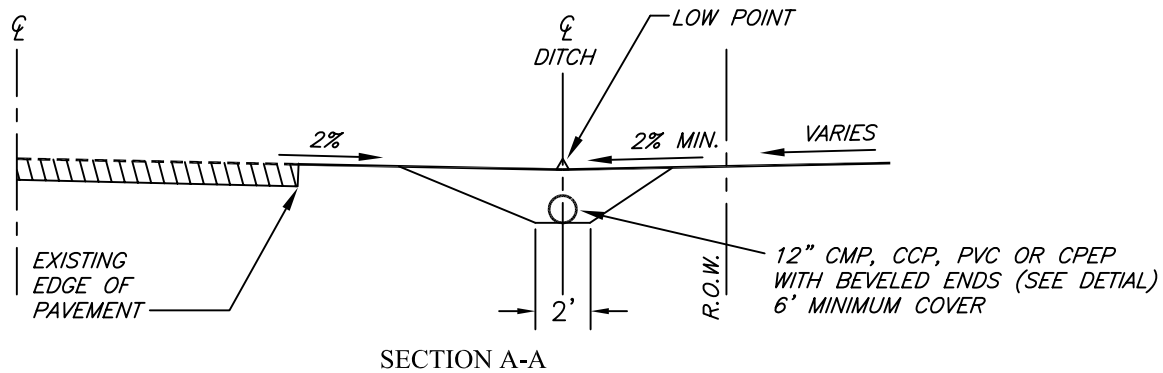
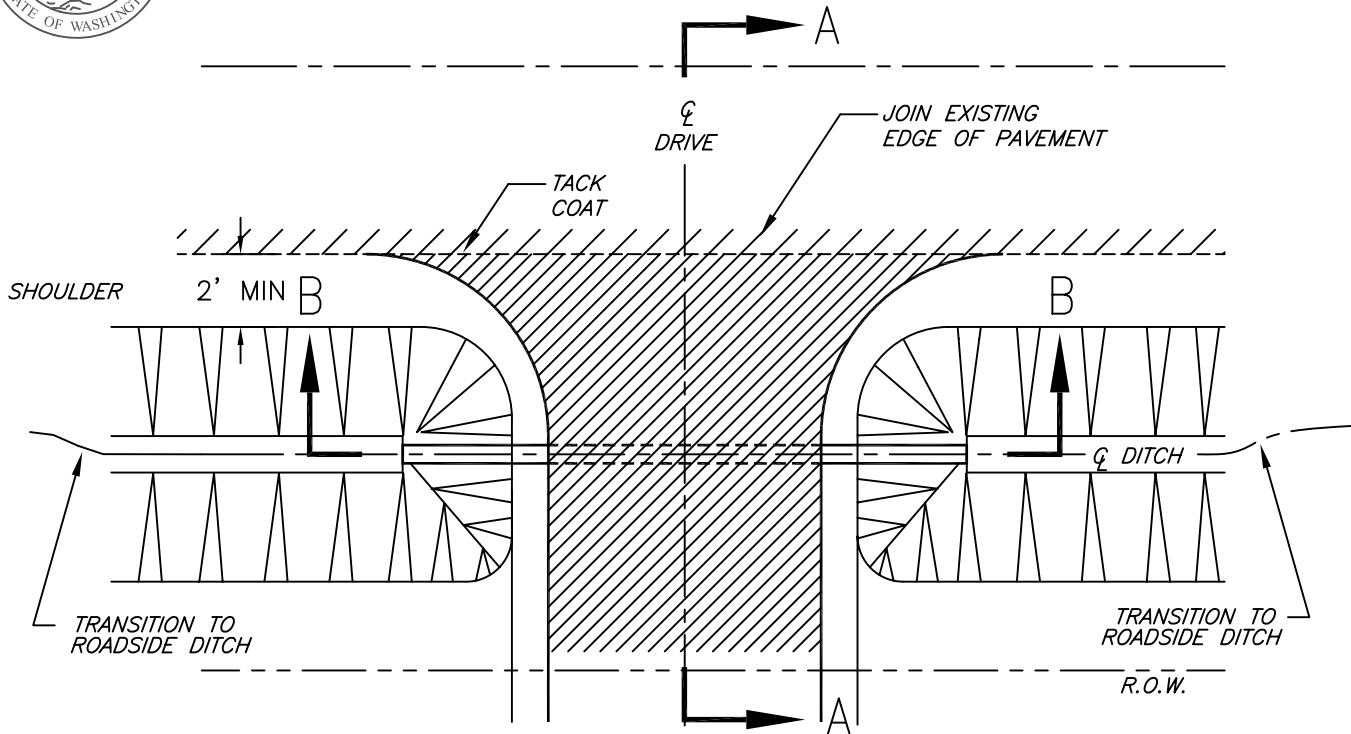
CALL FOR FORM INSPECTION BY CITY PRIOR TO POURING CONCRETE.

Date: April 1997	No.	Date	Revision	By	Apvd	Driveway Installation
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail



NOTES

1. STREET DEVELOPMENT PERMIT REQUIRED.
2. 6" CONCRETE (PLAIN FINISH) MAY BE SUBSTITUTED.

Date: April 1997

Approved By:

File: E:\eng_std\standard\transpo

No.	Date	Revision	By	Apvd

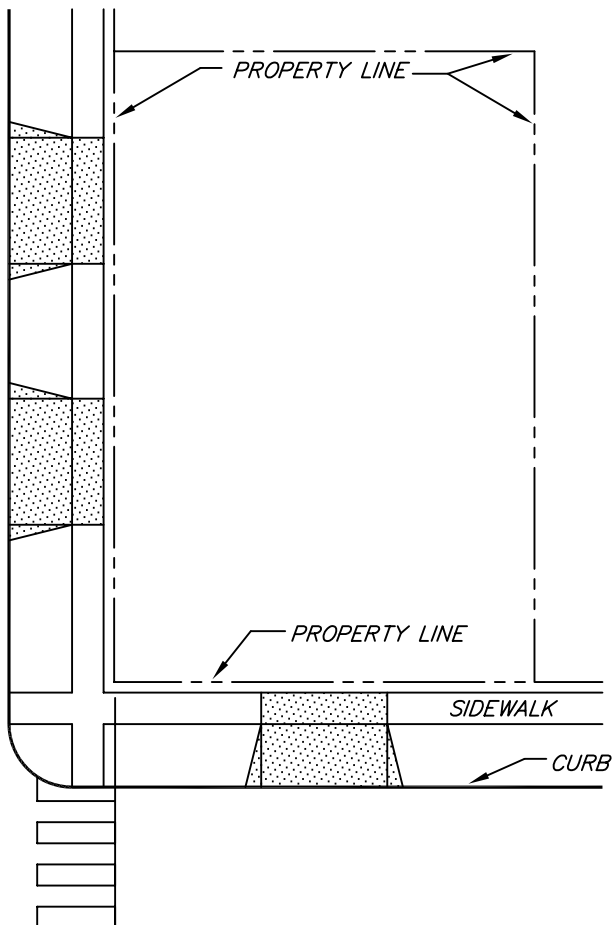
**Residential Driveway Approach
with Culvert**

Detail: T-19



City of Port Townsend - Public Works Department

Standard Detail



NOTES:

- ① ALLEY OR NON-ARTERIAL ACCESS IS ENCOURAGED WHERE POSSIBLE.
- ② DRIVEWAY SHALL BE LOCATED TO AVOID CONFLICT WITH POWER POLES, STREET LIGHTS, FIRE HYDRANTS OR SITUATIONS WHICH RESULT IN UNSAFE CONDITIONS.
- ③ DRIVEWAY WIDTHS AS SPECIFIED IN SECTION 26.
- ⑤ WHERE TWO OR MORE ADJOINING DRIVEWAYS ARE APPROVED FOR THE SAME PROPERTY, A FULL CURB HEIGHT SEPARATION BETWEEN EACH DRIVEWAY, OF NOT LESS THAN 15 FEET AT THE CURB, MUST BE PROVIDED.
- ⑥ DRIVEWAY APRONS SHALL NOT EXTEND INTO THE STREET FURTHER THAN THE FACE OF THE CURB.
- ⑦ DRIVEWAY SHALL BE LOCATED AWAY FROM INTERSECTION WHERE POSSIBLE AND IN ACCORDANCE WITH SECTION 26.
- ⑧ COMMERCIAL AND INDUSTRIAL DRIVEWAY LOCATIONS REQUIRE CITY ENGINEER APPROVAL AND SHALL BE SHOWN ON SITE PLAN WITH REQUIRED PARKING LAYOUT.
- ⑨ DRIVEWAYS THAT ARE ABANDONED OR RELOCATED SHALL BE REMOVED AND CURBING REPLACED TO FULL HEIGHT.

CALL FOR FORM INSPECTION BY CITY PRIOR TO POURING CONCRETE.

ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, AMERICAN PUBLIC WORKS ASSOCIATION.

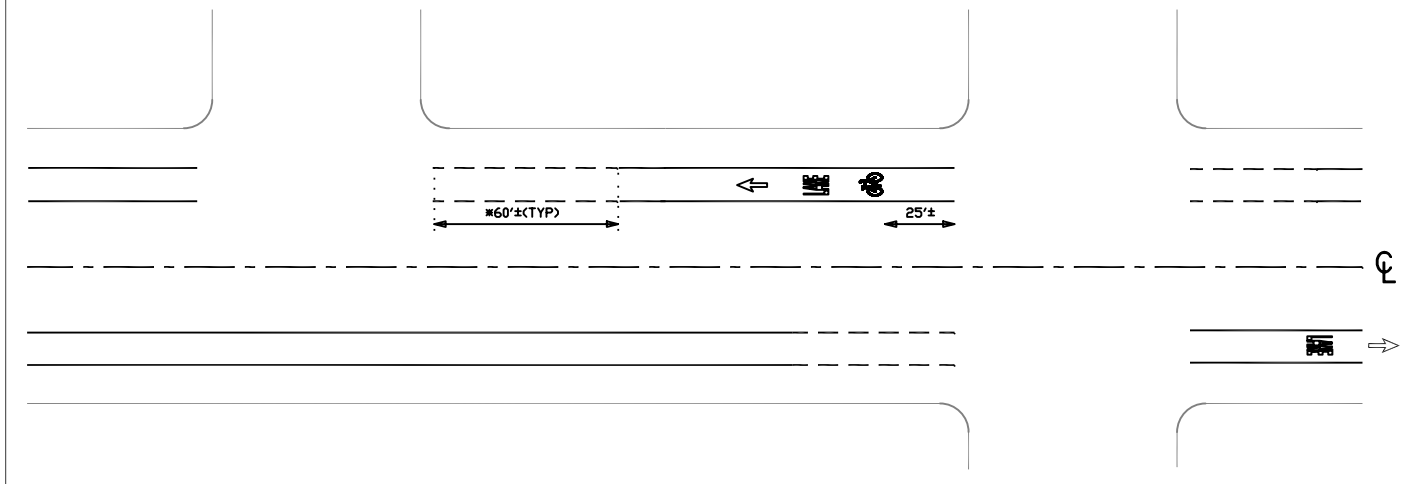
Date: April 1997	No.	Date	Revision	By	Apvd	Driveway Location
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail

TYPICAL INTERSECTION STRIPING DIMENSIONS
FOR STREETS AND ON-STREET PARKING

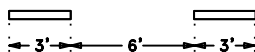


NOTES:

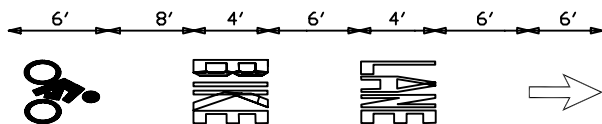
ALL STRIPING 4" WHITE

** VARIES, DEPENDING ON VOLUME OF TURNING TRAFFIC

STRIPING DETAILS FOR DASHED LINES



PREFERRED BIKE LANE SYMBOL,
AS PERMITTED BY 1993 WASHDOT MUTCD



NOTES:

STRIPING IS SHOWN FOR A GENERAL GUIDANCE ONLY
FOR STREET AND INTERSECTION STRIPING FOR BIKE LANES

Date: April 1997

Approved By:

File: E:\eng_std\standard\transpo

No.	Date	Revision	By	Apvd

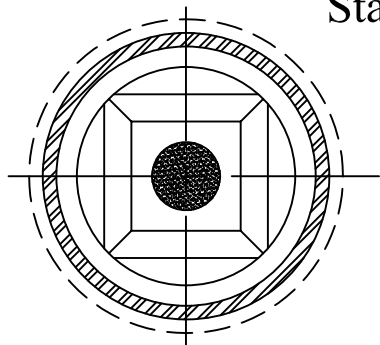
Bicycle Lane Striping
General Guide

Detail: T-21

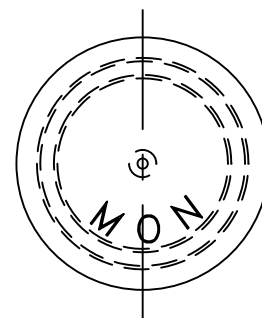


City of Port Townsend - Public Works Department

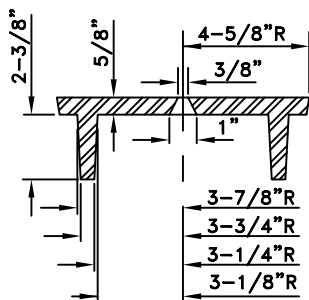
Standard Detail



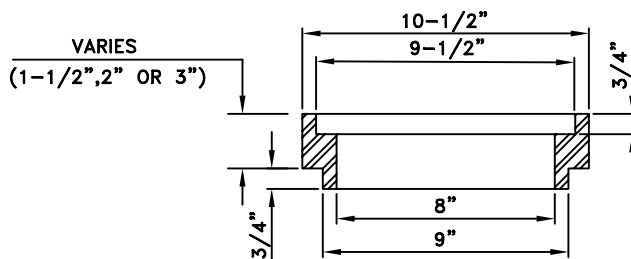
PLAN
COVER REMOVED



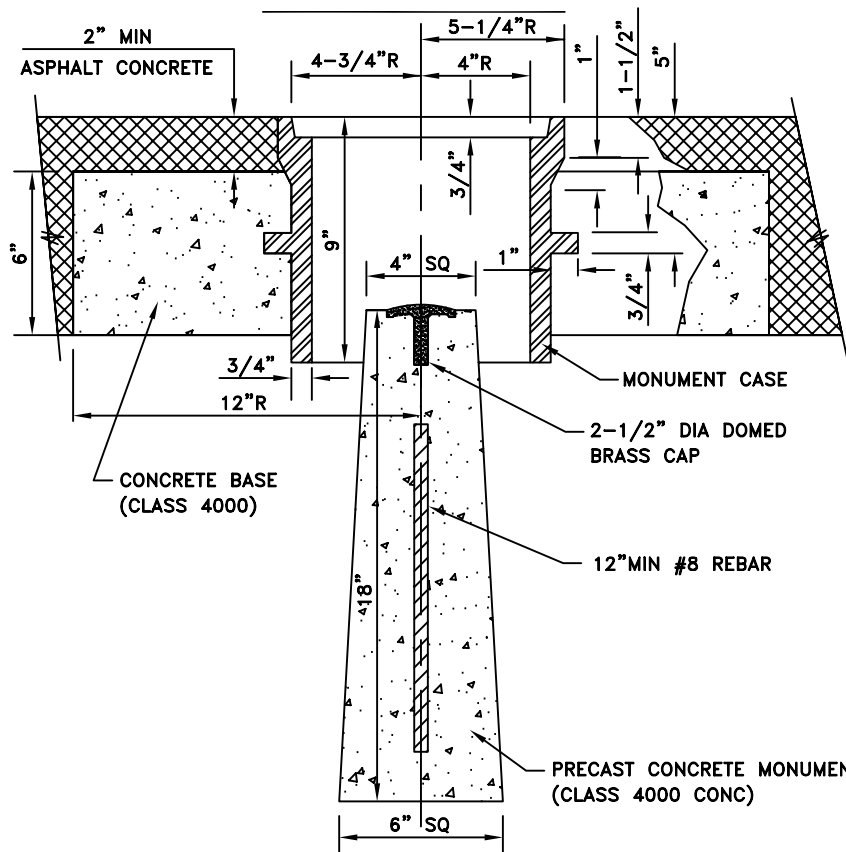
COVER PLAN



COVER SECTION



EXTENSION SECTION



SECTION

NOTES

1. MONUMENTS IN NON PAVED AREAS SHALL BE 3" ABOVE GRADE.
2. ALL MONUMENTS SHALL BE PRECAST CONC WITH REBAR AND 2-1/2" DIA BRASS CAP.
3. MONUMENT CASE AND RISER SECTION SHALL BE CAST IRON PER ASTM-A48, CLASS 30, WITH BITUMINOUS COATING.
4. COVER SHALL BE DUCTILE IRON PER ASTM-A536, GRADE 80-55-06. WITH BITUMINOUS COATING.
5. LEGEND ON COVER SHALL BE 1/8" RAISED INTEGRALLY CAST LETTERS 1" HIGH WITH A MIN FACE WIDTH OF 3/16".

Date: April 1997

Approved By:

File: E:\eng_std\standard\transpo

No.	Date	Revision	By	Apvd

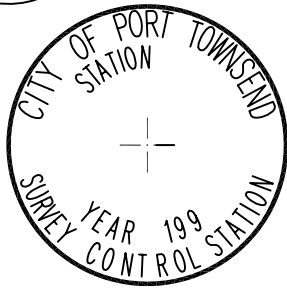
Survey Monument

Detail: T-22



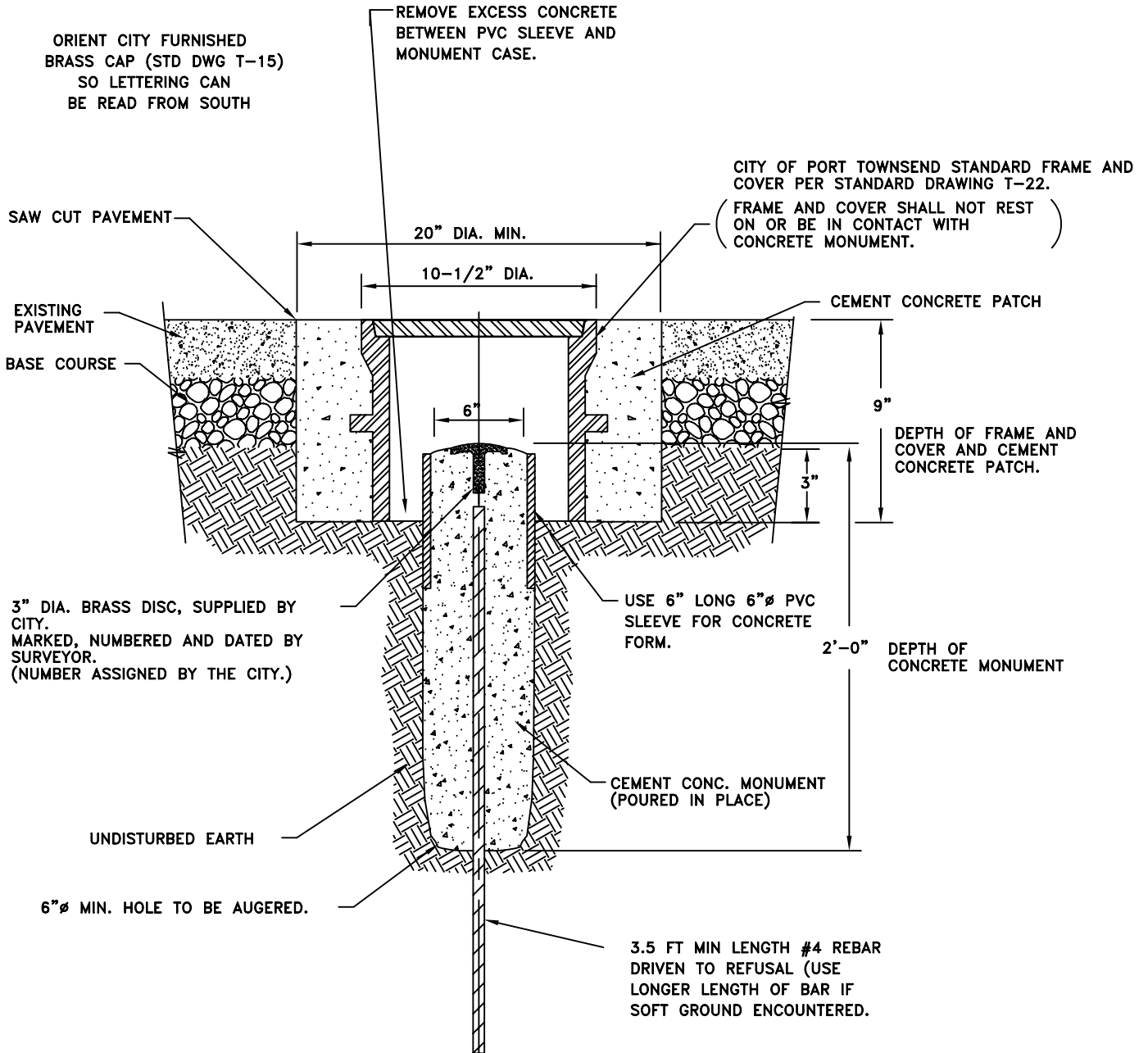
City of Port Townsend - Public Works Department

Standard Detail



NOTES

THIS MONUMENT SHALL BE USED ONLY FOR CONTROL MONUMENTATION SURVEYS AT LOCATIONS AS APPROVED BY THE CITY SURVEYOR.



