2016

PUBLIC WORKS STANDARDS

December 31, 2016

Public Works Department

City of Sammamish

801 228th Ave SE

Sammamish, WA 98075

Page intentionally left blank.

CONTENTS

TABLES

FIGURES

FOREWORD

The Public Works Standards contained in this document provide information to the development community to help with the processes, administration, engineering, and inspection that apply to private development within Sammamish. Land Use codes related to development can be found in Titles 21A and 21B of the Sammamish Municipal Code (SMC).

This manual has four divisions:

Division 1: Administration

Contains information related to permits.

Division 2: Right-of-Way

Presents standards and other information related to development within the right-of-way.

Division 3: Surface Water

Contains surface, storm water, as well as design standards.

Division 4: Construction and Inspection

Provides the basics regarding construction and inspection in the City right-of-way.

The appendices contain information that supplements the four referenced divisions.

Page intentionally left blank.

DIVISION 1 – ADMINISTRATION

Page intentionally left blank.

Chapter 1. Introduction

1.1. General Authority

Sammamish Municipal Code Chapter 14.01 authorizes the creation of Public Works Standards (PWS).

This manual addresses permitting and engineering requirements for site and right-of-way work related to development within the City of Sammamish. While this manual is directed toward the developer and the design/development engineer, it is intended to provide information to a wide group of users, including the development of Capital Projects by the City.

The manual sets forth minimum engineering criteria and specifications, and supplements the Sammamish Municipal Code. It does not replace the Code. These standards do not substitute for engineering design, nor are these standards intended to limit innovative design where equal performance in value, safety, and maintenance can be demonstrated. These Standards cannot provide for all situations. They are intended to assist but not to substitute for competent work by design professionals. It is expected that land surveyors, engineers, and architects will bring to each project the best of skills from their respective disciplines. These Standards are also not intended to limit unreasonably any innovative or creative effort that could result in better quality, better cost savings, or both. Any proposed departure from the Standards will be judged, however, on the likelihood that such deviation will produce a compensating or comparable result, in every way adequate for the City and its residents.

The Public Works Director may substitute more stringent design standards and specifications where special conditions warrant pursuant to SMC 21A. The City Manager or his or her designee shall have the authority to amend these standards without further City Council action, provided that any such amendments shall be in writing and shall be limited in scope and effect to procedural or clarifying amendments intended to update these standards to address changes in technology or construction practices, and other non-substantive amendments. An example of such a permitted amendment would be to replace a reference to the bottom lift of asphalt used in street construction from ATB (asphalt treated base) to HMA (hot mix asphalt).

The City's website provides access to the PWS, the Sammamish Municipal Code (SMC), informational handouts, permit applications, and other guidance documents. The Development Code is contained in SMC 21A and 21B.

City of Sammamish website: http://www.sammamish.us/

Public Works Standards: http://www.sammamish.us/government/departments/public-works/

Sammamish Municipal Code: http://www.codepublishing.com/WA/Sammamish/?SammamishNT.html

Development Handouts and Permit Applications: http://www.sammamish.us/permits-regulations/permit-center/building-permit-resources/

1.2. Vesting

A. A project is vested when the permit application is determined to be complete by the City. The vesting date is determined by state law. Refer to Submittal Checklists for guidance on complete applications.

1. The City periodically reviews and revises the PWS. In the case that a code or standard has been revised more recently than the update cycle for this manual, the most current code or standard supersedes the information provided in this manual.
2. A permit that has been canceled is no longer vested. If the Applicant wishes to continue with the project, a new application must be submitted and the project will be subject to the regulations in place at the time the new complete application is received by the City.
3. The edition of this manual that applies to a particular project is the edition in effect when the proposed project is vested. If a newer version of the PWS is published after a project is vested, either the newer version of the PWS in its entirety or the older version in its entirety may be used.

1.3. Copy of the PWS

The Public Works Standards are available online at http://www.sammamish.us/government/departments/public-works/

The PWS is also available digitally. Please contact the Public Works Department for a copy.

1.4. Contact Information

The contact information in Table 1.1 is provided for assistance during project planning and development and is not a comprehensive list of contacts. Also, refer to the directory available through the City of Sammamish website: http://www.sammamish.us/government/about/contact-us/

Table 1.1 Contact Information

Community Development 801 228th Ave SE Sammamish, WA 98075 http://www.sammamish.us/government/departments/community-development/ (425) 295-0500	Public Works Department 801 228th Ave SE Sammamish, WA 98075 http://www.sammamish.us/government/departments/public-works/ (425) 295-0500
Eastside Fire & Rescue 175 Newport Way NW Issaquah, WA 98027 http://eastsidefire-rescue.org/ (425) 313-3200	Sammamish Police Department 801 228th Ave SE Sammamish, WA 98075 http://www.sammamish.us/government/departments/police/ (425) 295-0770
Sammamish Plateau Water & Sewer District 1510 228th Ave SE Sammamish, WA 98075 http://spwater.org/ (425) 392-6256	Northeast Sammamish Sewer & Water District 3600 Sahalee Way NE Sammamish, WA 98074 http://www.nesswd.org/ (425) 868-1144
Electrical Permits and Boilers in Excess of 200k Btu/hr.: State of Washington Department of Labor and Industries http://www.lni.wa.gov/TradesLicensing/Electrical/default.asp (425) 996-1496 **NOTE: As of 7/1/17 All Electrical Inspections will be the responsibility of the City of Sammamish please contact the Permit County for information.**	Waste Management of Washington, Inc. PO Box 541008, PO Box 541065 Los Angeles, CA 90054 http://www.wmnorthwest.com/sammamish/index.html (800) 592-9995
Electric Purveyor: Puget Sound Energy 10885 NE 4th Street, P.O. Box 97034 Bellevue, WA 98009-9734 http://www.pse.com/Pages/default.aspx. (888) 225-5773	Natural Gas Purveyor: Puget Sound Energy 10885 NE 4th Street, P.O. Box 97034 Bellevue, WA 98009-9734 http://www.pse.com/Pages/default.aspx (888) 225-5773

Septic and Wells: Seattle/King County Public Health 14350 SE Eastgate Way Bellevue, WA 98007 http://directory.kingcounty.gov/ServiceDetail.asp?ServiceID=6768 (206) 296-4932	Republic Services of Bellevue 1600 127th Avenue NE Bellevue, WA 98005 http://site.republicservices.com/site/bellevue/en/pages/home.aspx (425) 452-4762

Page intentionally left blank.

Chapter 2. Permits

The information in this chapter summarizes the requirements in the City of Sammamish Municipal Code (SMC). If there are any conflicts, the SMC shall prevail. Prior to beginning a residential, commercial, or industrial development, or a project requiring construction of public infrastructure within the City, the proponent must prepare and submit a complete application, including permit application, plans, and specifications to the Department of Community Development (DCD) for review and approval.

2.1. Public Utilities

Public utilities owned by the city, are exempt from right-of-way permits.

2.2. Other Agencies

A. Utility and similar districts within the City are separate entities that are not owned or operated by the City (water and sewer district, fire district, and other utility providers). It is the Applicant's responsibility to obtain permits from other agencies. Prior to issuing City of Sammamish permit(s), verification that the Applicant has obtained other required permits may be required.

B. Sammamish Plateau Water, Northeast Sammamish Sewer and Water District, Eastside Fire and Rescue, and Puget Sound Energy are examples of entities that are separate from the City of Sammamish. In order to ensure coordination between these utilities, the proposed locations of water, sewer, gas, telephone, cable television, and power in the right-of-way must be approved by each provider as part of the permit review process.

C. The permit plans must show the right-of-way installation locations as approved by each provider. Each utility only needs to approve the proposed locations. Approval shall consist of signature/initials with phone number and date from a representative of each provider on a civil plan showing the proposed utility location.

D. Permits from other agencies (see Chapter 1 for contact information) may include, but are not limited to:

1. Electrical Permits: City of Sammamish.

2. Electrical Service Permit: Puget Sound Energy.
3. Propane Tanks: Eastside Fire and Rescue.
4. Sewer connection services and related information: Sammamish Plateau Water and Sewer District or Northeast Sammamish Sewer and Water District.
5. Water connection services and related information: Sammamish Plateau Water and Sewer District or Northeast Sammamish Sewer and Water District.
6. Natural gas connection services and related information: PSE
7. Washington Department of Fish and Wildlife
    i. Any work below the Ordinary High Water Mark (OHWM) of waters of the state including intermittent streams (work that uses, diverts, obstructs or changes natural flow or bed of State waters);
    ii. Any work that uses, diverts, obstructs, or changes the natural flow or bed of any of the salt or fresh waters of the state requires a Hydraulic Project Approval (HPA) permit. Download the application for an individual permit, called a Joint Aquatic Resource Permit Application (JARPA), from the Department of Fish and Wildlife website.
8. Department of Ecology
    i. An NPDES (National Pollutant Discharge Elimination System) Construction Permit Notice of Intent is required from the Washington State Department of Ecology for all soil disturbing activities (including clearing, grading, and/or excavation), and stormwater will be directly discharged to a receiving water (e.g., wetlands, creeks, unnamed creeks, rivers, marine waters, ditches, estuaries) or to storm drains that discharge to a receiving water. If all stormwater is retained on-site and cannot enter surface waters of the state under any condition, the project may not trigger a permit.
    ii. Water Quality Certification (401) ensures that limits placed in a permit on the quantity and concentration of pollutants discharged ar not exceeded.

9. U.S Army Corps of Engineers

    i. Activities that may affect endangered species shall be reviewed for permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The Army Corps of Engineers coordinates with the NOAA Fisheries and U.S. Department of Fish and Wildlife to ensure Endangered Species Act consistency.

10. Others

    i. Federal Emergency Management Agency (FEMA) administers programs related to flood protection.

Page intentionally left blank.

Chapter 3. Permit Process

This chapter describes how the Applicant and the City work together during the permit process. Each permit application submitted to the Department of Community Development (DCD) is assigned a project manager. The project manager or permit center can provide process information related to a specific permit. Contact DCD for more information.

3.1. Permit Issuance

Before a permit is issued, all requirements as stated by the Sammamish Municipal Code (SMC) and DCD for issuance must be met. These may include proof of required local, state, and federal permit approvals, liability insurance, financial guarantees, recorded covenants, easements, or dedications, and/or payment of any outstanding fees. When all conditions for issuance are met, and the permit is ready to issue, a representative from DCD will notify the Applicant that the permit is ready, and what fees are must be paid prior to issuance of the permit.

3.2. Pre-construction Meeting

Projects may require a pre-construction meeting. Depending on the project scope, more than one meeting may be required. Construction may begin only **after** the required pre-construction meeting(s) have been held. The Permittee is responsible for scheduling the pre-construction meeting(s) with the City. Directions for scheduling a pre-construction meeting(s) are found on the issued permit(s).

3.3. Permit Inspections

A. Refer to Chapter 20, Inspection, of the PWS for more information on inspections.

B. Inspections are performed by representatives of the City and shall be coordinated by the Permittee with the assigned inspector.

C. Inspections are usually performed Monday through Friday, from 8:00 a.m. to 4:00 p.m. Any requested inspections beyond the weekday work hours of the City must be requested at a minimum of 48 hours in advance.

D. Some projects may require special inspections performed by pre-approved third parties. Costs are the responsibility of the applicant.

3.4. Final Project Approval

Contact the project manager or DCD for specific information related to final project approval.

A. **Fees.** If, during construction, the number of estimated inspections is exceeded, or if revisions to approved plans have been submitted for review, additional fees may apply. All inspection, plan revision review, and other fees due to the City must be paid prior to final project approval.

B. **Permanent Stabilization.** All disturbed areas must have permanent stabilization in place and functioning before final project approval.

C. **Financial Guarantee.** Refer to the DCD for more information on Financial Guarantees.

D. **Declaration of Covenant.** Prior to the final project approval, executed covenants that have been recorded at the time of permitting must be verified to be in conformance with the constructed items.

E. **Record Drawings.** Record drawings (as-builts) must be provided for all public and private stormwater facilities, site grading, for right-of-way work, and for landscaping, recreation, required environmentally critical area mitigation or restoration. Refer to Appendix G, Record Drawing Criteria, of the PWS for more information.

F. **Inspections.** All inspections must be completed. Upon completion of all site or right-of-way work and associated conditions approved under a permit, the Permittee shall request a final inspection.

G. **Work Completion.** The permit process is complete upon final inspection approval by the City.

H. **Maintenance/ Defect Bonds**. Refer to SMC 27A for information on required maintenance and defect bonds.

3.5. Permit Timing and Expiration

Contact the project manager or DCD for specific information.

3.6. Right-of-Way Use Notification

A. When required, at the time of application for a right-of-way permit, the Applicant shall notify all public and private utility entities known to be using or proposing to use the same right-of-way of the proposed timing of such construction. Within seven days of receiving this notification, any such entity notified may request a delay of the proposed construction to coordinate other right-of-way construction with the Applicant.

B. **Notification is required** for any project that has the potential to disturb encroachments into the right-of-way. The permit applicant will notify and work with the abutting property owner(s) when there are encroachments that adversely affect installation of right-of-way improvements. For City Projects Public Works will be responsible for notification of the abutting property owners.

C. For closures and extended impacts to the public within the right-of-way, the applicant will be responsible for any additional notifications and advance warnings to the public as conditioned in the appropriate permit.

3.7. Franchises, Electric and Communication Facilities

In addition to a specific franchise agreement and the standards contained herein, requirements for the construction in and use of the right-of-way by utility providers can be found in SMC 14.

Page intentionally left blank.

Chapter 4. Permit Submittals

Depending on particular project elements, the City may request submittals in addition to those described herein. To be considered for continued processing and review, all applications must be deemed complete by the project manager. Not all projects are required to submit all of the information listed below. Additional information is available on permits and development on the City's website: http://www.sammamish.us/permits-regulations/permit-center/

4.1. Design Professionals

The following is a summary of the requirements for design professionals:

A. Engineering:

1. State law requires that certain work, including engineering and land surveying, be performed by or under the direction of a professional licensed to practice in Washington State.

B. Right-of-Way:

1. Nearly all right-of-way design, except simple activities, such as installation of a driveway apron, require design by a Washington State licensed civil engineer.

C. Stormwater:

1. Design of treatment facilities, flow control facilities (detention ponds or infiltration basins), structural source control Best Management Practices (BMPs), or drainage conveyance systems shall be prepared by or under the direction of a licensed civil engineer. Construction Stormwater Pollution Prevention Plans (SWPPPs) that involve engineering calculations must also be prepared by or under the direction of a licensed civil engineer.

D. Surveying:

1. Activities requiring a licensed surveyor pursuant to RCW 18.43 include:

i. Determining and establishing legal boundary lines and survey reference points.

ii. Construction of treatment or flow control facilities (detention ponds or infiltration basins), structural source control BMPs, or drainage conveyance systems to set locations and elevations.

iii. Cuts on slopes steeper than 15 percent require a professional surveyor to set the slope stakes to confirm top and toe of cuts.

iv. Setting of survey marks such as property corners, right-of-way lines, subgrade elevations, and slope stakes.

v. Placement, protection, and replacement of survey monuments. When no profile has been established for the streets abutting and leading to a development site, the City may require a survey of the street area by a licensed surveyor for the purpose of establishing the proposed centerline profile and the transition between the right-of-way and on-site.

vi. Flood Zone Elevation Certificates require surveyed finished floor elevations to confirm that structures meet the elevations set by the City.

vii. Information must be provided for private infrastructure that connects to the City's infrastructure, public facilities, and right-of-way work, that verifies that all improvements lie within the right-of-way and public easements.

E. Landscaping:

1. For site landscaping and environmental critical area design, a licensed landscape architect is required. Refer to SMC Title 21A for additional requirements.

4.2. Plans and Specifications

The plans must clearly indicate the location, nature, and extent of the proposed work and must provide sufficient detail to show that all provisions of the standards and codes are met. Specifications must accompany the plans whenever the plans and general notes do not adequately describe the proposed work and materials.

4.3. Survey

A. Survey Reference.

1. Horizontal Datum: All survey work, including but not limited to mapping, platting, planning, design, right-of-way surveys, and construction surveys, shall be in the Washington State Plane Coordinate System, North Zone, using NAD 83(1991) datum.
2. The plans shall show the horizontal control used to establish ties to the datum, with type, size and location, date visited, and the State Plane coordinates for each monument used. The project shall reference at least two King County survey horizontal control monuments. The basis of bearing shall be shown.
3. Vertical Datum: All survey work, including but not limited to mapping, platting, planning, design, right-of-way surveys, and construction surveys, shall be in the North America Vertical Datum of 1998 (NAVD 1988). Vertical datum shall also include the reference/ conversion to NGVD 29.
4. The plans shall show the benchmarks used to establish ties to the datum, with reference number, description, location and elevation of each benchmark used, and any project site benchmarks. The project shall be tied to at least two King County survey control benchmarks.
5. Flood Elevation certificates shall provide a conversion from 1988 NAVD to 1929 NAVD.

B. All real properties, including parcels, rights-of-way, and easements must be located and staked on the ground, starting from a monument.

C. Legal descriptions of the horizontal and vertical locations require the location of a monument as their beginning point of reference.

D. Refer to Appendix B – Survey Criteria.

4.4. Surface Water Report

The City of Sammamish has adopted the King County Surface Water Design Manual (KCSWDM) in order to comply with its NPDES II Municipal Stormwater Permit. The current version will be as

adopted by Ordinance. In addition, the City has developed an addendum to this manual, "City of Sammamish Addendum to the Surface Water Design Manual Which is found at this website.

http://www.sammamish.us/government/departments/public-works/stormwater-management-program/

The City encourages the use of emerging technologies. Examples of emerging technologies include media filters, catch basin inserts, engineered erosion control products, and low impact development techniques. Proposed emerging technologies must be listed on either the Washington State Department of Ecology's Technology Assessment Protocol (TAPE) or Chemical Technology Assessment Protocol (CTAPE). The Public Works Director must approve the emerging technology for use.

4.5. Geotechnical Report

A. A geotechnical report helps determine if the proposal for a site is appropriate. In addition to geotechnical reports required to support building designs, a geotechnical report is required for: 1) work on sites containing or adjacent to slopes that are 15 percent or steeper and 2) for some storm drainage design. Refer to SMC Chapter 21A.50 and 21A.15 for critical area information.

B. Refer to Appendix D – Geotechnical Report Guidelines of the PWS for the approved report format.

C. For site development on a site with no steep slopes, erosion hazards, or critical areas, a report previously prepared for that site may be accepted if:

1. The report is less than five years old and no significant changes have occurred.
2. The geotechnical engineer/engineering geologist who signed the report provides a letter stating the report is still applicable to the site and to the currently proposed project.

4.6. Traffic Impact Analysis (TIA)

Refer to Chapter 8, Traffic Impact Analysis, and Appendix E, Traffic Impact Analysis Report Guidelines, of the PWS for guidance in preparing a required TIA.

4.7. Traffic Control Plan

Prior to beginning any activity which might affect City right-of-way, the Applicant shall provide the City, for review and approval as part of any permit, a traffic control plan that meets either Manual of Uniform Traffic Control Devices (MUTCD) standards or WSDOT Standard Plans.

The traffic control plan must accurately reflect existing right-of-way conditions including accesses, channelization, sidewalks, bike/pedestrian paths, bus stops, hydrants, trees, poles, pavement edge, etc. The traffic control plan must allow for continued emergency services access through the work zone. The plan shall contain adequate connections and clear signage for pedestrian and business disruption within and through the work zone.

4.8. Declaration of Covenant

The City requires a Declaration of Covenant for all permanent surface water BMPs on all projects, both private and public. The City will supply the Covenant paperwork for completion with the exception of any exhibits, which shall be prepared by the Applicant and approved by the City. The Applicant will do final signature and recording with the King County Recorder's Office. After recording, the Applicant shall return a copy to the City.

4.9. Easements

Easements must be provided when facilities on private property will be used by more than one lot or will benefit the public.

A. **Utilities.** Each utility (water, sewer, power, drainage, etc.) determines the minimum width for an easement. See Chapter 18, Surface Water Standards, of the PWS for more information on drainage easements.

B. **Non-motorized.** Non-motorized easements facilitate public trail circulation between neighborhoods, schools, shopping centers, and other activity centers. A non-motorized easement shall be wide enough to include the trail plus at least two feet on each side.

C. **Temporary Construction Access.** Access easements are required when more than one lot shares a portion of land to provide access when construction activities cross onto neighboring properties or parcels, a temporary construction easement is needed. A temporary construction easement shall be wide enough to include all areas of construction activities.

4.10. Tracts

Tracts shall be used for facilities that serve a broader group of individuals, have some degree of access by the public, and typically require regular maintenance activities. Examples of facilities that may be located in tracts include private streets or drainage facilities serving more than one lot, recreational facilities, open spaces, etc. Tracts are not subject to minimum lot size standards for the zone, although they must be large enough to accommodate the facilities and activities located within them, including any setbacks. For additional information on types of tracts that may be created through the land division process, refer to SMC Title 19A.

A publicly maintained stormwater facility shall be located in the roadway right-of-way or in a tract dedicated to the City. At a minimum, the tract shall include the entire facility, site access area, and at least 10 feet of landscaping around the visible portion of the stormwater facility.

4.11. Dedication

A. Dedication shall occur at the time of recording for subdivision, or prior to permit issuance for construction projects.

B. The City may require right-of-way dedication to incorporate necessary transportation improvements. Refer to SMC Chapter 19A.08.100 for more information.

C. The Public Works Director may grant a deviation from the minimum right-of-way requirement where it is demonstrated that all conditions of the deviation process are met. Refer to Chapter 6, Section 6.2, Deviation from Engineering Standards, of the PWS.

D. Dedications may be required in the following situations:

1. Accommodation of motorized and non-motorized transportation, landscaping, utility, street lighting, traffic control devices, and buffer requirements;
2. The development project abuts an existing substandard public street and the additional right-of-way is necessary to incorporate future frontage improvements for public safety;
3. Right-of-way is needed for the extension of existing public street improvements necessary for public safety.
4. Right-of-way is needed in order to incorporate improvements that are reasonably necessary to mitigate the direct impacts of a development.

4.12. Dewatering Plan

Dewatering is defined as the removal and appropriate discharge and release of surface water and subsurface water. Temporary dewatering that occurs during construction must have a Temporary Dewatering Plan reviewed and approved by the City before dewatering begins.

4.13. Maintenance Plan

Improvements on private property, such as access, utilities, or surface water improvements, require the Permittee to prepare and submit an Operations and Maintenance Plan for City review before recording the plan with the King County Recorder's Office. The maintenance plan must spell out agreements regarding maintenance responsibility and costs.

4.14. Financial Guarantee

The City determines the performance, restoration, and maintenance financial guarantee amounts. The performance guarantee must be submitted before permit issuance. The maintenance guarantee must be provided before final approval. Refer to SMC Title 27A for more information. The maintenance/ defect period begins with the acceptance of the installation of the required improvements and approval of the as-built. Please contact the project manager or Department of Community Development (DCD) for more information.

4.15. Insurance

As a condition of the City permitting work within the public right-of-way, it is required that a certificate of liability insurance is provided indicating that the Permittee and/or contractor are covered by a Commercial General Liability insurance policy.

Additionally, when the City determines that the nature of any work on public or private property is such that it may create a hazard to human life, endanger adjoining property, street, street improvement or any other public property; the City may require the Permittee to provide a Certificate of Liability Insurance. In this case, the City shall determine the amount of insurance based on the nature of the risks involved.

The required liability insurance must be maintained for the duration of construction activities.

The City must be named as an additional insured under the Commercial General Liability insurance policy using ISO Additional Insured-State or Political Subdivisions-Permits CG 20 12 or a substitute that provides an equivalent endorsement.

Insurance requirements for work in the right of way are listed in SMC 14.30 Right of Way Use Permits.

Chapter 5. Permit Fees

The Department of Community Development (DCD) establishes and collects fees as set forth in the fee schedule adopted by the City Council.

Plan review and submittal fees are collected when the application is submitted. Additional fees, due and payable when the permit is issued, include but are not limited to independent review costs, additional inspection or review time, and transportation impact fees.

Page intentionally left blank.

DIVISION 2 – RIGHT-OF-WAY

Division 2 – Right-of-Way sets forth minimum engineering design criteria to support public safety and welfare within the right-of-way. Every effort has been made to ensure that these standards are in line with AASHTO, FHWA, ITE, and WSDOT standards.

The Public Works Director shall have the authority to administer the provisions of these technical standards, to determine applicability, to interpret unclear provisions, to determine the level of detail and methodologies for required analysis, and to promulgate procedures and rules for unique circumstances not anticipated within the standards and procedures contained within these Public Works Standards (PWS).

These standards do not substitute for engineering design, nor are these standards intended to limit innovative design where equal performance in value, safety, and maintenance can be demonstrated. More stringent design standards or specifications may be required where special conditions warrant.

All facilities in the right-of-way, unless specifically excluded, shall be designed by or under the direct supervision of a professional engineer licensed in Washington State. All right-of-way drawings, designs, sections, details, standard plans, and supporting data submitted to the City of Sammamish for approval, unless specifically excluded, must be stamped, signed, and dated by the engineer of record.

Page intentionally left blank.

Chapter 6. Standards

Design detail, construction workmanship, and materials shall be in accordance with these technical standards and the latest edition of the companion documents listed herein. Design and construction shall meet the applicable standards and codes, and the recommendations in specific reports, such as the geotechnical report, the traffic impact analysis, and the surface water report.

The following publications provide the basis for design and construction requirements for public and private development within the City:

A. City of Sammamish Comprehensive Plan

B. City of Sammamish Storm and Surface Water Management Comprehensive Plan

C. City of Sammamish Municipal Code (SMC)

D. City of Sammamish Non-Motorized Plan

6.1. Companion Documents

When standards or other design criteria are not specifically addressed in the Public Works Standards (PWS), then the latest editions of the following shall govern the design.

A. **Transportation Design Standards:**

1. A Policy on Geometric Design of Highways and Streets, AASHTO
2. Guidelines for Geometric Design of Very Low-Volume Local Roads, AASHTO
3. Guidelines for Urban Arterial Program, WSDOT
4. *Urban Street Geometric Design Handbook*, Institute of Transportation Engineers (ITE)
5. Guide for Development of Bicycle Facilities, AASHTO
6. ADA Standards for Accessible Design
7. Design Manual, WSDOT

B. Public Right-of-Way Accessibility Guidelines (PROWAG), U.S. Access Board **Surface Water Design Standards:**

1. *The City of Sammamish has adopted the King County Surface Water Design Manual (KCSWDM) in order to comply with its NPDES II Municipal Stormwater Permit. The version will be as adopted by Ordinance. In addition, the City has developed an addendum to this manual, "City of Sammamish Surface Water Design Manual Addendum Attachment "B". Which is found at this website:*

   http://www.sammamish.us/government/departments/public-works/stormwater-management-program/

C. Traffic Control Design Standards: *Manual on Uniform Traffic Control Devices*, Federal Highway Administration; available online at: http://mutcd.fhwa.dot.gov/

D. State Highway Guidelines: *Local Agency Guidelines*, WSDOT

E. Construction Specifications: *Standard Specifications for Road, Bridge, and Municipal Construction* M 41-10, WSDOT; WSDOT Manuals are available online at: http://www.wsdot.wa.gov/Publications/Manuals/

F. The following shall be applicable when pertinent, when specifically cited in these standards or when required by state or federal funding authority:

1. *Highway Capacity Manual*, Transportation Research Board
2. Standard Rock Wall Construction Guidelines, Associated Rockery Contractors
3. National Electrical Installation Standards (NEIS)
4. American Society for Testing and Materials (ASTM)
5. Design criteria of federal agencies including the Federal Housing Administration, Department of Housing and Urban Development, and the Federal Highway Administration, Department of Transportation.

6.2. Deviation from Engineering Standards

Deviation from the engineering standards contained in the PWS is a mechanism to allow the City to grant an adjustment in the application of the standards where there are unique circumstances relating to the proposal.

Deviations are submitted through a permit application and reviewed to determine that all requirements are met. All deviations must be approved by the Public Works Director in writing prior to the start of construction.

A. Requirements: The Director of Public Works shall grant a deviation from the Public Works Standards only if the applicant demonstrates all of the following;

1. The granting of such deviation will not be materially detrimental to the public welfare or injurious or create adverse impacts to the property or other property(s) and improvements in the vicinity in which the subject property is located.
2. The authorization of such deviation will not adversely affect the implementation of the Comprehensive Plan adopted in accordance with State Law.
3. The deviation shall not conflict with the standards of the critical areas regulations SMC 21A.50.
4. The deviation from the Public Works Standards shall only be granted if the proposal meets the following:
    i. Conform to the intent and purpose of the Sammamish Municipal Code;
    ii. Produce a compensating or comparable result which is in the public interest;
    iii. Meets the objectives of safety, function and maintainability based upon sound engineering judgement.
5. A deviation from roadway design standards must meet the objectives for fire protection. Any deviation that does not meet the International Fire Code shall also require approval by the Fire Marshall.

The procedure for deviations from the Engineering Standards is included in Appendix H

Page intentionally left blank.

Chapter 7. General Requirements

This chapter provides general requirements related to transportation improvements.

7.1. Americans with Disabilities Act

All designs shall meet the current Americans with Disabilities Act (ADA) requirements and standards. In the event field conditions prohibit meeting ADA requirements, the design engineer must submit documentation that the design meets ADA to the maximum extent feasible.

7.2. Low Impact Development

The 2013 National Pollutant Discharge Elimination Phase II Permit applies to onsite improvements as well as improvements in the right-of-way. Stormwater requirements shall meet the Surface Water Design Manual for work constructed in the right-of-way; see Chapter 18 Surface Water Standards.

7.3. Maintenance

The City of Sammamish maintains and repairs all streets and sidewalks within the public right-of-way except for instances where maintenance is a condition of the Plat. The City is responsible for vegetation removal in the right-of-way during emergencies, in order to remove hazards and protect public safety.

In areas where the City is responsible for maintenance of landscaping, the City will utilize low maintenance vegetation and practices. It shall be the responsibility of the abutting landowners or HOAs to maintain decorative landscaping

7.4. Tree Removal/Pruning

Tree removal and pruning in the right-of-way is regulated by SMC 21A.37, Development Standards – Trees.

A. All tree removals and/or pruning within the right –of-way require a right-of-way permit.

7.5. Connectivity

In order to provide connectivity, street layouts shall continue streets, street layouts and pedestrian connections to existing adjoining development(s) or their anticipated locations where adjoining property is not yet developed.