Date: April 1997

No.	Date	Revision	By	Apvd

Survey Control Monument

Approved By:

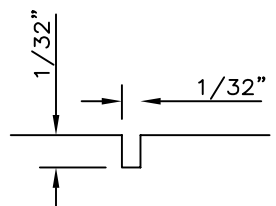
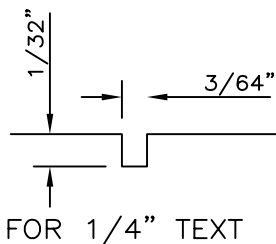
File: E:\eng_std\standard\transpo

Detail: T-23

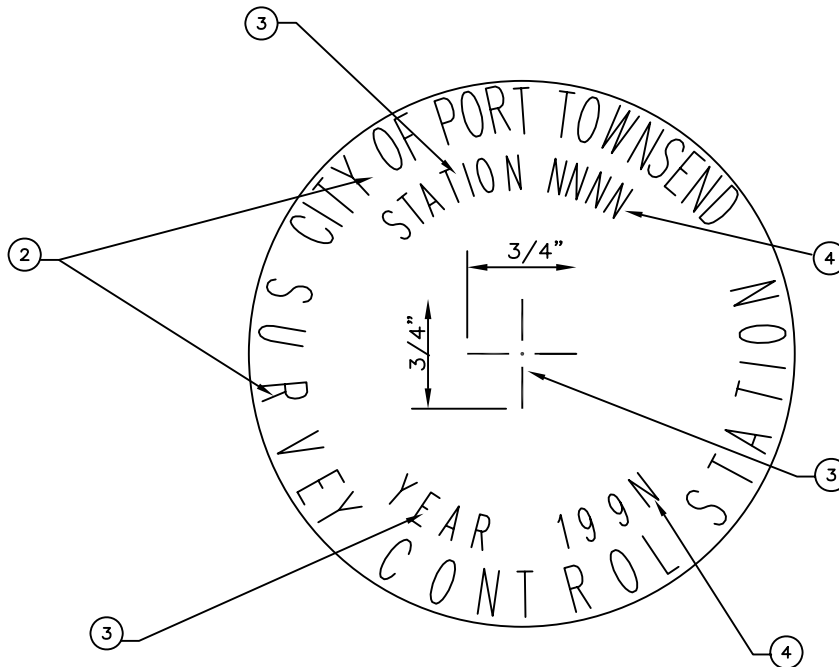


City of Port Townsend - Public Works Department

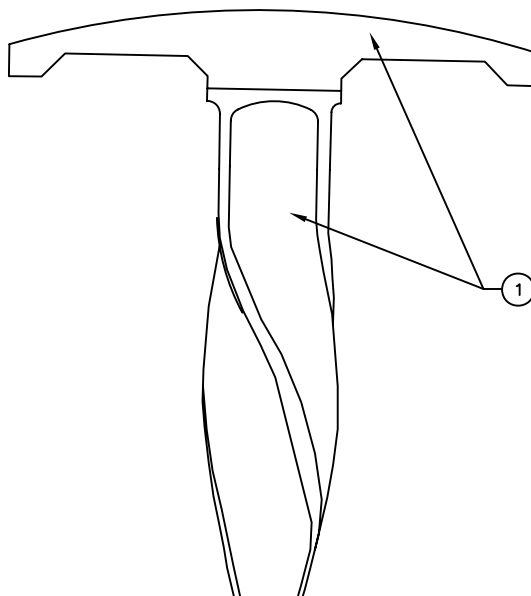
Standard Detail



GROOVE DETAIL



PLAN



ELEVATION

NOTES:

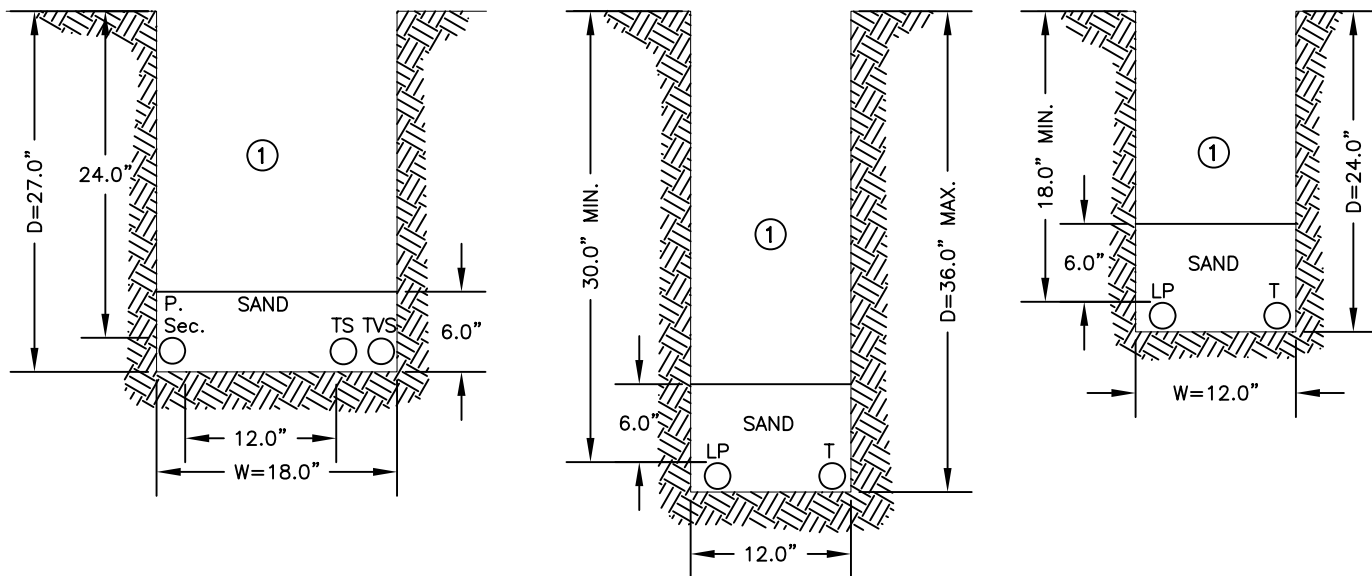
- ① DIMENSIONS OF CASTING BASE & CAP PER WSDOT/APWA STANDARD PLAN H-6.
- ② GROOVE FOR 1/4" HIGH CAST LETTERING ON CAP SHALL BE 1/32 IN DEEP BY 3/64 IN WIDE.
- ③ GROOVE FOR 3/16" HIGH CAST LETTERING AND LINES ON CAP SHALL BE 1/32 IN DEEP BY 1/32 IN WIDE.
- ④ FIELD STAMPED LETTERS AND NUMBERS SHALL BE OF SUFFICIENT DEPTH AND WIDTH SO AS TO BE CLEARLY READABLE AND SHALL BE A MIN. OF 3/16 IN. HIGH.
- ⑤ THIS BRASS DISC SHALL ONLY BE USED FOR CONTROL MONUMENTATION PER STD DWG T-14 AND AS DIRECTED BY THE CITY SURVEYOR. BRASS DISC AND STATION NO SHALL BE SUPPLIED BY CITY SURVEYER.

Date: April 1997	No.	Date	Revision	By	Apvd	Survey Control Monument 3" Brass Disc Detail: T-24
Approved By:						
File: E:\eng_std\standard\transpo						



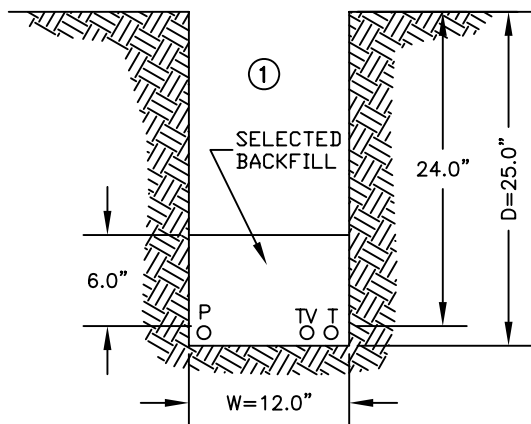
City of Port Townsend - Public Works Department

Standard Detail

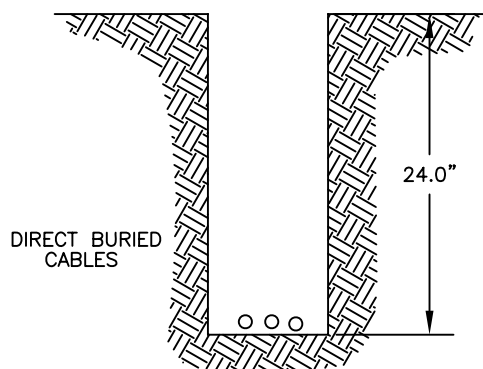


DIRECT BURIED CONDUIT

① =SELECTED OR IMPORTED BACKFILL PER APWA SECTION 61-6



DIRECT BURIED CABLES



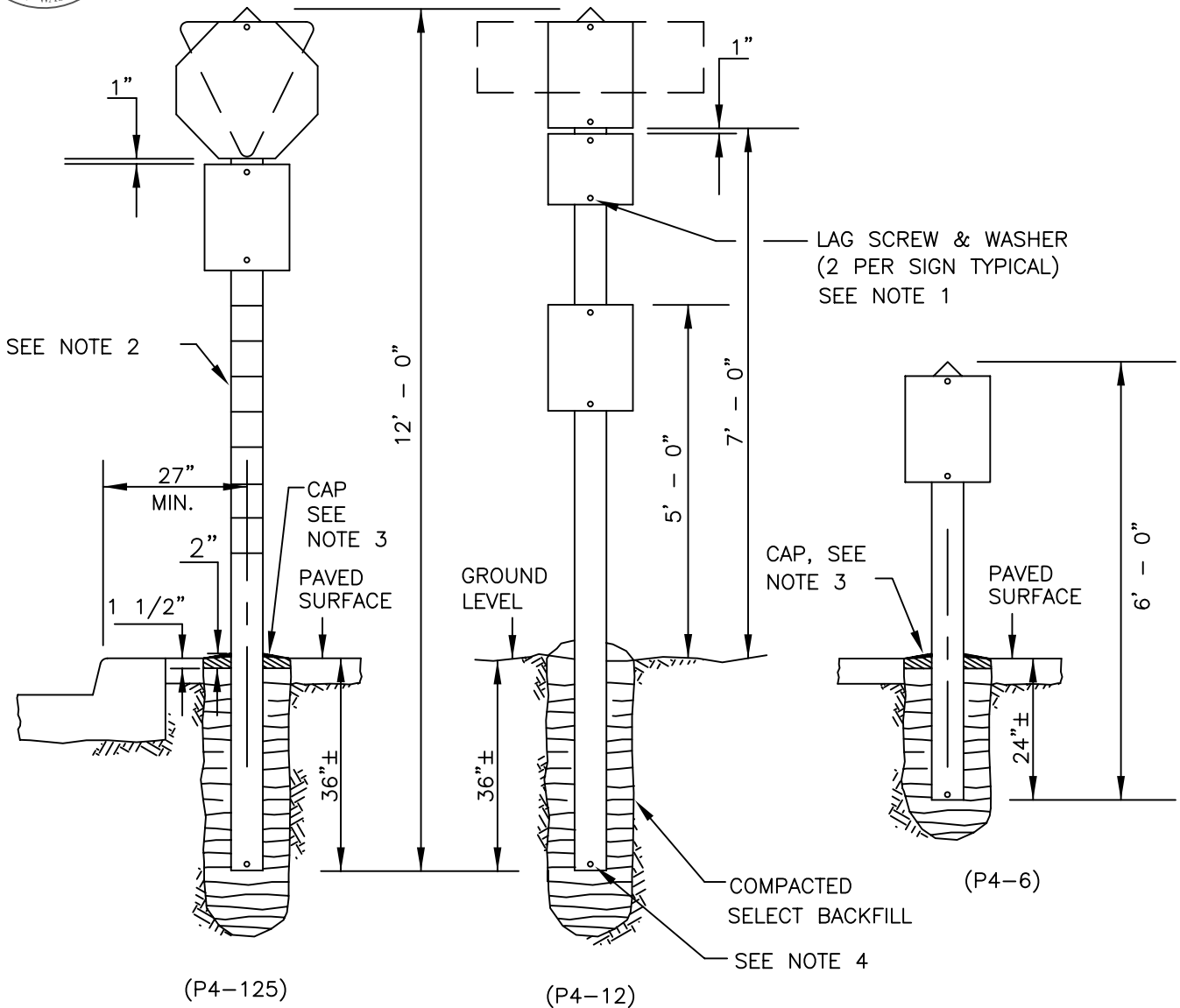
PLOWED INSTALLATION

Date: April 1997	No.	Date	Revision	By	Apvd	Joint Utility Trench Sec. for Secondary/Service Lines Detail: T-25
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail



NOTES:

1. 3 1/4 X 5/16" GALVANIZED OR PLATED LOG SCREW & 3/18" I.D. X 1" O.D. NYLON WASHER.
2. CAP SHALL BE THE SAME MATERIAL AS THE SURROUNDING SURFACE.
3. INSTALL 300 GALV. COMMON SPIKE ON THE FACE SIDE OF POST EXCEPT WHEN CONCRETE PAVING EXISTS. SPIKE SHALL BE 8" ABOVE BOTTOM OF POST AND SHALL PROTRUDE 2" FROM POST.

Date: April 1997	No.	Date	Revision	By	Apvd	<h3 style="margin: 0;">Traffic Sign Installation</h3> <p style="font-size: 1.5em; margin: 10px 0 0 0;">Detail: T-26</p>
Approved By:						
File: E:\eng_std\standard\transpo						



City of Port Townsend - Public Works Department

Standard Detail

FOR LOCAL AGENCY USE

TRAFFIC CONTROL PLAN

TRANSPORTATION BUREAU DEPARTMENT OF TRANSPORTATION
STATE OF WASHINGTON

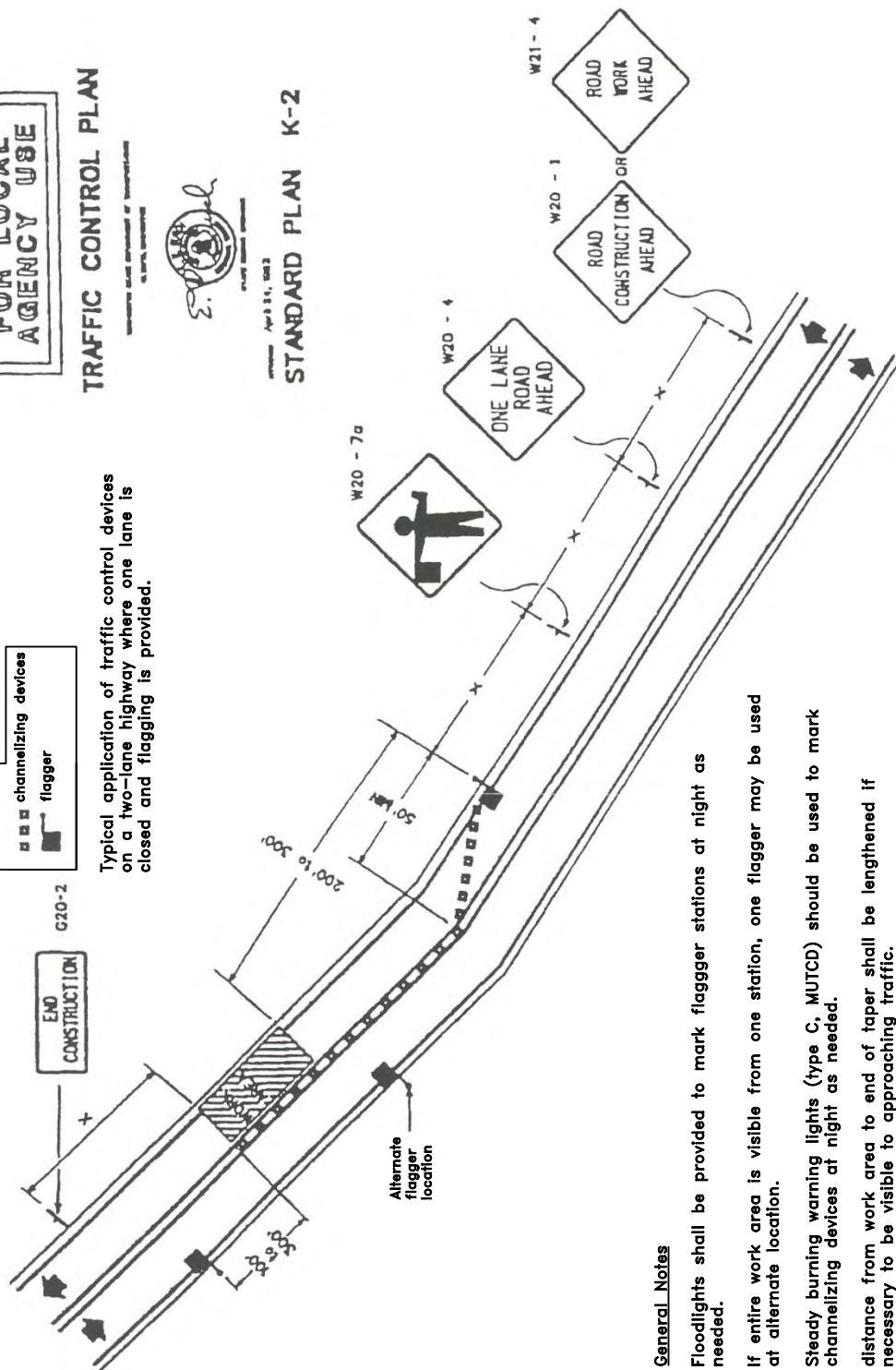


APR 3 1997

STANDARD PLAN K-2

Legend
 □ □ □ channelizing devices
 ■ flagger

Typical application of traffic control devices on a two-lane highway where one lane is closed and flagging is provided.



General Notes

- Floodlights shall be provided to mark flagger stations at night as needed.
- If entire work area is visible from one station, one flagger may be used at alternate location.
- Steady burning warning lights (type C, MUTCD) should be used to mark distance from work area to end of taper shall be lengthened if necessary to be visible to approaching traffic.
- Sign sequence is the same for both directions of travel.

Sign Spacing - X (feet)	
Rural Roads	500
Urban Arterials	40/55 mph
Urban Streets Residential and Business Districts	25/35 mph
	250

Date	Revision	By
8-31-90	Revised sign spacing table, flagger dimension, added W21-4, and realigned	ABN
10-18-91	Deleted End Construction signs, added "For Local Agency Use"	ABN
4-24-92	Replaced End Construction sign, added distance from flagger to work area and alternate flagger location, revised notes	ABN

Date: April 1997

Approved By:

File: E:\eng_std\standard\transpo

No.	Date	Revision	By	Apvd

Traffic Control Plan

Detail:

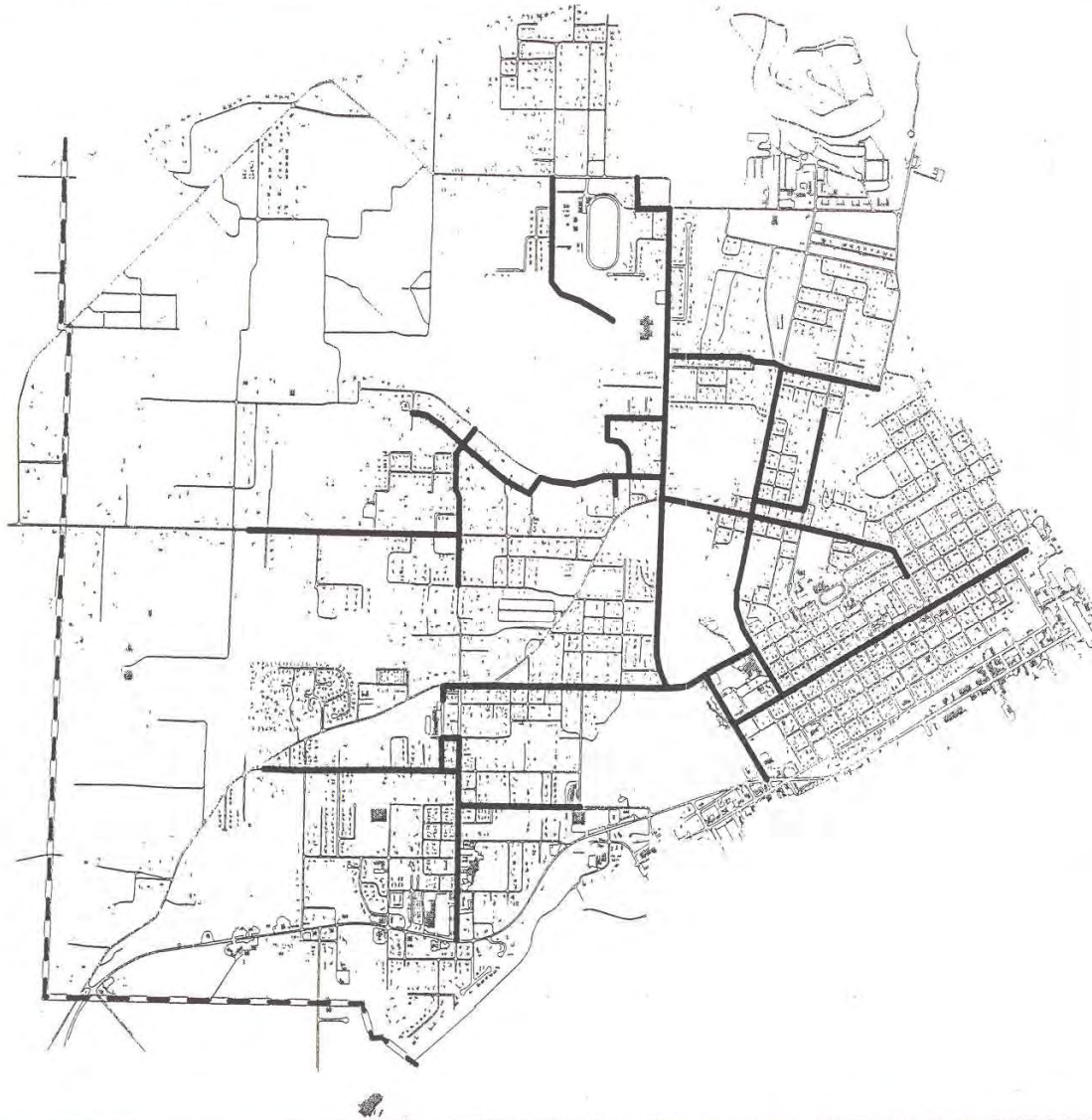
T-27

CHAPTER 6 - APPENDIX B
MAPS

Map 1	Safe Route to School
Map 2	Functional Classification

City of Port Townsend

Safest Routes to School



Date Printed: 02/1997

File: P:\activ\street_nyr\product\school\feroid\project\comp811.apr

Field verification of the accuracy of any information contained in this map is the sole responsibility of the user. Parcel information was obtained from the Jefferson County Assessor's office. Parcel lines are based on available public records and existing map sources, not from field surveys. Parcel lines have been adjusted to better fit planimetric data. This map may contain inaccuracies and should not be relied upon for site-specific analysis, property acquisition, determination of actual rights of way, property dimensions or land area. No representation of warranty regarding the positional accuracy of any map feature is either expressed or implied by publication of this map. By accepting this map, the user releases the City of Port Townsend from any and all direct or indirect liability for actions or decisions made based on information contained in this map.

City of Port Townsend

540 Water Street
Port Townsend, WA, 98368
(360) 385-3000








**Safest Routes
to School**

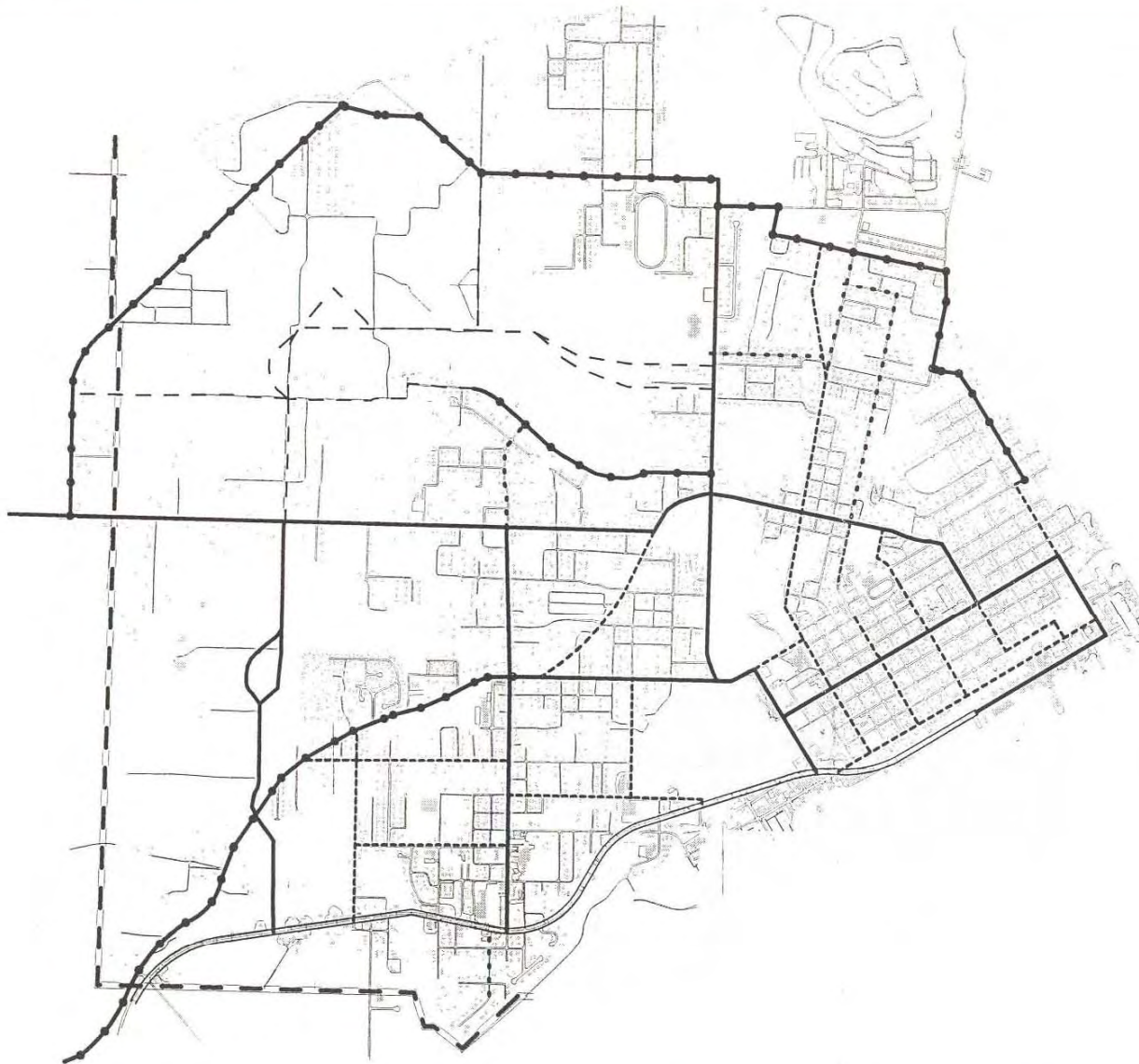
1 Inch = 0.5 Miles

City of Port Townsend

Proposed Functional Classification



-  Potential Future Collector or Arterial
-  Principal Arterial
-  Minor Arterial
-  Major Collector
-  Minor Collector
-  Scenic Collector
-  City Limits Roads



Date Plotted: 3/18/97

File F:\city\street\art_plan\project\cls.apr

Field verification of the accuracy of any information contained in this map is the sole responsibility of the user. Parcel information was obtained from the Jefferson County Assessor's office. Parcel lines are based on available public records and existing map sources, not from field surveys. Parcel lines have been adjusted to better fit planimetric data. This map may contain inaccuracies and should not be relied upon for site-specific analysis, property acquisition, determination of actual rights of way, property dimensions or legal uses. No representation of warranty regarding the positional accuracy of any map feature is either expressed or implied by publication of this map. By accepting this map, the user releases the City of Port Townsend from any and all direct or indirect liability for actions or decisions made based on information contained in this map.

City of Port Townsend

540 Water Street
Port Townsend, WA, 98368
(360) 385-3000

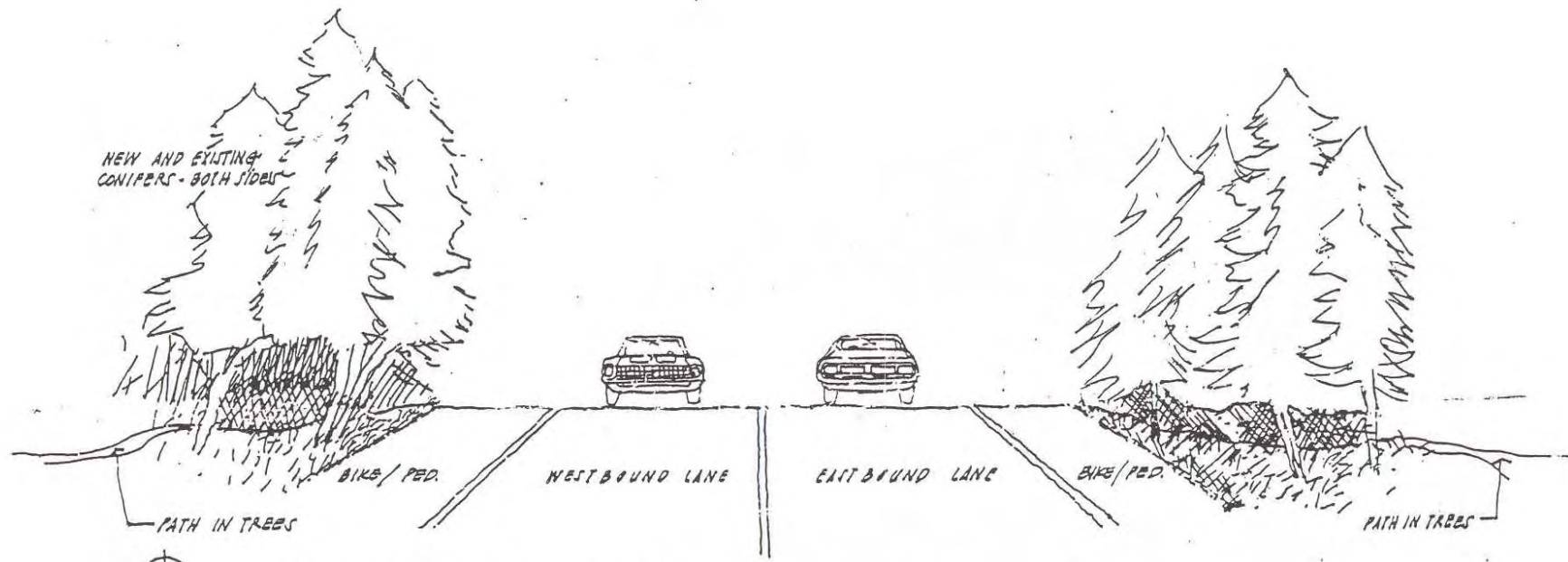
Proposed Functional Classification

1 Inch = 0.5 Miles

**CHAPTER 6 - APPENDIX C
GATEWAY PLAN DRAWINGS**

- Figure 1. Section at the Forest Corridor
- Figure 2. Section at Upper Commercial
- Figure 3. Section at Upper Commercial (Hancock to Grant only)
- Figure 6. Section at S-Curve
- Figure 7. Section at Flats
- Figure 10. Section at Bluff
- Figure 11. Typical Right-of-Way Configuration (three-lane)
- Figure 12. Typical Right-of-Way Configuration (four-lane)

Figure 1:



NEW AND EXISTING
CONIFERS - BOTH SIDES

PATH IN TREES

BIKE / PED.

WESTBOUND LANE

EASTBOUND LANE

BIKE / PED.

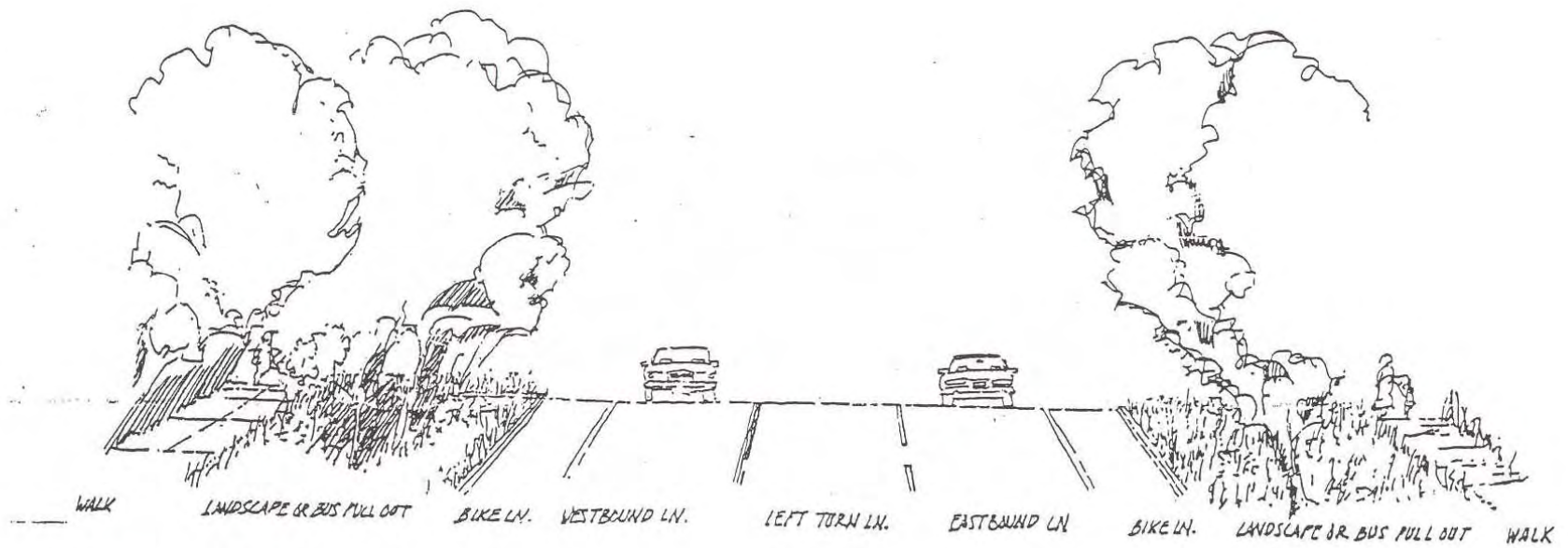
PATH IN TREES



SECTION AT THE FOREST CORRIDOR

Illustrates configuration of existing east and westbound lanes, development of existing shoulders into bike lane, and new pedestrian path through trees. Landscaping includes infill of conifers along both sides.

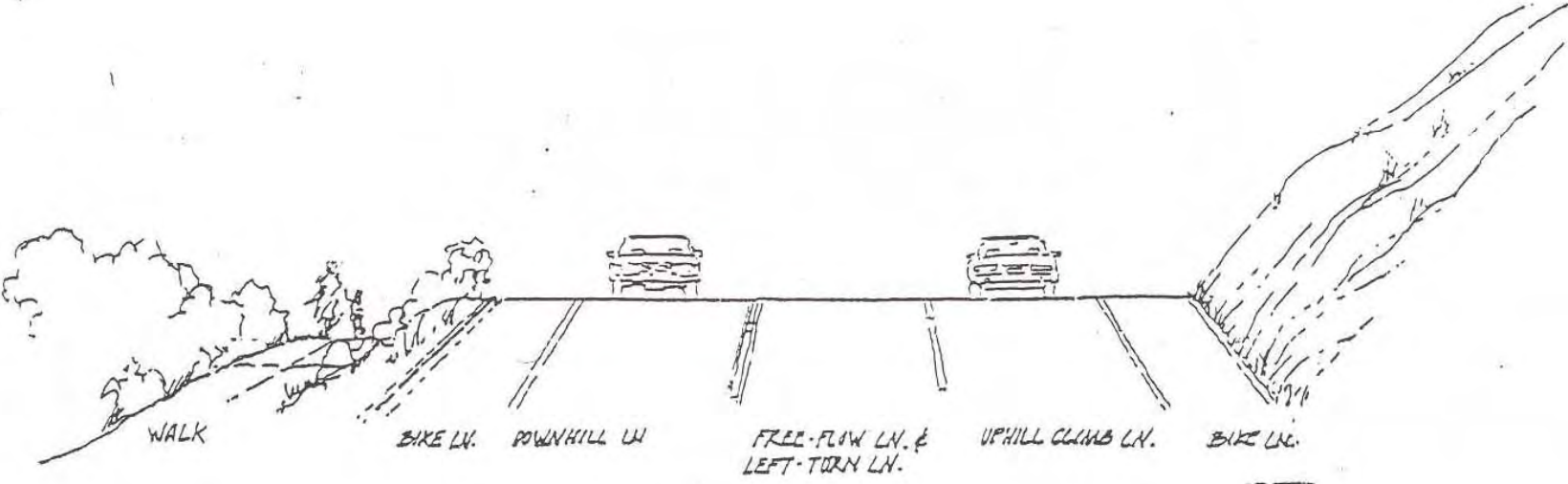
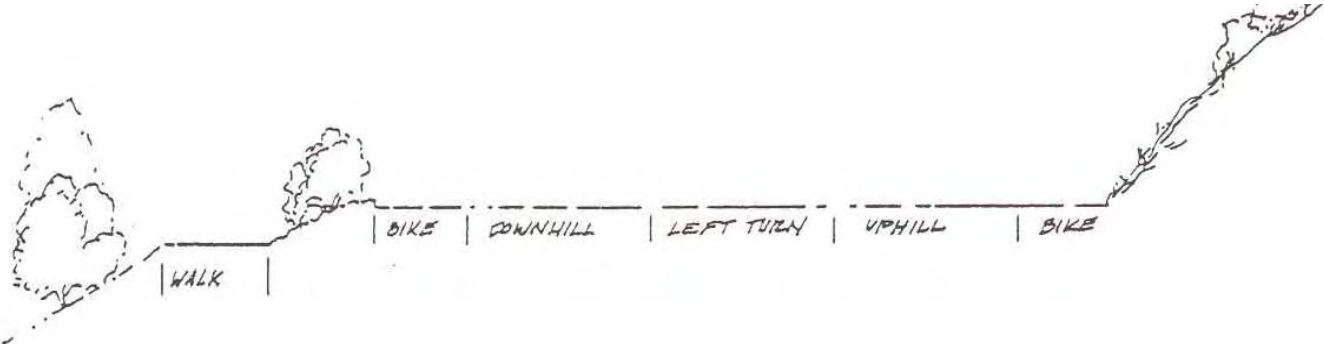
Figure 2:



SECTION AT UPPER COMMERCIAL

Illustrates configuration of existing eastbound and westbound lanes, with a new left turn lane. Bicycle lanes and sidewalks are created along both sides of Sims; new trees and shrubs or ground cover are proposed along the sidewalk.

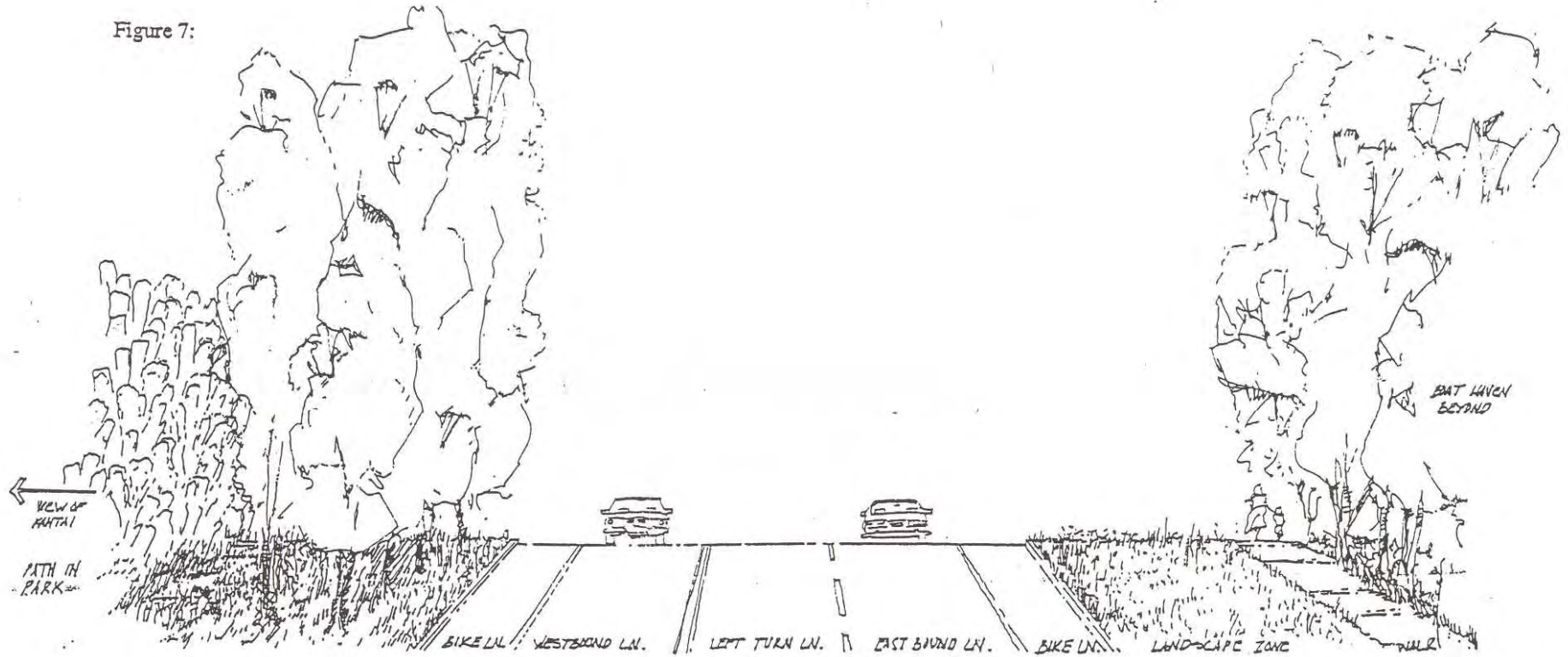
Figure 6:



SECTION AT S-CURVE

Illustrates configuration of a new westbound climbing lane and a planter centered between eastbound and westbound lanes. A new shoulder serves as a bike lane and a sidewalk is created along the south. Existing trees may be thinned to improve views.

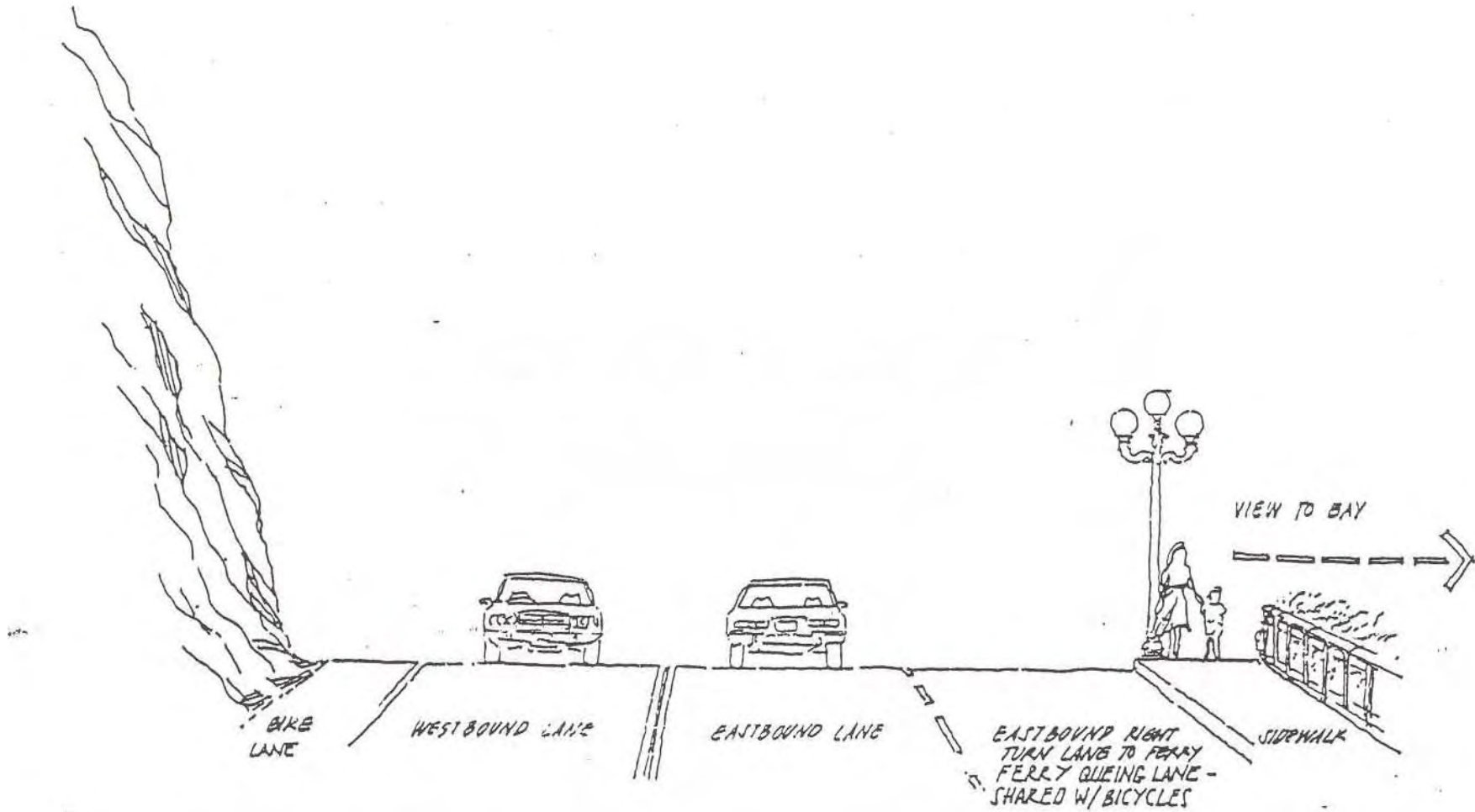
Figure 7:



SECTION AT FLATS

Illustrates configuration of new left turn lane between westbound and eastbound lanes. A new shoulder provides bike lane at north, and the existing south shoulder is developed into a bike lane and sidewalk. Existing poplars are thinned as required to improve view to Kah-Tai Park.

Figure 10:



SECTION AT BLUFF

Illustrates configuration of existing east and westbound lanes, with a bike lane along the north shoulder; a new Ferry queuing lane, bike lane, and a sidewalk along south.