A. Where existing adjoining properties have planned road and trail systems, connections shall be required.

B. Connection to existing roadway ends by new development shall be required when alignment between the roadways exist.

   1. Aesthetic and environmental character between existing and new development shall be maintained.

   2. Pedestrian facilities shall connect or have an approved transition where there is none in the existing development.

   3. Traffic mitigation shall be reviewed as part of the traffic study for the new development when connecting to an existing adjacent neighborhood. Vehicle and pedestrian safety shall be included in the review.

C. When a connecting road serves 100 residential units or more, a secondary access point shall be required.

7.6. Connectivity to Substandard Roadways

The following applies when a proposed improved roadway designed to current standards connects to an existing roadway that does not meet the current standard.

A. Transition lengths for connections to roadways shall be determined by the multiplication of the posted speed limit times the required change of width through the taper, (Length=WxS), or continuation of the required width to the nearest intersection, whichever is shorter. In the event the nearest intersection is with a higher volume roadway, such as an arterial, the transition shall extend to the intersection. (See Figure 7.1.)

B. When the connection is to an unimproved right-of-way consisting of a gravel or dirt surface, the new development shall construct a minimum of a half-street improvement within the

nonstandard section to the nearest intersection or where a transition to an existing asphalt or concrete road surface shall be achieved. A minimum of a 20' width of roadway asphalt or concrete road surface shall be required.

C. If there is a gap of pedestrian facilities beyond a roadway transition to the nearest intersection or existing pedestrian facilities within a 1 block limit, the developer shall be required to install an approved pedestrian facility (i.e. sidewalk, pathway, or paved shoulder) to eliminate this gap. These locations must be shown on an adopted sidewalk and pathway plan, or along a roadway classification of neighborhood collector in conjunction with safe routes to school.

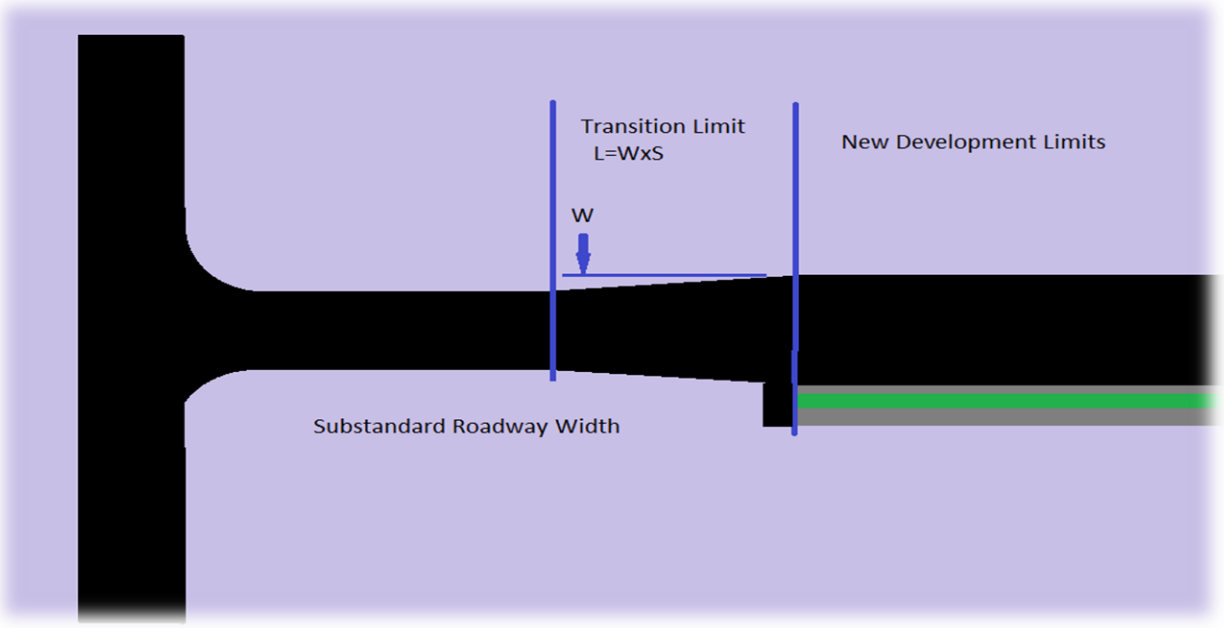


Figure 7.1 Transition Length to Substandard Roadway

7.7. Underground Utilities

A. The following applies to the connection from the distribution lines in the right-of-way to the property it serves (service connection):

B. If the existing service connection(s) in an area is/are underground, new service connections must be underground.

C. Existing overhead facilities, including utility poles will be allowed to remain above ground until one of the following events:

1. The City Council designates for undergrounding a capital improvement or public works project;
2. An entity instigates a joint trenching project that could reasonably serve to replace existing overhead facilities;
3. All services within the Town Center shall be placed underground.

7.8. Frontage Improvements

All new developments which obtain access from substandard public or private streets shall be required to construct all necessary street improvements to bring the portion of the roadway frontage to current City standards prior to approval. Such improvements shall run along the full frontage of the roadway the development is proposing access.

A. Standard frontage improvements consist of right-of-way dedication, curb, gutter, sidewalk, amenity zone and landscaping, drainage improvements, and pavement overlay up to one-half of each right-of-way abutting a property.

B. Additional offsite improvements beyond the development subject property shall be required, if determined through traffic mitigation outlined in an approved traffic study, or other standards such as safe routes to school. Improvements shall ensure safe movement of traffic, pedestrians, bicycles, transit, and non-motorized vehicles. The improvements can include widening, transit bus shelters, bus pullouts, utility undergrounding, street lighting, signage, and channelization.

C. When a development proposal triggers frontage improvements, existing frontage improvements shall be upgraded to current standards.

D. Design and installation of new or replaced frontage improvements may be adjusted during design or installation, with approval from the Public Works Director, to meet the existing conditions. Requests shall require a formal deviation.

E. The frontage improvements shall run the full length of the property line/right-of-way line. Transitions to existing conditions will occur outside the development frontage.

F. An amenity zone is required, except where an alternate street design deviation has been approved.

G. Required frontage improvements must be installed, inspected and approved by the City prior to final approval of the related building/site development permits and before a Certificate of Occupancy is issued or a permit receives final approval.

H. Exceptions

1. When the Director of Public Works deems that the above such improvements cannot be accomplished at the time of building construction, a recorded agreement on forms provided by the City shall be completed which provide for these improvements to be installed at a later date by the applicant or by the applicants singing of a waiver of protest to a local improvement district (LID) in favor of, and on a form acceptable to the City. Provided further that no street frontage improvements shall be required in conjunction with the building or remodeling of a single family home on single residential lot unless the lot is part of a subdivision of land which required street frontage improvements as a condition of final plat approval.
2. Requirements of this section shall not apply to the construction, remodeling or enlargement of any Group R, Division 3 (single family or duplex) or Group U occupancy (as defined in the International Building Code, IBC, to the construction of any accessory residential structure, to any sign, or to the structural addition, alteration or repair to any existing structure within any twelve month period which exceeds fifty percent of the value of the existing structure or increased the total floor space of the structure by more than ten percent.

7.9. Dedication of Right-of-Way

A. Dedication shall occur at the time of recording for subdivisions, or prior to permit issuance for construction projects.

B. The City may require right-of-way dedication to incorporate necessary transportation and frontage improvements if they are part of a current Capital Improvement project, and/or part of an overall master transportation plan.

7.10. Illumination

A. Puget Sound Energy (PSE) designs, installs, and maintains street lighting within the City of Sammamish right-of-way. When new street lighting is required, the Developer works with the Public Works Department and PSE regarding design and installation. The Developer pays the costs associated with the design and installation of the lighting system. These costs may include new electrical service or a new pole.

B. **General Location**: Luminaires shall be located near intersections, at street ends, at non-motorized crossings, and mid-block of streets over 300 feet in length. Luminaire locations shall be coordinated with the landscaping plans.

C. **Lighting Fees** – All costs associated with design and installation are the responsibility of the Developer. Maintenance fees are described in the Table 7.1 below.

Table 7.1 Lighting Costs

STREET CLASSIFICATION	OWNERSHIP	DESIGN FEES	MAINTENANCE FEES
Principal, Minor, or Collector Arterial Streets	City	Developer	City
Neighborhood Collector Street	PSE	Developer	HOA
Local Street	PSE	Developer	HOA

D. Street lighting system design requirements are as follows

1. City-owned arterial systems shall be based on WSDOT/APWA Standard Plans and Specifications.
2. All lighting shall conform to NEIS standards and be based on the latest IES Roadway Lighting Guidelines.
3. Street lighting system designs shall be stamped by a licensed engineer experienced with lighting design and shall include the following: luminaire spacing, illumination level, uniformity ratio, line losses, power source, the electrical and physical layout, installation details, plans, and specifications. All designs must be approved by the Public Works Director.
4. When lighting is installed as part of a Half Street improvement, these requirements for illumination levels and uniformity ratios only apply to the associated improvement.
5. Luminaires shall be LED with full-cut off lenses. Luminaires mounted on poles with powder coat finish shall match the color of the poles.
6. Poles to be owned and maintained by the City shall be per the WSDOT standard plans for davit arm and pole and shall have a black powder coat finish.
7. As-built street lighting plans for City-owned systems shall be provided to the City on CD-ROM in CAD and Portable Document Format (PDF) and on 22-inch by 34-inch mylars prior to final occupancy or final plat approval.
8. Street lighting systems shall be designed to be accessible by a wheeled vehicle.
9. Luminaires in residential areas shall be located near intersections, at street ends, at non-motorized crossings, and midblock of streets over 300 feet in length. Maximum spacing of luminaires in residential areas shall be 150 feet.
10. Controller cabinets equipped with electrical meters, time clocks, circuit breakers, and other required components are required on arterial installations of five or more streetlights or as required by the Public Works Director.
11. The exact location of the power source shall be indicated on the design plans together with the remaining capacity of that circuit. System continuity and extension shall be provided.

E. Street lighting is encouraged but not required along private streets. Street lighting systems for private streets shall be designed and constructed on a separate power source from the public street lighting system. The property owner, homeowner, or homeowners' association shall pay all street light maintenance, installation, and power costs for private street light systems. A maintenance agreement is required.

7.11. Curbing

A. Vertical curb and gutter shall be installed on all street classifications.

B. Rolled curb is not allowed for new construction. It may be used in limited areas to replace or match existing curbing, and in all cases must be approved by the Public Works Director.

C. Extruded curb is not allowed in public right-of-way, unless it is temporary and it is approved by the Public Works Director.

D. All curb removal shall be to the nearest joint. No saw cutting between joints is allowed.

7.12. Traffic Calming Devices

In locations where vehicle and pedestrian traffic is significantly increased within the non-arterial roadways, traffic calming techniques shall be assessed with all new developments. All new developments are to include analysis of impacts to adjacent neighborhoods when a connection is proposed. All proposed designs shall be reviewed and approved by the City Engineer.

A. Approved Traffic Control Devices that are currently allowed in the City include;

1. Traffic Circles;
2. Chicanes;
3. Choker Islands and Curb Extensions;
4. Raised Tables for Crosswalks
    i. Only allowed in school zones and on non-arterial roadways.
5. Roadway Narrowing;
6. Raised Intersections;

7. Medians.

B. For all existing developments that are not directly impacted by a new development application, traffic calming shall be evaluated as part of the City of Sammamish Neighborhood Traffic Management Program. (Ord. 2000-61)

7.13. Pavement Cut Moratorium

The following applies to a utility doing work (such as system repair or expansion) within the right-of-way.

A. Any street that has been constructed, reconstructed, resurfaced, overlaid or paved within the past five years cannot be cut for five years, unless the Director determines that:

1. Denying the permit would cause an undue hardship on the person applying for the permit; and
2. The need for the excavation could not have been reasonably anticipated before expiration of the moratorium.
3. Pavement shall be restored to the minimum requirements described in the standard details, the trench restoration map, and specific site requirements determined by the City Engineer.

B. Emergencies are exempt from the five-year moratorium. A right-of-way permit shall be applied for within one working day following the emergency.

Page intentionally left blank.

Chapter 8. Traffic Impact Analysis

Any development proposal that generates 10 or more new vehicle trips during the PM peak hour is required to submit a Traffic Impact Analysis (TIA). A TIA may also be required for unique projects that may not generate 10 AM and/or PM peak hour trips.

The amount of detail to be included in the TIA depends on the complexity of the proposed project. The scope of the TIA must be confirmed with the City Traffic Engineer prior to submittal. Refer to Appendix E for TIA guidelines.

Page intentionally left blank.

Chapter 9. Street Classification

Federal and State guidelines require that streets be classified based on function. The City divides streets into three categories; they are arterial, non-arterial, and private l streets.

9.1. Arterial Streets

Arterial streets provide a high degree of vehicular mobility through effective street design and by limiting property access to the right-of-way. Most vehicle trips on arterials are through-traffic. Arterials are divided into three classifications: Principal, Minor, and Collector Arterials. Minimum criteria for Arterial Streets are included in Table 9.1.

A. **Principal Arterials**: Principal arterials provide service for major traffic movement within the City. They are designed to be primary accesses through the City and carry large portions of daily traffic over extended distances in minimal time. Principal arterials connect freeways, highways and minor arterials. They have minimal driveway connections and local street connections.

(Examples: 228th Ave NE/SE, Sahalee Way and Issaquah Pine Lake Road, Issaquah Fall City Road)

B. **Minor Arterials**: Minor Arterials carry high volumes of traffic, but are typically designed with less regional mobility throughout the city than principal arterials. Their purpose is to connect primary arterials and various activity centers within the City, such as high schools and parks, with other principal arterials and collector arterials. Typically, they distribute to smaller geographical areas compared to principal arterials.

(Examples: E Lake Sammamish Pkwy, Inglewood Hill Road, 244th Ave SE-NE, NE 8th St., SE 8th St.)

C. **Collector Arterials:** Collector arterials are designed to connect multiple neighborhoods with non-arterial streets to the closest principal and minor arterial roadways. Collector arterials differ from minor arterial roadways because they may run adjacent to or extend into residential neighborhoods.

(Examples: 205th Pl NE, 248th Ave SE, and SE 24th St., Trossachs Blvd SE, 212th Ave SE)

Table 9.1 Street Classification Characteristics

	ARTERIAL STREETS		
	Principal	**Minor**	**Collector**
Function	- Connect cities and urban centers with minimum delay - Channel traffic to Interstate system - Accommodate long and through trips	- Connect activity centers within the City - Connect traffic to Principal Arterials and Interstate - Accommodate some long trips	- Access to community services and businesses - Connect non-arterial to Minor and Principal Arterial - Accommodate medium-length trips
Minimum Right of Way (1)(2)	94 feet	70 feet	70 feet
Travel Lane Width	11 feet	11 feet	11 feet
Auxiliary Lane Width	12 feet	12 feet	12 feet
Parking Lane/Width	None	Requires Public Works Director Approval/8 Feet	Requires Public Works Director Approval/8 Feet
Curb to Curb Width(3)	44 feet (3 Lane) 66 feet (5 Lane)	44 feet (3 lane)	44 feet (3 lane)
Sidewalk Width	Both Sides: 6 feet' wide (commercial areas may require up to 10 feet widths at discretion of the Public Works Director	Both Sides: 6 feet' wide (commercial areas may require up to 10 feet widths at discretion of the Public Works Director	Both Sides: 6 feet wide
Planter Strip Width(4)	Both sides 6 feet wide	Both sides 5 feet wide	Both sides 5 feet wide
Half Street Width(5)	28 feet	28 feet	28 feet
Design Speed (mph)	35-45	30-35	25-35
Daily Volumes (ADT)	>15,000	7,000-20,000	1,500- 10,000

	ARTERIAL STREETS		
	Principal	Minor	Collector
Lane	Two or more	Two or more	Two or more
Striping	Travel lanes delineated	Travel lanes delineated	Travel lanes shall be delineated
Buses/Transit Stops	Allowed	Allowed	Allowed
Bicycle Facilities	Lanes, shared lanes, or signage	Lanes, shared lanes, or signage	Lanes, shared lanes, or signage
Pedestrian Facilities	- Sidewalks both sides - Amenity strips	- Sidewalks both sides - Amenity strips	- Sidewalks both sides - Amenity strips

(1)Does not include easements for public and private utilities.

(2)ROW may be increased to accommodate Auxiliary Lanes, Parking, or Rain Gardens

(3)Minimum Width - Land use Density or Offsite Parking Provisions may require more for-street Parking

(4)Does not include curb

(5)Minimum width includes Eleven-foot lanes and Four-foot shoulders.

9.2. Non-Arterial Streets

Streets that are not designated as arterials, are non-arterial streets. Sammamish divides non-arterial streets into Neighborhood Collector Streets and Local Streets. Criteria for non-arterial streets are included in Table 9.2 below.

A. Neighborhood Collectors:

Neighborhood Collectors. Neighborhood collector streets are designed to connect local streets to arterials. Typically, neighborhood collector streets have limited driveway accesses and are built to accommodate localized populations in neighborhoods that are connected with the street.

B. Local Streets:

Local Streets. Local streets are the most common roadways and make up neighborhood roadways. Local streets typically contain a majority of driveway access points within an urban location and see minimal traffic from residents outside of the area.

Table 9.2 Non-Arterial Streets

	NON-ARTERIAL STREETS	
	Neighborhood Collector	**Local**
Function	- Connect Local to Arterials - Provide local access - Accommodate short trips to neighborhood destinations - Limited Driveway Access.	- Provide local access
Minimum Right of Way Width (1)(2)	60 feet	60 feet
Lane Width	10 feet (min)	10 feet (min)
Parking Lane Width	8 feet	8 feet
Curb to Curb Width(3)	28 feet in R-1 through R-4 Zoning 36 Feet in zones greater than R-4	28 feet in R-1 through R-4 Zoning 36 feet in zones greater than R-4
Parking	One Side in R-1 though R-4 Zoning Two Sides in zones greater than R-4	One Side in R-1 though R-4 Zoning Two Sides in zones greater than R-4
Sidewalk Width	5 feet	5 feet
Planter Strip Width(4)	5 feet (greater than R-4) 8 feet (R-1 through R-4)	5 feet (greater than R-4) 8 feet (R-1 through R-4)
Half Street Width(5)	20 feet	20 feet
Design Speed (mph)	25	25
Daily Volumes (ADT)	< 1,500-5,000	< 1500
Striping	No centerline striping	No centerline striping
Buses/Transit Stops	Allowed for short segments (School Only)	Allowed for short segments (School Only)
Bicycle Facilities	Shared lanes/signs	No specific bicycle facilities; may have signed route
Pedestrian Facilities	- Pedestrian access through use of sidewalks, trails, or other	- Pedestrian access through use of sidewalks, trails, or other

(1)Does not include easements for public and private utilities.

(2)ROW may be increased to accommodate additional Parking or Low Impact Storm Drainage facilities.

(3)Minimum Width - Land Use Density or Offsite Parking Provisions may require more on-street Parking.

(4)Does not include curb.

(5)Minimum width includes Ten-foot lanes and One-foot shoulders.

9.3. Alley

Alleys are considered private roads and are governed by the following criteria.

A. Allowed for primary access only when lots served have full frontage on a public street.

B. Serves a maximum of 30 lots, with a maximum length of 400 feet, no cul-de-sacs, and no dead ends if serving more than four lots.

C. When an alley is to be provided with utilities, the alley shall be located within a utility easement.

D. Minimum alley tract (easement if circumstances require) width of 20 feet with a pavement surface of 16 feet (including thickened edge), based on a ten-foot structure setback from property line or edge of tract (easement). For differing structure setback requirements, alley configuration shall be designated to provide for safe turning access to properties.

E. Alleyways shall be provided with a paved surface, a thickened edge on one side and cross slope in one direction.

F. Alleys will be allowed only when lots have frontage on a public street.

G. Alley entry shall be provided by a driveway cut.

H. Construction and inspection standards for public roads shall also apply to alleys unless otherwise noted within these standards.

I. Alleys shall contain no intersections or any 90-degree bends. Any alignment other than straight shall be approved by the Public Works Director.

9.4. Woonerf

Woonerfs are considered private and are governed by the following criteria.

A. Pedestrian friendly design.

B. Clear distinct entrance.

C. Required on-street parking. Parking can be parallel or perpendicular and grouped together. Parking is located off the access width of the Woonerf.

D. Traffic calming measures are required.

E. Must incorporate outdoor furnishings such as benches and landscaping.

F. Serves a maximum of 30 lots, with a maximum length of 400 feet, no cul-de-sacs, and no dead ends if serving more than four lots.

G. When a woonerf is to be provided with utilities, the alley shall be located within a utility easement.

H. Minimum tract (easement if circumstances require) width of 20 feet with a pavement surface of 16 feet (including thickened edge), based on a ten-foot structure setback from property line or edge of tract (easement). For differing structure setback requirements, woonerf configuration shall be designated to provide for safe turning access to properties.

I. Woonerf entry shall be provided by a driveway cut.

J. Woonerfs shall contain no intersections or any 90-degree bends. Any alignment other than straight shall be approved by the Public Works Director

K. Construction and inspection standards for public roads shall also apply to woonerfs unless otherwise noted within these standards.

9.5. Private Street

A private street is a privately owned and maintained street providing vehicular access within a property or properties. Refer to Chapter 12.8 Private Streets and Alleys for more information.

A. Private Streets shall serve a maximum of 9 dwelling units.

B. Private Streets shall be located within a private access tract.

C. Where a private street connects to another public or private roadway, this shall be considered as an intersection and shall meet all requirements stated in these standards.

D. Construction and inspection standards for public roads shall also apply to private streets unless otherwise noted within these standards.

E. Private Streets shall not result in land locking of present or future parcels, conflict with any transportation or street improvement plan, nor obstruct public street circulation.

Page intentionally left blank.

Chapter 10. Access Management

Access management is a means to protect the safety, operations, and functional purpose of the street system while considering access needs. Access management aims to provide access to land development while simultaneously preserving traffic flow. Appropriate access management strikes a balance between the operation and function of a street with the demand for access to right-of-way. Safety, speed, and capacity are the main reasons to institute access management. Access management recognizes the interests of both landowners and roadway users in providing a transportation system that better meets the needs of all interests.

The City's street system provides mobility to the traveling public and direct access to properties. At times, these two purposes can conflict. For example, multiple accesses on a road segment may compromise safety, speed, and capacity.

The existing and future function of each street is critical in determining the number, location, and design of access points for access control. Access management extends beyond simply specifying the number and separation of driveways and access points. Access management includes roadway design elements, such as auxiliary lanes, medians, stopping sight distances, channelization, and land development issues such as sign standards, internal site layout, driveway/parking lot layout, and alternative travel modes.

10.1. General

A. **Authority.** The Public Works Director approves the design, number, and location of access points to City Right-of-Way. When changes in land use result in changes to the type and operation of access, the access location and design will be reviewed with the development plans and shall be constructed or modified to meet current standards.

B. **Shared Access.** Pedestrians and bicyclists are especially vulnerable to turning vehicles at right-of-way accesses. The consolidation of access points benefits pedestrians and bicyclists by reducing the number of conflict points along the right-of-way. Access design for pedestrian and bicycle facilities shall conform to Chapter 11, Access Design, and the City's Standard Plans.

C. **Backing into the Right-of-Way**. Driveways, parking, or loading areas that require backing maneuvers in a public street shall not be approved except for single-family or duplex residential uses on non-arterial streets.

D. **Maintenance.** Maintenance of driveway approaches and driveway culverts shall be the responsibility of the owner whose property they serve.

E. **Restriction of Turning Movements**. Turning movements may be limited where necessary for the safe and efficient movement of traffic, both on-site and off-site. Traffic control devices controlling traffic from private property shall be installed and maintained by the property owner at no cost to the City.

F. **Abandoned Access.** All abandoned driveway approaches on the same frontage shall be removed; and the curbing and sidewalk, or shoulder, and ditch section shall be restored to meet current standards.

G. **Temporary Access.** The City may grant temporary access to accommodate phased development of a site. Temporary access shall be removed, relocated, redesigned, or reconstructed after permanent approved access is constructed.

H. **New Development.** All new development shall be served by adequate vehicular access as follows;

1. The circulation system of development shall intersect with existing and anticipated streets abutting the site at safe and convenient locations;
2. The circulation system of development shall provide direct connections to adjacent developments (inter-parcel) where appropriate; and
3. Every lot upon which one or more building(s) is proposed to be erected, or a traffic generating use is proposed, shall establish direct access from the street right-of-way. Direct access is needed to provide public services such as fire protection, emergency medical service, mail delivery or trash collection.

10.2. Access Requirements

A. If a property has more than one frontage, for example a corner lot, the access shall be located on the street with lower functional classification.

B. Properties deemed to be within a transition area shall follow the more stringent requirements unless otherwise approved by the Public Works Director. All vehicular access to proposed development in commercial zones shall be from arterial classified streets, unless determined by the Public Works Director to be technically not feasible or in conflict with state law addressing access to state highways. All developments in commercial zones shall conduct a Traffic Impact Analysis per the PWS. Developments that create additional traffic that is projected to use local streets may be required to install appropriate traffic-calming measures. These additional measures will be identified and approved by the City's Traffic Engineer.

C. Direct access, including single-family, onto an arterial is allowed only when alternative access is not available, or when specifically allowed in the SMC.

D. One access point per property ownership/tax parcel is allowed. The Public Works Director may approve more than one access for new access when approved through a deviation and;

1. The project is for one single-family residence or one duplex:
2. The second access will serve a second, separate dwelling unit, and site conditions prevent a shared access.

E. If the project is for one single-family residence or one duplex, the Public Works Director may approve through deviation a circular driveway (two access and one-way ingress/egress) from one property/tax parcel under the following conditions:

1. The accesses are onto a local access street;
2. Each access width shall be 10 to 12 feet wide;
3. Each access is offset from property lines by at least five feet; and
4. The accesses have adequate sight distance.

F. If the project is for other than one single-family residence or a duplex and:

1. A Traffic Impact Analysis shows that the additional access point(s) is/are required to adequately handle driveway volumes, and that the additional access point(s) will not be detrimental to safety, capacity, and traffic flow on adjacent streets, or
2. The accesses have adequate sight distance.

Chapter 11. Access Design

All accesses shall be located, designed, and constructed to minimize traffic congestion and maximize public safety on the street system. This chapter provides location and design criteria for access at the right-of-way line, access approach in the right-of-way, and driveways internal to a property.

11.1. General

A. Access. Access to the right of way shall be designed as an access approach.

B. Design. The designers of proposed developments must consider the access and driveway profile to ensure that required grade transitions can be achieved while considering building setback, terrain, and grades.

C. Emergency Vehicles. All accesses shall be located and designed to readily accommodate emergency vehicles that would ordinarily respond at the particular establishment. For driveways designated as fire lanes and/or fire apparatus access roads, the design standards delineated in the International Fire Code and by the Fire Marshal shall also apply.

D. Traffic Control Devices. All on-site traffic control devices, including signs and pavement markings, shall meet the Manual on Uniform Traffic Control Devices (MUTCD) standards.

11.2. Access Width

The access width is measured at the right-of-way/property line. Table 11.1 provides maximum/minimum access widths. The Public Works Director may approve a wider access when warranted by a traffic study or the turning radius of the appropriate design vehicle. Minimum tract/easement widths shall be maintained onto the property a minimum of 20 feet from the right-of-way line or to the nearest property line of the most distant lot sharing the access.

Table 11.1 Access Widths

Access Types	NON-ARTERIAL STREETS		ARTERIAL STREETS	
	Width (FT)		Width (FT)	
	Min.	Max.	Min.	Max.
Residential	10	24	20	24
Commercial	15	26	20	36
Industrial	22	NA	25	35

11.3. Access Clearance

A. The minimum distance for a residential driveway shall be 35 feet or the posted speed limit as measured in feet (i.e. 40 mph is 40 feet), whichever is greater, from a side street, intersection or adjacent driveway. The distance shall be measured from the road right-of-way line to the nearest edge of the driveway.

B. Minimum driveway spacing along an arterial roadway shall be 75 feet. Accesses along an arterial shall be aligned across the street from other access.

C. Whenever a potential access exists to any property from both a public road and a private easement, the City may refuse access to the public road.

D. Accesses in non-arterial roadways shall be aligned across the street from each other where possible.

E. Unless otherwise noted, all measurements shall be from center of driveway to center of driveway.

11.4. Access Approach

A. A paved access approach shall be provided between the property line and the edge of pavement in the right-of-way.

B. The maximum change in access approach profile grade, within the right-of-way, shall be six percent within any 10 feet of distance on a crest vertical curve and 12 percent within any 10 feet of distance in a sag vertical curve, per Standard Plan 2-01 Intersection Landing.

C. No portion of an access approach shall be allowed within five feet of a side property line in residential areas, or within nine feet in commercial areas, measured perpendicular to the side property line that is projected into the right-of-way, except:

1. On a cul-de-sac bulb as necessary for proposed residential access;
2. For a shared driveway.

D. An access approach, that crosses an open ditch section, will require installation of a culvert with a 12-inch minimum diameter and shall be adequately sized to carry anticipated stormwater flows.

11.5. Driveway

A. General

1. All driveway areas that are proposed to be abandoned or not used on the same frontage shall be removed and the curbing and sidewalk or shoulder and ditch section shall be properly restored in compliance with these PWS.
2. All driveways aprons shall be constructed of Portland cement concrete (PCC) or asphalt and shall be subject to the same testing and inspection requirements as curb, gutter, and sidewalk construction.
3. Joint use driveways serving two adjacent parcels are permitted upon formal written agreement by both property owners and approval of the Public Works Director. The agreement shall be a recorded easement for both parcels of land specifying joint usage. Joint use driveways shall be a minimum of 15 feet wide and paved along that portion which serves both parcels.
4. Grade breaks, including the tie to the roadway, shall be constructed as smooth vertical curves. The maximum change in driveway grade shall be eight percent within any 10 feet of distance on a crest and 12 percent within any 10 feet of distance in a sag vertical curve.
5. No commercial driveway shall be approved where backing onto the sidewalk or street will occur.
6. All driveway locations must be shown on the site development plans.

7. New driveway locations created by the development of property shall be combined whenever possible to create the fewest number of accesses onto a City street.
8. Combined driveways for adjoining properties are encouraged. In conjunction with the approval of a development, the City may require the applicant to provide an access and circulation easement to an abutting property, where joint access is reasonable, to serve future development
9. The maximum grade of a driveway within the right-of-way shall be 15%.

B. Arterial Streets.

1. No driveway may access an arterial within 75 feet (measured along the arterial) of an intersection of another.
2. No driveway access shall be allowed to an arterial street within 150 feet of the nearest right-of-way line of an intersecting street.
3. Within the limitations set forth above, access to arterial streets within the City shall be limited to one driveway for each tract of separately owned property. Properties contiguous to each other and owned by the same person are considered to be one tract.
4. Driveways giving direct access to arterials may be denied if alternate access is available.
5. Wherever a potential access exists to any property from both a public road and a private road or easement, the City may refuse access to the public road.
6. The Public Works Director and Metro Transit will determine the minimum separation that will be allowed between an existing bus stop and a proposed driveway.

C. Residential Driveways.

1. Residential driveways shall be constructed the maximum practical distance, but in no event less than 35 feet or the posted speed limit in feet, whichever is greater, from a side street or intersection. The distance is measured from the road right-of-way line to the nearest edge of the driveway.

Wherever a potential access exists to any property from both a public road and a private road or easement, the City may refuse access to the public road.

D. **Width.**

1. Maximum driveway width is shown in Table 11.1 of this chapter.
2. Road approaches and/or ingress and egress tapers may be required in industrial and commercially zoned areas as directed by the Public Works Director. Tapers shall be designed per the Institute of Transportation Engineers publication "Transportation and Land Development" by V.G. Stover and F. Koepke.

11.6. Parking Lot Throat Lengths

A. Traffic signage in a parking lot must meet the MUTCD.

B. The required throat length at a parking lot access to public right-of-way is determined during the permit review process and is usually based on the Traffic Impact Analysis.

C. The throat length vehicle storage in parking lots is based on a typical vehicle spacing of 20 feet, but may be increased where larger vehicles can be expected.

D. The City may adjust the on-site throat lengths for accesses with two approach lanes, subject to the transportation analysis findings, roadway geometry, traffic volumes, and site layout.

E. On-site storage is measured from the right-of-way line to the first parking stall or drive aisle in a parking lot.

F. **Outbound:** The throat shall be of sufficient length to provide adequate storage of outbound vehicles without interference with on-site circulation. Outbound vehicle storage areas shall be provided to eliminate backup and delay of vehicles within the development.

G. **Inbound.** The throat shall be of sufficient length to prevent vehicles from spilling onto the street system, and from obstructing the adjacent street, sidewalk, or circulation within the facility.

Page intentionally left blank.

Chapter 12. Street Design

This chapter sets the minimum standards for the geometric street section.

12.1. Reconstruction

A. Reconstructed roadways shall be brought up to current standards to the maximum extent feasible. Any deviation must be approved per Appendix H, Engineering Deviation Criteria.

B. Transitions or tapers necessary to connect with existing roadway of a different width shall meet AASHTO and MUTCD standards. The minimum taper rate shall be the shift width (feet) multiplied by the posted speed (mph). See Figure 7.1.

12.2. Widths

A. Lane widths vary in range from 10 to 12 feet and are typically determined based on location, roadway type and desired characteristics. Lane widths for the City Streets by classification are listed in Chapter 9 Street Classification.

12.3. Vertical Alignment

A. The minimum vertical profile is one half (0.5) percent. Maximum profile grades vary by road classification and are listed in Table 12.1.

Table 12.1 Maximum Profile Grade

MAXIMUM PROFILE GRADE				
Local	Neighborhood Collector	Arterial – Collector	Arterial – Minor	Arterial – Principal
15%	*10%*	*10%*	*10%*	*9%*

(1) Maximum profile grades may be exceeded for 300 feet or less, upon approval of a deviation by the Public Works Director. Exceptions exceeding 15 percent will require approval by the Fire Department and the Public Works Director. Any road at 15% or greater shall be Portland Cement Concrete construction.

(2) Maximum profile grade applies to either the road centerline or the edge of pavement line, whichever is steeper.

12.4. Vertical Curve Criteria

A. Vertical curves shall be designed to meet the latest AASHTO guidelines for the appropriate design speed.

B. The maximum rate of vertical curvature (K) may not exceed 167 feet per percent change in grade on streets with curb and gutter. The minimum curve length shall not be less than 50 feet.

C. Stopping Sight Distance (SSD): SSD applies as shown in Table 12.2 Vertical Curve – Minimum Stopping Sight Distance.

1. SSD is based on an eye height of three and one half feet and the height of an object at two feet.
2. On downgrades exceeding three percent, the SSD shall be increased by the values shown in Table 12.2.
3. The Public Works Director may approve sag vertical curves on local access streets with stopping sight distance less than that in Table 12.2, through deviation.

Table 12.2 Vertical Curve – Minimum Stopping Sight Distance (in feet)

DESIGN SPEED	FLAT		DOWNGRADE	
	0%	3%	6%	9%
25	165	165	175	185
30	200	210	220	230
35	250	265	280	305
40	325	345	365	400
45	400	425	455	505

12.5. Horizontal Curve Criteria

A. Super elevation is not required in the design of horizontal curves on local streets, but may be needed to meet terrain and right-of-way conditions.

B. Calculate super elevation according to AASHTO “Low Speed Urban Streets” design methodology.

C. See Table 12.3. Horizontal Curve Design.

Table 12.3 Horizontal Curve Design (in feet)

Design Speed (mph)	20[1] Grades >10%	25[1]	30[1]	35	40
Center line Radius[2] Minimum (ft.)	100	150	300	470	See note[3]
Horizontal Sight Distance Minimum (ft.)	150	200	200	250	325
Min. Reverse Curve Tangent – Minimum (ft.)	0	0	0	200	200
Approach Tangent at Intersections[3, 4] Minimum (ft.)	50	75	100	200	300
Tangent between Curves Minimum (ft.)		50	50		
Minimum Run-Off Length (ft.)		80	90	100	115
Super elevation		Not Required AASHTO	Not Required AASHTO	8% Maximum Calculate run-off lengths: AASHTO Geometric Design	
6% Super elevation Horizontal Curvature Radius (ft.)		185	275	380	510
8% Super elevation, Horizontal Curvature for Radius (ft.)		170	250	350	465

Source: "Low Speed Urban Streets", AASHTO

1 *Use these criteria without super elevation*

2 *Radii based on crown section with 2% slope on each side of crown*

3 *Where super elevation is used, calculate runoff lengths according the WSDOT Design Manual.*

4 *Where a curved road approaches an intersection, these tangent sections must be provided on the approach to the intersection to provide for adequate sight distance for traffic control devices at the intersection. The distance shall be measured from the flow line of the through street. Where super elevation is used, calculate runoff lengths according the WSDOT Design Manual intersection. The*

distance shall be measured from the flow line of the through street. Where super elevation is used, calculate runoff lengths according the WSDOT Design Manual.

12.6. Street End

Streets end in a cul-de-sac, an eyebrow, or a hammerhead.

A. Turnaround facilities shall be provided at street ends where the street length from the nearest intersection is more than 150 feet measured from the centerline of intersecting street to end of dead-end street pavement.

B. Cul-de-sac street ends shall be constructed as follows:

1. Minimum right-of-way diameter across bulb section: 114 feet in a permanent cul-de-sac, 84 feet in a temporary cul-de-sac, with bulb area lying outside straight-street right-of-way provided as temporary easement pending forward extension of the street.
    i. Right-of-way may be reduced, through deviation, provided that utilities and necessary drainage are accommodated on permanent easements within the development.
2. Minimum diameter of surfacing across bulb: 90 feet of paving in curb type road without parking. The diameter shall be increased a minimum of 8' for on street parking within the cul-de-sac.
3. Cul-de-sac Island: Required feature for any cul-de-sac. The island shall have full-depth vertical curb. Minimum diameter shall be 20 feet and there shall be at least 30 feet of paved traveled way in a curb type section around the circumference. Island shall be landscaped. The HOA or the adjacent property owners shall maintain the island.
4. Sidewalks shall be constructed on both sides of the stem and on the bulb.

C. A dead-end local street shall not be longer than 600 feet, measured from centerline of intersecting street to center of cul–de-sac. The maximum length may be extended to 1,000 feet if 50 or fewer potential lots are to be served and there is provision for emergency vehicle turnaround near mid-length.

D. The Public Works Director may require an off-street walk or an emergency vehicle access to connect a cul-de-sac at its terminus with other streets, parks, schools, bus stops, or other

pedestrian traffic generators, if the need exists. Off-street sidewalks shall be contained in the right-of-way or a sidewalk easement.

E. If a street is to be temporarily terminated at a property boundary during development and it serves more than three lots or is longer than 150 feet, a temporary bulb shall be constructed near the plat boundary. The paved bulb shall be 90 feet in diameter with sidewalks terminated at the point where the bulb radius begins. Removal of the temporary cul-de-sac, restoration, and extension of the sidewalk shall be the responsibility of the developer who extends the road.

F. The maximum cross slope of a street at the street end shall be 8 percent.

G. Partial bulbs or eyebrows shall have a minimum paved radius and an island configuration. Island shall be offset two feet from edge of traveled way.

H. A hammerhead per Standard Plan 2-32 Dead End Hammerhead, may be used to fulfill the requirement to provide a turnaround facility where the street serves (or will serve) four or fewer single-family residential units

12.7. Utility Locations

A. Utility structures shall be located in the amenity zone or at the back of sidewalk without encroaching onto private property, in the gutter line, or within the roadway as specified below.

B. New utility structures are not allowed in sidewalks, driveways, driveway approaches, or any portion of a curb ramp or landing.

C. Underground systems shall be located at least five feet away from road centerline and where they will not otherwise disturb existing survey monuments.

Table 12.4 Underground Utility Locations

UTILITY	LOCATION FROM CENTERLINE	COVER	NOTES
Water Main[1]	Five to ten feet north and east	Minimum 24-inch cover from finished grade.	
Water Service	N/A	Minimum 24-inch cover from finished grade.	For any one connection, not extend more than 60 feet along or through the right-of-way, or the minimum width of the existing right-of-way. Stub out perpendicular to water main preferred
Water Meter Box	In the right-of-way, at right-of-way line/property line in the one-foot setback between the back of sidewalk and right-of-way line. Not to be located within a driveway.		
Sanitary Main[1, 2]	Five feet south and west	Minimum 36-inch cover from finished grade.	Stub out perpendicular to water main preferred
Force Main Side Sewer	Within 10 degrees of perpendicular-to-road centerline, and extend to right-of-way line.	Minimum 36-inch cover from finished grade, ditch bottom or natural ground,	If nonmetallic, install wire or other acceptable proximity detection features; or place in a cast iron or other acceptable metal casing.
Gas Main	Five to ten feet south and west	Minimum 24-inch cover	
Power, telephone, fiber-optic cable, cable TV	Either side	Minimum 36-inch cover	

1 *Sanitary sewer and water lines shall be separated by a minimum of 10 feet in accordance with good engineering practice such as the Criteria for Sewage Work Design, Washington Department of Ecology, latest edition.*

2 *Gravity systems, whether sanitary or storm drainage, shall have precedence over other systems in planning and installation except where a non-gravity system has already been installed under previous approved permit and subject to applicable provisions of such permits or franchises.*

D. Electric utilities, power, telephone, fiber-optic cable, cable TV:

1. Utility poles or other appurtenances shall be located as far from the traveled way or auxiliary lane as conditions allow. No pole or appurtenance shall be located so that it poses a hazard to the general public. Utilities shall place and replace poles with primary consideration given to public safety.
2. Locations of poles shall be compatible with driveways, intersections, and other road features. A pole shall not interfere with sight distances, road signing, traffic signals, culverts, trees, etc.
3. Utility poles or other appurtenances shall be located at the back of ditches, unless an alternate location is approved.
4. Utility poles shall not be placed in sidewalks, curb ramps or landing areas unless approved by the city. Utility poles shall not impede ADA access in any way.
5. On principal and minor arterials, poles and obstructions shall be placed at least eight and one-half feet from face of curb.
6. On non-arterial streets (neighborhood collectors, local access), poles and obstructions shall be placed at least five and one-half feet from curb face.
7. Deviations from the pole and obstacle clearance criteria may be requested by utilities when there are no other viable alternatives. Deviation requests must identify adequate protection for motorized and non-motorized users. Deviations requests must comply with the deviations criteria contained herein.

12.8. Private Streets and Alleys

A. Private street and alley design and installation must meet ADA requirements.

B. An access approach shall connect the private street to the public right-of-way and is to be considered as an intersection. Alley entry shall be provided by a driveway concrete apron. Alleys will only be allowed when lots have frontage on a public street. See Chapter 9.3, Alley, for additional criteria associated with alleys.

C. Private streets or alleys must be paved with either concrete or asphalt. If parking on the private street is requested, an additional eight feet of pavement and tract width shall be provided on each side of the street where parking is to be allowed.

D. Pedestrian access at least five feet in width shall be provided on at least one side of the private street, except for projects with four dwelling units or less. The pedestrian access shall be separated by a curb or other acceptable delineation. Parking is not permitted in the pedestrian access areas. Street lighting systems for private streets shall be designed and constructed on a separate power source from the public street system lighting and shall be the responsibility of the property owner, homeowner, or homeowner's association for operation, ownership, maintenance and repair.

E. See Table 12.5. Private Street Dimensions.

Table 12.5 Private Street Dimensions

NUMBER OF SINGLE-FAMILY LOTS	TRACT OR EASEMENT WIDTH (FT)	PAVEMENT/TRAVELED WAY WIDTH (FT)	MAXIMUM LENGTH (FT)
*Private Street (3 **or 4** dwelling units)*	*26 (with an additional 6 feet utility easement outside tract)*	20	150*
*Private Street (**5** to 9 dwelling units)*	30	24	150*
*Alley (Residential only, no more than 30 dwelling units)***	20	20	400 max.

* *The dimensions may be adjusted by the Fire Department without a deviation.*

** *Secondary Property Access Only*

12.9. Dead End Street

A. Dead end streets shall be permitted only where there is no feasible connection to an adjacent street or if topographic or existing forested areas prevent such connections. Half streets, which do not provide for future full right-of-way width, shall not be allowed.

B. A dead end local street shall not be longer than 600 feet, measured from the centerline of the intersecting street to the center of cul-de-sac. The maximum length may be extended to 1,000 feet if 50 or fewer potential lots are to be served and there is a provision for emergency vehicle turnaround near mid-length.

C. Where possible, a pedestrian access shall be required to connect a cul-de-sac to adjacent streets, parks, schools, or other pedestrian facilities. The pedestrian access shall be in right-of-way or if approved, placed in a sidewalk easement. A turnaround facility shall be provided for a public or private dead end street where the street length is more than 150 feet, measured from the centerline of the intersecting street to the end of the dead-end street pavement.

D. A dead end street requires a hammerhead (allowed with approval from Fire Marshall for four lots or less) or cul-de-sac as a turnaround. Cul-de-sacs shall meet the following requirements:

1. The minimum right-of-way diameter across bulb section is 114 feet for a permanent cul-de-sac or 84 feet for a temporary cul-de-sac.
2. The minimum diameter of surfacing across the bulb is 90 feet of paving without parking. The diameter shall be increase a minimum of 8’ for on street parking within the cul-de-sac.
3. A 5’ amenity strip is required around the diameter of the cul-de-sac.
4. A Cul-de-sac Island: Required feature for any permanent cul-de-sac. The island shall have full-depth vertical curb. Minimum diameter shall be 20 feet and there shall be at least 30 feet of paved traveled way in a curb type section around the circumference. Island shall be landscaped. The HOA or the adjacent property owners shall maintain the island.

5. At least for public streets, a landscaped median is required in the center of a cul-de-sac. The median will be maintained by the HOA or adjacent homeowners.

Page intentionally left blank.

Chapter 13. Intersection Design

The design criteria in this chapter apply to street intersections. Intersections include driveway access as well as an approach to a street.

13.1. General

Intersection design shall conform to the guidelines set forth in AASHTO A Policy on Geometric Design of Highways and Streets, the ITE Urban Street Geometric Design Handbook, and the Manual on Uniform Traffic Control Devices (MUTCD). Refer to the WSDOT Design Manual for state highways. All intersection designs shall meet the requirements for entering sight distance and stopping sight distances as stated in the above reference standards. Deviations from these standards may be requested through the deviation process contained herein.

13.2. Alignment

A. The angle of an intersection of two streets or alleys shall be 85° to 95°.

B. The extension of the centerline of each leg of an intersection shall not be offset by more than two feet into the oncoming lane.

13.3. Spacing

A. The minimum distance between adjacent intersecting streets (both public and private) shall be measured from centerline to centerline. Minimum intersection spacing along a specific street classification shall be:

1. Principal Arterial: 350 feet.
2. Minor Arterial: 300 feet.
3. Collector Arterial: 200 feet.
4. Residential Collector: 150 feet
5. Local Street: 150 feet
6. Alley and Woornerf: No intersection allowed.

13.4. Design Vehicles

A. Intersections shall be designed to accommodate the design vehicle appropriate for the highest classified street forming the intersection.

B. The intersection design shall accommodate the use of the roadway as a designated truck route, bus route, or school bus route.

C. The minimum design vehicle for a local roadway is the SU-30, although use of larger design vehicles may be required depending on roadway classification, transit routes, truck routes, adjacent land use, etc.

D. All elements of the intersection shall be designed so the design vehicle will not encroach onto curbs, sidewalks, traffic control devices, medians, or the travel lanes of opposing traffic flow.

13.5. Curb Radii

A. Curb radii design must balance vehicle-turning movements with pedestrian safety. Typically, it is appropriate to use the smallest turn radii possible that still accommodates the design vehicle.

B. For design, curb radii shall be rounded up to the nearest five-foot increment.

C. Curb radii based on street classification are shown in Table 13.1, Typical Curb Radii Design Values. However, these values may be impacted by site conditions, including width of receiving lanes, on-street parking, and angle of intersecting roadways. Final required curb radii will be determined by the City.

Table 13.1 Curb Radii Design Values

STREET CLASSIFICATION (for highest street classification at intersection)	RADIUS
Arterial to Arterial	25 feet
Arterial to Local Street	20 feet
Non-Arterial to Non-Arterial Street	20 feet
Non-Arterial to Private Street	10 feet
Non-Arterial to Alley	10 feet
Transit/Truck Route	30 feet
Where vehicular turn is prohibited	10 feet
Radii for curb setbacks and bulb-outs	15 feet

13.6. Drainage

A. An intersection shall be laid out and graded so that surface water drains away from the intersection to the curb, and the intersection is safe and accessible for vehicles, pedestrians and bicyclists.

B. Drainage structures shall not be placed in an ADA ramp or landing area.

C. Drainage structures shall be located outside the corner radii.

D. Drainage structures shall be placed at the upstream side of crosswalks and ADA ramp areas to reduce runoff or ponds in these locations.

13.7. Intersection Grades

A. Intersections shall be on grades as flat as practical.

B. At an unsignalized intersection, the maximum allowable grade in the intersection is four percent (4%) extending a minimum of 50 feet in each direction, measured from the outside edge of the traveled way of the intersecting street. Grades above two percent may be allowed only in areas with steep topography or other unusual circumstances that prevent a flatter grade and only with an approved deviation request.

C. At signalized intersections, the maximum grade is two percent (2%) within the intersection, extending extends 200 feet in each direction. Grades above two percent may be allowed only in areas with steep topography or other unusual circumstances that prevent a flatter grade and only with an approved deviation request.

D. On sloping approaches at an intersection, landings shall be provided with grade not to exceed a one-foot difference in elevation for a distance of 30 feet approaching an arterial or 20 feet approaching a collector or local street, measured from future right-of-way line (extended) of intersecting street. See Standard Plan 2-03 Intersection Landing.

E. The point of vertical curvature shall not encroach into a cross street any farther than the center of pavement of the cross street.

13.8. Pedestrian Treatments

A. In order to provide pedestrian safety, accommodations for pedestrians shall be designed into all intersections. Pedestrian accommodations include sidewalks, crosswalks, trails, pedestrian refuge islands, ADA elements for disabled persons, etc.

B. Vaults, covers, castings, drainage grates shall not be placed within the crosswalk, or within crosswalk curb ramps or landing areas.

C. When allowed by an approved deviation to be placed in the pedestrian areas, catch basin, junction box solid covers etc. shall have non-slip covers. The non-slip surface shall be a non-grit, metallic alloy surface with a hardness of up to 62 on the Rockwell “C” scale, SlipNOT or equal. Diamond or checker plate surfaces are not considered equal. Manhole covers shall have non-slip low profile waffle tread when approved by deviation to be placed in sidewalks, pathways, crosswalks, or other pedestrian use areas. All covers within a sidewalk shall meet current ADA and PROWAG requirements.

D. Crosswalks, as defined by RCW 46.04.160, at intersections are delineated by one or more of the following:

1. Projecting the curb and back of sidewalk lines across the street;
2. A line 10 feet behind the face of the curb or roadway pavement, when there is no sidewalk; or

3. Crosswalk markings.

E. Curb Ramps

1. Consistent with the American with Disabilities Act (ADA), all projects, including alteration and new construction, shall meet ADA requirements and standards.
2. Curb ramps shall be fully within the crosswalk and shall align with the adjacent crosswalk. No utility boxes, utility box lids, drainage inlets, signs, and other fixed objects shall be located within the ramp.
3. The landing at the top of the ramp shall be four feet by five feet at a minimum, and shall be clear of all vertical obstructions.
4. Utility box lids shall not be located in the landing area. In situations where there are no other options, with an approved deviation, a junction box can be allowed if it is made skid resistant per WSDOT specifications.

F. Compliant curb ramps with tactile warning strips shall be installed at each corner of an intersection where possible and corresponding companion ramps (ramps directly across the street of a new ramp) shall be retrofitted or constructed per RCW 35.68.075.

G. When street paving impacts an intersection or a modification to a curb ramp occurs, the curb ramps must be retrofitted to meet the current curb ramp standard. For the purposes of this specific item, impact to an intersection is defined as:

1. Nine square feet or more of disturbance to the sidewalk within the area bounded by the curb, the right-of-way or property lines, and the extension of said curb, right-of-way or property lines across the sidewalk; or
2. Three lineal feet of disturbance to the curb; or
3. Development projects requiring installation of frontage improvements; or
4. Roadway resurfacing defined as an alteration by the 2013 “Department of Justice/ Department of Transportation Joint Technical Assistance on Title II of the Americans with Disabilities Act requirements to provide curb ramps when streets, roads, or highways are altered though resurfacing”. This includes asphalt overlays or addition of new asphalt/concrete roadway surface.

5. See Chapter 9, Street Classification, for required sidewalk widths.

13.9. Clear Sight Triangle

The following applies to:

- The intersection of two public streets;
- The intersection of a commercial driveway with a public street;
- The intersection of a residential driveway with a public street; and
- The intersection of a private street or alley with a public street.

A. **Obstructions:** Sight obstruction is defined as parked vehicle, signage, fencing, landscaping, or other obstruction installed, set out, or maintained, which obstructs the view of motor vehicle operators at an intersection within a clear sight triangle area and between the height limits.

1. Intersection Other Than Single-Family Residential. Sight obstruction shall not be allowed between a height of threefeet and tenfeet above the street surface within the sight triangle established by this section. Sight obstructions above seven and one-half feet above the street surface are allowed.
2. Intersection with a Residential Driveway. Sight obstruction is not allowed between three and seven feet above the street surface.
3. Landscaping, street furniture, marquees, awnings, or other such obstructions must not obscure sight lines to traffic control devices, such as signs or signals.
4. For intersections not clearly included in the above types and for which view problems may exist, the Public Works Director will establish setback lines as required.
5. Where unusual conditions preclude the application of this subchapter in a reasonable manner, the Public Works Director may establish minimum sight distances. These minimum sight distances may be more restrictive than provided herein.

Residential Driveway: The intersection of a residential driveway with a public street shall be considered as a stop controlled intersection.

B. Uncontrolled Crossing Intersection. The setback lines are measured along the centerlines of each approaching roadway. Setback measurements are based on approaching street speed limit. See standard details.

C. Stop-Controlled Intersection: - The setback lines are measured along the centerlines of each approaching roadway. Setback measurements are based on approaching street speed limit. See standard details.

13.10. Pedestrian Sight Distance

A. The minimum sight distance for pedestrian safety shall be determined as follows: the driver of an existing vehicle shall be able to view a one-foot-high object 15 feet from either edge of the exit lane at the driveway throat when the driver's eye is 14 feet behind the back of the pedestrian walkway.

B. The minimum sight distance shall be maintained at all driveways, buildings, garage entrances, etc. where structures, wing walls, etc., are located adjacent to or in close proximity to a pedestrian walkway.

13.11. Roundabout Intersection

Roundabout intersections shall be designed in accordance with the specifications as set forth in the WSDOT Design Manual and WSDOT/APWA Standard Specifications unless otherwise authorized by the City.

13.12. Signalized Intersections

Signals systems shall be designed in accordance with the specifications as set forth in the WSDOT Design Manual, WSDOT/APWA Standard Specifications and King County Standards unless otherwise authorized by the City.

Page intentionally left blank.

Chapter 14. Non-Motorized Facilities

14.1. General

A. Non-motorized facilities and associated amenities shall be provided when required by state or federal regulations, the municipal code and/or public works standards, when planned in an adopted City plan, or when needed to ensure safe walking/biking conditions as mitigation through a traffic impact analysis.

B. All facilities shall meet Americans with Disabilities (ADA) requirements and/or Forest Service Trail Accessibility Guidelines (FSTAG), as applicable.

C. All facilities located outside the Right-of-Way shall meet the approved city trail standards unless an alternative standard is required or approved by the Parks and Recreation Director.

14.2. Sidewalks

Sidewalks are required on all streets, except alleys. Sidewalk shall be required on private street and street endings, See Chapter 12 Street Design.

A. All designs shall meet the current Americans with Disabilities Act (ADA) and Public Right of Way Accessibility Guidelines (PROWAG) requirements and standards. Refer to Chapter 13 Intersection Design for curb ramp requirements.

B. Sidewalks shall be located between the property/right-of-way line and the amenity zone unless otherwise approved by the Public Works Director.

C. Sidewalk widths shall follow the minimum requirements as stated in Chapter 9, Street Classifications, based on the classification of the roadway.

D. The required width of a sidewalk may be greater than required by those stated in Chapter 9 when in accordance with the adopted Town Center Plan/Infrastructure Plan, or other adopted City plan or regulation, or, as part of a mitigation requirement through review that determines that greater widths are warranted due to expected pedestrian traffic volume.

E. Sidewalks shall be separated from the roadway with an amenity strip.

F. Sidewalks shall maintain their full width around obstructions that cannot be relocated.

G. When a sidewalk must transition to the existing frontage that does not have a sidewalk, the transition shall meet ADA requirements. Generally, an asphalt transition is acceptable. Refer to Standard Plan 3-11 Temporary Asphalt Transition Ramp to Shoulder.

H. Parking stalls shall be designed and constructed so that no part of any parked vehicle obstructs the Pedestrian Access Route as defined by ADA and sidewalk. For example, vehicle overhangs of a Pedestrian Access Route would require that the minimum required sidewalk width be widened by 3-feet to maintain the minimum five-foot clear width.

14.3. Bicycle Facilities

A. Bicycle facilities shall meet the standards of the AASHTO Guide for Development of New Bicycle Facilities, MUTCD – Manual for Unified Traffic Control Devices, and WSDOT – Washington State Department of Transportation.

B. Facilities shall be designed for uniformity in design, signage and pavement marking for bicyclist and motorist safety.

C. Direction of travel for on-street bicycle facilities shall be in the same direction as the motor vehicle traffic, unless in facilities such as a cycle tract that are designed to protect bicycle travel.

D. Vaned grates or solid lids shall be used on catch basins within bicycle facilities.

14.4. Regional Trails

Regional Trails are multi-use trails that provide recreation and transportation connections through the City to neighboring communities and other trail systems. Regional trails can be either paved or soft surface.

Regional Nature Trails are trails that provide recreation for pedestrians and/or equestrians and are soft surface trails (e.g. Emerald Necklace Trail).

A. Widths:

1. Regional Trails shall be at least ten feet in width, and twelve feet is preferred. Regional Nature Trails shall be a minimum of 10 feet wide unless topography or other limitations are present.
2. A minimum two-foot graded shoulder is required on either side of a Regional Trail. A wider graded shoulder may be required when heavy pedestrian use is anticipated, or in accordance with an adopted City regulation or plan. A minimum one-foot wide shoulder is required on either side of a Regional Nature Trail.
3. A five-foot horizontal clear zone shall be maintained on either side of the trail.
4. Maintain a minimum of a 10-foot vertical clear zone.

14.5. Connector Trail

Connector Trails are important linkages between key areas within the City such as the Town Center. These multi-use trails can be paved or soft surface, and shall be located within a public easement or public right-of-way.

A. Widths:

1. Connector Trails shall be a minimum six feet wide.
2. A minimum two-foot graded shoulder is required on either side of the trail. A wider graded shoulder may be required when heavy pedestrian use is anticipated, or in accordance with an adopted City regulation or plan.
3. A five-foot horizontal clear zone shall be maintained on either side of the trail.
4. Connector Trails shall have a minimum of a 10-foot vertical clear zone.

14.6. Local Trail

Local trails are used as neighborhood link trails or internal park trails. These multi-use trails can be paved or soft surface, and shall be located within a public easement or public right-of-way.

A. Width:

1. Local Trails shall be a minimum four feet wide.
2. A minimum two-foot graded shoulder is required on either side of the trail.
3. A five-foot horizontal clear zone shall be maintained on either side of the trail.
4. Local Trails shall have a minimum of a 10-foot vertical clear zone.

14.7. Nature Trail

Nature Trails are soft surface trails used by pedestrians and often built within natural environments that are constrained with steep terrain and/or critical areas.

A. Width:

1. Nature Trails shall be a minimum two feet wide, and may be required to be between two and six feet in width.
2. A minimum one-foot graded shoulder is required on either side of the trail.
3. Nature Trails shall have a minimum of an 8-foot vertical clear zone.

14.8. Waterway Trail

Waterway trails provide access to waterbodies within the City such as Beaver Lake, Pine Lake and Lake Sammamish. These trails are used by pedestrians for transporting non-motorized personal water craft from parking areas to designated water access points and should be accessible. Trails along waterbodies that access adjacent land areas shall follow local trail standards.

A. Waterway Trail Width:

1. Shall be a minimum three feet wide, and may be required to be between three and six feet in width.
2. A minimum of two-foot graded shoulder on each side is required.
3. A five-foot horizontal clear zone shall be maintained on either side of the trail.
4. Waterway Trails shall have a minimum of an 8-foot vertical clear zone.

14.9. Amenities

Amenities provide non-motorized users conveniences and include such items as benches, garbage receptacles, bicycle racks, and pet stations. The following is a list of some of the standard City of Sammamish amenities. Those not listed must be approved by the Parks and Recreation Director.

A. Benches:

1. Fair Weather, Plaza Series, Model PL-1.3, powder coated black semi-gloss finish. Manufacturer: Fair Weather Site Furnishings (www.fairweathersf.com), or equivalent.