Figure 11: Typical Right-of-Way Configuration (three-lane)

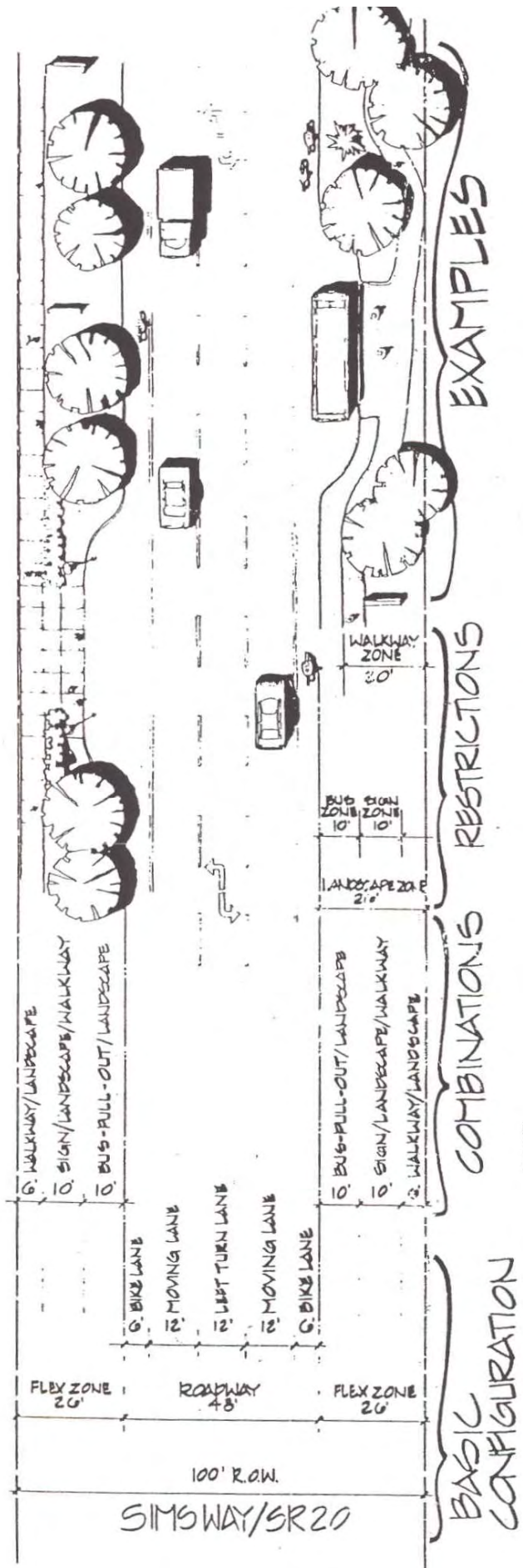
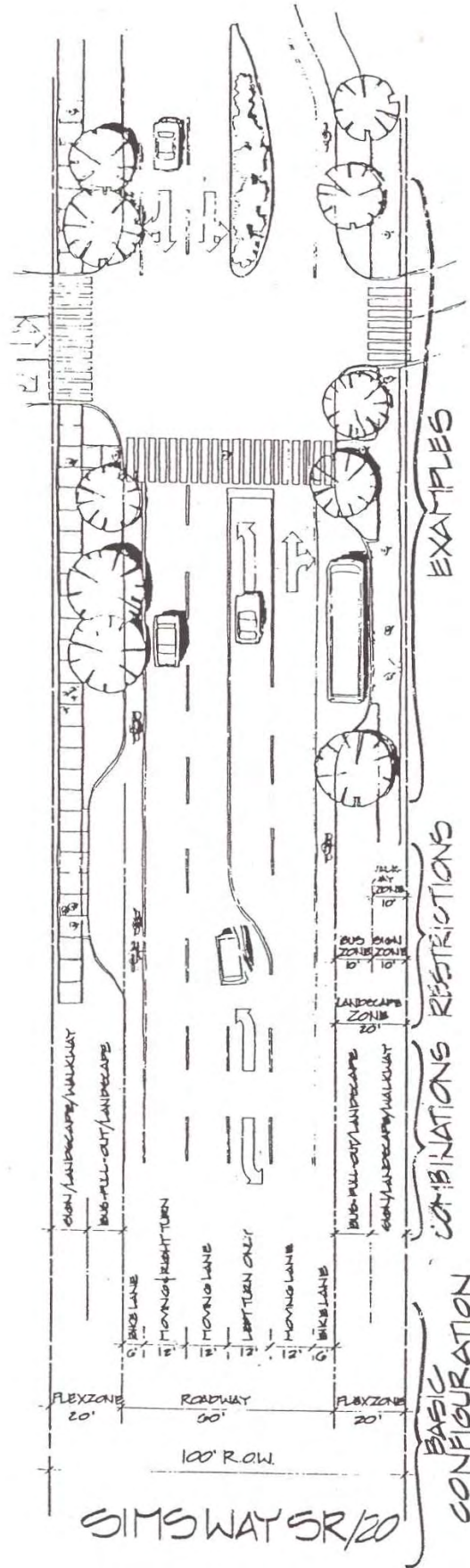


Figure 12: Typical Right-of-Way Configuration (four-lane)



**CHAPTER 6 - APPENDIX D
TREES AND VEGETATION**

Exhibit 1 Unique Trees and Vegetation

Exhibit 2 Street Trees

UNIQUE TREES AND VEGETATION LIST

UNIQUE TREES

Dogwood	<u>Cornus</u>
Madrona	<u>Arbutus menziesii</u>
Quaking aspen	<u>Populus tremuloides</u>
Western Mountain Ash	<u>Fraxinus ornus</u>
Washington Hawthorne	<u>Crataegus phaenophrun</u>

UNIQUE SHRUBS AND OTHER VEGETATION

Nootka Rose	<u>Rosa Nutkana</u>
Ocean Spray	<u>Holodiscus discolor</u>
Prickly Pear Cactus	<u>Oputia fogilis</u>
Red Currant	<u>Ribes sanguineum</u>
Rhododendron	<u>Rhododendron macrophyllum</u>
Shining Oregon Grape	<u>Berberis aquifolium</u>
Swordfern	<u>Polystichum munitum</u>
Snowberry	<u>Symphoricarpus albus</u>

Note: presence of these native varieties indicates a healthy local habitat and all effort should be made to allow these varieties to grow on shoulders and roadside areas to stabilize slopes, prevent invasion of non-native species (such as: thistles and other noxious weeds) and promote wildlife habitat wherever possible on roadside Rights-of-way.

STREET TREE LIST FOR THE CITY OF PORT TOWNSEND

NOTE: The City recommends planting the largest scale tree that is suitable for the designated space.

Small scale trees that may be planted under utility lines

Botanical name, common name, and comments

Acer ginnala (Amur Maple)

Acer platanoides 'Globosum' (Globe Maple)

Acer truncatum (Shantung Maple)

Cercis occidentalis (Western Redbud)

Cornus kousa (Kousa Dogwood)

Crataegus crus-galli 'Inermis' (Thornless Cockspur Hawthorn)

Crataegus x lavalleyi (Lavalley Hawthorn)

Crataegus phaenopyrum (Washington Hawthorn)

Koelreuteria paniculata (Panicled Golden Rain Tree)

Magnolia kobus (Kobus Magnolia)

Malus floribunda (Flowering Crabapple)

Photinia x fraseri (Tree form Photinia)

Prunus cerasifera 'Krauter Vesuvius' (Flowering Plum)

Prunus 'Okame' (Okame Flowering Cherry)

Quercus ilex (Holly Oak)

Styrax japonica (Japanese Snowdrop Tree)

Columnar trees that may be planted under utility lines

Botanical name, common name, and comments

Acer platanoides 'Columnare' (Norway Maple) Columnar form

Acer platanoides 'Compacta' (Norway Maple) compact columnar form

Acer rubrum 'Armstrong', 'Bowhall', 'Scarlet Sentinel', 'Karpic', 'Doric' (Columnar Red Maple)

Malus floribunda 'Tshonoskii' (Japanese Flowering Crabapple)

Pyrus calleryana 'Bradford', 'Capital', 'Chanticleer', 'Redspire' (Flowering pear)

Tilia cordata 'Chancelor' (Littleleaf Linden)

Columnar trees that may not be planted under utility lines

Botanical name, common name, and comments

Acer nigrum 'Greencolumn' (Greencolumn Maple)

Calocedrus decurrens (Incense Cedar)

Carpinus betulus 'Fastigata' (Pyramidal European Hornbeam)

Ginkgo biloba 'Princeton Sentry' (Princeton Sentry Ginko)

Metasequoia glyptostroboides 'Sheridan Spire' (Dawn Redwood)

Quercus robur 'Fastigata' (Upright English Oak)

Medium sized trees that may be planted under utility lines

Botanical name, common name, and comments

Acer campestre (Hedge Maple)

Acer truncatum x A. platanoides 'Warrenred' (Pacific Sunset Maple)

Medium sized trees that may not be planted under utility lines

Botanical name, common name, and comments

Acer platanoides 'Cleveland', 'Deborah', 'Schwedleri', 'Superform' (Norway Maple)

Acer psuedoplatanus (Sycamore Maple)

Aesculus x carnea 'Briotii' (Red Horsechestnut)

Carpinus caroliniana (American Hornbeam)

Ceridiphyllum japonicum (Katsura)

Corylus colurna (Turkish Filbert)

Fraxinus ornus (Flowering Ash)

Gleditsia triacanthos inermis 'Shademaster' (Thornless Honey Locust)

Liquidambar styraciflua (Sweet Gum)

Prunus sargentii (Sargent Cherry)

Pyrus calleryana 'Aristocrat' (Aristocrat Flowering Pear)

Sorbus aria (Whitebeam)

Thuja plicata (Western Red Cedar)

Tilia cordata 'Greenspire' (Littleleaf Linden)

Tilia x euchlora (Crimean Linden)

Zelkova serrata 'Village Green' (Village Green Zelkova)

Large trees not suitable for under utility lines

Botanical name, common name, and comments

Acer platanoides 'Crimson King', 'Emerald Queen' (Norway Maple)

Acer saccharum 'Temple's Upright' (Sugar Maple)

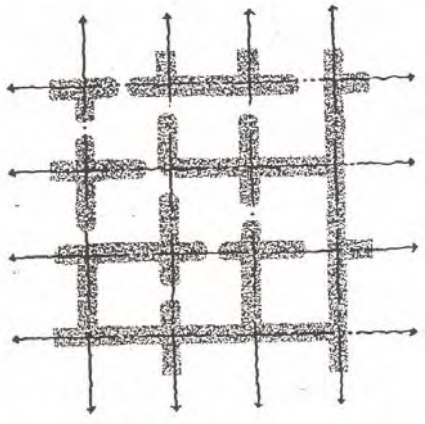
Aesculus hippocastanum 'Baumanii' (Bauman Horsechestnut)

Fagus sylvatica (European Beech)

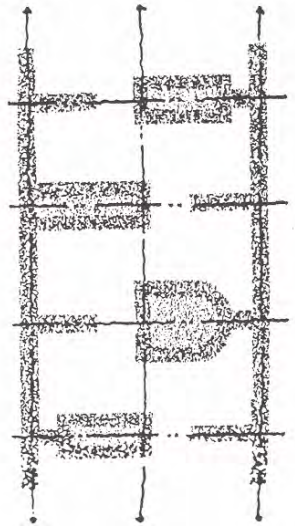
Fraxinus americana 'Autumn Purple' (American Ash)
Fraxinus excelsior 'Kimberly' (European Ash)
Fraxinus oxycarpa 'Raywood' (Raywood Ash)
Fraxinus pennsylvanica 'Patmore', 'Summit', 'Urbanite' (Green Ash)
Ginkgo biloba (Maidenhair Tree)
Liriodendron tulipifera (Tulip Tree)
Quercus acutissima (Sawtooth Oak)
Quercus coccinea (Scarlet Oak)
Quercus imbricaria (Single Oak)
Quercus phellos (Willow Oak)
Quercus robur (English Oak)
Quercus rubra (Red Oak)
Quercus shumardii (Shumard Oak)
Ulmus 'Pioneer', 'Homestead' (Hybrid Elms)

**CHAPTER 6 - APPENDIX E
STREET GRID, STREETScape, AND PATHWAY EXAMPLES**

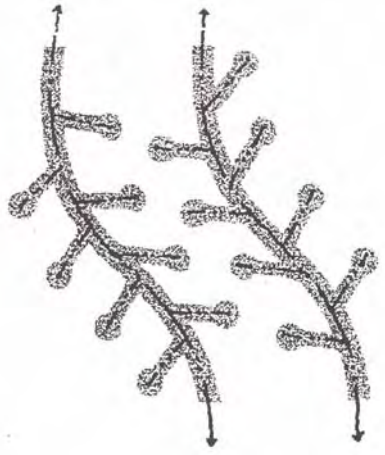
Gridiron with pedestrian connectedness and vehicular disconnectedness.



Connected cul-de-sacs and courts with public spaces.

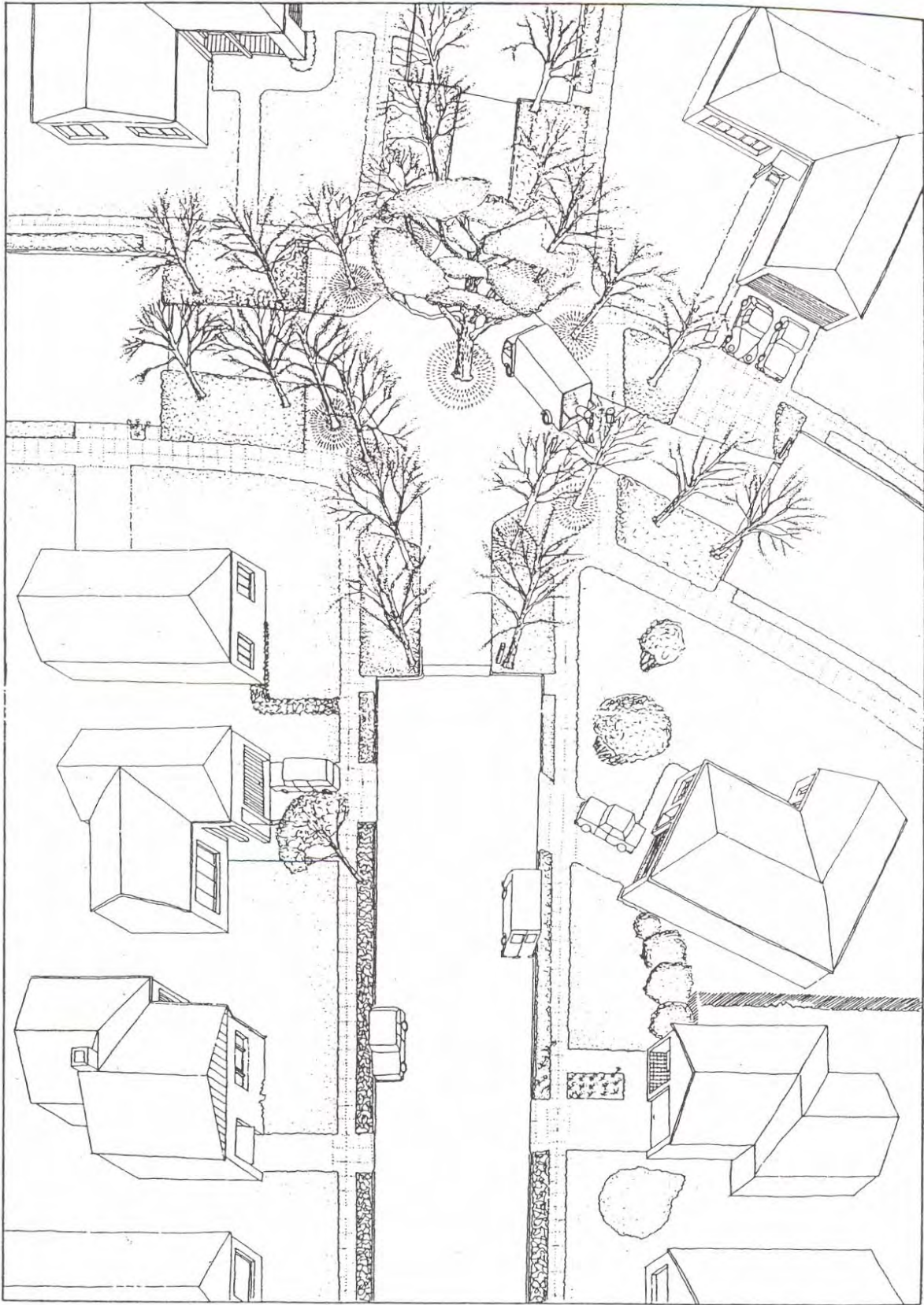


Conventional cul-de-sac pattern.

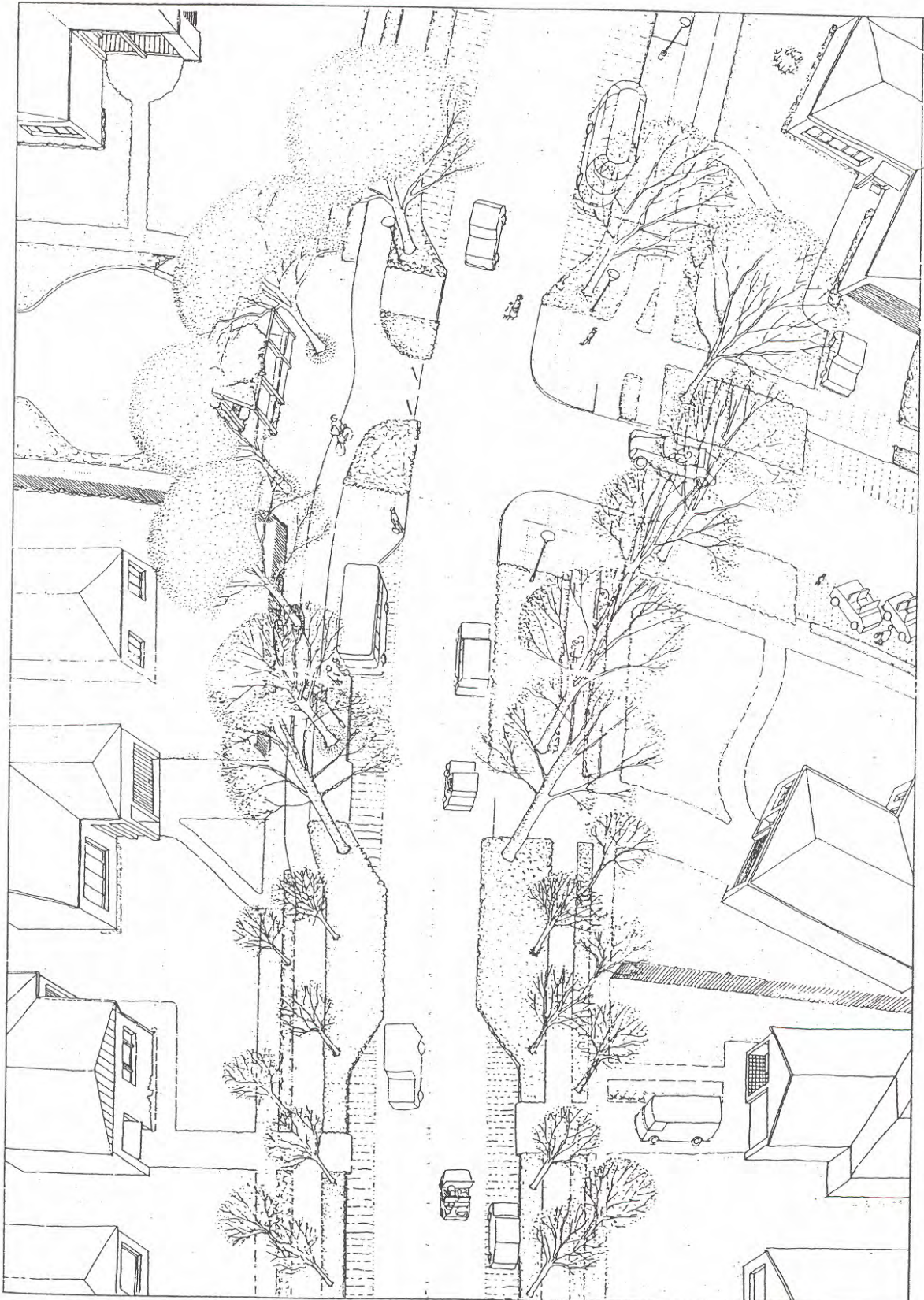


Pedestrian connected cul-de-sacs.