B. Fair Weather, Plaza Series, Model PL-3, powder coated black semi-gloss finish. Manufacturer: Fair Weather Site Furnishings (www.fairweathersf.com) , or equivalent.

C. Trash Receptacles

1. Fair Weather, Model TR-12, 35-gallon liner, spun dome top, powder coated black semi-gloss finish. Manufacturer: Fair Weather Site Furnishings (www.fairweathersf.com) , or equivalent.

D. Bike Rack

1. Fair Weather, Model BR-1.5, powder coated black semi-gloss finish. Manufacturer: Fair Weather Site Furnishings (www.fairweathersf.com) or Huntco BR-5, powder coated black semi-gloss finish. Huntco Supply (www.huntco.com) , or equivalent.

E. Pet Stations

1. DOGVALET, Model 1005-2, Poly, Forest Green. Manufacture: DOGIPOT (http://www.dogipot.com/), or equivalent.

Chapter 15. Roadside Features

15.1. Fixed Objects

A. Locate fixed objects so that vehicle and pedestrian sight distance meets the standards in Chapter 13 Intersection Design of this document.

B. Standard clearances shall be met in accordance with Table 15.1 Standard Horizontal Clearances and Table 15.2 Standard Vertical Clearances.

Table 15.1 Standard Horizontal Clearances

FROM	TO	STANDARD CLEARANCE
Curb Face	Closest part of any fixed object (excluding traffic control signs and signals and parking meter posts)	2 feet
Textured Surface of Wheel Chair Ramp	Closest part of any fixed object	1 foot
Edge of Sidewalk	Stair riser	2 feet
Utility or Light Pole Face, Fire Hydrant	Closest part of any fixed object (excluding traffic control signs and parking meter posts)	5 feet

Table 15.2 Standard Vertical Clearances

FROM	TO	STANDARD CLEARANCE
Roadway Surfaces	Any horizontal projection over surface: measured from the crown of the street to the lowest portion of the structure.	16 feet
Sidewalk Surfaces	Any horizontal projection over the surface	8 feet
Roadway Surfaces	Tree limbs	14 feet
Alley Surfaces	Any horizontal projection over paved surface	14 feet
Bicycle Path Surfaces	Any horizontal projection over surface	10 feet

C. Electrical Facilities. For projects that trigger installation of or adjustments to Puget Sound Energy (PSE) facilities, the applicant shall coordinate with PSE. Please visit the PSE website or PSE engineering for the most recent information on clearance requirements.

PSE and City staff will work closely with applicants to accomplish appropriate clearances required for design, during construction, and at final build-out. Communication and resolution of required clearances are critical to final design and construction approval of the proposal. Contact Puget Sound Energy for more information regarding service requirements.

15.2. Landscaping

The following criteria apply to landscaping improvements in the right-of-way. The landscaping design criteria in this section are based on transportation safety requirements and on minimum requirements for plants to achieve mature growth.

Please contact the City's Department of Community Development (DCD) for landscaping requirements on private property. This chapter applies to trees only where noted.

A. General

1. Any right-of-way landscaping disturbed by construction activity shall be replaced or restored to as existed or better condition.
2. All landscaping shall meet the sight distance and sight triangle requirements in Chapter 13, Intersection Design, of these standards.

B. Plan Design Requirements

1. The right-of-way landscaping plan, shall be drawn to an engineering scale, and shall show property lines, plant and tree locations, right-of-way infrastructure, driveways, and intersections, as well as all specifications needed to install and inspect the installation.
2. Coordinate landscaping with transportation and utility plans. Adjust locations of trees to accommodate utilities, pedestrians, and sight distance.

3. Trees shall have maximum spacing of 35 feet on center starting 15 feet from the side property line (may be adjusted as approved by the City to allow a 10-foot clear zone on either side of a driveway)
4. Preserve existing trees and landscaping where possible.

C. Plant Selection

1. All plants shall conform to American Association of Nurserymen (AAN) grades and standards as published in the "American Standard for Nursery Stock" manual, provided that existing healthy vegetation used to augment new plantings shall not be required to meet these standards.
2. Plant selection shall consider adaptability to climatic, geology, and topographic conditions of the site.
3. New trees must be at least two-inch caliper measured six inches above the base and must be selected from the City-approved street tree list in Appendix F included herein. Ground cover plants must be at least four-inch pot, spaced 18 to 20 inches on center or one-gallon pot spaced at 20 inches on center. Low growth shrubs must be one-gallon pots spaced at three feet on center. Shrubs must be 18 to 24 inches in height (or three-gallon pot) spaced at five feet on center.
4. Location of trees shall be based on the plant's mature canopy and root mat width. For planting purposes, root mat width is assumed to be the same width as the canopy.
5. When right-of-way width allows, additional clearance distance must be provided from utilities.
    i. When right-of-way width is limited and the five-foot clearance cannot be met, the City will evaluate site conditions and may permit one or both of the following.
    ii. Tree installation less than five feet clearance from ductile iron or PVC pipe.
    iii. Tree installation less than five feet from concrete pipe that has rubber gaskets.
6. Adjust placement to avoid conflict with driveways, utilities, and other functional needs. Trees shall be placed:

i. 35 feet on center starting 15 feet from the side property line (must not obscure stop signs and street signs).

ii. Three and one half feet back from the face of the curb.

iii. Eight feet from underground utility lines (three feet with root barriers).

iv. 15 feet from power poles.

v. 10 feet from driveway edges.

vi. 20 feet from streetlights or existing trees.

vii. 30 feet from curb or edge of travel lane (where no curb exists) at street intersections.

viii. 10 feet from roadway edge where no curb is present.

ix. Mature tree and shrub root mats may overlap utility trenches as long as approximately 80 percent of the root mat area is unaffected.

x. Trees must be staked using five-foot tall staking, and root barriers between the tree and the sidewalk and curb.

xi. Mature tree and shrub canopies may not reach an above ground utility such as streetlights and power lines.

7. Tree selection within the right-of-way shall promote diversity of species. Improvements that require more than two (2) new trees shall provide alternating patters of more than once species of tree.

D. Soil

1. The landscaping plan shall provide soil specifications, including soil depths.
2. Improvements that include low impact development drainage facilities require specific specifications for the soils. Refer to current City of Sammamish Surface Water Design requirements general soil specifications.

15.3. Mailboxes

A. United States Postal Service (USPS) must approve all mailbox locations, including temporary relocations.

B. The approach to mailboxes must be clear of obstruction.

C. Refer to Standard Plans for mailbox placement.

D. During construction, existing mailboxes shall be accessible for delivery of mail.

15.4. Steps, Stairways

A. Steps and stairways, and associated landings from private property shall not extend into the right-of-way.

15.5. Pedestrian Railing

A. Railings in the right-of-way shall be consistent with Standard Plans 3-24 Pedestrian Railing, and shall be made of anodized aluminum, galvanized steel, or wrought iron.

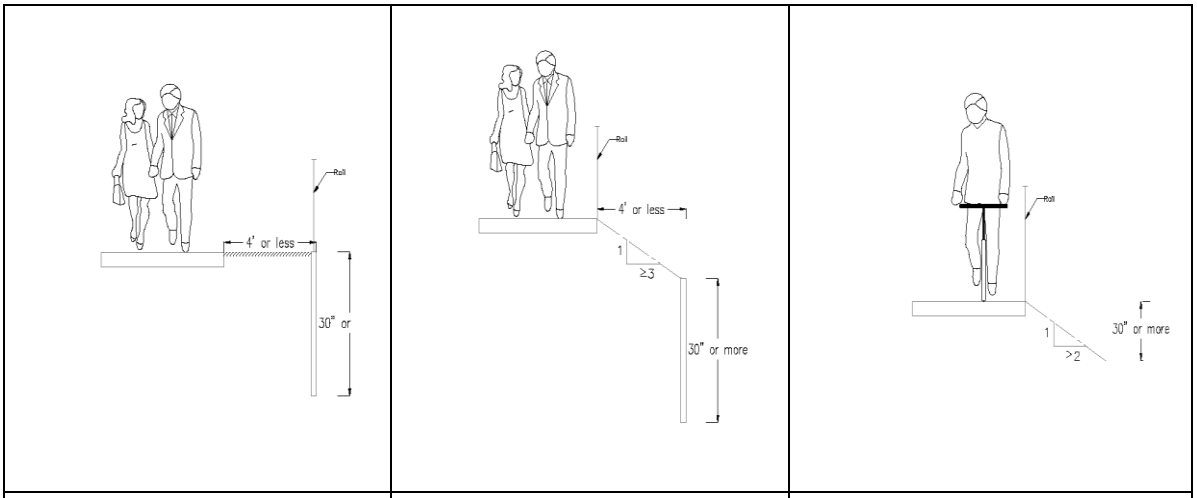
B. Railing in the right-of-way shall be installed along a non-motorized transportation facility when there is a drop from the facility of 30 inches or more and:

1. The vertical wall face is less than four feet in horizontal distance from the near side face of the facility. See Figure 15.3, Case A.
2. The vertical wall face is greater than four feet horizontally to the near side face of the facility and the slope to the wall top is steeper than 1V:3H. See Figure 15.3, Case B.
3. The slopes adjacent to the facility average greater than 1V:2H. See Figure 15.3, Case C.

C. Railings in the right-of-way shall be installed along a non-motorized transportation facility when there is a vertical drop from the facility of 18 inches or more.

D. Pedestrian railings shall be designed in accordance with Standard Plans, and the WSDOT Standard Specifications.

Figure 15.3 Railing Scenarios



CASE A	CASE B	CASE C

15.6. Cut-and-Fill Slopes

A. Side slopes shall be 2H:1V or flatter on both fill slopes and cut slopes.

B. Side slopes shall be stabilized by grass sod or seed, or by other approved plant or surface materials.

15.7. Guardrail

Guardrail shall be provided and installed by the applicant as directed by the Public Works Director. For purposes of warrants, design, and location, all guardrails along public and private roadways shall conform to the criteria of the WSDOT Standard Plans and Specifications.

15.8. Bus Stops

In locations throughout the City, the transit provider recommends bus stop locations. The City shall work with the service provider to provide all final stop locations.

A. Locations of bus stops shall be designed with safety as a paramount concern. Major arterials with high traffic counts shall be avoided where possible and only allowed with approved bus pull-outs providing pedestrian safety.

B. All permanent bus stop locations shall be identified. This shall include pavement marking and approved signage.

C. Pedestrian shelters are required at all bus pull-outs, transfer centers, and bus stops as part of frontage improvements for developments. Shelters are to be maintained by the service provider, home owner's association, or apartment owner, whichever is appropriate.

D. Bus shelter design shall be approved by the Public Works Director.

E. Advertising is not permitted on bus shelters or benches when placed within the public right-of-way.

Page intentionally left blank.

Chapter 16. Surface Treatment

This chapter provides criteria for paving and for restoring traveled ways within the right-of-way.

16.1. General

A. Hard surfacing including asphalt concrete or Portland cement concrete (PCC) are required within the right-of-way.

B. Grades steeper than 20 percent (when approved by deviation) must be paved with PCC.

C. Use of permeable pavement in the right-of-way requires review and a deviation approval by the Public Works Director.

16.2. Asphalt Pavement Design

A. Arterial Streets

1. Any pavement for arterial streets shall consider the load bearing capacity of the soils, based on actual field tests, and the traffic-carrying requirements of the roadway.
2. The analysis shall include the traffic volume and axle loading, the type and thickness of roadway materials and the recommended method of placement. Pavement sections shall not be less than those required for collector arterials.
3. Pavement design must be prepared by an engineer licensed in Washington State who is proficient in pavement design. Soils tests are required to assess the California Bearing Ratio (CBR) for the subgrade.

B. Non-Arterial Streets

1. Minimum asphalt pavement sections are identified in Standard Plan 1-05 Typical Local Road as:
    i. Surfacing: Two inches of 1/2-inch Hot Mix Asphalt (HMA); plus
    ii. Base: Four inches of 1/2-inch HMA over six inches Crushed Surfacing Top Course (CSTC). In areas of pavement restoration or adjacent to existing pavement, reconstruction shall at a minimum match the existing roadway section.

2. Poor Subgrade

    i. The minimum material thicknesses indicated herein are not acceptable if there is any evidence of instability in the subgrade. This includes free water, swamp conditions, fine-grained or organic soil, slides, or differential settlement. If there are any of these characteristics, the soil shall be sampled and tested sufficiently to establish a pavement design that will support the proposed construction. Any deficiencies, including an R-value of less than 55 or a CBR of less than 20, shall be fully considered and compensated for in the design.

16.3. Pavement Widening

A. Any widening of an existing roadway, either to add traveled way or paved shoulder, shall have the same surfacing material as the existing roadway. Or meet the minimum thickness standard in section 16.2.

B. When an existing shoulder is to become part of a proposed traveled way, a pavement evaluation shall be performed. The shoulder area shall match the existing roadway section or pavement design is required to determine if the shoulder is acceptable or if any improvements are necessary. Designs based on these evaluations are subject to review and approval by the Public Works Director. The responsibility for any shoulder material thickness improvement shall be considered part of the requirement for roadway widening.

Chapter 17. Traffic Control Devices

A. All traffic control devices shall conform to the Manual on Uniform Traffic Control Devices (MUTCD) and City of Sammamish standards.

B. All signs, such as street name, parking, stop, dead end, speed limit, and non-motorized indicators shall be approved as part of the project plan. The channelization plan showing pavement markings, permanent signing, and crosswalk locations shall be prepared by a licensed engineer.

C. Temporary traffic control to ensure traffic safety during construction activities shall be provided by the applicant and installed per MUTCD standards.

Page intentionally left blank.

DIVISION 3 – SURFACE WATER

Page intentionally left blank.

Chapter 18. Surface Water Standards

The following Surface Water Standards apply to all public and private development within the City.

The City of Sammamish has adopted the King County Surface Water Design Manual (KCSWDM) in order to comply with its NPDES II Municipal Stormwater Permit. The version will be as adopted by Ordinance. In addition, the City has adopted an addendum to this manual titled "City of Sammamish Surface Water Design Manual Addendum. This addendum is found at the following website:

http://www.sammamish.us/government/departments/public-works/stormwater-management-program/

The City encourages the use of emerging storm water treatment technologies. Examples of emerging technologies include media filters, catch basin inserts, engineered erosion control products, and low impact development techniques. Proposed emerging technologies must be listed on either the Washington State Department of Ecology's Technology Assessment Protocol (TAPE) or Chemical Technology Assessment Protocol (CTAPE). The Public Works Director must approve the emerging technology for use.

Page intentionally left blank.

DIVISION 4 – CONSTRUCTION AND INSPECTION

Page intentionally left blank.

Chapter 19. Construction

19.1. Standards

Construction, workmanship, and materials shall be in accordance with the approved plans, permit conditions, and the standards referenced in this manual.

A. City of Sammamish Public Works Standard Details

B. Latest edition of Standard Specifications for Road, Bridge, and Municipal Construction M 41-10, WSDOT.

C. Latest version of the adopted Surface Water Design Manual, together with "City of Sammamish Surface Water Design Manual Addendum.

D. Manual on Uniform Traffic Control Devices (MUTCD), Federal Highway Administration: http://mutcd.fhwa.dot.gov/

19.2. General

A. Work Hour Restrictions

1. Construction activities and noise shall meet the requirements of SMC 16.05.030.

B. Survey Monuments

1. Anyone performing construction, maintenance, or other work in Sammamish must protect all survey monuments within the area of work.
2. The applicant is responsible for all contractors working for him/her. If it is necessary to disturb a survey monument, the City Project Inspector must be notified and a permit from the Department of Natural Resources must be obtained before the disturbance occurs.
3. Failure to comply with Washington State requirements (RCW 58.04.015) regarding monument removal or destruction is a gross misdemeanor and is punishable by a fine and/or imprisonment, and liability for the cost of reestablishment.
4. Monuments shall be placed at the following locations:

i. All street intersections.

ii. At the points of curvature (PC) and points of tangency (PT) of all horizontal curves and at the point of intersection (PI) if it lies in the travelled roadway.

iii. At all DLC corners, section corners, quarter corners, and sixteenth corners that fall within the subdivision. Where these points fall outside of the pavement or sidewalks, a poured-in-place monument per City of Sammamish standards shall be set so that the top of the monument is one foot below the surface of the ground.

C. Vegetation

1. Drainage areas must be protected during construction. If an area has any type of channel/drainage swale that provides a hydrologic connection to a sensitive area(s) or wetland, the channel must also be protected throughout the construction phase by fencing and use of erosion control measures to prevent untreated construction site runoff from flowing into the channel.

2. Trees and tree root systems must be protected utilizing the following methods:

i. Reducing soil compaction during the construction phase by protecting critical tree root zones;

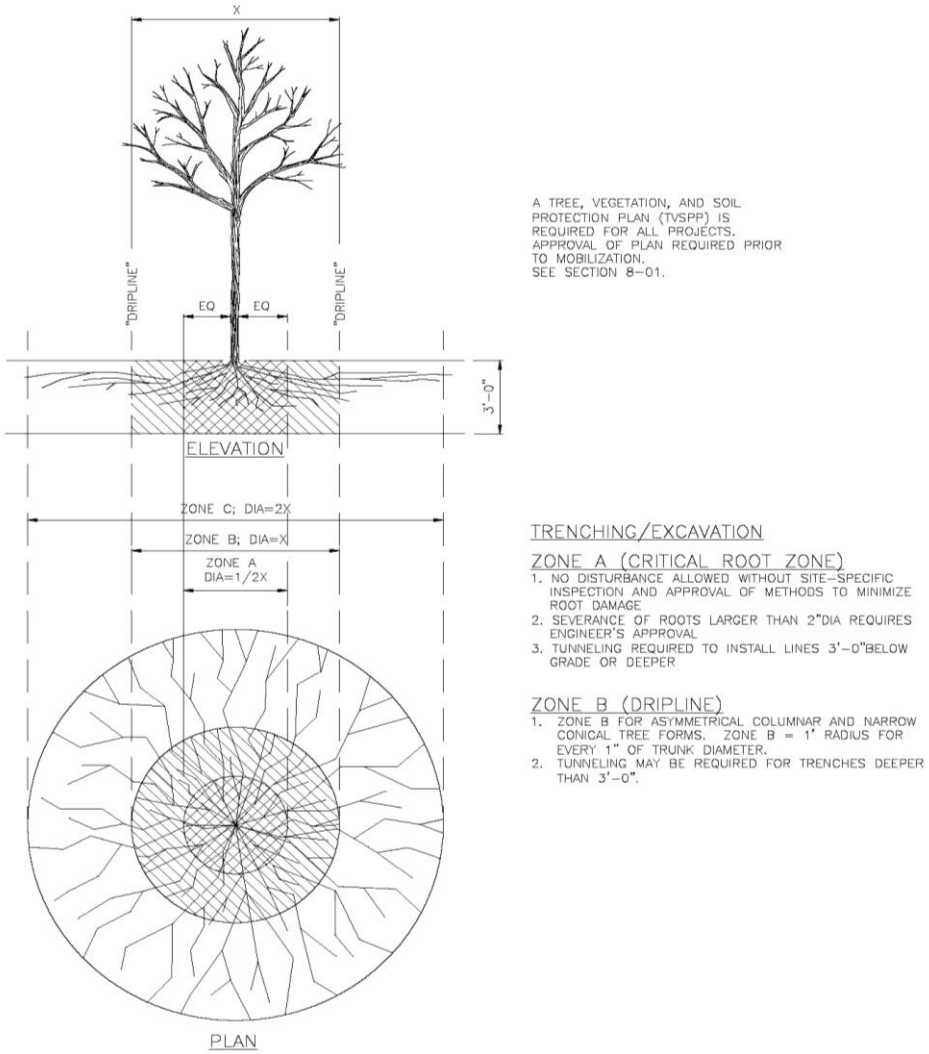
ii. Prohibiting the stockpiling or disposal of excavated or construction materials in the vegetation retention areas to prevent contaminants from damaging vegetation and soils;

iii. Avoiding excavation or changing the grade near trees that have been designated for protection. If the grade level around a tree is to be raised, a dry rock wall or rock well shall be constructed around the tree. The diameter of this wall or well shall be at least equal to the diameter of the tree canopy plus five feet; and/or

iv. Restricting trenching and excavation in critical tree root zone areas; (See Figure 19.1 Tree Protection Right of Way); and/or

v. Preventing wounds to tree trunks and limbs during the construction phase. In the event that a tree is damaged during construction, a licensed arborist shall inspect and determine if replacement is needed.

Figure 19.1 Tree Protection – Right-of-way



D. Permanent Traffic Control

1. All channelization and pavement markings, such as raised pavement markers, paint, thermoplastics, etc., shall be pre-marked by a City-approved striping contractor, and the layout approved by the City Inspector, prior to permanent installation by the contractor. Approval shall require a three working day advance notice.

2. The Applicant shall maintain traffic control devices in a condition acceptable to the City until the permit is final. The Applicant must maintain signs in good condition until the development and right-of-way are accepted by the City. Any damaged signs will be replaced by the applicant at her/his expense.

E. Cleanup, Incidental and Collateral Damage

1. The street right-of-way, material storage sites, construction staging areas, and all other areas affected by the work shall be left neat and presentable, and shall be fully restored to pre-existing or better condition.

2. Costs associated with site cleanup and restorations are integral to the project. If the City incurs additional cleanup costs, these costs shall be billed to the Applicant or contractor. Moreover, except as provided in RCW 19.122.030, any damage or destruction to existing public or private facilities done during the course of work shall be restored at the Applicant's or contractor's expense. This includes restoration of all traffic devices and pavement markings. The Public Works Director shall determine the extent of damage and order the scope and type of restoration.

19.3. Temporary Traffic Control

A. A traffic control plan shall be prepared for any activities within the right-of-way that disrupt traffic patterns for long periods.

B. A temporary traffic control (work zone) plan must be submitted and approved before beginning any work requiring traffic control for intermittent periods.

C. The Inspector shall approve field adjustments to traffic control to meet actual conditions.

D. The traffic control plan shall be consistent with the standards defined in the MUTCD. All of the following basic principles and standards must be observed by all those who perform work within a street right-of-way.

1. Work areas are safe and congestion is minimized; and

2. Motorized and non-motorized traffic is warned, controlled, and protected; and

3. Emergency access is maintained; and

4. All traffic is expedited through the work zone in a safe and timely manner.

E. The traffic control plan must allow for continued emergency services access to and through the work site. The plan shall contain adequate connections and clear signage for pedestrian and business disruption.

1. The traffic control plan shall show existing right-of-way conditions, such as accesses, channelization, lane widths, all traffic control devices, bicycle/pedestrian paths, bus stops, and pavement edge.

2. If steel plates are approved for use, the plates shall be non-skid, shimmed and pinned and cold mix asphalt ramps shall be added to provide suitable transition from the roadway to the top of the steel plates.

3. If the contractor work includes grooved pavement, abrupt lane edges, steel plates, or loose gravel, the roadway must be posted with signs stating the condition, as required by current law in RCW 47.36.200.

19.4. Staking

A. At a minimum, items that require staking include property corners, subgrade elevations, slope (grade) stakes, right-of-way location, drainage structures (with cut/fill to grate or lid) and other permanent structures including signal and light pole bases, junction boxes, utility vaults, controllers, etc.

B. In the right-of-way, all surveying and staking must be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work will be licensed by the State of Washington.

C. A pre-construction meeting must be held with the City prior to commencing staking. The minimum staking of streets will be as follows:

1. Stake centerline alignment every 25 feet (50 feet in tangent sections), points of vertical curvature (PVCs), points of vertical tangency (PVTs), high points and low points with cuts and/or fills to subgrade; and

2. Stake top of ballast and top of crushed surfacing at centerline and edge of pavement at the above described intervals; and

3. Stake top back of curb at a consistent offset for vertical and horizontal alignment at the above described intervals with cuts and/or fills to subgrade; and
4. Staking will be maintained by the applicant throughout construction period.

19.5. Trenches

A. General

1. The Public Works Director shall require trenchless methods such as boring or jacking when;
    i. It is demonstrated that trenching methods are not possible due to surface and subsurface conflicts or soil conditions, or
    ii. when the utility is installed after reconstruction or overlay of the road.
2. Open trench sides shall be kept as nearly vertical as possible and follow WISHA safety requirements.
3. When ground water is anticipated or encountered during trenching, a dewatering plan must be provided for approval.

B. Backfill

1. All subgrade will be compacted to 95 percent maximum density as described in Section 2-03 of the latest version of the WSDOT Standard Specifications;
2. Crushed surfacing materials used for backfill will conform to Section 4-04 of the latest version of the WSDOT Standard Specifications;
3. Granular material will conform to Section 9-03.19 of the latest version of WSDOT Standard Specifications;
4. Native material may only be used if deemed acceptable by the City. Soils test are required to determine if the material is acceptable and to test for adequate compaction;
5. Controlled Density Fill (CDF) shall meet the requirements of 2-09.3 of the WSDOT Standard Specifications. CDF shall not be used within 10 feet of a steam line.

C. Temporary Trench Closure

1. Trenches that will receive traffic or that will be left open overnight before final restoration shall be covered by a temporary patch or by installation of steel plates. The temporary patch material can be hot mix, cold mix, or asphalt-treated base (ATB) dumped directly into the trench, bladed out, and compacted. The trench must be filled flush to the surrounding surfaces to provide a smooth riding surface.
2. Use of steel plates requires approval from the Inspector. If approved, follow section 28.4 of this chapter.
3. Steel plate(s) shall cover CDF for at least 48 hours prior to pavement placement.
4. Prior to predicted or possible snow events, the Inspector must be notified of all steel plate locations.

19.6. Traffic Signal Loops

A. Coordination of disruptions to signal loops during construction will occur at the project pre-construction meeting.

B. No splicing of traffic signal loops shall be permitted within the roadway.

19.7. Sidewalks

A. Where approved, temporary sidewalks shall be at least five feet wide, except temporary sidewalks installed during construction in accordance with Chapter 7.5, Frontage Improvements.

B. Permanent Sidewalks

1. During removal, panels shall be removed to the nearest complete and competent panel.
2. Installation:
    i. See Standard Plan 3-09 Sidewalk,
    ii. Install an 18-inch root barrier placed between trees and sidewalks/curbs/driveways;

iii. Use Class 4000 PCC four-inches thick with a non-slip broom finish, except driveway approaches, where the concrete shall be six-inches thick;

iv. The concrete shall be placed and finished per WSDOT Standard Specifications 8-14.3(3);

v. All concrete shall be free of postmarks, graffiti, footprints, and tire marks prior to acceptance;

vi. Concrete sidewalks shall be cured for at least 72 hours before it can be used. During curing time, sidewalk must be protected from pedestrian and vehicle traffic;

vii. An expansion joint consisting of 3/8-inch or 1/4-inch x 2-inch, full depth of pre-molded joint material shall be placed around fire hydrants, poles, posts, utility castings, and along walls or structures in paved areas;

viii. An expansion joint consisting of 3/8-inch or 1/4-inch x 2-inch of pre-molded full depth joint material shall be placed in curbs and sidewalks at of 10-foot intervals and at sides of drainage inlets. When curbs and/or sidewalks are placed by slip-forming, a pre-molded strip up to 1/2-inch thick and up to full depth shall be used;

ix. Expansion joints in sidewalks shall match the joints in the curb whether the sidewalk is adjacent to the curb or separated by an amenity zone;

x. Tool joints consisting of 1/4-inch V-grooves shall be made in the sidewalk at intervals equal to the width of the sidewalk;

xi. Interface between curb and adjacent sidewalks on integral pour construction shall be formed with 1/4-inch radius edging tool. On separate pour construction an expansion joint consisting of 3/8-inch or 1/4-inch x 2-inch full depth premolded joint material shall be placed between the curb (or thickened asphalt edge) and the adjacent sidewalk.

19.8. Landscaping

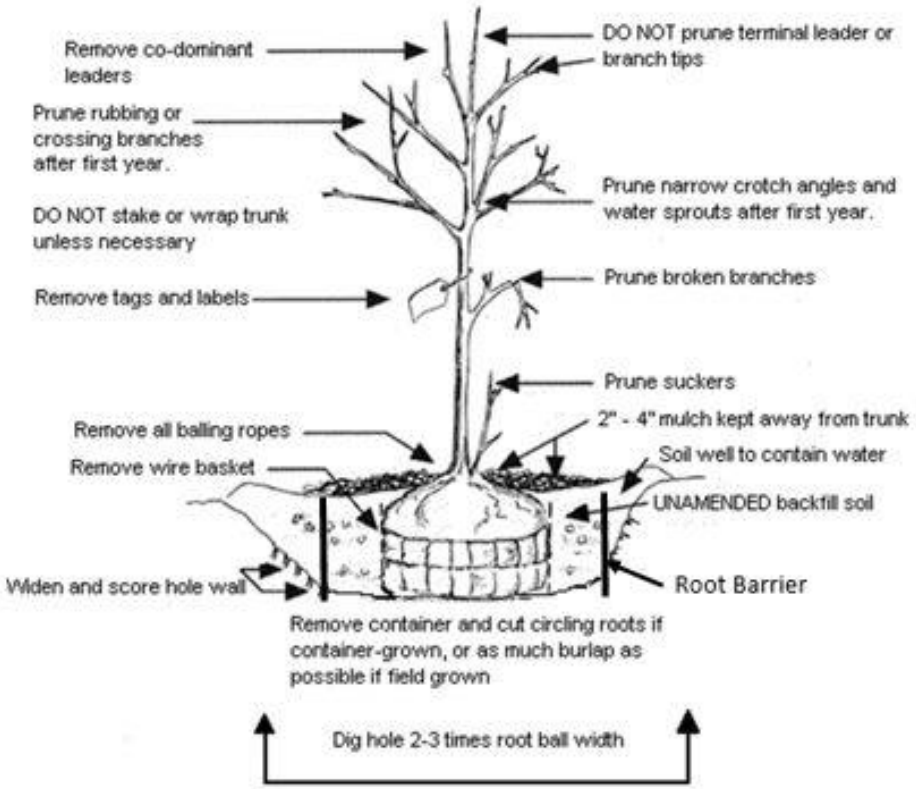
A. Soil

1. All disturbed soils that do not have structures on them shall be remediated according to BMP T5.13 Post Construction Soil Quality and Depth (Stormwater Manual); except
2. Soils for improvements, such as bio filtration and raingardens, shall meet specified material and installation requirements.

B. Trees

1. Installation of trees shall follow all notes shown in Figure 19.2 – Tree Installation – Right-of-Way.
2. Root barrier shall be required for all landscaping within amenity strips (aka landscape strips) within or adjacent to public roadway or drainage facilities.

Figure 19.2 Tree Installation – Right-of-way



19.9. Grading

A. Amenity zone: The final grade of soil surfaces in planting strips must accommodate runoff from sidewalk surfaces cross-sloped to drain toward the street.

B. Tree pits and location

1. Tree wells shall be graded to provide a soil surface two inches below the adjacent sidewalk and curb elevation, and shall then be top-dressed with bark or wood chips to surrounding grade.

19.10. Curb, Gutter, Access Approach

A. Type A vertical curb and gutter shall be used on all street classifications. Refer to Standard Plan 03-12 Curbs.

B. All curb and gutter shall be constructed with Class 4000 PCC furnished and placed in accordance with WSDOT Standard Specifications, Sections 6-02, 8-04, and 8-14. Cold weather precautions as set forth in WSDOT Standard Specifications Sections 5-05.3(14) and 6-02.3(6) shall apply.

C. All curb removals shall be to the nearest joint.

D. Subgrade compaction for curbs, gutters, and sidewalks shall meet a minimum 95 percent of maximum density ASTM D1557.

E. Extruded curb is not allowed in the public right-of-way, unless it is temporary and approved by the Public Works Director.

1. When temporarily allowed, extruded cement concrete curb shall be anchored to existing pavement by either steel tie bars or adhesive in conformance with WSDOT Standard Specification Section 8-04.
2. When temporarily allowed, extruded asphalt curb shall be anchored by means of a tack coat of asphalt in accordance with WSDOT Standard Specification Section 8-04.
3. A concrete access approach must have a construction joint at the right-of-way line.

19.11. Pavement Restoration

A. General: Anyone cutting into and removing an area of the roadway surface in the right-of-way is responsible for permanent pavement restoration.

1. Temporary cold mix patches must be installed within 3 days.
2. Final pavement restoration must be completed within 30 days of trench closure.
3. Concrete Pavement
    - i. Concrete roadways shall be restored to the nearest full panel.
    - ii. Concrete shall be replaced or patched with concrete per Section 5-05 and Section 6-02.3(2) B.
    - iii. Any concrete pavement traffic lane affected by the trenching shall have all affected panels replaced.
    - iv. Concrete pavement shall be connected to existing concrete pavement with dowels and epoxy and restored with a WSDOT approved mix.
    - v. Concrete pavement shall be restored consistent with WSDOT Standard Plan A-60.10-02.

B. Asphalt Pavement

1. Refer to Standard Plan for Trench-Pavement Restoration.
2. Asphalt pavement removal shall be by full depth saw cut or drum grinder.
3. Asphalt pavement cut widths, based on the final trench width, however, the Inspector shall extend cut limits to competent roadway pavement.
4. The Inspector shall approve the restoration limits before restoration begins.

Table 19.1 Pavement Cut Dimensions

TRENCH DEPTH (FT)	MINIMUM CUT BEYOND TRENCH (FT) ALL FOUR SIDES
Up to 4	1.0
More than 4 up to 6	1.5
More than 6 up to 8	2.0
10	2.5
12	3.0
14	3.5
16	4.0
18	4.5
20	5.0

Resource: Utility Cuts in Paved Roads, FHWA-SA-97-049

5. Cuts in asphalt must be wide enough to accommodate compaction equipment.
6. Cuts shall be expanded to include joints, panel edges, existing patches, or cracks within four feet of the opening.
7. Cuts shall be expanded to ensure that new longitudinal joints are not located in a wheel path.
8. The cut face shall be neat, straight, and vertical. The corners shall be square.
9. When an existing asphalt paved street is to be widened, the edge of pavement shall be saw-cut to provide a clean, vertical edge for joining to the new asphalt at the time of the placement of the new asphalt. After placement of the new asphalt section, the joint shall be sealed.
10. When a pavement cut extends beyond half the travel lane's width, the pavement repair shall be extended to include the full width of the travel lane.

C. Overlay

1. A public street shall be overlaid as indicated when any of the following conditions exist:

i. Utility installation parallel to the pavement centerline requires half-street overlay from the centerline to the curb line for the entire length of the utility extension. If the utility trenching encroaches on both sides of the centerline, a full width street overlay will be required;

ii. Utility installation consisting of three or more perpendicular (transverse) trenches within 150 feet, measured along the pavement centerline, requires overlay from the curb line to the centerline for the full length plus 5 feet on each end. If a trench extends beyond the centerline, a full width street overlay will be required;

iii. Utility installation at an angle to the pavement centerline: requires an overlay from the centerline to the curb line for the entire length plus 5 feet on each end of the utility installation. If the utility trenching encroaches on both sides of the centerline, a full width street overlay will be required;

iv. Road cuts are made in a moratorium overlay street that has been resurfaced or constructed within the last 5-years

v. Plane existing road at ends of the overlay perpendicular to the roadway for at least 40 feet for arterials and 15 feet for non-arterial roadways to provide a flush transition. For half-street or full-street overlays, planing (grinding) of the entire paving area is required (centerline to gutter or gutter to gutter). All asphalt joints and tapered transitions shall be sealed with AR4000 or equivalent.

D. Testing

1. Prior to placing any asphalt surface materials on the roadway, the Inspector shall review and approve density test reports, certified by a professional engineer, for the crushed surfacing base course and the crushed surfacing top course.
2. Testing shall be performed by a certified independent testing laboratory. The cost of testing is the responsibility of the franchise utility or contractor. The testing and approval by the Inspector does relieve the contractor from any liability for the trench restoration.

3. Material testing shall be required for trench backfill (native or imported), asphalt, and concrete.
4. All densities shall be determined by testing specified in WSDOT Standard Specifications.
5. Compaction of all lifts of asphalt shall be 91 percent of maximum density as determined by WSDOT Standard Specifications.
6. Testing of CDF shall be in accordance with WSDOT Standard Specifications.
7. The compaction tests in back filled trenches shall be performed in maximum increments of two feet. The number of tests required shall be determined per square feet of compaction area as follows:
    i. One test for less than 50 square feet;
    ii. Two tests for 50 to 100 square feet;
    iii. Three tests for 100-plus to 300 square feet;
    iv. One test for every 200 square feet over 300 square feet or every 100 lineal feet of crushed rock.
    v. Proof rolling shall be required by the inspector prior to asphalt installation.

Chapter 20. Inspection

The City's inspectors inspect work performed under an approved permit. Public Works right-of-way inspectors provide inspection services for permitted right-of-way development, site development and franchise permits in the right-of-way.

A. Inspections for the City's capital improvement projects (CIP) are governed by the CIP contract and are not addressed in this manual.

B. The following pertains to inspections by Public Works ROW Inspectors.

20.1. Authority and Duties of Inspectors

A. The Inspector functions as a resource for Permittees and contractors. At a minimum the Inspector:

1. Conducts field investigations;
2. Interprets and applies standards;
3. Troubleshoots and assists with field changes;
4. Monitors compliance with permit conditions;
5. Monitors utilities protection;
6. Monitors traffic control and pedestrian access;
7. Monitors excavation, shoring, backfill and restoration, and public safety;
8. Reviews the Stormwater Pollution Prevention Plan during construction;
9. Reviews as-constructed drawings (record drawings).

B. The Inspector has the authority to reject defective material and suspend work that is being done improperly. The Inspector may advise the Applicant or contractor of any faulty work or materials; however, failure of the Inspector to advise the Applicant or contractor does not constitute acceptance or approval. The Inspector has the authority to require revisions to approved engineering plans when necessary due to conflicting field conditions.

C. The Inspector is not authorized to revise, alter, or relax the provisions of these standards. Such changes must be approved by the Public Works Director through the deviation process outlined in Appendix H of these standards.

20.2. Requirements

A. At all times during construction, the Applicant/contractor must have the issued permits and approved plans and specifications on the job site.

B. All construction or work for which a permit is required shall be subject to inspection by the City. The City may inspect any project at any stage of the work to determine that adequate control is being exercised.

C. Approval as a result of an inspection shall not be construed to be an approval of a violation of approved standards or City ordinances.

D. It shall be the duty of the Applicant to cause the work to remain accessible and exposed for inspection purposes. Failure to notify the City of readiness for inspection in a timely manner will result in the requirement to remove and/or replace buried or hidden elements. The City shall not be liable for the expense entailed in the removal or replacement of any material required to allow an inspection to occur.

E. Site and right-of-way inspections may include the items listed below. Specific inspections are determined at the pre-construction meeting:

1. Survey monuments;
2. Survey stakes;
3. Construction staking prior to construction, including contour lines of boundaries and depth of all existing floodplains, wetlands, channels, swales, streams, storm drainage systems, roads (low spots), bogs, depressions, springs, seeps, swales, ditches, pipes, groundwater, and seasonal standing water; property corners, subgrade elevations, slope (grade) stakes, right-of-way location; field verification of existing and proposed grading contours; work limits and clearing limits; and foundation form elevations (before concrete is poured);
4. Stormwater Pollution Prevention Plan installation and maintenance;

i. Including prompt street sweeping and prevention of tracked dirt on adjacent streets;

ii. Native vegetation protection and critical area buffers;

iii. Locations of proposed infiltration facility areas to be protected;

iv. Staging and stockpile areas;

v. Construction traffic routing, traffic control, signage and channelization;

vi. Surface water facilities – materials and installation;

vii. Retaining walls;

viii. Utility installation depth and location;

ix. Pavement cuts;

x. Trench backfill/compaction;

xi. Roadway centerline elevations;

xii. Elevations at curb radii, PVC's, PVI's, and PVT's;

xiii. Right-of-way pavement restoration;

xiv. Landscaping installation and restoration plants, root barriers, and irrigation;

xv. Clean-up;

xvi. Record drawing with as-constructed information;

xvii. Punch list.

Page intentionally left blank.

APPENDIX A - ACRONYMS AND DEFINITIONS

These acronyms and definitions are for use with this Engineering Development Manual. Unless specifically defined below, words or phrases used in this manual shall be interpreted to give them the meaning they have in common usage and to give this manual its most reasonable application.

Page intentionally left blank.

Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
APWA	American Public Works Association
ASTM	American Standards for Testing Materials
ATB	Asphalt treated base
BMP	Best Management Practices
C	Long Chord Length (straight line between PC and PT) – horizontal curve
CDF	Controlled Density Fill
CFR	Code of Federal Regulations
CSTC	Crushed Surfacing Top Course
CWA	Clean Water Act
DCD	City of Sammamish Department of Community Development
DNR	Department of Natural Resources
e	Rate of Super elevation – horizontal curve
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Association
HMA	Hot Mix Asphalt
HPA	Hydraulic Project Approval

ITE	Institute of Transportation Engineers
JARPA	Joint Aquatic Resource Permit Application
KCSWDM	King County Surface Water Design Manual
L	Curve Length – horizontal curve
MUTCD	Manual on Uniform Traffic Control Devices, current edition
NAD	North American Datum, horizontal, of 1983/1991
NAVD	North American Vertical Datum
NGVD	National Geodetic Vertical Datum of 1929
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
PC	Point of Curvature (point at which the curve begins) – horizontal curve
PCC	Portland Cement Concrete
PI	Point of Intersection (point at which the two tangents intersect) – horizontal curve
PIT	Pilot Infiltration Test
PROWAG	Public Right of Way Accessibility Guidelines
PSE	Puget Sound Energy
PT	Point of Tangent (point at which the curve ends) – horizontal curve
PVI	Point of vertical interception (intersection of initial and final grades) – vertical curve
PW	Public Works
PWS	Public Works Standards

R	Radius – horizontal curve
SMC	City of Sammamish Municipal Code
SWPE	Solid Wall Polyethylene
SWPPP	Stormwater Pollution Prevention Plan
T	Tangent Length – horizontal curve
TESC	Temporary erosion and sediment control
TIR	Technical Information Report
TIP	Transportation Improvement Plan
TSS	Total Suspended Solids
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Administration
WSDOT	Washington State Department of Transportation

Definitions

Access. The safe, adequate, and usable ingress/egress (entrance/exit) between private property and the public street system. Usually defined at the right-of-way/property line.

Adverse Effect or. Effect that is a direct or indirect result of a proposed action, or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. In the event that the overall effect of the proposed action is beneficial, but is also likely to cause some adverse effects, then the proposed action is considered to result in an adverse effect.

Alley. A service roadway, not designed for general travel, providing a means of automobile, service vehicle, or emergency vehicle access to abutting property and not intended for primary traffic or pedestrian circulation.

Alignment. The route of the road or other facility, defined as a series of horizontal tangents and curves.

Amenity Zone. That area, adjacent to the curb or paved roadway and within the right-of-way, which is commonly landscaped, but may include other features for the City's benefit such as utilities, traffic signs, mailboxes, rain gardens, etc.

Annual Average Daily Traffic. Daily traffic that is averaged over one calendar year.

Average Daily Traffic (ADT). The average number of vehicles passing a specified point during a 24-hour period.

Average Weekly Traffic (AWT). The average number of vehicles passing a specified point turn a 7-day period.

Applicant. Any person, governmental agency, or other entity that executes the necessary forms to procure official approval of a project or a permit to carry out construction of a project within the City ROW. This could be the property owner, contractor, developer or permittee.

As-Constructed. Actual surveyed locations of constructed elements. As-constructed (or as-built) information is included on Record Drawings.

Auxiliary Lane. The portion of the roadway adjoining the traveled way for parking, turning, or other purposes supplementary to through-traffic movement.

Best Management Practices. When used with reference to stormwater it is defined as: Schedules of activities, restrictions, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to Waters of the State.

Bicycle Facilities. A general term denoting improvements and provisions to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways specifically designated for bicycle use. AASHTO

Bicycle Lane or Bike Lane. A portion of a roadway which has been designated by pavement markings and, if used, signs, for the preferential or exclusive use of bicyclists. AASHTO

Bicycle Path or Bike Path. A pathway that is exclusively used by bicyclists, where a separate, parallel path is provided for pedestrians and other wheeled users. Most pathways are shared between bicyclists and other users: see Shared Use Path. AASHTO

Bikeway. A generic term for any road, street, path or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes. AASHTO

Building. Any structure used or intended for supporting or sheltering any use or occupancy.

Bulb. Area for vehicle turnaround typically located at the end of a cul-de-sac street.

City. The City of Sammamish.

City Engineer. The City of Sammamish City Engineer or designee.

Clear sight triangle. An area of unobstructed vision at street intersections or street and driveway intersections defined by lines of sight between points at a given distance from the intersection of street and/or driveway lines.

Clearance. The minimum distance between elements in, under and above the street right-of-way.

Clearing. The cutting, moving or removal of vegetation from a site by physical, mechanical, chemical, or other means which exposes the earth's surface or any actions which disturb the existing ground surface. This does not mean landscape maintenance or pruning consistent with accepted horticultural practices. Clearing is an activity, which does not require reforestation per an approved Forest Practices Application/Notification issued under the Forest Practices Act.

Commercial Driveway. A driveway which is used to provide access to business and non-single family residential enterprises, including but not limited to sales, service, industry, churches or other quasi-public buildings

Comprehensive Plan. The latest edition of the plan and amendments as described in SMC Chapter 24.

Conveyance System. Natural and man-made drainage features that collect, contain, and convey surface water. Natural drainage features include swales, streams, rivers, lakes, and wetlands. Man-made features include swales, gutters, ditches, pipes, and detention/retention facilities.

Critical Areas. Critical areas as defined in SMC Chapter 21A.

Cross Section. Vertical section of a roadway showing the position and number of vehicle and bicycle lanes and sidewalks, along with their cross slope or banking. Cross sections also show drainage features, utilities, pavement structure, and other items outside the category of geometric design.

Cul-de-Sac. The circular turnaround at the terminus of a street end.

Crosswalk. The portion of the roadway between the intersection area and a prolongation or connection of the farthest sidewalk line or in the event there are no sidewalks then between the intersection area and a line 10 feet there from, except as modified by a marked crosswalk. See RCW 46.04.160

Dead End. Street End. A road or street without an exit.

Declaration of Covenant. A legal document between the City and persons holding title to the property requiring the titleholder to perform required maintenance and repairs on drainage facilities necessary to meet the City's specified standards within a reasonable time limit.

Design Speed. A selected speed used to determine the various geometric features of the roadway.

Developer. The person or entity that owns or holds purchase options or other development control over property for which development activity is proposed.

Development (Land Use). The division of a parcel of land into two or more parcels; the construction, reconstruction, conversion, structural alteration, relocation, or enlargement of any structure; any mining, dredging, drilling, paving, clearing, or grading; changes to surface or ground waters; or any use, change of use, or extension of the use of land. See SMC Chapter 19.

Development (Flood). Any man-made change to improved or unimproved real estate in the Regulatory Floodplain, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, storage of equipment or materials, subdivision of land, removal of more than five percent of the native vegetation on the property, or alteration of natural site characteristics. For definition related to surface water, refer to the Stormwater Manual.

Development Project. Any project submitted to the City for permitting and construction within the City of Sammamish City limits.

Development Review Engineer. Public Works Department Engineer that is responsible for the review of a development.

Deviation. Written permission from the City to depart from the requirements of the Public Works Standards.

Director. The Public Works Director or designee, except that when referring to enforcement of permitting and review processes defined in SMC Chapter 21A Director shall mean the Director of Community Development or designee.

Discharge. To throw, drain, release, dump, spill, empty, emit, or pour forth any matter or to cause or allow matter to flow, run or seep from land or be thrown, drained, released, dumped, spilled, emptied, emitted or poured into water.

Drainage. Collection, conveyance, containment, and/or discharge of surface water and stormwater runoff.

Driveway. The direct access between a property and public right-of-way or access tract.. Driveway is privately owned and maintained.

Driveway Approach. That area of an access to a property lying between the pavement edge of the intersecting street and the right-of-way/property line.

Driveway Apron. See Driveway Approach.

Easement. A grant by a property owner of an interest and/or the use of a strip of land by the public, an entity, or person for specific purposes.

Emergency Vehicle Access. An all-weather drivable surface that is constructed and maintained for emergency vehicle access.

Emerging Technologies. Stormwater Treatment technologies that have not been evaluated with Department of Ecology approved protocols, but for which preliminary data indicate they may provide a necessary function(s) in a stormwater treatment system

Engineer Geotechnical. A practicing, professional civil engineer licensed by the State of Washington, who has at least four years of professional employment as a geotechnical engineer.

Engineer – Professional. An engineer, licensed to practice in the State of Washington as a Professional Engineer.

Engineer – Soils. See Engineer – Geotechnical.

Engineering – Geotechnical. The application of soil mechanics in the investigation, evaluation, and design of civil works involving the use of earth materials and the inspection or testing of the construction thereof.

Engineering – Geologist. A geologist certified by the State as experienced and knowledgeable in engineering geology.

Engineering – Geology. The application of geologic knowledge in the investigation and evaluation of naturally occurring rock and soil for use in the design of civil works.

Eyebrow. A partial bulb located adjacent to the serving road that provides access to lots and serves as a vehicle turnaround.

Financial Guarantee. A surety, bond, cash deposit, escrow account, assignment of funds, irrevocable letter of credit, or other means acceptable to the City to guarantee acceptable performance, execution, completion of the work and maintenance, in accordance with the project's approved plans and in accordance with all applicable governmental requirements.

Fire Apparatus Access Road. As defined in the International Fire Code.

Fire Lane. As defined in the International Fire Code.

Fixed Object. An object having properties greater than a four-inch by four-inch wooden post.

Frontage. Any lot line abutting street right-of-way.

Frontage Improvements. Motorized and non-motorized facilities, transit facilities, utilities, landscaping, and other such features located within the public right-of-way.

Grading. See Land Disturbing Activity.

Ground Disturbance. See Land Disturbing Activity.

Grubbing. The removal and disposing of all unwanted vegetative matter from underground, such as sod, stumps, roots, buried logs and other debris.

Half-Street. A street constructed utilizing at least half the regular width of the right-of-way and permitted as an interim facility pending construction of the other half.

Hard Surface. An impervious surface, a permeable pavement, or a vegetated roof.

Impervious Surface. A hard surface area, which either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. A non-vegetated area, which causes water to run off the surface in greater quantities or at an increased rate of flow from that present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for the purposes of determining whether the thresholds for application of minimum requirements are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling.

Improvements. Any improvement to public, real, or personal property, including but not limited to, installation of streets, roads, pedestrian/bike facilities, streetlights, landscape features, sewer and waterlines, bridge structures, storm drainage facilities, and traffic control devices.

Infiltration. The downward movement of water from the surface to the subsoil.

Inspector. Designee of the Public Works Director or City Engineer.

Internal Street. A road that is contained within the development.

Intersection. The area from the intersection of a roadway to the radius tangent point or stop bar on each approach, whichever is greater.

Land Disturbing Activity. Any activity that results in movement of earth, or a change in the existing soil cover (both vegetative and non-vegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to clearing, grading, grubbing, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land disturbing activity. Vegetation maintenance is not considered land disturbing activity. Stormwater facility maintenance is not considered a land-disturbing activity if conducted according to established standards and procedures.

Land Surveying. Establishment of corners, lines, boundaries, and monuments, the laying out and subdivision of land, the defining and locating of corners, lines, boundaries and monuments

of land after they have been established, the survey of land areas for the purpose of determining the topography thereof, the making of topographical delineations and the preparing of maps and accurate records thereof, when the proper performance of such services requires technical knowledge and skill.

Landing. A road or driveway approach area to any public or private road or intersection.

Loop. Road of limited length forming a loop, having no other intersecting road, and functioning mainly as direct access to abutting properties. A loop may be designated for one-way or two-way traffic.

LID Best Management Practices. Distributed stormwater management practices, integrated into a project design, that emphasize pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation, and transpiration. LID BMPs include, but are not limited to, bio retention/rain gardens, permeable pavements, roof downspout controls, dispersion, soil quality and depth, minimal excavation foundations, vegetated roofs, and water re-use.

Low Impact Development (LID). A stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.

Low Impact Development (LID) Principles. Land use management strategies that emphasize conservation, use of on-site natural features, and site planning to minimize impervious surfaces, native vegetation loss, and stormwater runoff.

Maintenance. Repair and maintenance includes activities conducted on currently serviceable structures, facilities, and equipment that involves no expansion or use beyond that previously existing and results in no significant adverse hydrologic impact. It includes those usual activities taken to prevent a decline, lapse, or cessation in the use of structures and systems. Those usual activities may include replacement of dysfunctional facilities, including cases where environmental permits require replacing an existing structure with a different type structure, as long as the functioning characteristics of the original structure are not changed. One example is the replacement of a collapsed, fish blocking, round culvert with a new box culvert under the same span, or width, of roadway. Concerning stormwater facilities, maintenance includes

assessment to ensure ongoing proper operation, removal of built up pollutants (i.e. sediments), replacement of failed or failing treatment media, and other actions taken to correct defects as identified in the maintenance standards of the latest version of the City of Sammamish Stormwater Drainage Manual.

Municipal Separate Stormwater System (MS4). A conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), owned or operated by the state, City, county, or special purpose district having jurisdiction over disposal of wastes, stormwater, or other wastes, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; designed or used for collecting or conveying stormwater; which is not a combined sewer; and which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES). The national program for issuing, modifying, revoking, and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington Department of Ecology.

Native Vegetation. Vegetation comprised of plant species, other than noxious weeds, that are indigenous to the coastal region of the Pacific Northwest and which reasonably could have been expected to naturally occur on the site. Examples include trees such as Douglas Fir, western hemlock, western red cedar, alder, big-leaf maple, and vine maple; shrubs such as willow, elderberry, salmonberry, and salal; and herbaceous plants such as sword fern, foam flower, and fireweed.

Nephelometric Turbidity Units (NTU). These units are a quantitative measure of water clarity based on the scattering of a standard beam of light directed into a standard sample of the water when the scattering is measured at right angle to the beam. A higher reading means the sample is cloudier. See also the definition for “turbidity” included below.

Off-Street Parking Space. An area accessible to vehicles, exclusive of right-of-way, that is improved, maintained, and used for the purpose of parking a motor vehicle.

Operation and Maintenance Plan. A set of instructions and schedules to keep drainage facilities working to meet the design performance criteria.

Pavement Width. Paved area on shoulder-type roads or paved surface between curb, thickened edge, or gutter flow line on all other roads.

Peak Hour of Generator. A development that generated additional traffic on the roadways as determined through a Traffic Analysis and standards adopted by ITE.

Performance Guarantee. See Financial Guarantee.

Permeable Pavement. Pervious concrete, porous asphalt, permeable pavers, or other forms of pervious or porous paving material intended to allow passage of water through the pavement section. It often includes an aggregate base that provides structural support and acts as a stormwater reservoir.

Pervious Surface. Any surface material that allows stormwater to infiltrate into the ground. Examples include lawn, landscape, pasture, native vegetation areas, and permeable pavements.

Pipe Stem. A strip of land having a width narrower than that of the lot or parcel to be served and is designed for providing access to that lot or parcel.

Plans. The plans, profiles, cross sections, elevations, details, and supplementary specifications showing the location, character, dimensions, and details of the work to be performed.

Pollution. Contamination or other alteration of the physical, chemical, or biological properties of waters of the state that will or is likely to create a nuisance or render waters harmful, detrimental, or injurious 1) to public health, safety, or welfare, or 2) to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or 3) to livestock, wild animals, birds, fish, or other aquatic life. Contamination includes discharge of any liquid, gas, or solid, radioactive, or other substance. Alteration includes temperature, taste, color, turbidity, or odor.

Project Manager. City of Sammamish DCD staff member responsible for review of a development project.

Project. Activity encompassing all phases of the work to be performed and is synonymous with the term “improvement”, “work”, “development” or “redevelopment.” A project may entail work on one or more parcels of land.

Project Site. That portion of a property, properties, or right-of-ways subject to land disturbing activities, new hard surfaces, or replaced hard surfaces. See Hard Surface above.

Profile. When referring to roadway design: Vertical aspect of the road, including crest and sag curves, and the straight grades connecting them.

Public Works Director. The City of Sammamish Public Works Director or designee.

Rainy Season. The period starting on October 1 of each year and ending April 30 of the following year. These dates may be adjusted by the Public Works Director based on climatic conditions for a particular year.

Record Drawings. Drawings that document as-constructed (or as-built) conditions of a permitted development or redevelopment project. See As-Constructed definition above.

Redevelopment. For surface water purposes: on a site that is already substantially developed (i.e., has 35 percent or more of existing impervious surface coverage), the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including construction, installation or expansion of a building or other structure; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities.

Replaced hard surface. For structures, the removal, and replacement of hard surfaces down to the foundation. For other hard surfaces, the removal down to bare soil or base course and replacement.

Replaced Impervious Surface. For structures, the removal, and replacement of impervious surfaces down to the foundation. For other impervious surfaces, the removal down to bare soil or base course and replacement.

Right-of-Way. Property granted or reserved for, or dedicated to, public use for street purposes and utilities, together with property granted or reserved for, or dedicated to, public use for walkways, sidewalks, bikeways, horse trails, and parking whether improved or unimproved, including the air rights, sub-surface rights and easements thereto.

Road. Interchangeable with “Street,” “Roadway,” or “Street Way.”

Runoff. Water that travels across the land surface and discharges to water bodies either directly or through a collection and conveyance system. See also “Stormwater.”

Sediment/Erosion-Sensitive Feature. An area subject to significant degradation due to the effect of construction runoff, or areas requiring special protection to prevent erosion. See the latest edition of the City of Sammamish Stormwater Manual.

Shoulder. The paved or unpaved portion of the roadway outside the traveled way.

Sidewalk. All hard-surface walkways within public rights-of-way or a public easement in the area between the street margin and the roadway.

Sight Distance. The distance along a roadway throughout which an object of specified height is continually visible. This distance depends on the height of the driver’s eye above the road surface, the height of the specified object above the road surface, and the height and lateral positions of obstructions within the driver’s line of sight. See AASHTO: A Policy on Geometric Design

Sight Distance – Stopping. The distance needed a driver to perceive and react to a discernible hazard and then brake to a stop before reaching the hazard. (Urban Street Geometric Design Handbook, ITE)

Sight Distance – Intersection. The distance needed to safely make a right turn or a left turn from an access or to a cross street, or for a driver to safely make a left turn from a street to an access. (Urban Street Geometric Design Handbook, ITE)

Sight Distance – Decision. The distance needed for a driver to ascertain and safely respond to an unexpected difficult or unfamiliar situation. Regarding access location, sight distance should

give familiar and unfamiliar drivers enough distance to safely turn into the desired access. (Transportation Research Board, 2003. Urban Street Geometric Design Handbook, ITE)

Site. Any tract, lot, or parcel of land, or combination of tracts, lots, or parcels of land which are in one ownership, or are contiguous and in diverse ownership, where development is to be performed as a part of a unit, subdivision, or project.

Site Plan. The development plan for one or more lots on which is shown the existing and proposed conditions of the lot, topography, vegetation, drainage, flood plains, walkways; means of ingress and egress; circulation; utility services; structures and buildings; signs and lighting; berms, buffers, and screening devices; surrounding development; or any other information that reasonably may be required in order that an informed decision can be made by the reviewing authority.

Special Drainage Areas. An area which has been formally determined by the City to require more restrictive regulation than City-wide standards afford in order to mitigate severe flooding, drainage, erosion or sedimentation problems which result from the cumulative impacts of development.

Stabilization. The prevention of soil movement by any various vegetative and/or structural means.

Storm Drainage Plan. A set of drawings and documents submitted as a prerequisite to obtaining a development permit. The plan contains all of the information and specifications pertaining to surface water management both on-site and offsite.

Stormwater. Water runoff during and following precipitation and snowmelt events, including surface runoff, drainage, or interflow.

Stormwater Manual. The most recent version of the City of Sammamish Stormwater Design Manual.

Street. A public or recorded private thoroughfare providing pedestrian and/vehicular access through neighborhoods and communities and to abutting property.

Surface Water. Water originating from rainfall and other precipitation that is found on ground surfaces and in drainage facilities, creeks, rivers, streams, springs, seeps, ponds, lakes, wetlands, as well as shallow ground water.

Surveyor. A person licensed by the State of Washington to engage in the practice of land surveying, as defined by RCW 18.43.020.

Traveled Way. The part of the road made for vehicle travel excluding shoulders and auxiliary lanes.

Turbidity. The visual cloudiness of runoff especially as caused by suspended solids and settle able solids that are being carried by the runoff.

Utility. Private or municipal corporations owning or operating, or proposing to own or operate facilities that comprise a system or systems for public service. Private utilities include gas, oil, electric, telecommunications, cable, storm drainage, sewer, or water companies that are subject to the jurisdiction of the State Utilities and Transportation Commission and that have not been classified as competitive by the commission.