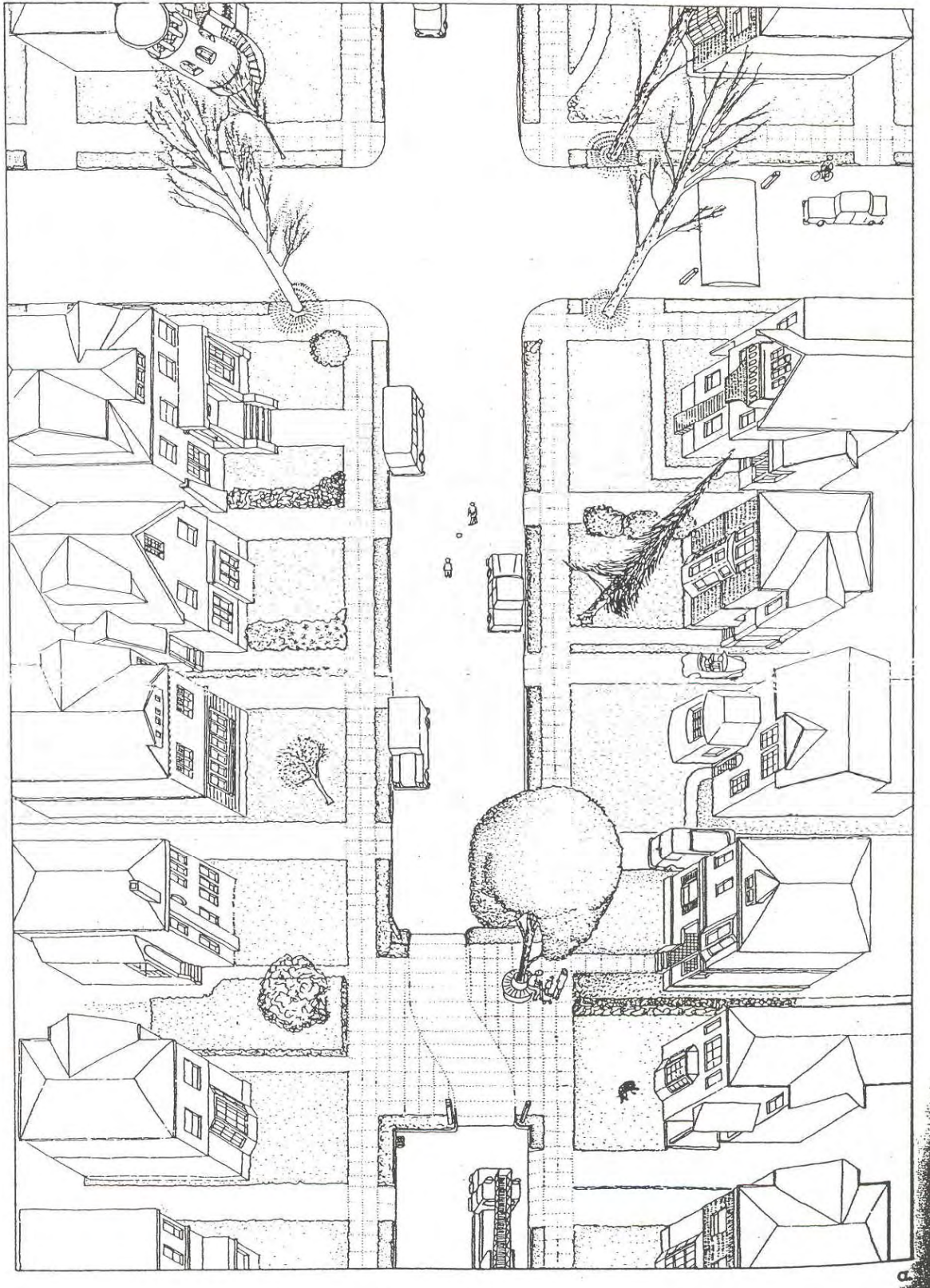




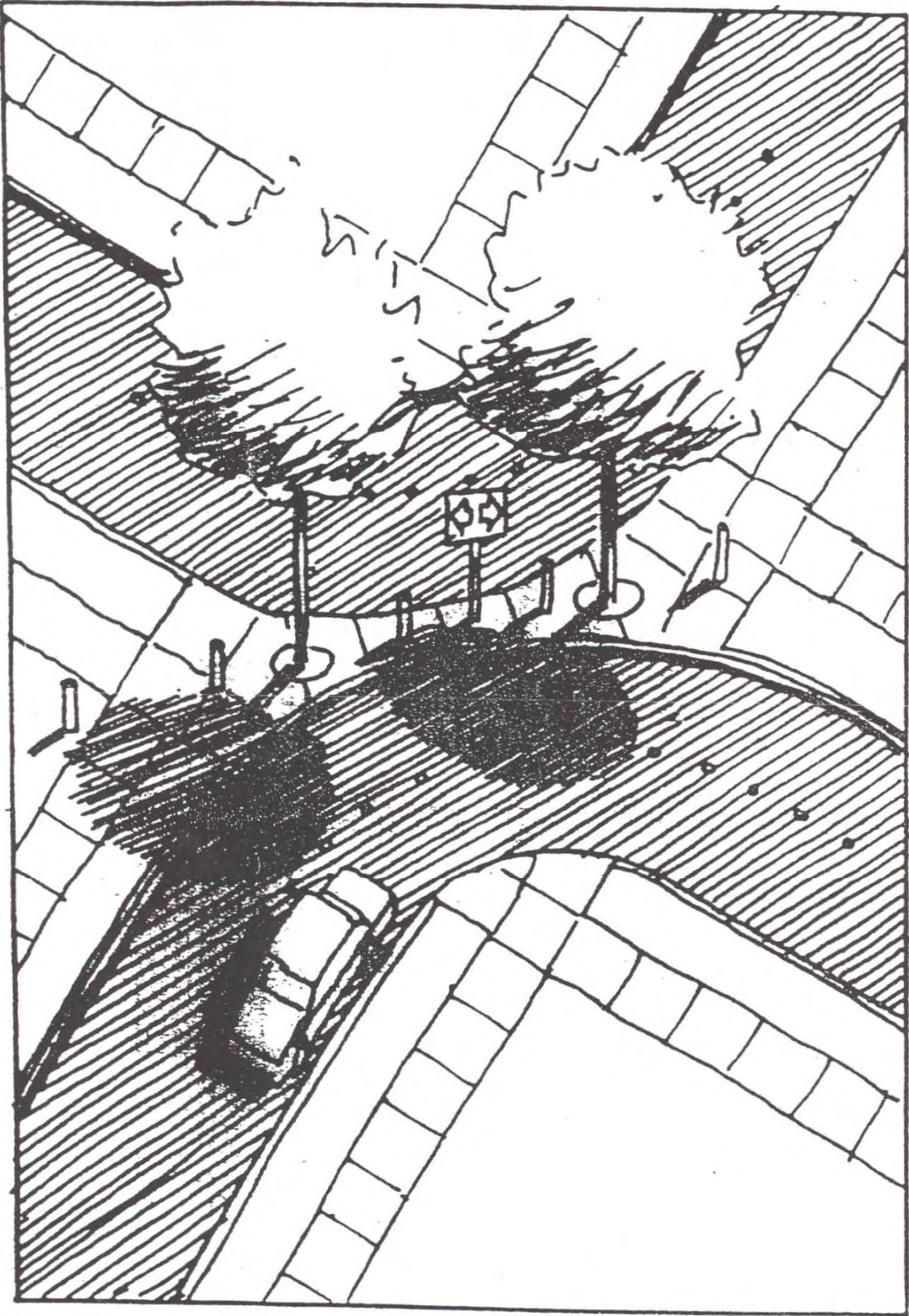
27-3. Streets laid out in the 1950 automobile suburb were designed foremost as speedy and efficient channels for car traffic. The strategic placement of trees on (this page) a street with low traffic volumes, and (b) the same street redesigned for high volumes, can enhance the aesthetic and recreational character of the street, while improving its safety.



b.



27-2. Streetcar suburbs with (a) lightly trafficked streets would benefit from attractively designed speed bumps that could also serve as pedestrian rest areas, and from amenities, such as bus shelters which would enhance residents' use of public transit.



Diagonal Diverters

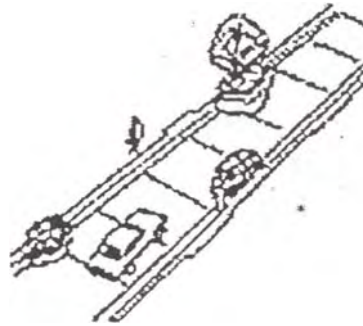


Figure 31. Pinch Points in Pavement

Typical Application

Effective in limiting the ability of cars to pass one another through narrow pavement, and thus reduce speeds.

Description

Constrictions are built in a form of extended planters or sidewalks at intervals along one side or both sides of the street. Width is influenced by various factors such as traffic, volume, provision for large vehicles and one or two-way traffic. Pinch points are usually most effective when combined with other controlling measures such as speed bumps. Provisions for cyclists and drainage may be necessary in some cases.

This European technique for controlling traffic is not widely used in the United States. Seven of the surveyed cities indicate actual use of the technique, and ten others show an interest and possible application in future development. The majority of cities (52) have not used the technique.

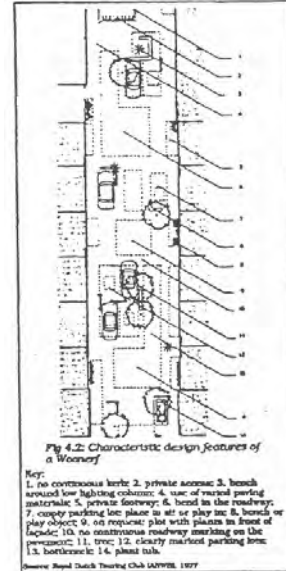


Figure 41. Shared Streets

Description

The shared street concept (Woonerf) is the prevalent technique for residential neighborhood traffic control in Europe. Its fundamental concept is an antithesis to the notion of segregating pedestrians and vehicles. It is defined by the elimination of the traditional division between roadway and sidewalks. One road surface is created and the maximum vehicle speed is restricted to a walking pace. Thus pedestrians, children at play, bicyclists, parked cars, and moving cars all share the same surface. Though it seems these uses conflict with each other, the physical design is such that the pedestrian has primary rights, while the driver is the intruder. Various studies and surveys conducted in the last twenty years indicate a considerable reduction in traffic speed and accidents. They also show an increase of street's social interaction, play, and a high degree of satisfaction by the residents.

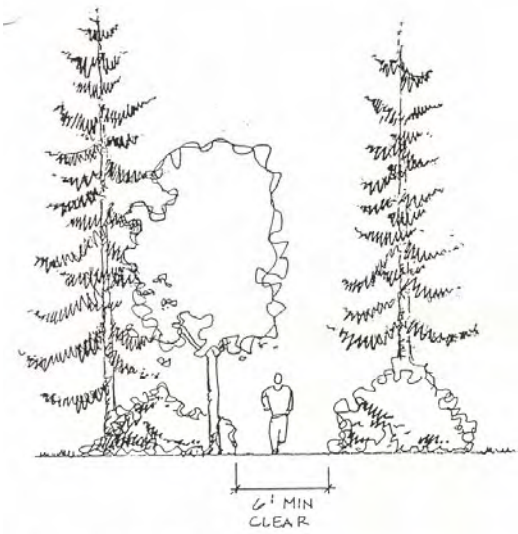


Figure IV - 9. Use Trail

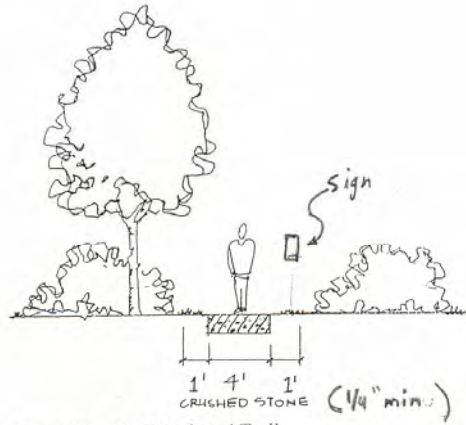
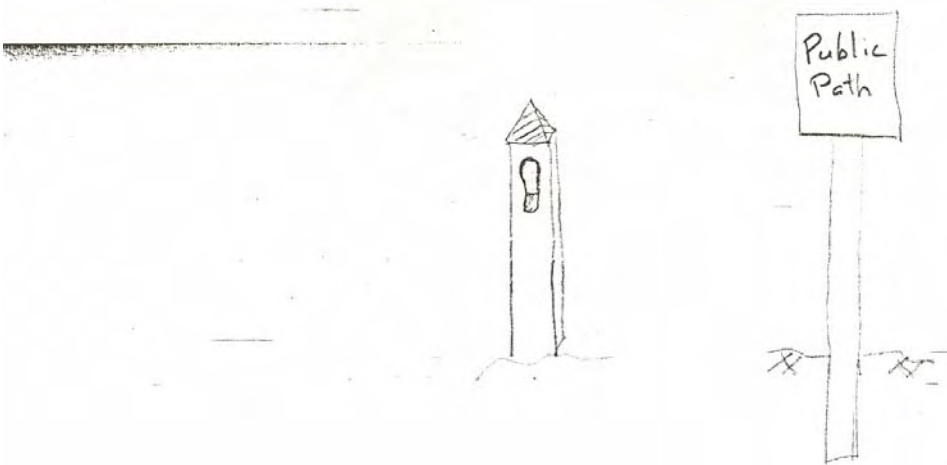
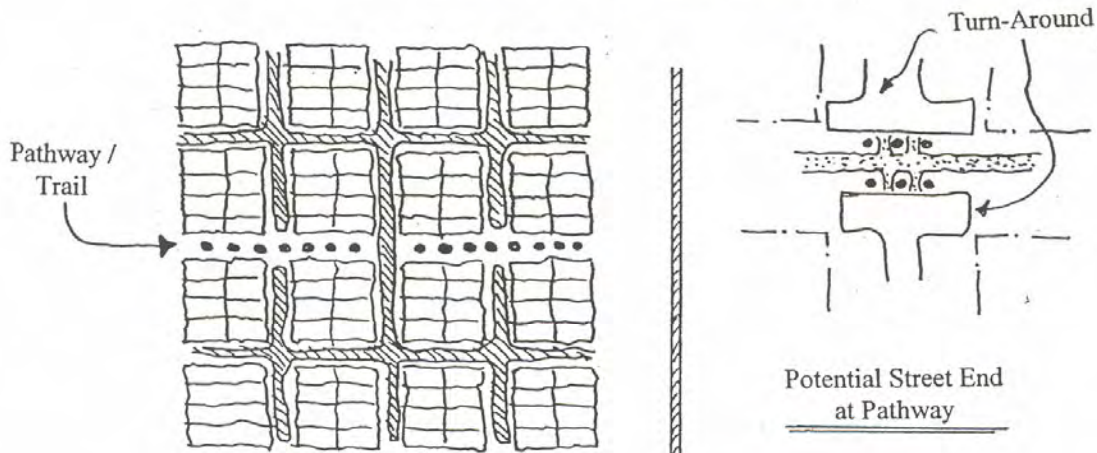


Figure IV - 10. Developed Trail

Secondary Neighborhood Connector

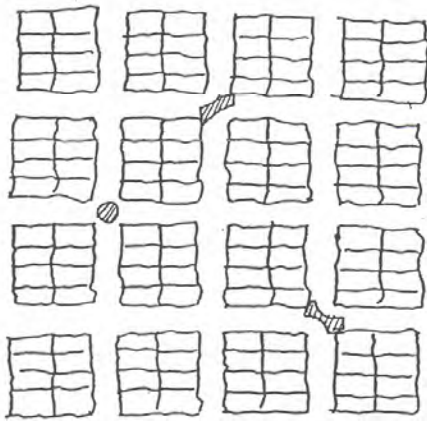


NEIGHBORHOOD STREETS
ALTERNATIVE USE OF RIGHTS-OF-WAY

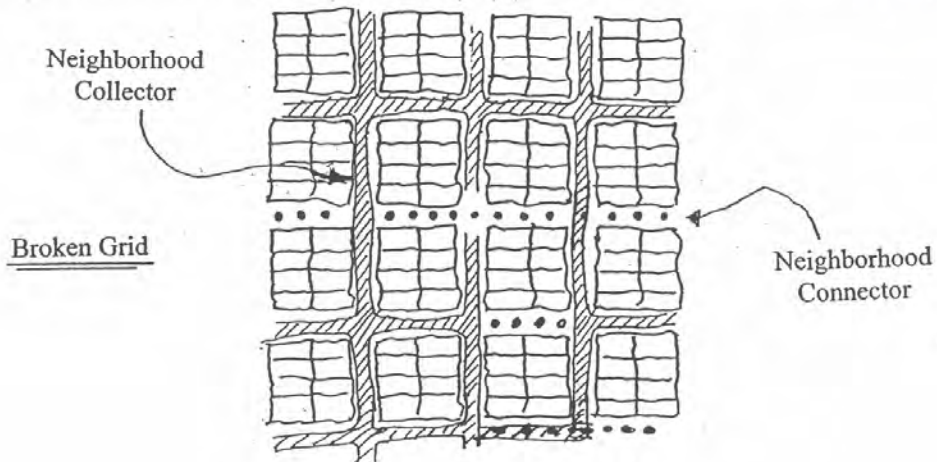
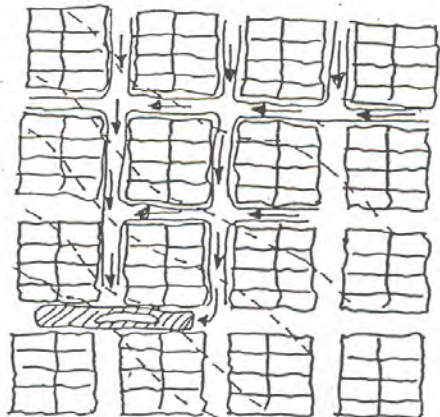


Minimize Trail Crossings

Traffic Calming, Diversion



Stormwater Detention



**CHAPTER 6 - APPENDIX F
TRAFFIC IMPACT ANALYSIS**

TRAFFIC IMPACT ANALYSIS

Introduction

1. A traffic impact analysis is a specialized study of the impacts a certain type and size of development will have on the surrounding transportation system. The traffic impact analysis is an integral part of the development impact review process. It is especially concerned with the generation, distribution, and assignment of traffic to and from the “new development.” The purpose of the analysis is to determine what impact the development traffic will have on the existing and proposed street network and what impact the existing and projected traffic on the street system will have on the “new development.” A “new development” is a site action that triggers SEPA requirements which can include cumulative impacts.
2. The BCD Department in consultation with the Public Works Department will determine if there is a need for a traffic impact analysis. In general the need for this analysis will be based upon the size of the development proposed, existing street and intersection conditions, traffic volumes, accident history, community concerns, and other pertinent factors relating to traffic impacts attributable to “new developments.”
3. When Required. If a site action requires an Environmental Checklist to be prepared, a Traffic Impact Analysis may be required if any of the following conditions are met. This does not preclude the SEPA Responsible Official’s authority to require additional analysis if in his judgment such analysis is necessary or to waive this analysis.
 - a. The “new development” generates more than 20 vehicles in the peak direction of the peak hour on the adjacent streets and intersections. This would include the summation of all turning movements that affect the peak direction of traffic.
 - b. The “new development” generates more than 25% of site-generated peak hour traffic through a signalized intersection or the “critical” movement at an unsignalized intersection.
 - c. The “new development” is within an existing or proposed transportation benefit area. This may include Latecomer Agreements, Transportation Benefit Districts (TBD), Local Improvement Districts (LID), or local/state transportation improvement areas programmed for development reimbursements.
 - d. The “new development” may potentially affect the implementation of the street system outlined in the Transportation Element of the Comprehensive Plan, the Transportation Improvement Program, or any other documented transportation project.
 - e. The “new development” proposes a rezone of the subject property that could significantly change transportation patterns.
 - f. The original analysis of the site is over two years old.
4. Qualifications for Preparation of Documents. Traffic Impact Analysis shall be conducted under the direction of a responsible individual or firm acceptable to the BCD Director and

Public Works Director. The analysis shall be prepared by an engineer licensed to practice in the State of Washington with special training and experience in traffic engineering.

5. Scope of Work. The level of detail and the scope of work of a Traffic Impact Analysis may vary with the size, complexity, and location of the “new development.” The analysis shall be a thorough review of the immediate and long-range effects of the “new development” on the transportation system.
 - a. A New Development Description
 - i. Provide a reduced copy of the site plan showing the type of development, street system, right-of-way limits, access points, and other features of significance in the “new development.” Also include pertinent off-site information such as intersections, driveways, land-use descriptions and other significant features with respect to the development.
 - ii. Provide a “vicinity map” of the project area showing the transportation system to be impacted by the development.
 - iii. Discuss specific development characteristics such as type of development proposed (single-family, multi-family, retail, industrial), internal street network, proposed access locations, parking requirements, zoning, and other pertinent factors.
 - iv. Discuss project completion and occupancy schedule.
 - b. Existing Conditions
 - i. Discuss street characteristics including functional class, number of traveled lanes, lane width, shoulder treatment, bicycle paths, and intersection traffic control.
 - ii. Identify safety and access problems including discussions on accident history, sight distance restrictions, traffic control, and pedestrian conflicts.
 - iii. Obtain all available traffic data from the city and other jurisdictions as applicable. If data is not available, then data shall be collected by the firm to supplement the discussions and analysis.
 - iv. Conduct manual peak hour turning movement counts at study intersection, if traffic volume data is more than three (3) years old, unless otherwise directed by the city.
 - v. A figure shall be prepared showing existing average daily traffic and peak hour traffic volumes on the adjacent streets and intersections in the study area. Complete turning movement volumes shall be illustrated.
 - c. Development Traffic
 - i. Elements of the analysis shall be conducted initially to identify the limits of the study area. The study area shall include all pertinent intersections and streets impacted by the development traffic.
 - ii. Individual or firm preparing the analysis shall submit a figure illustrating the proposed “trip distribution” for the new development to the City Engineer. Once the figure is approved, a formal “scoping” of the study area and the study contents can be conducted to clearly identify the elements of the study.
 - iii. Methodology and procedures used in preparing the trip generation and trip distribution elements of the analysis are as follows:

- (1) Trip Generation - Site-generated traffic of the “new developments” shall be estimated using the latest edition of the ITE TRIP GENERATION MANUAL. Variations of trip rates will require the approval of the City Engineer. Average trip rates shall be used for all land-use categories where applicable. Trip rate equations will be allowed for those land uses without average rates.
 - (2) Site traffic shall be generated for daily and A.M. and P.M. peak hour periods. Adjustments made for “passer-by” and “mixed-use” traffic volumes shall follow the methodology outlined in the latest edition of the ITE TRIP GENERATION MANUAL. A “passer-by” traffic volume discount for commercial centers shall not exceed 25% unless approved otherwise by the City Engineer. For multi-use and/or “phased” projects, trip generation tables shall be prepared showing proposed land-use, trip rates, and vehicle trips for daily and peak hour periods and appropriate traffic volume discounts, if applicable.
 - (3) Trip Distribution - The trip distribution for a “new development” shall be approved by the City Engineer and prior to the formal scoping of the analysis. The methodology shall be clearly defined and discussed in detail in the analysis. The analysis shall identify other transportation modes that may be applicable, such as transit, bicycle, and pedestrian use. New developments are encouraged to implement Transportation Demand Management practices such as “Flex Time” for employees and ride sharing programs including car pools, van pools, shuttle buses etc.
- iv. Future Traffic
- (1) Future Traffic Conditions not including Site Traffic. Future traffic volumes shall be estimated using information from transportation models or applying an annual growth rate to the base-line traffic volumes. The future traffic volumes shall be representative of the time of full build out based upon current zoning. The City Engineer will determine an appropriate growth rate, if that option is utilized. In addition, proposed “on-line” projects shall be compared to the increase in traffic by applying an annual growth rate. If modeling information is not available, the greatest traffic increase from either the “on-line” developments or the application of an annual growth rate shall be used to forecast the future traffic volumes.
 - (2) Future Traffic Conditions including Site Traffic. The site-generated traffic shall be assigned to the street network in the study area based on the approved trip distribution model. The site traffic shall be combined with the forecasted traffic volumes to show the total traffic conditions estimated at development completion. A future will be required showing daily and peak period turning movement volumes for each traffic study intersection.
- v. Traffic Operations
- (1) The level of service (LOS) and capacity analysis shall be conducted for

each pertinent intersection in the study area as determined by the BCD and Public Works Directors. The methodology and procedures for conducting the capacity analysis shall follow the guidelines specified in the Highway Capacity Manual-Special Report 209, 1985 Edition. The individual or firm preparing the analysis shall calculate the intersection LOD for each of the following conditions:

- (a) Existing peak hour traffic volumes
 - (b) Existing peak hour traffic volumes including site-generated traffic
6. Future traffic volumes not including site traffic
 7. Future traffic volumes including site traffic
 8. Level of Service results for each traffic volume scenario.
 - a. The Level of Service Table shall include the LOS results for A.M. and P.M. peak periods, if applicable. The table shall show LOS conditions with corresponding vehicle delays for signalized intersections and LOS conditions for the critical movements at unsignalized intersections. For signalized intersections, the LOS conditions and average vehicle delay shall be provided for each approach and the intersection as a whole.
 - b. The capacity analysis for existing signalized intersections shall include existing phasing, timing, splits and cycle lengths in the analysis as observed and measured during the peak hour traffic periods. All traffic signal system operational data may be obtained from the Public Works Department.
 - c. If the “new development” is scheduled to be completed in phases, the analysis shall conduct a LOS analysis for each separate phase of the development. The incremental increases in site traffic from each phase shall be included in the LOS analysis for each proceeding year of development completion.
 - d. The Public Works Department may require that the analysis be conducted on computer software compatible with City software.
 9. Mitigation
 - a. The analysis shall include a proposed mitigation plan. The mitigation may be either the construction of necessary transportation improvements or contributions to any established transportation impact fund.

ITE TRIP GENERATION RATES BY MAJOR LAND USE CATEGORIES

Land Use Type*	Average Weekday Trip Generation Rates
<hr/>	
Residential	Trips per Indicated Measure: Dwelling Unit
<hr/>	
Single-family detached	10.06
Condominium/townhouse**	5.86
Multi-Family apartment	6.60
Mobile home park	4.81
Retirement community	3.30
Recreational home (owner)	3.16
<hr/>	
Office Building	Trips per Indicated Measure: 1,000 gross sq.ft. of building area
<hr/>	
General office, 10,000 gross sq.ft.	24.39
General office, 50,000 gross sq.ft.	16.31
Medical office building	34.17
Office park	11.40
Research center	6.09
<hr/>	
Retail	Trips per Indicated Measure: 1,000 gross sq.ft. of leasable area
<hr/>	
Specialty retail	40.67
Discount store	71.16
Shopping center	
10,000 sq.ft. gross leasable area	166.35
50,000 sq.ft. gross leasable area	94.71

Land Use Type*

Average Weekday Trip Generation Rates

Industrial	Trips per Indicated Measure:	
	Employee	1,000 gross sq.ft. of building area
Light industrial	3.02	6.97
Industrial park	3.41	6.97
Manufacturing	2.09	3.85
Warehousing	3.89	4.88
Mini-Warehouse	56.28	2.61

Lodging	Trips per Indicated Measure:	
	Employee	Room
Hotel	14.34	8.70
Motel	12.81	10.19

Institutional	Trips per Indicated Measure:	
	Employee	Student
Elementary school	13.10	1.03
High school	16.79	1.39
Junior/community college	10.06	1.55
Library	49.50	45.50

(per 1,000 gross sq.ft.)

Notes:

*For definitions, see below.

**High-rise condominium (>2 stories) = 4.18

RESIDENTIAL STREET HIERARCHY: DEFINITION

<i>Residential Street Type</i>	<i>Function</i>	<i>Guideline Maximum ADT</i>
1) Local Access Street	<p>Lowest order of residential streets. Provides frontage for access to lots, and carries traffic having destination or origin on the street itself. Designed to carry the least amount of traffic at the lowest speed. All, or the maximum number of housing units, shall front on this class of street.</p> <p>Residential access streets should be designed so that no section conveys an ADT greater than 250. Each half of a loop street may be classified as a single residential access street, but the total traffic volume generated on the loop street should not exceed 500 ADT, nor should it exceed 250 ADT at any point of traffic concentration.</p>	250 (each loop) 500 (total)
2) Minor (neighborhood) Collector	<p>Middle order of residential street. Provides frontage for access to lots and carries traffic of adjoining residential access streets. Designed to carry somewhat higher traffic volumes with traffic limited to motorists having origin or destination within the immediate neighborhood. Is not intended to interconnect adjoining neighborhoods or subdivisions and should not carry regional through traffic.</p> <p>Subcollectors shall be designed so that no section conveys an ADT greater than 500. Each half of a loop subcollector may be classified as a single subcollector street, but the total traffic volume conveyed on the loop street should not exceed 1,000 ADT, nor should exceed 500 ADT at any point of traffic concentration.</p>	500 (each loop) 1,000 (total)
3) Major Collector	<p>Highest order of residential streets. Conducts and distributes traffic between lower-order residential streets and higher-order streets. Function is to promote safe, free traffic flow; therefore, parking and direct access to homes from this level of street should be discouraged.</p>	3,000 (total)
4) Minor Arterial	<p>A higher order, interregional road in the street hierarchy. Conveys traffic between centers.</p>	3,000 +

CHAPTER 7 – APPENDIX

Tree List for the City of Port Townsend- refer to Chapter 6

Unique Tree List

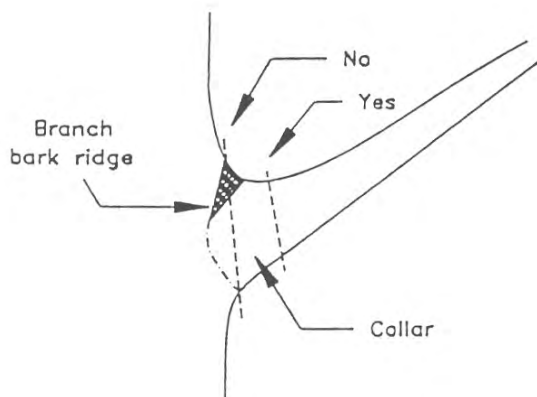
- | | |
|-------|---|
| PT-F1 | Pruning Deciduous Trees |
| PT-F2 | Pruning Drop-Crotch |
| PT-F3 | Street Tree Spacing and Location Requirements |
| PT-F4 | Tree and Shrub Detail |

UNIQUE TREE LIST

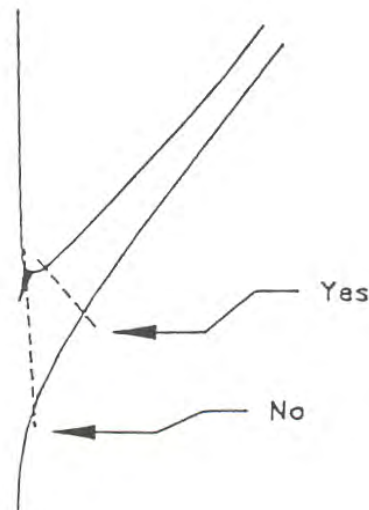
Madrona	<u>Arbutus menziesii</u>
Rhododendron	<u>Rhododendron macrophyllum</u>
Quaking Aspen	<u>Populus tremuloides</u>
Soapberry	<u>Shepherdia canadensis</u>
Red Currant	<u>Ribes sanguineum</u>
Collomia	<u>Collomia grandiflora</u>
Goldenrod	<u>Solidage canadensis</u>



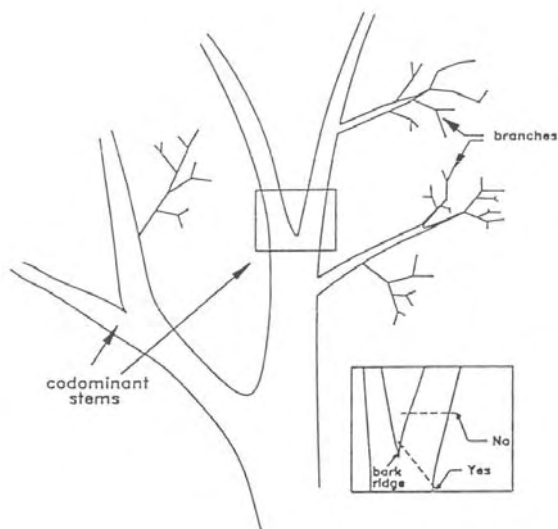
City of Port Townsend - Public Works Department Standard Detail



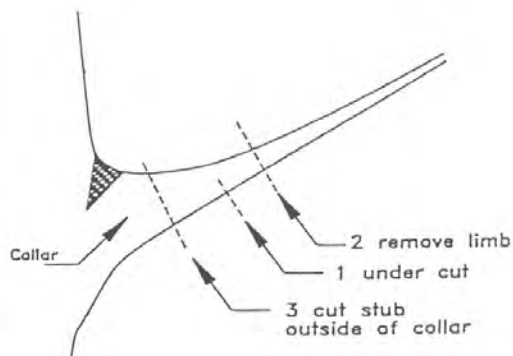
When removing a branch, always cut outside the branch bark ridge and collar. Do not make flush cut.



Branches that do not have a distinct collar should be cut at a right angle to the branch outside the branch bark ridge.



Trees may have co-dominant stems, as shown above on the left. If a co-dominant stem must be removed, cut at an angle outside of the bark ridge. Avoid leaving any stubs.



When removing heavy limbs, first make an undercut several inches outside of the collar. Then remove the limb by a second cut an inch or so outside of the first cut. Remove stub with a third cut.

Date: 7/18/95

City of Port Townsend
181 Quincy Street, Suite 301
Port Townsend, WA 98368

No.	Date	Revision	By	Apvd

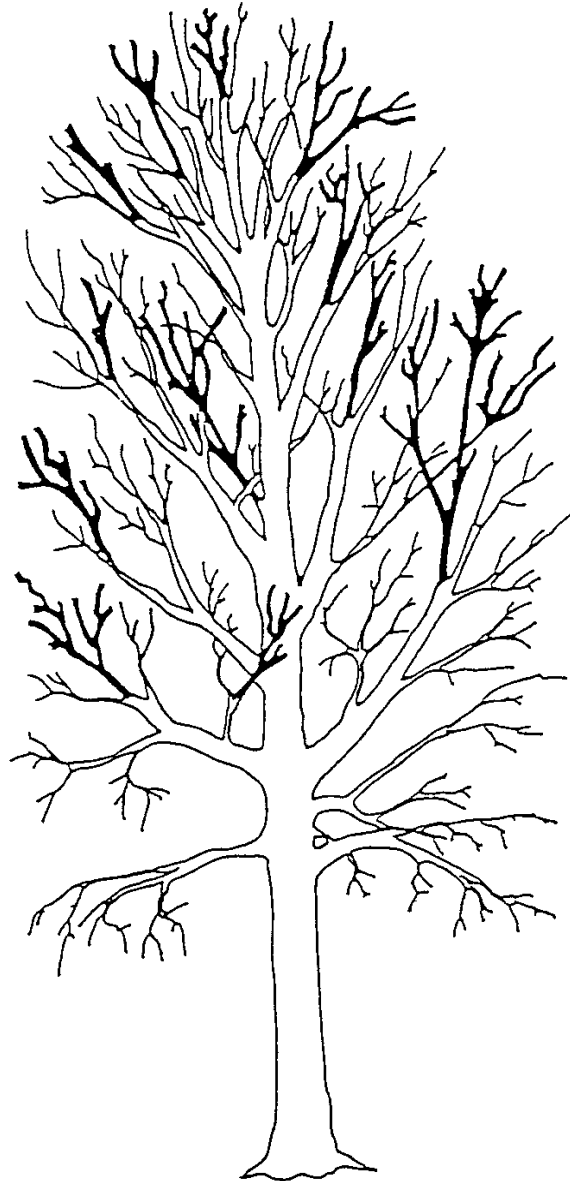
Pruning
Deciduous Trees

Detail: PT-F1



City of Port Townsend - Public Works Department

Standard Detail



This illustration shows proper drop-crotch pruning. In each case a leader at least 1/3 the diameter of the stem from which it grows is allowed to remain. This prevents or reduces latent bud growth and thus reduces unwanted waterspouts. After drop-crotch pruning the tree is thinned and somewhat reduced in size but does not appear to be heavily pruned or sheared.

Date: 7/18/95

City of Port Townsend
181 Quincy Street, Suite 301
Port Townsend, WA 98368
Phone: (360) 385-7212

No.	Date	Revision	By	Apvd

Pruning
Drop-Crotch

Detail:

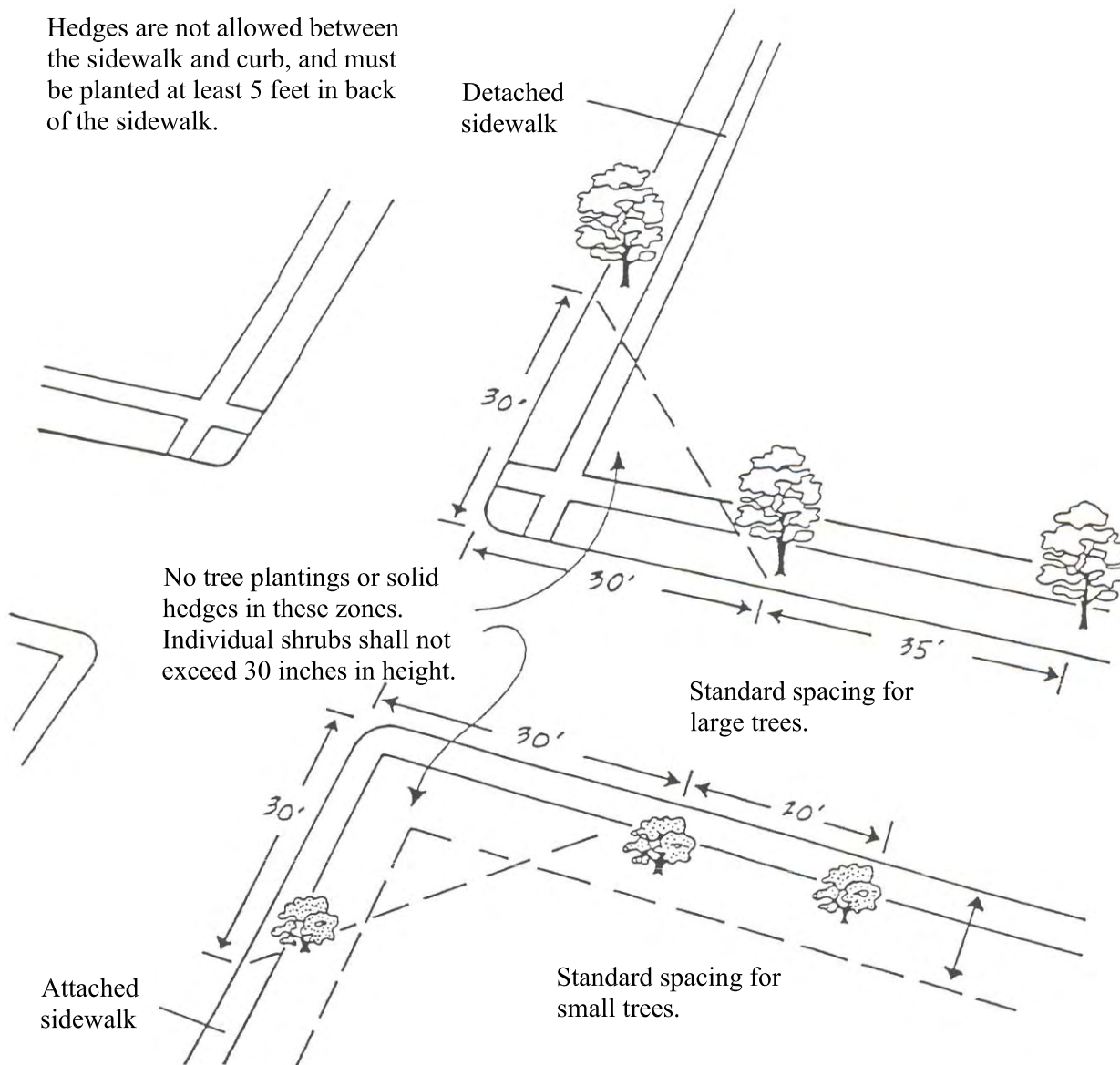
PT-F2



City of Port Townsend - Public Works Department

Standard Detail

Hedges are not allowed between the sidewalk and curb, and must be planted at least 5 feet in back of the sidewalk.



Almost all streets within the city have rights-of-way that extend back of the curb line. This area is public property and is generally used for utilities, walks and landscaping. The width of this right-of-way area varies considerably in different sections of town.

Date: 7/18/95

City of Port Townsend
181 Quincy Street, Suite 301
Port Townsend, WA 98368

No.	Date	Revision	By	Apvd

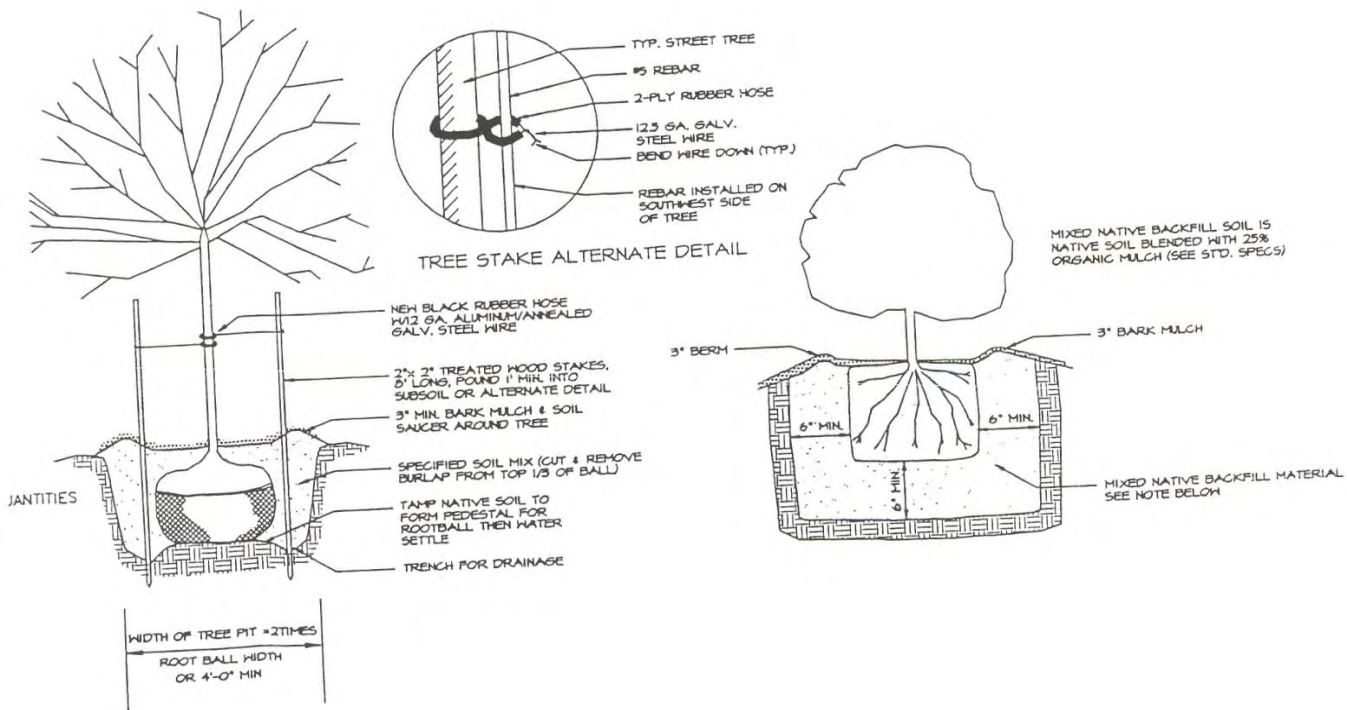
Street Tree Spacing
and Location Requirements

Detail: PT-F3



City of Port Townsend - Public Works Department

Standard Detail



Date: 7/18/95

City of Port Townsend
 181 Quincy Street, Suite 301
 Port Townsend, WA 98368

No.	Date	Revision	By	Apvd

Tree and
Shrub Detail

Detail: PT-F4

**Department of Public Works
Permit Applications, Forms and Information Materials**

1. Development Checklist
2. Technical Conference Application
3. Street Development - Minor Improvement Permit Application
4. Street Development & Utility Development Permit Application
5. Project Review Checklist
6. Latecomer Agreement: Water/Sewer Line
7. Street Development Reimbursement Agreement
8. Conveyance of Public Facilities
9. Map Request
10. As-Built Example - Water Service Connection
- Sewer Service Connection
11. Erosion & Sediment Control Practices - Minimum Requirements for Clearing, Grading, Filling and Drainage Facilities



PUBLIC WORKS DEPARTMENT DEVELOPMENT CHECKLIST

NAME OF DEVELOPMENT _____

DEVELOPER _____ PROJECT NO. _____

CONTACT PERSON _____ PHONE _____

ENGINEER _____ PHONE _____

CONTRACTOR _____ PHONE _____

- | | |
|--|---|
| <p>_____ 1. Initial discussion and Technical Conference, as needed.</p> <p>_____ 2. First submittal (draft plans)
a. Street Development and/or Utility Development Permit Application
b. Three (3) sets of plans, specs, and estimates</p> <p>_____ 3. SEPA and ESA complete, if applicable.</p> <p>_____ 4. Proportionate share determination, if applicable</p> <p>_____ 5. Plans reviewed for compliance by City and preliminary check prints returned to Developer.</p> <p>_____ 6. Second submittal (final plans)
a. Three (3) sets of final plans</p> <p>_____ 7. City submits plans to DOE and/or Department of Health for approval, where appropriate.</p> <p>_____ 8. Public Works approves the permit and plans for construction.</p> <p>_____ 9. Developer obtains all necessary County, State, and/or Federal permits and pays all fees.</p> <p>_____ 10. Developer pays permit and initial inspection.</p> <p>_____ 11. Developer's contractor provides proof of insurance and bonds, as required.</p> <p>_____ 12. Pre-Construction Conference arranged by Developer's contractor. City inspector to be in attendance.</p> <p>_____ 13. Developer's contractor notifies City inspector 48 hours in advance of starting construction.</p> <p>_____ 14. Underground utilities location to be requested a minimum of 2 days in advance of construction by Developer's contractor.</p> | <p>_____ 15. Temporary Erosion Control in place.</p> <p>_____ 16. Construction starts.</p> <p>_____ 17. Ongoing inspection and testing (compaction, water quality, pressure testing, as needed).</p> <p>_____ 18. Construction completed.</p> <p>_____ 19. Final inspection by City.</p> <p>_____ 20. Punch list complete. City approval of installation.</p> <p>_____ 21. Paperwork completed
a. As-built and testing records provided to the City.
b. Developer furnishes City an executed Conveyance of Public Facilities Document
c. Easements received and recorded.
d. Public Facilities Maintenance Bond received from Developer, if applicable.
e. Latecomer Agreement finalized, if applicable.</p> <p>_____ 22. Developer receives letter of acceptance of sewer, water, street, and/or storm drain facilities for maintenance and operation by City.</p> <p>_____ 23. System(s) approved for hookups and public use by City.</p> <p>_____ 24. Final warranty inspection made by City prior to end of twelve (12) month warranty period.</p> <p>_____ 25. Release of bond by City, if applicable.</p> |
|--|---|



PUBLIC WORKS DEPARTMENT TECHNICAL CONFERENCE APPLICATION

The Public Works **Technical Conference** is designed to provide the prospective home builder or developer with a **preliminary** estimate of potential development requirements for a specific site. The completed application will be evaluated by the Public Works Department in concert with other departments of the City, as appropriate. A fee of \$180 is charged. Fees paid may be applied toward a street and utility development permit for projects in Tier 1 if a complete permit application is received within one year of date of receipt above, unless changes to project plans or surrounding development require further review.

If you only wish to receive the location of the utilities along the property frontage, call the Utility locate service at 1-800-424-5555. Maps of water and sewer utility locations may be purchased from the Public Works Department or reviewed at the Building and Community Development office.

Owner's Name: _____ Phone: _____

Mailing Address: _____

Site Legal Description: Lot(s) _____, Block _____, _____ Addition

Zoning District _____ Tier No. _____

Proposed Project: _____ Single-Family residence(s) with _____ outbuildings

_____ Multi-Family dwelling with _____ outbuildings

_____ Mixed use, commercial or manufacturing

_____ Subdivision or PUD

Project Description: _____

The principle means of automobile access to the site is proposed to be from _____ Street.

The **area** of the entire site is _____ square feet, of which _____ square feet is to be covered with buildings, decks, etc. (Write "**NK**" if information is not known at this early stage of project planning.)

Is any part of the subject property within 200 feet of a fresh or salt water shoreline?

Yes No

Is any part of the subject property within (1) a 100-year flood plain? (2) an Environmentally Sensitive Area (ESA)?

(1) Yes No (2) Yes No

Is the property subject to any conditions placed on any prior action of the City; e.g., subdivision, short plat, variance, conditional use permit, street vacation or planned unit development? (Attach copies of any such restrictions or conditions, if available. This information can be obtained from a title company.)

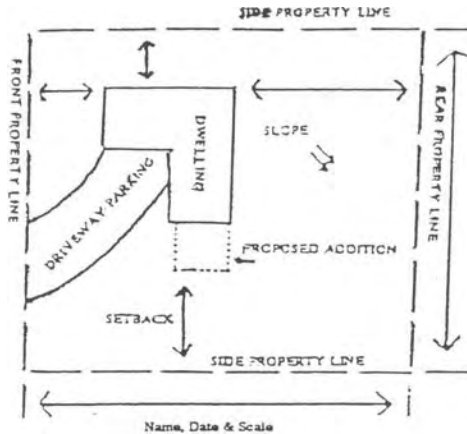
Yes No

Please submit two copies each of a **Vicinity Map** and a **Scaled Site Plan**.

Sample Vicinity Map



Sample Scaled Site Plan



Please include the following information on the Vicinity Map and Site Plan:

On both: north arrow, street names, street rights-of-way, and easements of record.