Waters of the State. Those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the state" as defined in chapter 90.48 RCW which includes lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and water courses within the jurisdiction of the State of Washington.

Woonerf: A private roadway that gives equal priority to all modes of transportation such as pedestrians, bicycles, and vehicles. The roadway includes design for shared spaces, traffic calming, and low speeds.

Page intentionally left blank.

APPENDIX B - SURVEY CRITERIA

Page intentionally left blank.

Survey Format and Content

The following applies to surveys submitted to Public Works for development under review and use for city projects. Contact Community Development for survey requirements for land use as stated in the SMC. A survey acceptable to the City Public Works Department must contain the elements listed below. Review of the survey will be done as part of the plan review process.

1. The surveyor's stamp, signature, contact information and the date signed (see Note 1).
2. North arrow, graphic scale, legend, and vicinity map
3. Legal Description, if needed (see Note 2)
4. Both NAVD 88 and NAD83/91 are required (see Note 3)
5. Monuments within the project area (see Note 4)
6. Site benchmarks (see Note 5)
7. Rights-of-way with dimensions, source references, and methods used to determine (see Note 6)
8. Easements with type, dimensions, and source references (see Note 7)
9. Property lines with bearings and distances (see Note 8)
10. Buildings (see Note 9)
11. Streets and street improvements (see Note 11)
12. Utilities (see Note 11)
13. Contours (see Note 12)
14. Steep slopes (See Note 13)
15. Topography (see Note 14)
16. Significant Trees (see Note 15)

17. Water features (see Note 16)

18. Protected areas, including wetland boundaries (see Note 17)

19. Setbacks (see Note 18)

20. Underground hazards (see Note 19)

21. Any monuments in the project area that may be disturbed, destroyed, or removed shall be noted on the plans as requiring replacement. An application for a permit to remove or destroy a survey monument must be filed with the Washington State Department of Natural Resources, pursuant to RCW 58.24.040(8). Under such conditions, add Note 21 to General Notes on plan (see Note 20).

Survey Requirements Notes

Note 1. **Land Surveyor's Stamp** – Work consisting of the Practice of Land Surveying shall be done by or under the direction of a Surveyor licensed to practice in the State of Washington (RCW 18.43.010), and shall conform to all RCWs and WACs pertaining to surveying and engineering. Plans, specifications, plats, and reports prepared by the Surveyor shall be signed, dated, and stamped with the Surveyors' seal. (RCW 18.43.070) Washington State law defines the "practice of land surveying" as "assuming responsible charge of the surveying of land for the establishment of corners, lines, boundaries, and monuments, the laying out and subdivision of land, the defining and locating of corners, lines, boundaries and monuments of land after they have been established, the survey of land areas for the purpose of determining the topography thereof, the making of topographical delineations and the preparing of maps and accurate records thereof, when the proper performance of such services requires technical knowledge and skill." (RCW 18.43.020(9))

Note 2. **Legal Description** – Legal Descriptions are needed for plats, short plats, easements containing City utilities, pathways, walkways, sidewalks etc. Include the plat name or short plat number, block number if any, and lot number or parcel letter, or the metes and bounds description of the parcel.

Note 3. **Datum** – The Washington State Lambert Grid Coordinate System North Zone, using the NAD83 (1991) datum as established in accordance with Chapter 58.20 Revised

Code of Washington. The unit of measurement shall be the U.S. Survey Foot. The plans shall show the horizontal control used to establish ties to the datum, with type, size, and location, date visited, and the State Plane coordinates for each monument used. Show at least two monuments on each street in the project.

Project control may be shown on the design drawings, or on its own sheet. The Vertical datum for all survey work (including but not limited to mapping, platting, planning design, right-of-way surveys, and construction surveys) shall be the North American Vertical Datum of 1988 (NAVD 1988). The plans shall show the benchmarks used to establish ties to the datum, with reference number, description, location, and elevation of each benchmark used, and any project site benchmarks. Information on horizontal and vertical control monuments can be found in the Washington Council of County Surveyors Data Warehouse at http://plso.wadnr.gov/surveycontrol/data.htm.

Other acceptable sources for benchmarks are WSDOT, King County, and NOAA. When another benchmark is used, establish one benchmark for each datum and show on the plans. Include a local conversion factor between the two data. The benchmark used to establish the conversion factor must be the benchmark nearest to the project site.

Note 4. **Monuments** – The plans shall show all monuments, geometry, and references used to establish the right-of-way, lines referencing the right-of-way, property lines, easements, and any rights in real property shown. The plans shall show bearing and distance on monument lines, or radius, delta angle, and curve length on curving monument lines, and the station at each monument. If construction baselines other than the monument line are used, show the relation of each baseline to the monument line. Survey control and boundary information shall be shown on the design drawings, the vicinity map, or on its own sheet. The survey shall tie into a minimum of two (2) monuments with the state plane coordinate system.

Note 5. **Benchmarks** – Show site benchmarks. Project site benchmarks shall be established by measurement from two local benchmarks, meeting Third Order procedural requirements as specified in the Geospatial Positioning Accuracy Standards by the Federal Geographic Data Committee. Site benchmarks shall be set in a location that will not be disturbed by the proposed construction.

Note 6. Rights-of-way – Show the width on each side of the monument line, and the references used. If the right-of-way is of variable width, show the width at each end of the block.

Note 7. Easements – Show easements, Native Growth Retention Areas, and critical area buffers within the project area, with type, dimensions, and source reference.

Note 8. Property Lines – Show bearings and distances for straight property lines, and radius, delta angle, and arc length for curves.

Note 9. Buildings – Show the location of all existing buildings, including projections, roof overhangs, and covered breezeways. Show the perpendicular distance to the property and right-of-way lines when significant to development. Show footprints of recently demolished buildings.

Note 10. Streets – Show the right-of way lines, monument lines, concrete surfaces, asphalt surfaces, gravel surfaces, and channelization, centerlines, pavement edges, pavement widths, shoulders, ditch lines, curbs, sidewalks, and access locations.

Show the curbs, curb cuts, wheelchair ramps, gutter and flow lines, sidewalks, landscape areas, pedestrian and bike paths.

Note 11. Utilities – Field locate and show all visible utilities, structure and appurtenances. Show buried utilities and the source of the information used. Show the location, size, and description of all utilities including water, power, gas, sewer, and storm drainage systems, and appurtenances. Show elevations at rim and inverts of manholes, catch basins, and inlets. Locate and dimension all fire hydrants, vaults, utility poles, wells, etc.

Note 12. Contours – Show existing and proposed contours at two-foot intervals for portions of the site that will be graded and areas with slopes less than 40 percent. Show 5-foot intervals for portions of the site with slopes that exceed 40 percent but will not be disturbed.

Note 13. Steep Slopes – Identify the top and toe slopes 15 percent and steeper. Show the top and toe of slopes 40 percent or steeper.

Note 14. Topography – Show rockeries, retaining walls, fences, bridges, swales, culverts, etc. Show the location, length, and height above finished grade of all fences, rockeries, and retaining walls. Note heights at end and mid points.

Note 15. Significant Trees – Show evergreen trees that are eight inches or more in diameter and deciduous trees that are twelve inches or more in diameter. Diameter is measured four feet above existing grade. Label each tree with common name and diameter. Show drip lines.

Note 16. Water Features – Show lakes, rivers, streams, ditches, ponds, and other surface water features. Show the line of ordinary high water and the top of any well-defined banks. Show the 100-year floodplain, and show wetland boundaries. Show protected areas: top of bank of Type 1, 2, and 3 streams, and the centerline of Type 4 streams.

Note 17. Environmentally Sensitive Areas – Show areas defined in Sammamish's Critical Areas Ordinance (SMC Chapter 21A.50) and in the Surface Water Design Manual. If the survey shows protected areas on or adjacent to the site, contact the Department of Community Development for boundary verification prior to designing the project.

Note 18. Setbacks – Show the required primary setbacks from the protected areas.

Note 19. Underground Hazards – Show areaways, tunnels, mines and other underground hazards.

Page intentionally left blank.

APPENDIX C - SURFACE WATER REPORT GUIDELINES

Page intentionally left blank

Surface Water Report Guidelines

The Surface Water Report or Technical Information Report (TIR) is a comprehensive supplemental report containing all technical information and analyses related to storm drainage/surface water design for a project. A full TIR or abbreviated version is required for a project according to the thresholds identified in the Surface Water Design Manual. The content will also depend on the complexity of the project and site conditions.

The TIR must be prepared, stamped, and dated by a licensed Civil Engineer in Washington State.

The report submitted to the City must address each requirement and element in the Surface Water Design Manual. If a section does not apply, the engineer may simply mark "N/A" with a brief explanation. This standardized format allows a quicker, more efficient review of information required to supplement the site improvement plan.

When the report requires revisions, the revisions must be submitted in a complete revised report.

Submit two copies of the bound or stapled, 8.5” x 11” report and one PDF electronic version on a compact disk. Figures and drawings may be on larger paper. Include 11” x 17” copy of all drainage plans as an appendix of the report. Figures and drawings larger than 11” x 17” shall be provided separately from the bound document. Please number each page, including figures, and include a Table of Contents.

Page intentionally left blank.

APPENDIX D - GEOTECHNICAL REPORT GUIDELINES

Page intentionally left blank

Geotechnical Report Guidelines

The City may require a geotechnical investigation and report based on the nature of the proposal. Site development for one single-family residence on a site with no steep slopes, erosion hazards, or critical areas, may submit a report previously prepared for that site if:

1. The report is less than five years old and no significant changes have occurred.
2. The geotechnical engineer/engineering geologist who signed the report provides a letter stating the report is still applicable to the site and currently proposed project.

The report must be stamped, signed, and dated by a licensed professional civil engineer in Washington State, who meets the City's criteria for geotechnical engineer. The attached report outline describes the contents for the elements in a geotechnical report; the report submitted to the City must address each element in the outline.

The content under each element will depend on the complexity of the project and site conditions. For example, a single-family residence on a glacial till site without groundwater issues warrants a short, simple report. A high-rise structure with a deep excavation on an alluvial site warrants a longer, more detailed report. The report shall state "Not applicable" for each outline element that does not apply.

The Geotechnical Engineer determines the actual scope of investigation, analysis, and reporting necessary to meet the Standard of Practice with respect to the project and its geotechnical requirements.

Please use double-sided printing for the report.

Number each page.

Cover Sheet

A. The cover sheet has the:

1. Project name and address;
2. Applicant's name, address, and telephone number;
3. Engineering firm’s name, address, and contact information;
4. Engineer's name and license number;
5. Report date and revision dates.

Summary

The report summary presents the major conclusions of the geotechnical investigation and their bases. This section shall be included in all lengthy or complex reports.

Introduction

The introduction sets the stage for the entire report and contains the following sections:

Overview

Introduce the formal project name, address, and parcel numbers.

Describe slope classification(s) according to SMC 21A.

Describe briefly the current or previous work used to form the basis for the conclusions and recommendations contained in the report.

Background

Describe the project’s history when relevant to the reason for the investigation.

List other geotechnical reports completed for the site or adjacent sites and note whether any environmental site assessments or other environmental work has been completed.

Describe the scope of work, including grading, retaining walls, structures, construction materials, and utilities. Include dimensions, quantities, proposed finish floor elevations, maximum depth of cut or fill, foundation and floor loads, etc.

Describe all assumptions that were relied upon to develop the conclusions and recommendations contained in the report.

Purpose and Scope of Services

State succinctly the primary purpose for the geotechnical engineering services.

Summarize the scope of geotechnical engineering services that form the basis for the conclusions and recommendations contained in the report.

Indicate any limitations to the scope of geotechnical engineering services provided, particularly if the scope represents a departure from services typically provided on similar projects.

Investigations Summary

Provide the dates, general nature, and extent of the geotechnical investigation. This section should include data research, borings, test pits, geophysics, physical laboratory testing, chemical testing, field instrumentation or testing, etc.

If the investigation was complex, present a complete and detailed explanation and results in the form of an appendix.

Report Overview

Introduce and describe other sections of the report, directing the reader to critical sections, if appropriate.

Identify and describe all attachments and appendices.

SITE CONDITIONS

Describe all site features relevant to the study and the geotechnical engineering conclusions and recommendations. Terminology shall be clear and consistent through the entire report.

Location and Surface Conditions

Provide the cross streets, addresses, and parcel numbers in order to locate the site.

Describe the site and adjoining properties, including surface elevation, topography, and drainage.

Provide current uses of the site and adjacent properties.

Identify all current structures, subsurface utilities, wells, manmade fills and other surface features.

Describe vegetation, topsoil, paving, and other surface coverings.

Describe any indications of historic geological processes or hazards on or near the site (e.g., slope instability, landslides, liquefaction, flooding, etc.)

Describe any indications of surface releases or other contamination or potential contamination sources.

Describe any planned changes to the surface conditions described above which will take place after the investigation.

Geological Setting

Provide an overview of regional geology, local stratigraphy, groundwater occurrence, etc.

Subsurface Soil Conditions

Describe each soil or geologic unit encountered by their classifications and group units with respect to the properties that are most relevant to the conclusions and recommendations. Give each group unit a unique, clear, common title and consistently refer to this unit by its given title throughout the report.

Provide important results of the laboratory physical property testing and its indications of soil behavior.

Provide design infiltration rate per the current Sammamish SWDM.

Avoid detailed descriptions of the sequence of units found in individual borings; rather, focus on variations in the units across the site, if appropriate. Refer the reader to the exploration logs for details.

Describe any expected changes in subsurface conditions that may occur with time after the investigation.

Groundwater Conditions

Describe the nature and occurrence of groundwater.

Provide an opinion on likely seasonal variations in groundwater levels or flows, and the possibility for changes from those encountered at the time of exploration.

Show groundwater levels on soil logs.

Subsurface Contamination

Describe the nature and extent of soil and/or groundwater contamination as revealed by the explorations. Reference any applicable Environmental Assessments if performed.

Provide important results of the analytical laboratory testing and indications about contamination distribution and concentration.

Indicate limitations of knowledge on the nature and extent of contamination.

Discuss possible changes that may occur in these conditions over time.

DISCUSSION AND CONCLUSIONS

The Discussion and Conclusions shall set out major geotechnical issues and alternatives for the project, along with the Geotechnical Engineer's conclusions, in a succinct and clear manner. This section shall clearly describe the logic and reasoning supporting the recommended approach, or alternative approaches. Specific recommendations shall be presented in the Recommendations section.

Discussions and Conclusions should:

1. Build on information described in the previous sections;
2. Describe project features, soils and construction materials using consistent terminology;
3. Explain any apparent inconsistencies in the data or investigations;
4. Describe clearly any limitations or restrictions to the conclusions and recommendations.

Slope Stability

1. Summarize data and analysis used to evaluate slope stability.
2. Provide an opinion regarding the risk of instability on the site or adjacent properties currently, during construction, and after the project is completed.
3. Describe how design and construction recommendations will reduce or eliminate the risk of stability.
4. Discuss any construction or post-construction measures necessary to verify slope stability.

Seismic Considerations

1. Provide an opinion on the expected level of ground motion during a major earthquake.
2. Describe any seismic risks associated with an earthquake such as liquefaction, lateral spreading, landslides, or flooding.

3. Describe how design and construction recommendations will reduce or eliminate the impact of seismic risks.

Site Work

1. Describe proposed site grading and earthwork and provide an opinion on the proper sequence and approach to accomplish the site work.
2. Describe key issues, which will impact earthwork, including short-term slope stability, on-site and import fill materials, groundwater and drainage, rainfall and moisture sensitive soils, and erosion.
3. Describe how these key issues will be addressed during construction, including dewatering, temporary retaining structures, and erosion control.
4. Include specific recommendations for on-site erosion control based on soil erodibility and the presence of groundwater, surface water, and slopes.
5. Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.
6. Describe suitability of the possible use of native soils for structural backfill.

Retaining Structures

1. Recommend appropriate temporary retaining systems.
2. Recommend the most appropriate permanent retaining system or systems and describe their expected performance with respect to stability and deflection.
3. Summarize the data and analysis used to evaluate permanent retaining systems.
4. Clearly define all limitations on backfill materials, reinforcement, and drainage for reinforced soil slopes and reinforced soil backfill.
5. Describe the limitations on such systems.
6. Emphasize any aspects of site work, particularly with respect to the native soil materials, backfill and drainage, which could impact performance of the retaining structures.
7. Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

Rockeries

1. Emphasize that rockeries usually protect a slope face from erosion. Indicate which rockeries will protect the slope face by preventing soil erosion and sloughing.
2. Include the design criteria for rockeries that serve as retaining structures. Indicate which rockeries will function as retaining structures.
3. Recommend locations for rockeries such that a contractor can reach them for maintenance and repair.
4. Discuss what type of inspection and testing may be required during rock wall construction.

Foundation Support

1. Summarize the data and analysis used to evaluate foundation systems.
2. Provide an opinion on the most appropriate foundation system and possible alternatives, along with the expected level of performance with respect to load capacity and settlement.
3. Emphasize any aspects of site work that could impact the performance of foundations.
4. Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

RECOMMENDATIONS

The Recommendations shall present all detailed geotechnical engineering recommendations for design and construction in a clear and logical sequence.

A. For each item covered in the recommendations sections, present the following:

1. Specific design recommendations along with their limitations;
2. Factors of safety;
3. Minimum dimensions;
4. Effect of expected variations in actual conditions.

B. Specific construction recommendations including

1. Definitions;
2. Materials;
3. Execution;
4. Monitoring testing, or other quality control measures and;
5. Any other construction requirements to support the design recommendations.

Recommendation for the ownership of responsibility for seeing that each recommendation is met, such as owner, geotechnical engineer or other design consultant or contractor.

Site Grading and Earthwork

A. Provide specific design recommendations for:

1) Depth of stripping

2) Soil excavation limits and slopes

3) Depth and lateral limits of over-excavation to remove unsuitable materials

4) Preload fills

5) Location and thickness of particular fill material or compaction requirements

6) Maximum temporary and permanent slopes

7) Permanent surface and subsurface drainage systems

8) Permanent erosion controls.

B. Provide specific construction recommendations for:

1) Clearing

2) Use of on-site and/or import fill materials

3) Excavation and compaction equipment

4) Fill material moisture conditioning, placement, and compaction

5) Proof-rolling, in-place density testing and other quality control measures

6) Temporary seepage and drainage control measures

7) Permanent surface of subsurface drainage system installation (as appropriate)

8) Temporary slope protection and erosion control measures.

All design and construction methodologies shall be specific and identifiable; generalized or vague statements are NOT acceptable.

Temporary Shoring and Retaining Walls

Provide specific design recommendations for:

1. Active and passive earth pressures
2. Surcharge pressures
3. Bearing capacity
4. Minimum or maximum dimensions and depth of penetration
5. Lateral support
6. Wall or backfill drainage systems
7. Any other appropriate structured details

If appropriate, provide specific design recommendations for tie-back anchors including:

1. Anchor inclination
2. No load zones
3. Minimum anchor length
4. Anchor bond zone
5. Anchor adhesions
6. Corrosion protection

Provide specific construction recommendations for:

1. Installation
2. On-site and/or import backfill materials
3. Backfill material moisture conditioning, placement, and compaction
4. In-place density testing or other control measures
5. Seepage and drainage control

If appropriate, provide construction recommendations for tie-back anchors including:

1. Anchor installation methods
2. Anchor testing
3. Monitoring

Rockeries

Provide recommendations as outlined in the Associated Rockery Contractors (ARC) Standard Rock Wall Construction Guidelines (December 1992).

The geotechnical engineer shall provide direct input to the design of the rockeries and provide construction monitoring and testing as appropriate. Specific design parameters may include rock quality, density, and frequency of testing, slopes, keyways, surcharges, drainage, rock sizes, face inclination, and surface drainage.

Reinforced Soil Structures

Geogrid or geotextile fabric may be used to reinforce a fill. If reinforced slopes are used, the geotechnical engineer shall specify, at a minimum, the fill soil materials, vertical spacing of the reinforcement, the specific type of reinforcement and the distance to which it must extend into the fill, the amount of overlap at the reinforcement joints, and the construction sequence. Additional design parameters will be required for each specific site.

Structure and Foundations

Provide seismic design recommendations for

1. Building Code soil type and site coefficients
2. Any specific recommendations to reduce the risk of damage due to earthquakes.

Spread footing foundations – provide design recommendations for:

1. Bearing soils
2. Bearing capacity
3. Minimum footing depths and widths for both interior and exterior footings
4. Lateral load resistance
5. Foundation drainage systems
6. Frost protection

Mat foundations – provide design recommendations for:

1. Bearing soils
2. Bearing capacity
3. Modulus of subgrade reaction
4. Minimum dimensions
5. lateral load resistance

Pile foundations – provide design recommendations for:

1. Type of pile
2. Means of support (end of friction)
3. Minimum dimensions and depths
4. Allowable vertical and uplift capacity
5. Allowable lateral loads and deflections
6. Group effects and minimum spacing

Spread footing or mat foundations – provide construction recommendations for:

1. Foundation subgrade preparation and protection
2. Verification of bearing capacity
3. Installation of foundation drainage system

Pile foundations – provide construction recommendations for:

1. Pile driving equipment
2. Pile installation
3. Pile load tests or verification piles
4. Monitoring and testing during pile installation

Floors

Slab-On-Grade Floors – provide design recommendations for

1. Slab base rock thickness
2. Capillary break
3. Vapor barrier
4. Floor system drainage

Supported Wood Floors – provide design recommendations for

1. Vapor barrier
2. Crawl space drainage.

Slab-On-Grade Floors – provide construction recommendations for:

1. Subgrade preparation
2. Slab base rock placement and compaction
3. Capillary break and vapor barrier installation
4. Floor drainage system installation (when appropriate)

Pavements

Provide design recommendations for pavement design section and pavement drainage.

Provide construction recommendations for pavement subgrade preparation and verification, and pavement base and subbase materials, placement and compaction.

Utilities

Provide construction recommendations for

1. Utility excavation
2. Bedding material placement
3. Backfill material (native and/or imported), placement and compaction

Drainage

Recommend provisions for subsurface drainage at walls, floors, and footings.

Evaluate permanent and temporary surface and subsurface drainage for both walls and floors if applicable. Provide approximate flow rates in gallons per minute and pipe sizes if required by design.

Provide design and recommendation for infiltration facilities, including setbacks from steep slopes per the adopted Stormwater Design Manual.

Hazards

Present additional information if natural or man-made hazards exist on the property. The City's Critical Areas maps identify hazards such as wetlands, streams and flood hazards, erosion, and steep slopes. Recommendations shall be general, and further studies may be required.

FIGURES AND ILLUSTRATIONS

Vicinity Map

Include a Vicinity or Location Map that presents adequate street and/or other physical references to allow clear identification or the project location. This map may be an individual figure or may be included on the Site Plan.

Site Plan

Show the project boundaries, property lines, existing features and the proposed development and structures. A north arrow and scale shall be included along with all subsurface exploration locations. The accuracy of exploration locations shall be indicated on the Site Plan or in the report.

Exploration Logs

Include logs of all explorations describing soil units encountered, soil classification, density or stiffness, moisture conditions, groundwater levels, stratigraphic sequence, common geologic unit name, and other descriptive information.

Laboratory Test Data

Include figures or tables of laboratory test results if presentation of all the data, in the text, would require more than a simple paragraph to supplement the data provided in the exploration logs.

Cross Sections

Include cross sections to visually present all but the simplest subsurface conditions.

Standard Plans

Include figures, graphs and other visual aids to clearly present detailed recommendations. Provide design details (stamped by a licensed professional civil engineer in Washington State) on drawings such as: rockeries, reinforced earth, interceptor trenches, wall and footing drains, utility backfill and other details used for a particular design.

PROJECT ENGINEER'S CERTIFICATION

The report shall contain a page with the professional engineer's seal, signature, and date signed, with the following statement:

"I hereby state that this geotechnical report for _____ (name of project) has been prepared by me or under my supervision and meets the standard of care and expertise which is usual and customary in this community for professional engineers. I understand that the City of Sammamish does not and will not assume liability for the sufficiency, suitability, or performance of facilities prepared based on this report."

APPENDIX E - TRAFFIC IMPACT ANALYSIS REPORT GUIDELINES

Page intentionally left blank

Traffic Impact Analysis Guidelines

A. Introduction

A traffic impact analysis (TIA) 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 specifically concerned with the generation, distribution, and assignment of traffic to and from the development.

The purpose of a TIA is to determine what impact 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 project.

These guidelines have been prepared to establish the requirements for a TIA. The public works department will be responsible under SEPA as well as City ordinances for determining the need for a TIA.

B. When Required

To adequately assess a development's traffic impact on the transportation system and its level of service (LOS), the public works department may require a traffic impact analysis (TIA). The requirement for a TIA will be based on 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 the development.

If a site action requires that an environmental checklist be prepared, a TIA may be required if any of the following conditions are met:

1. The development generates 10 or more trips in the peak hour(s) at any given intersection. This would include site-generated traffic for all turning movements for the peak hour(s) at all affected intersections. The public works department may require analysis of either or both the a.m. and/or p.m. peak hour, and/or peak hour of generator; or
2. The development proposes a use of the subject property, which will increase the amount of site-generated traffic; or

3. The original TIA is more than two years old.
4. Where the increase in traffic volume as measured by ADT, peak hour, or peak hour of the critical movement is more than 10 percent. If the department of public works has made the determination to require a TIA, the TIA shall follow the format outlined in subsection (D).

C. Qualifications for Preparing TIA Documents

The TIA shall be conducted under the direction of a responsible individual or firm. The TIA shall be prepared by an engineer licensed to practice in the state of Washington with special training and experience in traffic engineering and who is a member of the Institute of Transportation Engineers (ITE).

D. Scope of Work

The level of detail and scope of work of a TIA will vary with the size, complexity, and location of the development. A TIA shall be a thorough review of the immediate and long-range effects of the development on the transportation system.

1. Development Prospectus
    - i. Provide a reduced copy of the site plan showing the type of development, street system, rights-of-way limits, access points, and other features of significance in the development. The site plan shall also include pertinent off-site information such as locations of adjacent intersections and driveways, land use descriptions, street right-of-way limits for the existing roadways and other features of significance.
    - 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, multifamily, retail, industrial, etc.), internal street network, proposed access locations, parking requirements, zoning, and other pertinent factors attributable to the development.

iv. Discuss project completion and the occupancy schedule for the development. Identify horizon years for traffic analysis purposes.

2. Existing Conditions

   i. Discuss street characteristics including functional classification, number of traveled lanes, lane width, shoulder treatment, bicycle path corridors, and traffic control at study intersections. A figure shall be used to illustrate existing transportation facilities.

   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 of Sammamish and surrounding jurisdictions if applicable. If data is unavailable, the individual or firm preparing the TIA shall collect the necessary data to supplement the discussions and analysis in the TIA.

   iv. Conduct peak hour turning movement counts at study intersections if traffic volume data is more than two years old, unless otherwise required by the public works department. A copy of the reduced data shall be attached to the TIA when submitted to the City for review.

   v. A figure shall be prepared showing existing average daily traffic (ADT) and peak(s) hour traffic volumes on the adjacent streets and intersections in the study area. Complete turning movement volumes shall be illustrated. This figure shall represent the base-line traffic volumes for analysis purposes.

3. Development Traffic

   This element of the TIA shall be conducted initially to identify the limits of the study area. The study area shall include all pertinent intersections and streets impacted by development traffic.

   The threshold requirement of development traffic exceeding 10 vehicles in the peak hour(s) on the adjacent streets and intersections shall apply. The individual or firm preparing the TIA shall submit to the public works department a figure

illustrating the proposed trip distribution for the development. The trip generation shall be included in a table format on the figure with the peak hour traffic volumes assigned to the study area in accordance with the trip distribution.

Once approved by the public works department, a formal “scoping” with the public works department of the development proposal shall be conducted to clearly identify the study area and contents expected in the TIA. The methodology and procedures used in preparing the trip generation and trip distribution elements of the TIA are as follows:

i. *Trip Generation*. Site-generated traffic of developments shall be estimated using the latest edition of the ITE Trip Generation Manual. Variations of trip rates will require the approval of public works. Average trip rates shall be used for all land use categories where applicable and/or required by public works. Site traffic shall be generated for p.m. and/or a.m. peak hour periods as required by public works. 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 percent. For multi-use and/or phased projects, a trip generation table 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.

ii. *Trip Distribution*. The trip distribution for a development shall be approved by public works prior to the formal scoping of the TIA. The methodology shall be clearly defined and discussed in detail in the TIA.

A regional trip distribution map will be required for large-scale development projects. The TIA shall identify other transportation modes that may be applicable, such as transit use, bicycle, and pedestrian facilities. Developments are encouraged to implement transportation demand management practices such as flextime for employees and ridesharing programs including carpools, vanpools, shuttle buses, etc.

4. Future Traffic

    i. *Future Traffic Conditions Not Including Site Traffic.* Future traffic volumes shall be estimated using information from transportation models for applying an annual growth rate to baseline traffic volumes. The future traffic volumes shall be representative of the horizon year for project development. Public Works shall determine an appropriate growth rate, if that option is utilized. In addition, proposed on-line development projects shall be taken into consideration when forecasting future traffic volumes.

    ii. *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 volume to show the total traffic conditions estimated at development completion. A figure will be required showing daily and peak period turning movement volumes for each traffic study intersection. In addition, a figure shall be prepared showing the base-line volumes with site-generated traffic added to the street network. This figure will represent site-specific traffic impacts to existing conditions.

5. Traffic Operations

    i. The level of service (LOS) and capacity analysis shall be conducted for each pertinent intersection in the study area as determined by the TIA scoping process. The methodology and procedures for conducting the capacity analysis shall follow the guidelines specified in the latest Highway Capacity Manual. The individual or firm preparing the TIA shall calculate the intersection LOS for each of the following conditions:

        1) Existing peak hour traffic volumes (figure required).

        2) Future traffic volumes not including site traffic but including pipeline projects (figure required).

        3) Future traffic volumes including site traffic (figure required).

        4) LOS results for each traffic volume scenario (table required).

ii. The LOS table shall include LOS results for a.m. peak, p.m. peak, and peak hour of generator 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. The capacity analyses 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 will be made available by the City of Sammamish.

iii. If the "new development" is scheduled to be completed in phases, the TIA shall conduct a LOS analysis for each separate development phase. The incremental increases in site traffic from each phase shall be included in the LOS analysis for each proceeding year of development completion. A figure will be required for each horizon year of phased development.

iv. If the development impacts a traffic signal coordination system currently in operation, the TIA will include an operational analysis of the system. Timing plans and proposed modifications to the coordination system will be analyzed. The capacity analysis shall be conducted using a City approved software package. The computer worksheets of each capacity analysis shall be submitted concurrently with the TIA document. For unsignalized intersections, the methodology from the latest edition of the Highway Capacity Manual shall be used. For roundabout intersections, the capacity analysis shall be conducted using City approved roundabout analysis software. A copy of the capacity analyses worksheets shall be submitted concurrently with the TIA document.