On the Scaled Site Plan:

- _____ Plan scale
- _____ Legal description
- _____ Property lines and dimensions, including all interior lot lines
- _____ Likely location of house and accessory buildings, if known. (Please include: **setback from property lines and outline (footprint) of each proposed building.**)
- _____ Location of any existing buildings on adjacent property within 10 ft. of subject property
- _____ Off-street parking (2 spaces/single-family dwelling; 1.5 spaces/multi-family unity - each 19' x 9')
- _____ Location of existing streets and proposed street access
- _____ Slope of the land (indicate if slope is 15% or greater)
- _____ If waterfront property, show bank height, setback between proposed buildings and top of bank, all creeks, rivers, etc.
- _____ Existing and proposed utilities: service lines and pipe size (if known)
- _____ Building lines and exterior dimensions (if known)
- _____ Building and exterior dimensions (if known)

I hereby certify that all information given above and on accompanying plans is complete and accurate to the best of my knowledge. I understand that the requested comments/requirements by the City of Port Townsend regarding the above referenced project are an estimate only and may be subject to change. Additional information may become available when actual permit applications are made, or there may be discretionary approvals required under which specific mitigating conditions may be required.

The undersigned hereby saves and holds the City of Port Townsend harmless from any and all causes of action, judgements, claims, or demands, or from any liability of any nature arising from any noncompliance with any restrictive covenants, plat restrictions, deed restrictions, or other restrictions which may have been established by parties other than the City of Port Townsend.

Applicant or authorized representative

Date

For department use only.	Technical Conference Fee of \$	Receipt No.
Paid on (date)	Received for Treasurer by:	

Information Requirements for Public Works Technical Conferences

The purpose of the Public Works Technical Conference is to acquaint the applicant with the requirements of the Port Townsend Municipal Code and the Engineering Design Standards and to allow an exchange of information and ideas based upon the applicant's preliminary sketch of the proposal. Issues commonly addressed at the conference include utility and access requirements, the permitting and construction process, timing, fees, and submittal requirements. Prior to the conference, Public Works will perform an internal review of project requirements.

To schedule your Public Works Technical Conference, please submit the application form together with the required information listed below. A meeting will be scheduled within 15 calendar days of the submittal of all required information.

REQUIRED INFORMATION: You will need to submit the following information/materials prior to the technical conference:

1. The completed application form.
2. Two copies of Conceptual Site Plan Map, 8-1/2" x 11" or 11" x 17" size. Include all existing and proposed structures, lot lines (interior and exterior), general topography of site, proposed vehicle access to the site, provision of utilities, and all platted and opened roads serving the site. **FINAL DRAWINGS ARE DISCOURAGED FOR THIS TECHNICAL CONFERENCE.**
3. Identification of all land uses on adjacent properties.
4. Other property owned by the applicant within 200 feet of the proposal.
5. Anything else that may be useful in evaluating the proposal (existing photos, geology reports, economic analysis, etc.) These items are not mandatory, but if you have them, please submit them with your application.
6. The application fee.

If you have any questions before submitting your application, please contact Development Review at 360-379-3208.



**CITY OF PORT TOWNSEND PUBLIC WORKS DEPARTMENT
STREET DEVELOPMENT - MINOR IMPROVEMENT PERMIT**

CONTACT NAME _____ DATE _____

ADDRESS _____ PHONE _____

LOCATION OF IMPROVEMENT

Lot(s) _____ Block _____ Addition _____

Street No. _____ Name _____

IMPROVEMENT TYPE:

- Driveway Parking (1-2 spaces) Sidewalk Culvert Building drain
 Other _____

DESCRIPTION OF PROPOSED IMPROVEMENT (Attach drawings):

Signature of Applicant: _____ Date: _____

PUBLIC WORKS REQUIREMENTS:

APPROVAL OF PERMIT: _____ Date: _____

FINAL INSPECTION BY: _____ Date: _____

ACCEPTANCE OF INSTALLATION: _____ Date: _____

See attached list of selected engineering design standards; others may also apply. Call for an INSPECTION prior to any backfilling, concrete, or paving work. For questions or to schedule inspection(s), call Development Review at (360-379-3208).

For Department Use Only:	Checklist No. _____
Application Fee of _____	Paid on _____
Receipt No. _____	Initials _____
BARS NO. 110.345.810.00	Permit No. _____



**PUBLIC WORKS DEPARTMENT
STREET DEVELOPMENT and
UTILITY DEVELOPMENT PERMIT APPLICATION**

1. PROPERTY OWNER or AGENT _____
CONTACT NAME _____ PROJECT NAME (if applicable) _____
ADDRESS _____ PHONE _____

2. PROPOSED CONTRACTOR(S) _____

City Business License #(s) _____ State Contractor's License #(s) _____
Underground Utilities License #(s) _____
ADDRESS _____ PHONE _____

3. LEGAL DESCRIPTION OF PROPERTY TO BE SERVED BY STREETS and/or UTILITIES
Lot(s) _____ Block _____ Addition _____
Street No. _____ Name _____
Other _____

4. PROPOSED IMPROVEMENTS _____

Tier 1, 2, or 3 _____

5. REASON FOR PROPOSED STREET DEVELOPMENT OR UTILITY INSTALLATION (Check all that apply.)

STREET	SEWER	WATER	STORMWATER	MISCELLANEOUS
<input type="checkbox"/> New street(s)	<input type="checkbox"/> Sewer main	<input type="checkbox"/> Water main	<input type="checkbox"/> Stormwater main	<input type="checkbox"/> Paving repairs
<input type="checkbox"/> Curb & gutter	<input type="checkbox"/> Srvc Connection	<input type="checkbox"/> Srvc Connection	<input type="checkbox"/> Catchbasin	<input type="checkbox"/> Utility installation
<input type="checkbox"/> Repair exst. street	<input type="checkbox"/> Maintenance	<input type="checkbox"/> Fire hydrant	<input type="checkbox"/> Roadway ditch	<input type="checkbox"/> Splice pit
<input type="checkbox"/> Other _____	hole	<input type="checkbox"/> Biofiltration swale	<input type="checkbox"/> Other _____	<input type="checkbox"/> Other _____

6. DATE WORK IS TO COMMENCE _____ DATE WORK IS TO BE COMPLETED _____

7A. DOES THE PROJECT SERVE EXISTING CUSTOMERS? Yes No

7B. WILL THIS PROPOSAL SERVE VACANT PROPERTIES OTHER THAN THE PROJECT SITE? _____
____ (If yes, attach list of sites which could be served.)

8. IS A LATECOMER AGREEMENT PROPOSED? Yes No If yes, attach proposed benefit area.

9. ENVIRONMENTAL QUESTIONS

Is the Environmentally Sensitive Areas (ESA) determination complete? _____

Is SEPA determination complete? _____

Is there standing water within 200 ft of the project site during the rainy season? _____

Will any significant vegetation be removed? _____ If yes, describe and show on plans.

10. OTHER PERMITS

List other permits applied for: _____

11. PLANS AND SPECIFICATIONS

☛ Scaled plans of the proposed improvements must be included with this application. Engineered plans may be required. The plan shall indicate how the engineering design standards are met. The plan shall include the street(s) to be improved beginning with the nearest existing opened street. In the case of utility installation, the plan shall include the street(s) in which the utilities will be installed, from the point of extension to termination, including maintenance holes, hydrants, etc., and how the service connections will be made. VEGETATION TO BE REMOVED, AND TYPES, MUST BE IDENTIFIED ON THE PLAN AND ATTACHED TO THIS APPLICATION.

I request that the engineering design be performed by the City of Port Townsend. My project is in Tier 1 and involves extensions of water, sewer or, streets of less than 1 block (260 feet).

12. BOND/ESCROW (if applicable): Describe bond arrangements (attach bond) or escrow instructions.

13. OTHER:

Signature of Applicant: _____ Date: _____

Received By _____ Date: _____
Public Works Department

For Department Use Only:	Checklist No. _____
Application Fee of _____	Paid on _____
Receipt No. _____	Initials _____
BARS NO. 110.345.810.00	Permit No. _____

<i>Further BCD Review is required for:</i> SEPA <input type="checkbox"/> yes <input type="checkbox"/> no		ESA <input type="checkbox"/> yes <input type="checkbox"/> no	
Other _____		<input type="checkbox"/> yes <input type="checkbox"/> no	
			Date _____
<i>Director, Building & Community Development</i>			

PERMIT CONDITIONS

- A. Owner and/or Owner's Agent understands that the improvements outlined in this permit must be completed and approved before final building inspection unless project phasing is approved through bond, improvement method report, or other approved means.
- B. The undersigned Owner and/or Owner's Agent hereby agree to the following:
1. That all regulations and requirements set forth by Title 12 and Title 13 of the Port Townsend Municipal Code and current amendments thereto, of the City of Port Townsend, be complied with fully and completely. The issuance of this permit and acceptance by the Owner, or agent, will be construed as prima facie evidence that the Owner, or agent, has read same and agrees to its terms and stipulations in their entirety.
 2. That the work under this permit shall be constructed in accordance with the Engineering Design Standards of the City of Port Townsend, and further, that access to the property by authorized representatives of the City of Port Townsend shall be permitted at any reasonable time for the purpose of inspection for compliance with all City regulations.
 3. That 48 hours notice will be given to all utility companies involved where work is to take place. Call 1-800-424-5555 TWO DAYS BEFORE COMMENCING WORK.
 4. That all significant vegetation must be preserved in the right-of-way unless express permission for removal is granted by the Public Works Director.
 5. The Owner and/or Owner's Agent agree that any disturbance or damage to the facilities on the existing street frontage shall be repaired to its original or better conditions. Street drainage shall be restored.
 6. The Owner and/or Owner's Agent hereby agree to safeguard the work done under this permit in such a manner as to prevent injury and/or damage to the public and the owner's/agent's employees. Such precautions shall include the employment of all necessary ditch safeguards such as lanterns, barricades and safe access or egress through the working area. The owner/agent is responsible for following all Labor & Industries standards for safety.
 7. The Owner and/or Owner's Agent agree to obtain and maintain, at no cost or liability to the City, any other permits which may be required for construction work to be accomplished under this permit.
- C. The Owner and Owner's Agent hereby agree to accept full responsibility for, and to indemnify and hold harmless the City of Port Townsend, its officers, agents, and employees, from and against any liability, claims, damages, and/or costs including attorneys fees, for personal injury, death or property damage, which may arise directly or indirectly out of prosecution of the work under this permit.

- D. The Owner and/or Owner's Agent agree to take the utmost care in protecting the environment, and preventing stormwater quality problems during construction as required by the City of Port Townsend Engineering Design Standards and the Department of Ecology (DOE) Stormwater Management Manual. All disturbed areas shall be revegetated.
- E. The Owner and/or Owner's Agent shall submit to the Public Works Department, prior to final acceptance of public improvements (1) final inspection by the Public Works Department, (2) final as-builts of the improvements, and (3) a bill of sale or conveyance deed.
- F. Expiration
 - 1. All street development permits not tied to a building permit shall expire unless the work is completed within 12 months after issuance of the permit unless earlier revoked; *provided however*, that a written request for an extension may be made *prior to* expiration upon a showing to the public works director that justifiable delays or unanticipated events beyond the control of the applicant have or will preclude timely commencement or completion of the work. Any extension shall include a condition that the work will be completed within a reasonable time, not to exceed one year, as specifically set forth in the grant of the extension. Only one extension may be granted under this section.
 - 2. All street development permits tied to a building permit shall remain valid so long as the building permit remains active with the Building and Community Development Department (BCD), as shown in the BCD files. In the event the building permit becomes inactive as further set forth in the Uniform Building Code and Title 16 PTMC, the street development permit shall automatically expire.
- G. This permit may not be assigned to another person.
- H. A preconstruction conference is required prior to the start of construction; contact the Development Review Engineer to schedule this conference (360/385-3000).

PERMIT APPROVAL

Owner's Signature _____ Date _____
 (or Authorized Agent)

Approved by _____ Date _____
 City of Port Townsend

Escrow Fee Paid _____ Date _____

Received By _____
 City of Port Townsend

Bond Received _____ Date _____

Verified By _____
 City of Port Townsend



CITY OF PORT TOWNSEND - PUBLIC WORKS DEPARTMENT PROJECT REVIEW CHECKLIST

Permit No.	Applicant
Project Type	Mailing Address
Date received from PW	Phone
Public Works Department Review by: _____ Date: _____	

Project Location

Lot(s) _____ Block _____ Addition _____

Tier No. _____ Zoning District _____

Other Customers

Latecomer Agreement in effect? _____ Name: _____

Existing Customers to be served Water Sewer Streets

Streets

Development is on an existing street. Street name _____

Substandard street

No Protest required?

Improvements required?

Existing street is adequate;

Minor Activities Permit is required for driveways, drainage, etc.

New street required

Design Detail _____

Special features required _____

Access shall be from _____; see attached drawing.

New connecting streets required.

Applicant: _____

Sewer

- Existing sewer main in _____ Street Size _____
 - May be connected for service
 - An existing payback agreement may obligate applicant to reimburse the person who developed this main.* Name: _____
 - Submit Utility Development Permit Application.

- No sewer main exists adjacent to the site.
 - Applicant to construct _____ inch diameter sewer main from _____ to _____.
 - A payback agreement may be possible for partial reimbursement of your sewer main development costs.*
 - Design plans and specifications are required.
 - Existing customers may be served by the project.

- Grade from site to sewer main will not allow gravity flow; pumping system to be installed to standard specifications. _____

- Maintenance holes ("manholes") to be installed by applicant at termination and each intersection of main. Location: _____
- As the closest existing sewer main is further than 500 ft. from property and property is greater than one acre, septic system would be acceptable with valid septic permit from the Jefferson County Health Department.

FOR COMMERCIAL / MANUFACTURING ONLY

- Pretreatment needed?
- Grease trap required?
- Additional information needed: _____

Comments: _____

* Please contact the Public Works Department regarding payback agreements, 385-7212.

Applicant: _____

Water

- Estimated water pressure _____.
- Estimated water use _____.
- Required meter size _____.
- Existing water main in _____ Street may be connected for service. (See attached drawing for location of service.)
 - Booster pump suggested / required.
 - Pressure reducing valve suggested.
 - An existing payback agreement may obligate you to reimburse the person who developed this main.*
 - Submit water service application
- No water main exists adjacent to site.
 - Construct _____ inch diameter water main from _____ to _____.
 - A payback agreement may be possible for partial reimbursement of your water main development costs.*

Comments: _____

Fire Hydrants

- Existing fire hydrant is within 250 ft.- Location _____ Flow test _____ gpm
 - Adequate flow
 - Inadequate flow
- The nearest hydrant is further than 250 ft.
 - A hydrant shall be installed at _____.

Comments: _____

* Please contact the Public Works Department regarding payback agreements, 385-7212.

Project Review Checklist

Applicant: _____

Drainage

EXISTING DRAINAGE

- Is the site within a historical flooded area? _____ ESA? _____
- Is there open drainage across site? _____
- Total impervious surface area is _____ sq. ft.; _____ % of total area.
 - Drainage plan required
 - Drainage plan not required

- Install a _____ inch diameter culvert under driveway at drainage ditch.
- Submitted drainage plan dated _____ is approved. incomplete (see comments).

Comments: _____

Project Review Checklist

Applicant: _____

General Project Requirements

Engineered plans required? Yes No

Other

Project Review Checklist

Applicant: _____

Fees

Permit fee \$ _____ + _____ hours @ \$ _____/hour = \$ _____

Inspection Fee (Includes 2 hours of inspection)* \$ _____

Water Connection _____ (tap size) \$ _____

or Meter Drop in _____ (size)

System Development Charges
Water \$ _____

Sewer \$ _____

TOTAL \$ _____

Engineering - if designed by the City of Port Townsend

Water line extension @ \$200 \$ _____

Sewer line extension @ \$200 \$ _____

Street @ \$200 \$ _____

TOTAL \$ _____

* More than 2 hours inspection will be billed at \$35 /hour.

AFTER RECORDING RETURN TO:
Public Works Department
181 Quincy Street, Suite 301
Port Townsend, WA 98368

Abbreviated legal description: _____ (complete legal description is on page 2 of this document) Affects Assessor's Tax Parcel Nos.

Latecomer Agreement: [Water/Sewer] Line

This Agreement is made this ___ day of _____, 20___, by and between _____ [name and address of reimbursee], referred to as "Contractor" for convenience, and the **City of Port Townsend**, a Washington municipal corporation and statutory city of the second class, referred to as "City" for convenience.

As required by the City, Contractor has constructed or caused to be constructed a ___-inch [water/sewer] line and related facilities ("the utility line") connected to the City's [water/sewer] system in order to extend service to the area in which Contractor's real property is located.

The construction of the utility line by Contractor will provide a benefit to certain other real property not owned by Contractor in the area of the utility line that is adjacent to or likely to require a connection to the utility line in order to be developed.

Contractor and the City desire to enter into an Agreement, pursuant to RCW 35.91, as amended, and PTMC Chapter 13.28, to partially reimburse Contractor for the costs of constructing the utility line. PTMC Chapter 13.28 is incorporated herein by this reference.

Now, therefore, Contractor and the City agree as follows:

1. Utility Line Described. The utility line constructed by Contractor is approximately ___ feet in length beginning at its connection to the City's existing [water/sewer] system at _____ and then running in a _____ direction in the right-of-way for _____ Street to _____ Street within the [water/sewer] service area of the City of Port Townsend.

2. Reimbursement Obligation. Until the expiration of this Agreement, Contractor and the authorized assigns of Contractor shall be reimbursed by the owner of real property within the benefit reimbursement area described herein that is subsequently connected to or uses the utility line; a parcel that is not included in the benefit reimbursement area may not connect to the utility line.

3. Term Modification. This Agreement shall be in effect for 15 years from the date first set forth above, or until such time as Contractor has received all reimbursements to which Contractor is entitled by this Agreement, whichever shall first occur. If the City Public Works Director determines that all or any portion of the utility line is rendered useless by reason of redesign or reconstruction, then the City's obligation to collect reimbursements pursuant to this Agreement shall terminate to the extent of such determination.

4. Limitations. Extensions of the utility line are not subject to the reimbursement provisions of this Agreement. The reimbursement provisions of this Agreement do not apply to any real property along the utility line purchased from Contractor after construction of the utility line. If two or more adjoining parcels within the benefit reimbursement area are under the same ownership, and a connection or use of the utility line benefits improvements legally situated entirely within the boundaries of less than all such adjoining parcels, the reimbursement amount shall be calculated based on the parcel(s) within which the improvements are situated.

5. Benefit Reimbursement Area; Amounts. In accordance with PTMC 13.28.070, a benefit reimbursement area has been determined to include the following parcels of real property, each of which is subject to the indicated latecomer reimbursement amount:

A. Lots ___ and ___ in Block ___ of the plat of _____ Addition, as per plat recorded in Volume ___ of Plats, page ___, records of Jefferson County, Washington.

B. Lots ___ through ___ in Block ___ of the plat of _____ Addition, as per plat recorded in Volume ___ of Plats, page ___, records of Jefferson County, Washington.

The reimbursement amount for the foregoing is to be calculated at the rate of \$ ___ per front foot.

The amounts set forth above are subject to an administrative surcharge, payable to the City by the connecting property owner pursuant to PTMC 13.28.130B. Unless otherwise specified in this Agreement,

the amount of surcharge is 10% of the reimbursement amount, or \$20.00, whichever is greater.

6. Certificate of Payment. Upon request, the City shall provide a certificate of payment to an owner of a parcel of real property for which the payment due to pursuant to this Agreement has been received by the City; the certificate may be recorded at the owner's expense.

7. Effectiveness. The provisions of this Agreement shall not be effective with respect to any owner of real property other than Contractor unless this Agreement has been recorded in the office of the Jefferson County Auditor prior to the time there is a connection to or use of the utility line by an owner of real property other than Contractor.

8. Acceptance; Contractor's Warranty. Upon completion of the utility line by Contractor, the city may approve the construction in writing and thereby accept the utility line as a facility of the City. To be accepted, the utility line must conform to all applicable specifications, standards, regulations, laws and ordinances. As a condition of acceptance, Contractor shall warrant that the utility line is fit for use as part of the City's water distribution system. For the period of 1 year measured from the date of acceptance, Contractor shall remain responsible for all work found to be defective. Subject to the foregoing, the City shall bear all maintenance and operation costs of the utility line from and after the date of acceptance. In consideration of the benefits to be derived from City utility service, and in further consideration of the terms and conditions of this Agreement, Contractor agrees to execute and deliver to the City such documents as may be necessary to transfer ownership of the utility line to the City upon acceptance.

9. Utility Charges. From and after the date the utility line is put into service, the City shall charge for its use such rates and charges as the City may by law be authorized to establish. Billing for utility charges attributable to the utility line may not be deemed or construed to constitute acceptance of the utility line by the City.

10. Indemnification; Hold Harmless. If any lien against the utility line is asserted after its acceptance by the City and the basis for such lien arose on or prior to the date of acceptance, Contractor shall indemnify and save harmless the City from any loss on account thereof. During construction of the utility line and for the duration of the 1 year warranty period described above, Contractor shall indemnify, defend and hold harmless the City from any and all liability, claims and costs, including but not limited to reasonable fees for legal services, arising directly or indirectly out of the construction or use of the utility line. If the city incurs any expenses in defense against any such lien or claim, or in taking any other action that is required of Contractor under this Agreement, the City shall have a lien in the full amount thereof against any funds then or thereafter collected by the City pursuant to this Agreement.

11. Enforcement. No person or legal entity may be granted a permit or otherwise be authorized to connect to the utility line during the term of this Agreement without first paying to the City, in addition to any and all other costs and charges made or assessed for such connection or for any other utility line or facility constructed in connection therewith, the amount set forth in this Agreement. If any connection is made to the utility line without such payment having first been made to the City, the City may remove or cause to be removed such unauthorized connection and all connected tile or pipe located in the public right-of-way, and dispose of such materials so removed without any liability whatsoever.

12. Payment Transmittal. Payments received by the City pursuant to this Agreement shall be transmitted to Contractor by Certified Mail at the address furnished by Contractor within 60 days of receipt, less the administrative surcharge authorized by PTMC 13.28.130B. It is the responsibility of the Contractor to advise the City of any change in Contractor's mailing address at all times during the term of this Agreement. Payments returned to the City unclaimed shall be held for 6 months and then deposited in the maintenance fund of the relevant utility, or as allowed by applicable law. If there is a valid assignment or transfer of Contractor's rights, whether voluntary or involuntary, the city shall thereafter pay any benefits accruing, after notice, to the successor of Contractor.

13. Binding Effect. This Agreement shall be binding upon Contractor, Contractor's heirs, personal representatives, successors in interest and assigns, and the successors in interest and assigns of the City.

14. Creation of Lien. The terms and conditions contained in this Agreement constitute covenants running with the land. The amount of any payment due pursuant to this Agreement until fully paid shall be a lien against the real property connected to the utility line and such lien shall have priority over all other liens and encumbrances except liens for taxes or special assessments imposed by governmental authority.