6. Mitigation

The TIA shall include a proposed mitigation plan. The mitigation may be either the construction of necessary transportation improvements or contributions to the City

for the developments of a fair share of the costs for identified future transportation improvements. Level of service of “E” and “F” shall be used as the threshold for determining appropriate mitigating measures on roadways and intersections in the study area. Mitigating measures shall be required to the extent that the transportation facilities operate at a level of service “D” condition or better upon completion of the development. The following guidelines shall be used to determine appropriate mitigating measures of traffic impacts generated by new developments.

i. On transportation facilities where the need is to construct improvements by the horizon year of the development, the cost for the mitigation will be entirely borne by the development. However, in the event public works identifies more than one development under simultaneous review, cumulative impacts, and distribution of mitigation costs will be considered. A latecomer’s agreement could be formulated by the applicant for reimbursement of mitigation costs.

ii. On transportation facilities programmed for improvements as part of a City project, the adverse traffic impacts of the development will be considered mitigated by the applicant providing a proportionate share contribution of the costs for the proposed improvements. The proportionate share of costs for the improvements shall be based on the percentage of highest peak hour development traffic generated through the intersection. The percentage shall be based on the total projected peak hour traffic volumes for the horizon year of the transportation facility.

iii. If the transportation facility currently operates at less than level of service “D”, the development may be required to make interim facility improvements to improve the level of service to LOS “D” or better. The cost of the interim improvements will be deducted from the development’s proportionate share of costs for the programmed facility improvements only if the cost of the interim improvements is less than the ultimate proportionate share. If the interim improvements cannot be incorporated into the ultimate improvements programmed for the

transportation facility, there will be no reimbursement for interim costs incurred.

iv. On transportation facilities where the existing level of service condition is less than LOS “D” and where no improvements are programmed to improve capacity and traffic operations, the “new development” shall mitigate the intersection to an acceptable level of service “D” condition or wait until the improvements are implemented by the City or other developments.

v. Unsignalized intersections that currently operate less than a level of service “D” condition shall be analyzed for traffic signal and intersection improvements. If traffic signal warrant is satisfied, signal, or roundabout, or intersection improvements will be required as a mitigating measure for the development. If it is determined by the Public Works Department that traffic signal warrants are close to being satisfied by the development’s horizon year, the TIA shall determine if traffic signal warrants and intersection improvements would be needed within a five-year period after the development’s horizon year. The development would be required to provide a proportionate share of the cost as a traffic mitigation fee towards future traffic signal and intersection improvements if warranted within the five-year period.

However, if traffic signal warrants were not satisfied after a five-year period from the development’s horizon year, mitigation fees would not be required from the development for traffic signal improvements.

vi. Signalized intersections where the projected level of service condition is at “D”, but where one or more of the level of service conditions on the approaches falls below level of service “D”, mitigating measures may be required to improve the capacity and traffic operations at the intersection. The City reserves the right to review all adverse traffic impacts at these intersections and to determine appropriate mitigating measures.

vii. Where there are no bicycle lanes on abutting streets, which have been identified in the City’s capital improvement plan or bike, trails, bikeways,

pathways plan as streets to have bicycle lanes, the applicant shall provide sufficient right-of-way to allow the construction of the planned bicycle lane.

viii. To mitigate pedestrian impacts, a concrete gutter/curb/sidewalk section shall be constructed along abutting streets. For formal plats, to provide for the safety of schoolchildren walking to the bus, concrete curbs, gutters, and sidewalks shall be provided along each side of all interior plat roads. To mitigate pedestrian impacts, a bus stop shelter on a concrete pad shall be constructed where Metro Transit and/or the school district has identified a need for a bus stop to serve the development and the citizens of Sammamish. Metro Transit and/or the school district shall provide design standards for the bus shelter.

Page intentionally left blank.

APPENDIX F - RIGHT-OF-WAY STREET TREE LIST

Page intentionally left blank.

Right of Way Street Tree List

The following list is a guide for general use within the public Rights of Way (ROW) in the City of Sammamish. Any changes or additions requested shall be required to be approved by the Public Works and Parks & Recreation Directors on a case by case basis. For consideration of conifers within the ROW at a minimum there must be:

1. Ample area for root growth whereas roots will not impact finish surfaces (asphalt, concrete, etc.)
2. No impact to pedestrian and vehicular sight distances
3. The recommendation shall be made by a licensed arborist and include all details necessary pertaining to the tree species proposed.
4. Vertical clearances shall be maintained in a manner appropriate for the application.

LARGE COLUMNAR TREES

Scientific & Common Name	Mature Height (ft.)	Spread (ft.)	Under Wires/View Covenants	Min Strip Width (ft.)	Flower Color	Fall Color	Comments
Acer nigrum 'Green Column' Green Column Black Sugar Maple	50	10	No	6	N/A		Good close to buildings
Nyssa sylvatica Tupelo	50	25	No	6	N/A		Handsome chunky bark – Great Plant Pick
Quercus 'Crimschmidt' Crimson Spire Oak	45	15	No	6	N/A		Hard to find in the nursery trade
Quercus frainetto Italian Oak	50	30	No	6	N/A		Drought resistant – beautiful green, glossy leaves in summer. Great Plant Pick
Quercus robur 'fastigiata' Skyrocket Oak	40	15	No	6	N/A		Columnar variety of oak

LARGE TREES

Scientific & Common Name	Mature Height (ft.)	Spread (ft.)	Under Wires/View Covenants	Min Strip Width (ft.)	Flower Color	Fall Color	Comments
Acer saccharum 'Bonfire' Bonfire Sugar Maple	50	40	No	8	N/A		Fastest growing sugar maple
Acer saccharum 'Commemoration' Commemoration Sugar Maple	50	35	No	8	N/A		Resistant to leaf tatter. Great Plant Pick
Acer saccharum 'Green Mountain' Green Mountain Sugar Maple	45	35	No	8	N/A		Reliable fall color. Great Plant Pick

Scientific & Common Name	Mature Height (ft.)	Spread (ft.)	Under Wires/View Covenants	Min Strip Width (ft.)	Flower Color	Fall Color	Comments
Acer saccharum 'Legacy' Legacy Sugar Maple	50	35	No	6	N/A		Limited use - where sugar maple is desired in limited planting strip area. Great Plant Pick
Aesculus flava Yellow Buckeye	60	40	No	8			Least susceptible to leaf blotch – large fruit – fall color is varied, but quite beautiful
Cercidiphyllum japonicum Katsura Tree	40	40	No	6	N/A		Needs lots of water when young – can produce large surface roots. Great Plant Pick
Fagus sylvatica Green Beech	90	40	No	8	N/A		Silvery-grey bark
Fagus sylvatica 'Asplenifolia' Fernleaf Beech	70	40	No	8	N/A		Beautiful cut leaf. Great Plant Pick
Gymnocladus dioicus 'Espresso' Espresso Kentucky Coffee	50	35	No	8	N/A		Very coarse branches - extremely large bi-pinnately compound leaves
Liriodendron tulipifera Tulip Tree	60	30	No	8	N/A		Fast-growing tree – can get very large in open conditions
Quercus bicolor Swamp White Oak	50	45	No	8	N/A		Interesting shaggy peeling bark
Quercus coccinea Scarlet Oak	50	40	No	8	N/A		Best oak for fall color
Quercus imbricaria Shingle Oak	60	50	No	8	N/A		Nice summer foliage - leaves can persist throughout the winter
Quercus muhlenbergii Chestnut Oak	60	50	No	8	N/A		coarsely toothed leaf

Scientific & Common Name	Mature Height (ft.)	Spread (ft.)	Under Wires/View Covenants	Min Strip Width (ft.)	Flower Color	Fall Color	Comments
Quercus robur English Oak	50	40	No	8	N/A		Large, sturdy tree. Acorns do not need dormant cold period to germinate, so can be invasive.
Quercus rubra Red Oak	60	45	No	8	N/A		Fast growing oak – large tree that needs space
Quercus velutina Black Oak	70	50	No	8	N/A		More drought tolerant than red oak
Taxodium distichum Bald Cypress	65	35	No	8	N/A		A deciduous conifer, broadly spreading when mature – columnar when young. Great Plant Pick
Ulmus 'Homestead' Homestead Elm	60	35	No	6	N/A		Complex hybrid - close in form to American elm - Resistant to Dutch elm disease
Ulmus 'Frontier' Frontier Elm	50	35	No	6	N/A		Resistant to Dutch elm disease
Zelkova serrata 'Greenvase' Green Vase Zelkova	45	40	No	6	N/A		Attractive exfoliating bark provides Winter appeal. Dark green leaves turn orange-red and purple in Fall. Great Plant Pick
Zelkova serrata 'Village Green' Village Green Zelkova	40	40	No	6	N/A		Green Vase, Mussichino and Halka are improved forms. Great Plant Pick
Fraxinus latifolia 'Oregon Ash'	50	30	No	6	N/A		Native to PNS, prefers wet areas

Scientific & Common Name	Mature Height (ft.)	Spread (ft.)	Under Wires/View Covenants	Min Strip Width (ft.)	Flower Color	Fall Color	Comments
Metasequoia glyptostroboides 'Dawn Redwood'	70	25	No	6	N/A		Fast growing deciduous conifer
Pinus nigra 'Austrian Pine'	55	30	No	8	N/A	N/A	Cold hardy, adaptable

MEDIUM / LARGE TREES

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Acer campestre Hedge Maple	40	30	No	5	N/A		Contrary to its name, this is not a small tree – nice overall shape and structure
Acer campestre 'Evelyn' Queen Elizabeth Hedge Maple	40	30	No	5	N/A		More upright branching than the species.
Acer freemanii 'Autumn Blaze' Autumn Blaze Maple	50	40	No	6	N/A		Cross between red and silver maple – fast growing with good fall color
Acer miyabei 'Morton' State Street Maple	40	30	No	8	N/A		Similar to, but faster growing and larger than Hedge maple
Acer pseudoplatanus 'Atropurpureum' Spaethii Maple	40	30	No	8	N/A		Leaves green on top purple underneath.
Aesculus x carnea 'Briottii' Red Horsechestnut	30	35	No	6			Resists heat and drought better than other horsechestnuts

Nothofagus antarctica Antarctic Beech	50	30	No	6	N/A		Rugged twisted branching and petite foliage – difficult to find in the nursery trade
Tilia americana 'Redmond' Redmond Linden	60	35	No	8	N/A		Pyramidal, needs extra water when young
Tilia cordata 'Greenspire' Greenspire Linden	40	30	No	6	N/A		Symmetrical, pyramidal form – sometimes has structural issues due to tight branch attachements
Ulmus parvifolia 'Emer II' Allee Elm	60	40	No	8	N/A		Exfoliating bark and nice fall color – Resistant to Dutch Elm Disease

MEDIUM COLUMNAR TREES

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Carpinus betulus 'Fastigiata' Pyramidal European Hornbeam	35	20	No	6	N/A		Broadens when older. Great Plant Pick
Fagus sylvatica 'Dawyck Purple' Dawyck Purple Beech	45	15	No	6	N/A		Purple foliage.
Liriodendron tulipifera 'Fastigiatum' Columnar Tulip Tree	60	20	No	6			Good next to buildings – can have problems with tight branch angles. Great Plant Pick
Malus 'Tschonoskii' Tschonoskii Crabapple	30	15	Yes	4			Sparse green fruit, pyramidal

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Oxydendron arboreum Sourwood	35	15	No	4			Consistent and brilliant fall color. Great Plant Pick
Pyrus calleryana 'Cambridge" Cambridge Pear	40	15	No	4			Narrow tree with better branch angles and form than the species – brittle limbs may be a problem with ice or wet snow. Limit large plantings.

MEDIUM TREES

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Acer grandidentatum 'Schmidt' Rocky Mt. Glow Maple	25	20	Yes	5	N/A		Intense red fall color - Limited availability in nursery trade
Acer truncatum x A. platanoides 'Keithsform Norwegian Sunset Maple	35	25	No	6	N/A		Reliable fall color - nice reddish orange
Acer truncatum x A. platanoides 'Warrensred' Pacific Sunset Maple	30	25	Yes	6	N/A		Limited use under higher wires
Betula albosinenesis var septentrionalis Chinese Red Birch	40	35	No	6	N/A		White and pink peeling bark. Great Plant Pick
Carpinus caroliniana American Hornbeam	25	20	Yes	6	N/A		Outstanding fall color (variable – yellow, orange, red) – nice little tree. Great Plant Pick

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Cladrastis kentukea Yellowwood	40	40	No	6			White flowers in spring, resembling wisteria flower – blooms profusely only every 2 to 4 years – yellow/gold fall color
Cornus controversa 'June Snow' Giant Dogwood	40	30	No	6			Frothy, 6-inch clusters of white flowers in June – Great Plant Pick
Crataegus crus-galli 'Inermis' Thornless Cockspur Hawthorne	25	30	Yes	4			Red persistent fruit
Cornus 'Eddie's White Wonder' Eddie's White Wonder Dogwood	30	20	Yes	4			A hybrid of C. florida and C. nuttalii
Crataegus x lavalii Lavalle Hawthorne	25	20	Yes	4			Thorns on younger trees. Great Plant Pick
Davidia involucrata Dove Tree	40	30	No	6		N/A	Large, unique flowers in May. Great Plant Pick
Eucommia ulmoides Hardy Rubber Tree	50	40	No	8	N/A	N/A	Dark green, very shiny leaves – insignificant fall color
Fagus sylvatica 'Rohanii' Purple Oak Leaf Beech	50	30	No	8	N/A	N/A	Attractive purple leaves with wavy margins. Great Plant Pick
Halesia monticola Mountain Silverbell	45	25	No	4			Attractive small white flower
Halesia tetraptera Carolina Silverbell	35	30	No	4			Attractive bark for seasonal interest

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Koelreuteria paniculata Goldenrain Tree	30	30	Yes	4			Midsummer blooming – slow growing. Great Plant Pick
Magnolia denudata Yulan Magnolia	40	40	No	4		N/A	6" inch fragrant white flowers in spring. Great Plant Pick
Magnolia grandiflora 'Victoria' Victoria Evergreen Magnolia	25	20	Yes	4		N/A	Evergreen magnolia – can be damaged in years with wet, heavy snow. Limit large plantings. Most suitable for protected locations close to buildings. Great Plant Pick
Magnolia kobus 'Wada's Memory' Wada's Memory Magnolia'	30	20	Yes	4			Does not flower well when young. Great Plant Pick
Ostrya virginiana Ironwood	40	25	No	4	N/A		Hop like fruit – slow growing
Phellodendron amurense 'Macho' Macho Cork Tree	40	40	No	6	N/A		This variety is fruitless – fall color can be varied. High drought tolerance
Prunus cerasifera 'Krauter Vesuvius' Vesuvius Flowering Plum	30	20	Yes	4		N/A	Burgundy colored leaves – tree best used as an accent rather than in mass plantings
Quercus Ilex Holly Oak	40	30	No	6	N/A	N/A	Evergreen oak - Underside of leaf is silvery-white. Often has a prominent umbrella form

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Rhamnus purshiana Cascara	30	20	Yes	4	N/A		Native tree – fall color depends on exposure – purplish fruit feeds many native birds
Sorbus x hybridia Oakleaf Royal Mt. Ash	30	20	Yes	4			It has leaves which are similar to English oak, and interesting bark for seasonal features.
Styrax japonica Japanese Snowbell	25	25	Yes	4			Reliable and easy to grow, it has plentiful, green ½" inch seeds. Flowers similar to lily in the valley. Great Plant Pick
Tilia cordata 'De Groot' De Groot Littleleaf Linden	40	20	Yes	5	N/A		One of the smaller stature littleleaf lindens.
Tilia cordata 'Chancole' Chancelor Linden	35	20	No	6	N/A		Pyramidal when young. Fragrant flowers that attract bees.
Ulmus parvifolia 'Emer I' Athena Classic Elm	30	35	No	4	N/A		High resistance to Dutch Elm Disease. Drought resistant. Cinnamon colored exfoliating bark for seasonal interest.
Chamaecyparis nootkatensis 'Pendula' 'Weeping Alaska Cedar'	30	10	No	8	N/A	N/a	Narrow, conical, light green foliage
Pinus strobus 'Fastigiata' 'Fastigiate White Pine'	30	10	No	8	N/A	N/a	Narrow, upright form, blue-green foliage

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Prunus cerasifera 'Cripoizam' 'Crimson Pointe Plum'	25	10	Yes	5			Pink buds open to white flowers that contrast nicely with the emerging purple foliage
Prunus cerasifera 'Thundercloud' 'Thundercloud Plum	30	20	Yes	5		N/A	Can produce significant fruit
Pinus flexillis 'Vanderwolf's Pyramid' 'Vanderwolf's Pyramid Pine	40	20	No	8	N/A	N/A	Pyramidal shape, blue green foliage
Sorbus x hybridia 'Oak-leaf Mountain Ash	40	30	No	5	N/A		Resistant to dutch elm disease, vase shaped form
Gingko biloba 'Princeton Sentry' 'Princeton Sentry Ginkgo	40	15	No	6	N/A		Narrowly pyramidal form, seedless male clone
Halesia Carolina 'Carolina Silverbell'	40	35	No	5			Bell shaped flowers

SMALL COLUMNAR TREES

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Maackia amurensis Amur Maackia	30	20	Yes	4		N/A	Interesting exfoliating bark – flowering in June or July - varies in intensity from year to year
Malus 'Adirondack' Adirondack Crabapple	20	10	Yes	4			Very resistant to apple scab – one of the narrowest crabapples –

							persistent reddish ¼" fruit. Great Plant Pick
Malus 'Red Barron' Red Barron Crabapple	20	10	Yes	4			Deep pink blossom and persistent red berries for seasonal interest
Prunus serrulata 'Amanogawa' Amanogawa Flowering Cherry	20	10	Yes	4			Pinkish flower bud, changing to white flower.
Sorbus americana 'Dwarfcrown' Red Cascade Mountain Ash	20	10	Yes	4			Nice winter form - Red berries persistent in clusters

SMALL TREES

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Acer buegerianum Trident Maple	25	25	Yes	4	N/A		Somewhat shrub-like – must train to a single stem – interesting bark. Great Plant Pick
Acer ginnala 'Flame' Flame Amur Maple	25	20	Yes	4			Clusters of small cream colored flowers in spring – very fragrant. Nice fall color. Informal branch structure.
Acer griseum Paperbark Maple	25	20	Yes	4	N/A		Peeling cinnamon colored bark for seasonal interest. Great Plant Pick
Acer palmatum Japanese Maple	20	25	Yes	4	N/A		Many varieties available – select larger varieties for street planting

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Acer triflorum Three-Flower Maple	25	20	Yes	4	N/A		Multi seasonal interest with tan, exfoliating bark and red, orange/red fall color. Great Plant Pick
Amelanchier grandiflora 'Princess Diana' Princess Diana Serviceberry	20	15	Yes	4			Good for narrower planting strips
Amelanchier x grandiflora 'Autumn Brilliance Autumn Brilliance Serviceberry	20	15	Yes	4			Good for narrower planting strips – reliable bloom and fall color
Carpinus japonica Japanese Hornbeam	30	25	Yes	6	N/A		Wide spreading, slow growing – fall color is not outstanding. Great Plant Pick
Cercis canadensis Eastern Redbud	25	30	Yes	4			Deep pink flowers on bare twigs in spring
Cercis siliquastrum Judas Tree	25	30	Yes	4			Deep pink flowers on bare twigs in spring – drought resistant
Cornus alternifolia Pagoda Dogwood	25	25	Yes	4			Small white flowers in flat clusters – fall color is varied. Great Plant Pick
Cornus kousa 'Chinensis' Kousa Dogwood	20	20	Yes	4			Does not do well on harsh, dry sites. Limit large plantings. Great Plant Pick
Cotinus obovatus American Smoke Tree	25	25	Yes	4			Showy pinkish panicles of flowers in the spring – reddish purple leaves on some varieties. Great Plant Pick

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Lagerstroemia 'tuscarora' Tuscarora Hybrid Crape Myrtle	20	20	Yes	4			Light cinnamon brown bark lends year round interest – drought resistant – likes a warm site
Magnolia 'Elizabeth' Elizabeth Magnolia	30	20	Yes	4		N/A	Yellowish to cream colored flower in spring. Great Plant Pick
Magnolia 'Galaxy' Galaxy Magnolia	25	25	Yes	4			Showy pink flowers. Great Plant Pick
Magnolia x loebneri Loebner Magnolia	20	20	Yes	4			Flower is 'star' shaped rather than tulip like – white to pinkish white in March or April. Great Plant Pick
Malus 'Golden Raindrops' Golden Raindrops Crabapple	20	20	Yes	4			Disease resistant – persistent yellow fruit in fall and winter. Great Plant Pick
Malus 'Donald Wyman' Donald Wyman Crabapple	25	25	Yes	4			Large white blossom – nice green foliage in summer
Malus 'Lancelot' ('Lanzam') Lancelot Crabapple	15	15	Yes	4			Red flower buds, blooming white – red persistent fruit
Parrotia persica Persian Parrotia	30	25	Yes	4			Blooms before it leafs out – drought tolerant - Varied fall color - reds, oranges and yellows. Great Plant Pick

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Prunus 'Frankthrees' Mt. St. Helens Plum	20	20	Yes	4		N/A	Burgundy colored leaves – tree best used as an accent rather than in mass plantings
Prunus 'Newport' Newport Plum	20	20	Yes	4		N/A	Burgundy colored leaves – tree best used as an accent rather than in mass plantings
Prunus 'Snowgoose' Snow Goose Cherry	20	20	Yes	4			This selection sports abundant white flowers and healthy green, disease-resistant foliage
Prunus x yedoensis 'Akebono' Akebono Flowering Cherry	25	25	Yes	4			Has masses of large, semi-double, pink flowers – most widely planted cherry in Pacific Northwest
Sorbus alnifolia Korean Mountain Ash	40	25	No	6			Simple leaves and beautiful pink/red fruit. Great Plant Pick
Stewartia monodelpha Orange Bark Stewartia	30	20	Yes	4			Extraordinary cinnamon colored bark – avoid hot, dry sites. Great Plant Pick
Stewartia psuedocamellia Japanese Stewartia	30	20	Yes	6			Patchwork bark, white flower in spring. Great Plant Pick
Styrax obassia Fragrant Styrax	25	20	Yes	4			Smooth gray bark and fragrant white flowers. Great Plant Pick
Acer platanoides 'Globosa' 'Globe Norway Maple'	15	18	Yes	5	N/A		Dense and round crown

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Acer tataricum 'Taterian Maple'	25	20	Yes	5	N/A		Oval to rounded shape, often low branched
Amelanchier laevis 'Snowcloud' 'Snowcloud Serviceberry'	28	20	Yes	4			Edible fruit
Crataegus laevigata 'Crimson Cloud' 'Crimson Cloud Hawthorn'	25	18	Yes	5		N/A	Wavy branches
Fraxinus excelsior 'Aureafolia' 'Golden Desert Ash	20	18	Yes	5	N/A		Small rounded tree, bright golden stems and twigs
Fraxinus excelsior 'Globosa" 'Globe Ash'	20	20	Yes	5	N/A		Dense and cylindrical crown
Halesia carolina 'Wedding Bell Silverbell'	20	15	Yes	5			White, bell shaped flowers
Malus 'Jarmin' Marllee Crabapple'	24	10	Yes	5			Narrow, upright form, good disease resistance
Malus 'Royal raindrops' 'Royal Raindrops Crabapple'	20	15	Yes	4			Disease resistant, good fall colors
Prunus sargentii 'JFS-KW58' 'Pink Flair Cherry'	25	15	Yes	5			Upright narrow case shape
Prunus serrulata 'Royal Burgundy' 'Royal Burgundy Cherry	20	15	Yes	5			Vase shaped crown
Prunus 'Snow Goose' 'Snow Goose Cherry'	20	20	Yes	5			Disease resistant, strongly upright form
Prunus viginiana 'Canada Red' 'Canada red Chokecherry'	25	20	Yes	5			Foliage turns fron green in spring to dark purple as weather warms and a deeper red in autumn
Pyrus calleryana 'Jaczam' 'Jack Pear'	16	10	Yes	5			Tight, upright form

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Sorbus Americana 'Dwarfcrown' 'Red Cascade Mountain Ash	18	8	Yes	5			Small, red berries in clusters

NATIVE EVERGREEN SPECIES

Use only in large plater strips 10'+, Use only where lower branch growth will not interfere with site distance

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Abies grandis 'Grand Fir'	100	30	No	10	N/A	N/A	Native evergreen, conical
Pinus ponderosa 'Ponderosa Pine'	80	30	No	15	N/A	N/A	Native evergreen, adaptable to west-side
Thuja plicata 'Western Red Cedar'	100	40	No	15	N/A	N/A	Native evergreen, large maturing species
Tsuga heterophylla 'Western Hemlock'	100	30	No	15	N/A	N/A	Native evergreen, large maturing species

Page intentionally left blank.

APPENDIX G - RECORD DRAWING CRITERIA

Page intentionally left blank.

Record Drawing Requirements (As-Builts)

Record drawings for all right-of-way construction projects and for surface water drainage systems that connect to City infrastructure, are required prior to a request for final inspection or issuance of Certificate of Occupancy.

A. Record drawings shall accurately reflect revisions made to approved plans during construction. The record drawings shall locate all newly installed, existing, and abandoned utilities encountered during construction, but not shown on the approved plans.

B. Record drawings shall be stamped, signed, and dated by a State of Washington Registered Civil Engineer.

C. As-constructed survey information provided on a record drawing shall be provided by a licensed land surveyor.

D. The Applicant shall provide the City inspector preliminary record drawings on paper. Once the City approves the preliminary submittal, the Applicant provides the final record drawings in the following formats. Each plan sheet shall bear the engineer and the surveyor stamps, signature, and date signed:

1. Paper (for review only);
2. Mylar (22 inches by 34 inches) (Upon request after completed review);
3. AutoCAD format; and
4. PDF electronic file

E. Each sheet of the record drawings shall include the following statement located in the bottom right hand corner of the sheet.

> **"These plans are record drawings and the information shown accurately reflects existing field conditions as of this date _____."**

F. Final corrected drainage Technical Information Report (TIR) shall be submitted in accordance to the requirements of the Surface Water Design Manual.

CAD GUIDELINES

A. Required Electronic Submittals:

1. AutoCAD Civil 3D 2014.
2. Xref file (External reference files) = these are other files that are linked to the main drawing such as other drawings and images. All Xref files shall be merged into one drawing file.
3. *.ctb files = this is the color settings file.
4. PDF file of the complete drawing.

B. Survey Info:

1. Horizontally referenced to WA State Plane Coordinates, North Zone, NAD 83 HARN GCS 4602 in Survey Feet.
2. Vertically referenced to NAVD 1988, feet.
3. Provide eastings and northings for existing and new monuments and benchmarks in the coordinate system referenced, as an embedded or separate table.

C. Drafting Guidelines

1. When record drawings reflect changes in the permitted plans, strike throughs shall be used on design details such as pipe inverts, pipe soffits, pipe slopes, pipe sizes, pipe materials, and grading changes and the recorded information displayed adjacent to the strike out details.
2. Layering Designations in CAD Files shall be separated and delineated for storm facilities (separate layers for pipes, catch basins and other structures), water utilities, sanitary sewer utilities, buildings, pavement edges, sidewalks, curb ramps, water bodies, wetlands, poles, trees, property lines, ROW boundaries, luminaires, signs, pavement markings, traffic signals, barriers, handrails, guard rails, landscape areas and fences.

3. All lines shall be snapped and closed, and attributes shall be defined on Layer 0.
4. Drawings shall be purged of empty, unused, or non-essential drawing data.
5. Drawings shall be in full-scale format (1ft =1ft).
6. All plan sheets shall be drafted to fit 22x34 inch paper scale.
    i. Layout Management:
    ii. All elements shall be created in Model space. (Note: The City's GIS software does not draw features created in Paper space).

Page intentionally left blank.

APPENDIX H - ENGINEERING DEVIATION CRITERIA

Page intentionally left blank.

Deviation from Public Works Standards Guidelines

Deviations from public works standards is a mechanism to allow the City to grant an adjustment in the application of the public works standards where there are unique circumstances relating to the proposal.

A. Decision Criteria

The Director of Public Works shall grant a deviation from the Public Works Standards only if the applicant demonstrates all of the following;

1. The granting of such deviation will not be materially detrimental to the public welfare or injurious or create adverse impacts to the property or other property(s) and improvements in the vicinity in which the subject property is located.
2. The authorization of such deviation will not adversely affect the implementation of the Comprehensive Plan adopted in accordance with State Law.
3. The deviation shall not conflict with the standards of the critical areas regulations SMC 21A.50.
4. The deviation from the Public Works Standards shall only be granted if the proposal meets the following:
    - i. Conform to the intent and purpose of the Sammamish Municipal Code;
    - ii. Based upon sound engineering judgement;
    - iii. The requirements for safety, environmental consideration, function, appearance, and maintainability are fully met;
    - iv. The deviation is in the best interest for the public.
5. A deviation from roadway design standards must meet the objectives for fire protection. Any deviation that does not meet the International Fire Code shall also require approval by the Fire Marshall.

B. Procedure

1. Applicant shall submit a deviation request in the format of the approved City of Sammamish Deviation Review form. Any supporting figures and plans shall be on a size no larger than 11”x17”.
2. The Engineering department shall review the deviation request to ensure that all decision criterial are met. Recommendations shall be submitted to the Public Works Director for approval or denial.
3. The Public Works Director shall approval or deny the deviation request and provide a summary of conclusions to the applicant.

801 228th Avenue SE, Sammamish, Washington 98075-9509
Phone: 425-295-0500 • Fax: 425-295-0600 • www.sammamish.us

Application for Deviation
From Public Works Standards (PWS)

Permit Number: _____ _____

Applicant:_____

Applicant Address/Phone/Email:_____

Applicant Signature: _____

Project Name: _____

Project Address: _____

Associated Applications: _____

Instructions to Applicant:

Pursuant to Chapter 6, Section 6.2 of the 2016 Public Works Standards, deviations to the PWS may be authorized only upon submittal and approval of information, plans, and/or design data by the engineer which indicates that the requested deviation is: (1) Conform to the intent and purpose of the Sammamish Municipal Code, (2) based upon sound engineering judgment; (3) that requirements for safety, environmental considerations, function, appearance, and maintainability are fully met; and (4) the deviation is in the best interest of the public.