15. General Provisions. This Agreement shall be governed by the laws of the State of Washington. Venue for any legal action regarding this Agreement shall be Jefferson County. If any term or provision of this Agreement is in whole or in part held to be invalid or unenforceable by any Court of

competent jurisdiction, the remainder of this Agreement shall not be affected thereby, and shall continue in full force and effect. The failure of the City to take action to enforce any term or condition of this Agreement in any particular instance shall not be deemed or construed to be a waiver of the right of the City to take such action in the future.

In Witness Whereof, Contractor and the City have signed this Agreement as of the date first appearing above.

Contractor

City of Port Townsend

Mayor

Attest:

Approved as to form:

City Clerk

City Attorney

After Recording Return To:
Public Works Department
181 Quincy Street, Suite 301
Port Townsend WA 98368

Abbreviated legal descriptions:
Affects Assessor's Tax Parcel Nos.

Street Development Reimbursement Agreement

This Agreement is made this ___ day of _____, 20___, by and between _____ (name and address of reimburse), referred to as "Contractor" for convenience, and the **City of Port Townsend**, a Washington municipal corporation and statutory city of the second class, referred to as "City" for convenience.

As required by City ordinances, Contractor is obligated to construct certain street improvements, as defined in PTMC 12.26.020 ("the improvements"), in order to develop Contractor's real property.

The construction of the improvements by Contractor will provide a benefit to the owners of other real property in the vicinity of the improvements to the extent that such owners will not be required to install similar improvements as a prerequisite to development because the improvements were constructed pursuant to this Agreement.

Contractor and the City desire to enter into an Agreement, pursuant to RCW 35.72, as amended, and PTMC Chapter 12.26, to partially reimburse Contractor for the cost of constructing the improvements. PTMC Chapter 12.26 is incorporated herein by this reference.

Now, therefore, Contractor and City agree as follows:

1. Description of Improvements. The following is a summary of the improvements that shall be constructed by Contractor in accordance with this Agreement:

(A) The right of way for _____ Street, as dedicated in _____ Addition to the City of Port Townsend, as per plat recorded in Volume ___ of Plats, page ___, records of Jefferson County, Washington, and as dedicated in _____ Addition to the City of Port Townsend, as per plat recorded in Volume ___ of Plats, page ___, records of Jefferson County, Washington, is to be paved to a width of ___ feet;

(B) Vegetated swales for the control and conveyance of stormwater runoff are to be constructed along the sides of the improved roadway;

(C) A traffic signal is to be installed at the intersection of _____ Street and _____ Avenue; and

(D) Turning lanes within the right of way for _____ Avenue.

The foregoing summary does not validate or modify the detailed plans and drawings of the entire improvements prepared and stamped by a professional engineer, as submitted to the Public Works Director.

All of the foregoing improvements shall be constructed by the Contractor in accordance with such plans and drawings as may be approved by the Public Works Director, and all municipal ordinances, state and federal statutes, and all rules and regulations promulgated pursuant to such ordinances and statutes.

2. Reimbursement Obligation. Until the expiration of this Agreement, Contractor and the authorized assigns of Contractor shall be reimbursed by the owner of real property within the benefit reimbursement area described herein that is permitted by the City to be developed without being required as a condition of development to construct improvements similar to those described herein due to the fact that such improvements were constructed by Contractor in accordance with this Agreement.

3. Term; Modification. This Agreement shall be in effect for 15 years from the date first set forth above, or until such time as Contractor has received all reimbursements to which Contractor is entitled by this Agreement, whichever shall first occur. If the City Public Works Director determines that all or any portion of the improvements is rendered useless by reason of redesign or reconstruction, then the City's obligation to collect reimbursements pursuant to this Agreement shall terminate to the extent of such determination.

4. Limitations. An extension of any of the improvements is not subject to the reimbursement provisions of this Agreement. The reimbursement provisions of this Agreement do not apply to any property within the benefit reimbursement area described herein that is owned by Contractor at the time of construction of the improvements and is subsequently purchased from Contractor.

5. Cost Estimate; Adjustment. Contractor submitted an itemized estimate of the total projected cost of the improvements, as prepared and certified by either a licensed contractor or a licensed engineer. The reimbursement amount set forth herein is based on this estimate. As provided in PTMC 12.26.100, upon a showing of good cause by Contractor, this Agreement is subject to modification to include Contractor's cost overruns to a maximum of ten percent of the estimated total projected cost. If the actual cost of constructing the improvements is no less than ten percent lower than the estimated total projected cost, the City Public Works Director shall recalculate the benefit reimbursement amounts, reducing them accordingly.

6. Benefit Reimbursement Area; Amounts. In accordance with PTMC 12.26.070, a benefit reimbursement area has been determined to include the parcels of real property described in the attached Exhibit A, which is made a part of this Agreement by this reference. During the term of this Agreement, the owner of each parcel shall be required to pay the indicated reimbursement amount prior to the issuance of a building permit, unless otherwise provided herein. Such amounts are subject to an administrative surcharge, payable to the City by the connecting property owner pursuant to PTMC 12.26.130B; the amounts of such surcharge is 10% of the reimbursement amount, or \$20.00, whichever is greater.

7. Certificate of Payment. Upon request, the City shall provide a certificate of payment to an owner of a parcel of real property for which the payment due pursuant to this Agreement has been received by the City; the certificate may be recorded at the owner's expense.

8. Effectiveness. The provisions of this Agreement shall not be effective with respect to any owner of real property other than Contractor unless this Agreement has been recorded in the office of the Jefferson County Auditor.

9. Acceptance; Contractor's Warranty. Upon completion of the improvements by Contractor, the City may approve the construction in writing and thereby accept the improvements as facilities of the City. To be accepted, the improvements must conform

to all applicable specifications, standards, regulations, laws and ordinances, including, but not limited to, PTMC Chapter 12.04. As a condition of acceptance, Contractor shall warrant that the improvements are fit and suitable for use as facilities of the City. For the period of 1 year measured from the date of acceptance, Contractor shall remain responsible for all work found to be defective. If the Public Works Director has required bonding, Contractor shall maintain such bonding for such period. Subject to the foregoing, the City shall bear all maintenance and operation costs of the improvements after the date of acceptance in the manner provided in PTMC Chapter 12.04. In consideration of the benefits to be derived from City services, and in further consideration of the terms and conditions of this Agreement, Contractor agrees to execute and deliver to the City such documents as may be necessary to transfer ownership of the improvements to the City upon acceptance, together with all necessary easements or other property interests.

10. Indemnification; Hold Harmless. If any lien against the improvements is asserted after acceptance by the City and the basis for such lien arose on or prior to the date of acceptance, Contractor shall indemnify and save harmless the City from any loss on account thereof. During the construction of the improvements and for the duration of the 1 year warranty period described above, Contractor shall indemnify, defend and hold harmless the City from any and all liability, claims and costs, including but not limited to reasonable fees for legal services, arising directly or indirectly out of the construction or use of the improvements. If the City incurs any expense in defense against any such lien or claim, or in taking any other action that is required of Contractor under this Agreement, the City shall have alien in the full amount thereof against any funds then or thereafter collected by the City pursuant to this Agreement.

11. Enforcement. No person or legal entity owning property within the benefit reimbursement area described herein may be granted a building permit during the term of this Agreement without first paying to the City, in addition to any and all other costs and charges made or assessed for the use of any of the improvements constructed in connection herewith, the amount set forth in this Agreement. If the City Public Works Director determines that a condition exists in violation of PTMC Chapter 12.26, or any other code or standard required to be adhered to by this Agreement, such individual is authorized to take such corrective or other action to discontinue such condition pursuant to procedures set forth in PTMC Chapter 20.10.

12. Payment Transmittal. Payments received by the City pursuant to this Agreement shall be transmitted to Contractor by Certified Mail at the address furnished by Contractor within 60 days of receipt, less the administrative surcharge authorized by PTMC 12.26.130B. IT is the responsibility of Contractor to advise the City of any change in Contractor's mailing address at all times during the term of this Agreement, and the City has no obligation to locate Contractor or any assignee. Payments returned to the City unclaimed shall be held for 6 months and then be credited as revenue of the street fund or of the relevant utility, or as allowed by applicable law. If there is a valid assignment or transfer of Contractor's rights, whether voluntary or involuntary, the City shall thereafter pay any benefits accruing, after notice, to the successor of the Contractor.

13. Binding Effect. This Agreement shall be binding upon Contractor, Contractor's heirs, personal representatives, successors in interests and assigns, and the successors in interest and assigns of the City.

14. Creation of Lien. The terms and conditions contained in this Agreement constitute covenants running with the land. The amount of any payment due pursuant to this Agreement until fully paid shall be a lien against the real property benefited by the improvements, as described herein, and such lien shall have priority over all other liens and encumbrances except liens for taxes or special assessments imposed by governmental authority.

15. General Provisions. This Agreement shall be governed by the laws of the State of Washington. Venue for any legal action regarding this Agreement shall be Jefferson County. If any term or provision of this Agreement is in whole or in part held to be invalid or unenforceable by any Court of competent jurisdiction, the remainder of this Agreement shall not be affected thereby, and shall continue in full force and effect. The failure of the City to take action to enforce any term or condition of this Agreement in any particular instance shall not be deemed or construed to be a waiver of the right of the City to take such action in the future.

In Witness Whereof, Contractor and the City have signed this Agreement as of the date first appearing above.

Contractor

City of Port Townsend

Mayor

Attest:

Approved as to form:

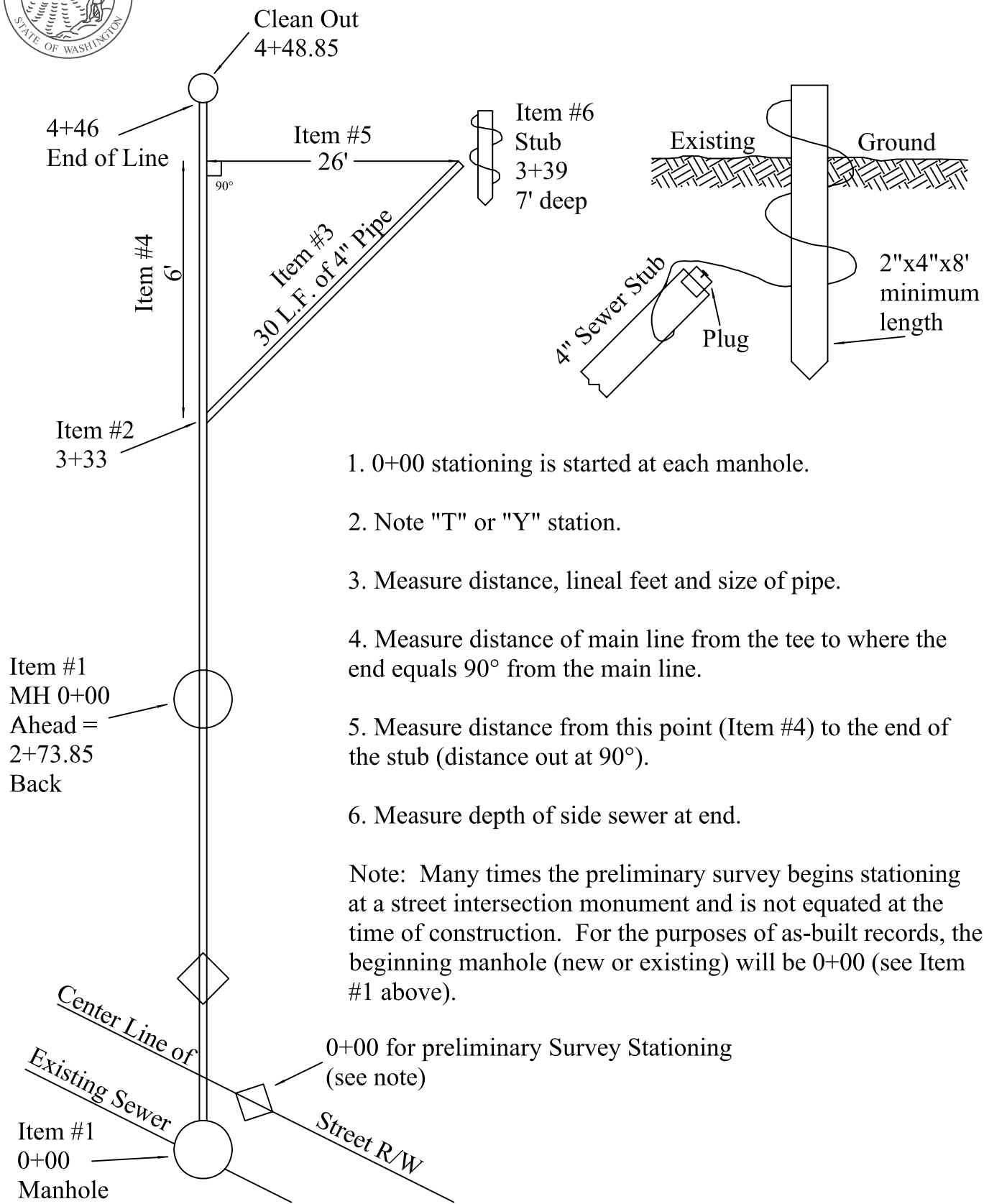
City Clerk

City Attorney



City of Port Townsend - Public Works Department

Standard Detail



1. 0+00 stationing is started at each manhole.
2. Note "T" or "Y" station.
3. Measure distance, lineal feet and size of pipe.
4. Measure distance of main line from the tee to where the end equals 90° from the main line.
5. Measure distance from this point (Item #4) to the end of the stub (distance out at 90°).
6. Measure depth of side sewer at end.

Note: Many times the preliminary survey begins stationing at a street intersection monument and is not equated at the time of construction. For the purposes of as-built records, the beginning manhole (new or existing) will be 0+00 (see Item #1 above).

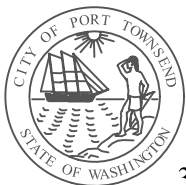
Date: 7/18/95

City of Port Townsend
 181 Quincy Street, Suite 301
 Port Townsend, WA 98368

No.	Date	Revision	By	Apvd

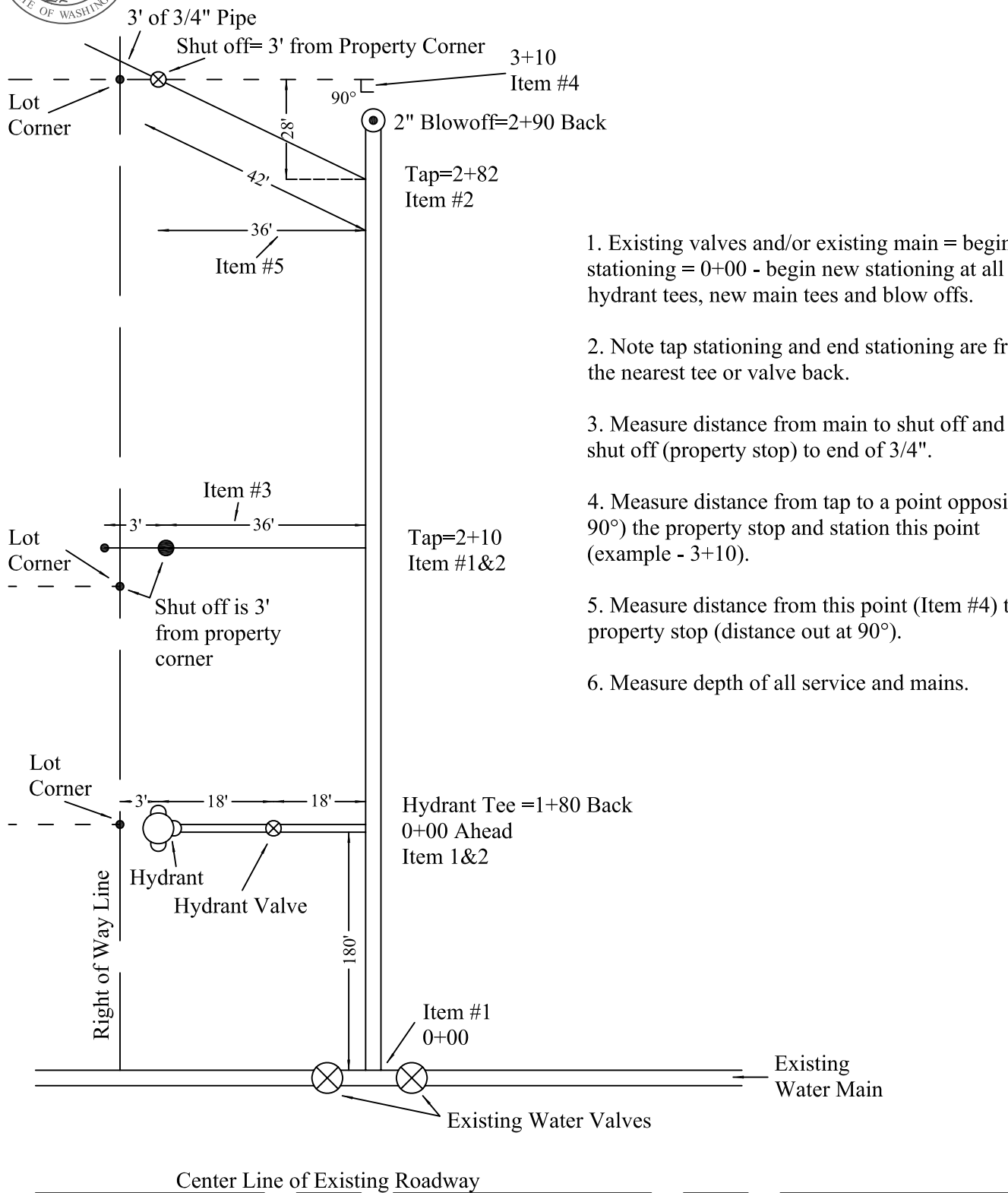
As Built
Sewer

Detail: PT-AB1



City of Port Townsend - Public Works Department

Standard Detail



1. Existing valves and/or existing main = beginning stationing = 0+00 - begin new stationing at all hydrant tees, new main tees and blow offs.
2. Note tap stationing and end stationing are from the nearest tee or valve back.
3. Measure distance from main to shut off and from shut off (property stop) to end of 3/4".
4. Measure distance from tap to a point opposite (at 90°) the property stop and station this point (example - 3+10).
5. Measure distance from this point (Item #4) to the property stop (distance out at 90°).
6. Measure depth of all service and mains.

Date: 7/18/95

City of Port Townsend
 181 Quincy Street, Suite 301
 Port Townsend, WA 98368

No.	Date	Revision	By	Apvd

As Built
Water

Detail: PT-AB2



EROSION & SEDIMENT CONTROL PRACTICES

MINIMUM REQUIREMENTS for CLEARING, GRADING, FILLING, AND DRAINAGE FACILITIES

Land alteration and land disturbing activities such as clearing, grading, cutting, filling, and construction can create erosion and sedimentation which adversely affect the quality of our local streams, wetlands, Port Townsend Bay, and the Strait of Juan de Fuca. The goal of the following MINIMUM erosion control practices is to see that no sediment leaves the construction site. These minimum practices are to be followed for all land disturbing activities whether a separate permit or erosion and sediment control plan is required or not.

(1) **CONSTRUCTION SITE ACCESS:** Provide a clean hard surface for vehicles entering the construction site to eliminate tracking of soil onto the street. This access should be limited to one route, wherever possible. Surface materials may include quarry spalls, crushed rock, river rock, or other non-soil or non-sand materials.

Maintenance: The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with 2-inch stone or other approved material as conditions demand, and repair and/or cleanout of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately.

(2) **GRADING:** The following are the minimum standards for grading activities:

1. Grading shall not contribute to or create landslides, accelerated soil creep, or settlement of soils.
2. Natural land and water features, vegetation, drainage and other natural features of the site shall be reasonably preserved.
3. Grading shall not create or contribute to flooding, erosion, increased turbidity, or siltation of a watercourse.
4. Groundcover and tree disturbance shall be minimized.
5. Grading operations shall be conducted so as to expose the smallest practical area to erosion for the least possible time.
6. Grading shall not divert existing watercourses or drainageways.

(3) **CUTS AND FILLS** The following are the minimum standards for cutting and filling:

1. Cut slopes shall be no steeper than is safe for the intended use. Cut slopes greater than five (5) feet in height shall be no steeper than two (2) horizontal to one (1) vertical, except where approved retaining walls are to be installed.
2. Filling should only occur where the ground surface has been prepared by removal of vegetation and other suitable materials or preparation of steps where natural slopes are steeper than five to one (5 to 1). Fill slopes should not be constructed on natural slopes greater than two to one (2 to 1).
3. Fill slopes shall be no steeper than is safe for the intended use. Fill slopes greater than five (5) feet in height shall be no steeper than two (2) horizontal to one (1) vertical, except where approved retaining wall are engineered and installed.
4. Steeper cut/fills may be permitted if supported by an approved soils/geological report.
5. Cut and fill slopes shall not encroach upon adjoining property without written approval of the adjacent owner.
6. Cut and fill slopes shall be provided with subsurface and surface drainage provisions to approved discharge locations as necessary to retain the slope.
7. The faces of slopes shall be prepared and maintained to control erosion. Check dams, riprap, plantings, terraces, diversion ditches, sedimentation ponds, straw bales, other methods shall be employed where necessary to control erosion and provide safety. The erosion control measures shall be initiated or installed as soon as possible and shall be maintained by the owner.
8. Fill materials used as a structural fill shall be compacted in accordance with the requirements applicable to the future use.

(4) **STABILIZATION OF DENUDED AREAS:** All exposed and unworked soils shall be stabilized using the best management practice for the site, which can involve sod, vegetation, plastic covering, mulching, etc.

(5) **CLEAN-UP:** Persons and/or firms engaged in clearing, grading, and filling, or drainage activities shall be responsible for the maintenance of work areas free of debris or other material that may cause damage to or siltation of existing or new facilities or have the potential of creating a safety hazard.

(6) **CONTROL OF SITE RUNOFF:** Adjacent properties shall be protected from sediment by installation of (a) a silt barrier downstream of the work using a silt fence and/or hay bales; (b) a sump or basin with a filtering system to accommodate the directed runoff prior to discharge to the existing drainage facilities.

STRAW BALES:

1. Secure bales with 2 stakes or rebar driven through each bale.
2. Ends of adjacent bales shall tightly abut one another.

Maintenance:

1. Straw bale barriers shall be inspected immediately after each runoff-producing rainfall and at least daily during prolonged rainfall.
2. Close attention shall be paid to the repair of damaged bales, end runs, and undercutting beneath bales.
3. Sediment deposits should be removed after each runoff-producing rainfall.

FILTER FENCE:

1. The material used in a filter fabric fence must have sufficient strength to withstand various stress conditions and it also must have the ability to allow passage of water while retaining soil particles. The ability to pass flow through must be balanced with the material's ability to trap sediments.
2. Monofilament and non-woven geotextiles shall have an A.O.S. of 70.
3. Slit film fabrics shall have an A.O.S. of 40 to 60.
4. Inspect immediately after each rainfall, and at least daily during prolonged rainfall. Repair as necessary.
5. Sediment must be removed when it reaches approximately one third the height of the fence, especially if heavy rains are expected.
6. Any sediment deposits remaining in place after the filter fence is no longer required shall be dressed to conform with the existing grade, prepared and seeded.

IF YOU HAVE ANY QUESTIONS REGARDING THE MAINTENANCE OF THE CONSTRUCTION SITE, PLEASE CONTACT DEVELOPMENT REVIEW AT 360-379-3208.