Please be sure to include all plans, sketches, photos and maps which may assist in complete review and consideration of this deviation request. Failure to provide all pertinent information may result in delayed processing or denial of your request.

All deviations must be approved by the Public Works Director in writing prior to the start of construction.

General Description of Deviation Request and Applicable PWS Standards:

Description of Unique Circumstances Justifying Deviation Request:

Proposed Deviation Design and Detailed Description:

Decision Section

Decision: **APPROVED** / **DENIED**

The applicant has / has not demonstrated that the proposed variance is in the public interest and that requirements for safety, function, fire protection, appearance, and maintainability based upon sound engineering judgment are fully met.

Summary of Basis for Decision:

Review and Authorization Signature

Development Review Engineer:_____ Date: _____

City Engineer: _____ Date: _____

Public Works Director:_____ Date:_____

APPENDIX I - RIGHT OF WAY VACATION

Page intentionally left blank.

Street and Alley Vacation Procedures

A street "vacation" means that the public is letting go of, or "vacating," the public interest in a public right-of-way. After a street or an alley is vacated, the public no longer has a right to the use of the property for access. The purpose of the appendix section is to establish the procedures, notice requirements and fees for the vacation of streets and within the City. This appendix is intended to implement the authority granted to the City by Chapter 35.79 RCW and RCW 35A.47.020 and to conform to their provisions.

A. Initiation of Vacation

The owners of an interest in any real property abutting upon any public right-of-way who may desire to vacate the full right-of-way, or any part thereof, may petition the City council. In the alternative, the City council may itself initiate a vacation by resolution. The petition or resolution shall be filed with the City clerk.

B. Petition for Vacation

The petition shall be in the form prescribed by the Public Works Director. The petition shall also discuss the criteria set forth. The sufficiency of the petition shall be governed by RCW 35A.01.040.

C. Petition Fees

Every petition for the vacation shall be accompanied by a fee in the amount established by resolution by the City to defray the administrative costs incurred in processing the petition, publishing, posting and mailing notices, plus any consulting costs incurred by the City during the review process.

D. Survey, Vicinity Map, Plat Map and Legal Description

1. Every petition shall be accompanied by:

    i. A survey, containing an exact legal description of the portion of the right – of-way to be vacated prepared and sealed by a professional land surveyor, registered in the State of Washington;

    ii. A vicinity map showing the general area of the proposed vacation;

iii. A plat map prepared and sealed by a professional land surveyor, registered in the State of Washington, indicating the specific parcels abutting the proposed right of way to be vacated;

iv. A name and address of all property owners for the properties which lie within three hundred (300) feet of the right of way to be vacated.

2. Flagging which indicates the boundaries of the right-of-way shall be installed within the survey is conducted.

E. Setting of Hearing

Upon receipt of the petition, fee, and all required documents, the City Clerk shall make a determination whether the petition has been signed by the owners of more than two-thirds (2/3) of the property owners abutting the part of the right-of-way to be vacated. The City clerk shall then forward the petition and required documents to the Public Works Director for further review and action. If the petition has been signed by required signatures, the petition shall be forwarded to the City Council. The City council shall, by resolution, fix a time when the petition will be heard and determined by the City council or committees. The hearing shall not be more than 60 days nor less than 20 days after the date of adoption of the resolution. Where the City Council initiates the vacation by resolution, that resolution shall fix a time when the proposed vacation will be heard by the City Council or committee.

F. Staff Report

The public works department shall prepare a report concerning the proposed vacation, which shall address the criterial listed in this Appendix. The City Council shall use this report in determining whether to vacate the right-of-way or a portion thereof, and such other information as deemed appropriate by the department. In preparing the report, the department shall solicit comments from the police, fire, other City departments, utilities, and other governmental agencies which may be affected by the right-of-way vacation. The report shall be submitted to the City Council, or Committee members hearing the matter, and to the petitioners, not less than five (5) days before the hearing.

G. Notice of Hearing

Upon passage of the resolution fixing the time for the hearing the petition or proposal for vacation, the City Clerk shall give notice to the time, place and purpose of the hearing as set forth in RCW 35.79.020 and by;

1. Publishing written notice once in the City's official newspaper;
2. Posting a placard in a visible place at each end of right-of-way to be vacated. The placard shall be highly visible and at least 11 by 14 inches in size, and shall include a map showing the location of the right-of-way to be vacated;
3. Mailing written notice to all petitioners at the address on the petition and all owners of property abutting the right-of-way to be vacated, as shown on the records of the King County assessor. In addition, notice shall be given to the owners of property which lie within 300 feet beyond the right-of-way to be vacated, measuring in both directions around the subject area. The public works department shall send the same written notice to the petitioners at the address on the petition.

H. Protest

If 50 percent or more of the owners of the abutting property file written objections with the City clerk, prior to the time of the hearing, the City shall not proceed with the resolution.

I. Compensation for the Vacation

1. Where a vacation has been initiated by petition, the owners of the property abutting the area vacated, shall pay to the City, prior to the effective date of the ordinance vacating the area, a sum equal to one-half of the appraised value of the area, plus the full cost of physical closure and road repairs.
2. Where the vacation was initiated by the City Council or was a requirement by the City as a condition of a permit or approval, the owners of the property abutting the area vacated shall not be required to pay such sum that includes the appraised value of the area and costs associated with the physical closure.

3. Where the vacation was acquired at public expense, the owners of the properties abutting the vacated area shall pay to the City a sum equal to the full appraised value of the area to be vacated.

4. Conveyance of other property acceptable to the City may be made in lieu of the required payment, where required to mitigate adverse impacts of the vacation. When the conveyance is made for street purposes, one-half of the fair market value of the land conveyed shall be credited to the required payment. When the conveyance is made in fee for purposes other than street purposes, the full appraised value of the land conveyed shall be credited to the required payment.

5. When the value of the in-lieu parcel is less than the required payment, the petitioners shall pay the difference to the City. When value of the in-lieu area exceeds the required payment, the City shall pay the difference to the petitioners.

J. Appraisals

1. The director of public works shall determine the appraised value of the area vacated based on an appraisal from a state-certified real estate appraiser who has an MAI or SRA designation from the Appraisal Institute. To obtain such appraisal, the director shall present to the representatives of the petitioners a list of three such certified and designated appraisers from which one shall be selected. The petitioner shall pay for the appraisal. If the director is not satisfied with eh appraisal, the director may order a second appraisal form a state-certified appraiser. The City shall pay for the second appraisal.

2. The director shall use the appraisal having the highest value for the area to be vacated. The Director of Public Works shall be responsible for obtaining the appraisal for areas to be granted to the City in-lieu of cash payment as stated in this Appendix.

K. Payment of Compensation of Conveyance

After determining the appraisal value of the right-of-way to be vacated, the Director of Public Works shall notify the representative of the petitioners of the amount of compensation. The payment shall be delivered to the director, who upon receipt of payment, shall transmit it to the

finance department for deposit in the street fund and shall make a written report of the payment to the City council. If the petitioner has been authorized to deliver an instrument granting or dedicating to the City a parcel or parcels of land in lieu of cash payment, the director, at the petitioner's expense, may obtain either a policy of title insurance insuring title of the property in the City, or a certificate of title as to the title thereof. Upon receipt of such policy or certificate, the director shall transmit it to the City Council.

Page intentionally left blank.

STANDARD DETAILS

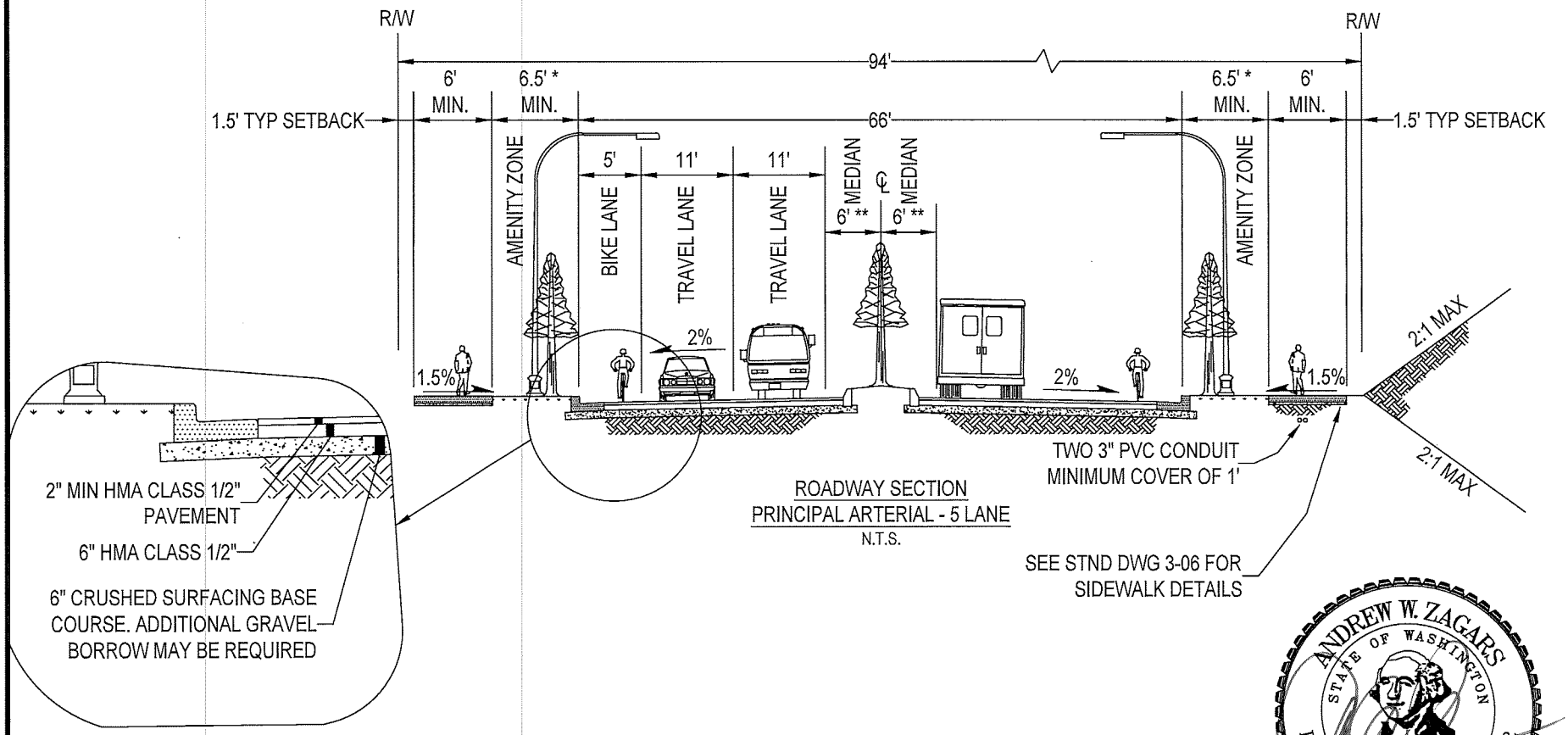
Page intentionally left blank.

Detail #	Detail Title
1-01	Roadway Section Principal Arterial
1-02	Roadway Section Minor Arterial
1-03	Roadway Section Collector Arterial
1-05a	Roadway Section Non-Arterial Roadway
1-05b	Roadway Section Non-Arterial Roadway
1-06	Pedestrian/Bike Path Connection Between Through Street and Cul-De-Sac
1-07	Non-Arterial Roadway Section Half Street
1-08	Roadway Section Typical Alley
2-01	Intersection Landing
2-02	Traffic Circle
2-03	Shoulder Treatment
2-05	Trench-Pavement Restoration Detail
2-05b	HMA Pavement Overlay for Trench Repair
2-06	Perpendicular Curb Ramp
2-07	Parallel Curb Ramp
2-08	Single Direction Curb Ramp
2-09	Combination Curb Ramp
2-11a	Monument Case and Cover With Riser
2-11b	Monument Case and Cover
2-14	Bus Pullout
2-15	Rock Retaining Wall
2-18	Planter Strip Detail
2-19a	Sight Obstruction
2-19b	Sight Obstruction
2-20	Residential Driveway
2-21	Dead End Hammerhead
2-22	Permanent Cul-De-Sac
2-23	Butt Joint Detail
3-01	Curb and Gutter Section Driveway Approach
3-02	Driveway Approach: Reverse Slope
3-03	Driveway Approach: Reverse Slope without Amenity Zone
3-04	Driveway Approach without Amenity Zone (8' Sidewalk Width)

Detail #	Detail Title
3-05	Amenity Zone
3-06	Sidewalk
3-07	Asphalt Transition Ramp to Shoulder
3-08a	Curbs
3-08b	Extruded Curb Detail
3-09a	Concrete Curb Inlet
3-09b	Concrete Curb Inlet
3-10	Curb Channel and Grate
3-11	Pedestrian Curb
3-12	Intersection Curb Extension
3-13a	Curb Extension Section
3-13b	Curb Extension Section
3-14	Curb Ramp Locations
3-15	Pedestrian Railing
3-16	Stairs
3-17	Cement Concrete Stairway
3-18	Chain Link Fence
3-20	Greenbelt Fence
4-01	Channelization - Left Turn Lanes
4-02	Channelization -Vehicle & Bicycles
4-03a	Pavement Markings
4-03b	Raised Pavement Markers
4-04	Intersection Approach Striping
4-05	Pavement Symbols
4-06	Street Sign Installation
4-07	Curb Extension/Chicane Channelization
5-01	Rock Facing - Fill Section
5-02	Rock Facing Under Sidewalk
5-03	Bollards
5-04	Mailbox Stand Non-Arterial
5-05	Mailbox Stand Without Amenity Zone
5-06	Neighborhood Delivery & Collection Box Unit Installation
7-01	Beveled End Pipe Section
7-02	Trash Rack (Debris Cage) - Pipe End

Detail #	Detail Title
7-03	Trash Rack (Debris Cage) - Conical
7-04	Catch Basin Type 1
7-05	Catch Basin Type 1-L
7-06	Catch Basin Installation
7-07	Catch Basin Type 2 - 48", 54". 60", 72" & 96"
7-08	Catch Basin - Type 2 Details
7-09	Manhole Type 1 - 48", 54" & 60"
7-10	Manhole Type 2 - 72" & 96"
7-11	Manhole Type 3 - 48", 52", 60", 72" & 96"
7-12	Manhole Details
7-13	Locking Manhole Cover and Installation
7-14	Through-Curb Inlet & Vertical Curb Installation
7-15	Through-Curb Inlet Frame
7-16	Vaned Grate
7-17	Standard Grate
7-18	Standard Frame Installation
7-19	Solid Cover
7-20	Flow Restrictor (Tee)
7-21	FROP-T Shear Gate Detail
7-22	Flow Restrictor (Baffle)
7-23	Floatable Material Separator - 6" or 8" Pipe
7-24	Floatable Material Separator - 12" & Larger
7-25	Control Structure - 54" Diameter
7-26	Control Structure - 72" Diameter or Larger
7-27a	Bioretention Swale
7-27b	Bioretention Swale Section
8-01	Rigid Pavement Restoration Details
8-02	Flexible Pavement Patching
9-01	One-lane, Two-way Traffic Control with Flaggers
9-02	Pilot Car Operation
9-03	Single-Lane Closure for Multi-lane Roadways
9-04	Double-lane Closure for Multi-lane Roadways
9-05	Shoulder Closure - Low Speed (40 mph or less)
9-06	Right Lane Closure with Shift - 5 Lane Roadway

Detail #	Detail Title
9-07	Left Lane and Center Turn Lane Closure - 5 Lane Roadway
9-08	Lane Shift - Three Lane Roadway
9-09	Short Term Ramp Closures
9-10	Intersection Lane Closure - Three Lane Roadway
9-11	Intersection Lane Closure - Five Lane Roadway
9-12	Intersection Pedestrian Traffic Control
9-13	Temporary Pedestiran Ramp
9-14	Single-lane Closure with Shift
9-15	Typical Roundabout Flagging Operation
9-16	Bike Rack
9-17	Pedestrian Push Button Post
9-18	Sidewalk Ramp Retrofit
9-19	Skid Resistant Lid



ROADWAY SECTION
PRINCIPAL ARTERIAL - 5 LANE
N.T.S.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-15

NOTES:

1. NO ON-STREET PARKING PERMITTED.
2. SUBGRADE SHALL BE COMPACTED TO 95% INCLUDING UNDER CURB, GUTTER, AND SIDEWALK.
3. PROOF ROLL OF SUBGRADE MAY BE REQUIRED BY ENGINEER.
4. SIDEWALK WIDTH IS DETERMINED BY ADJACENT LANDUSE.

* MAY BE ELIMINATED OR WIDTH REDUCED WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY OR CRITICAL AREAS, SUBJECT TO CITY ENGINEER'S APPROVAL.

** MAY BE REDUCED WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY OR OTHER FACTORS, SUBJECT TO CITY ENGINEER'S APPROVAL. FACE OF MEDIAN CURB IS OFFSET ONE FOOT FROM TRAVEL LANE.

REV

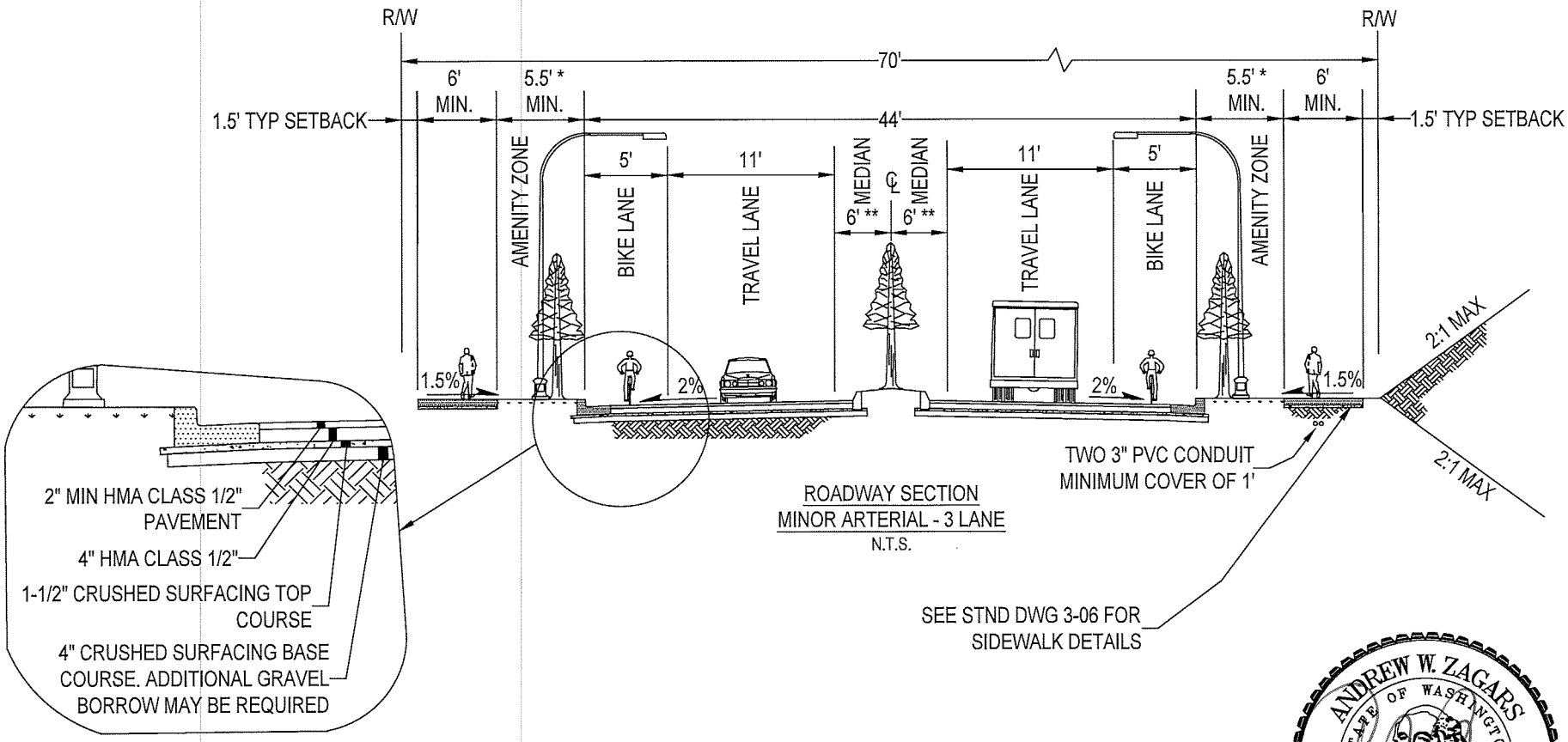
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

ROADWAY SECTION
PRINCIPAL ARTERIAL

APPROVED BY
CITY ENGINEER _____ DATE _____

DWN	CKD	DATE	FILE
TTC	AWZ	AUG-XX-2015	FIG01-01

REV. NO. X



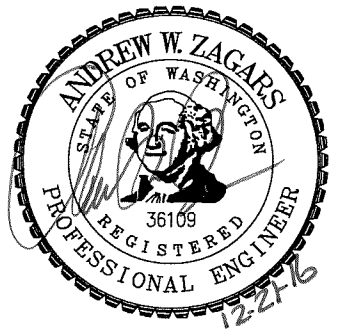
ROADWAY SECTION
MINOR ARTERIAL - 3 LANE
N.T.S.

NOTES:

1. WIDTH OF ROADWAY SECTION AND RIGHT-OF-WAY MAY BE INCREASED TO ALLOW PARKING.
2. SUBGRADE SHALL BE COMPACTED TO 95% INCLUDING UNDER CURB, GUTTER, AND SIDEWALK.
3. PROOF ROLL OF SUBGRADE MAY BE REQUIRED BY ENGINEER.
4. SIDEWALK WIDTH IS DETERMINED BY ADJACENT LANDUSE.

* MAY BE ELIMINATED OR WIDTH REDUCED WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY OR CRITICAL AREAS, SUBJECT TO CITY ENGINEER'S APPROVAL.

** MAY BE REDUCED WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY OR OTHER FACTORS, SUBJECT TO CITY ENGINEER'S APPROVAL. FACE OF MEDIAN CURB IS OFFSET ONE FOOT FROM TRAVEL LANE.



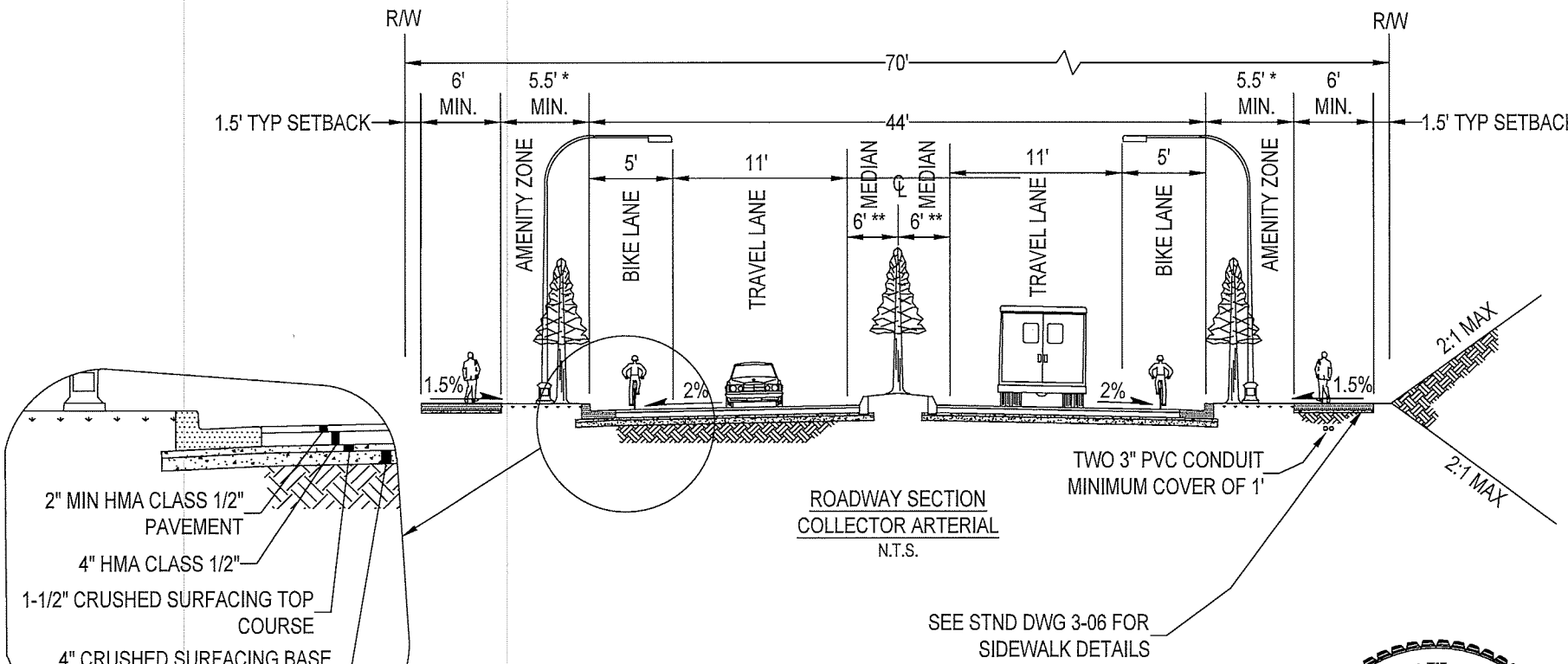
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

ROADWAY SECTION MINOR ARTERIAL

APPROVED BY CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG01-02

REV. NO. X



ROADWAY SECTION
COLLECTOR ARTERIAL
N.T.S.

NOTES:

1. WIDTH OF ROADWAY SECTION AND RIGHT-OF-WAY MAY BE INCREASED TO ALLOW PARKING.
2. SUBGRADE SHALL BE COMPACTED TO 95% INCLUDING UNDER CURB, GUTTER, AND SIDEWALK.
3. PROOF ROLL OF SUBGRADE MAY BE REQUIRED BY ENGINEER.
4. SIDEWALK WIDTH IS DETERMINED BY ADJACENT LANDUSE.

* MAY BE ELIMINATED OR WIDTH REDUCED WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY OR CRITICAL AREAS, SUBJECT TO CITY ENGINEER'S APPROVAL.

** MAY BE REDUCED WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY OR OTHER FACTORS, SUBJECT TO CITY ENGINEER'S APPROVAL. FACE OF MEDIAN CURB IS OFFSET ONE FOOT FROM TRAVEL LANE.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-15

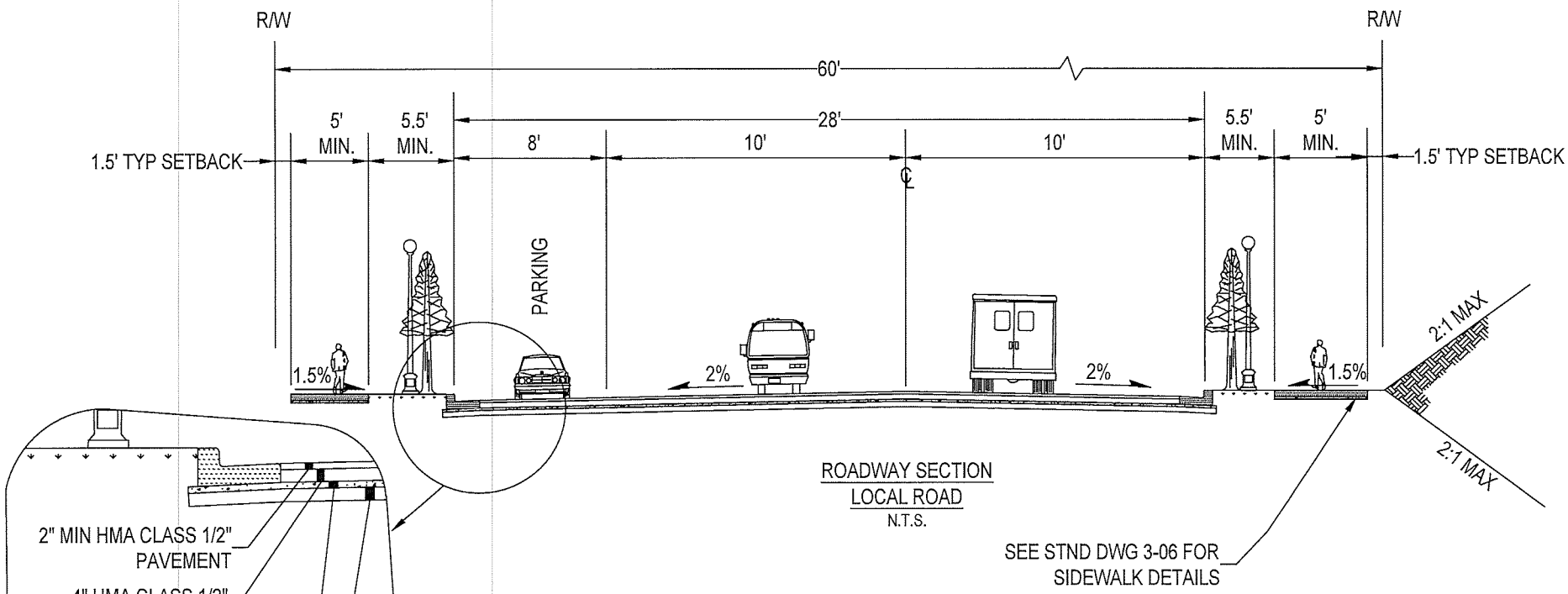
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

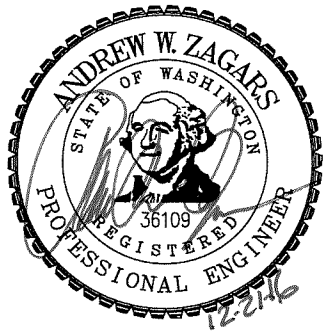
ROADWAY SECTION COLLECTOR ARTERIAL

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG01-03

REV. NO. X





NOTES:

1. PARKING ON ONE SIDE OF ROAD ONLY. APPROVAL OF WHICH SIDE BY CITY ENGINEER.
2. INSTALL NO PARKING SIGNS ON ONE SIDE OF STREET PER DIRECTION OF ENGINEER.
3. SUBGRADE SHALL BE COMPACTED TO 95% INCLUDING UNDER CURB, GUTTER, AND SIDEWALK.
4. PROOF ROLL OF SUBGRADE MAY BE REQUIRED BY ENGINEER.
5. SIDEWALK WIDTH IS DETERMINED BY ADJACENT LANDUSE.

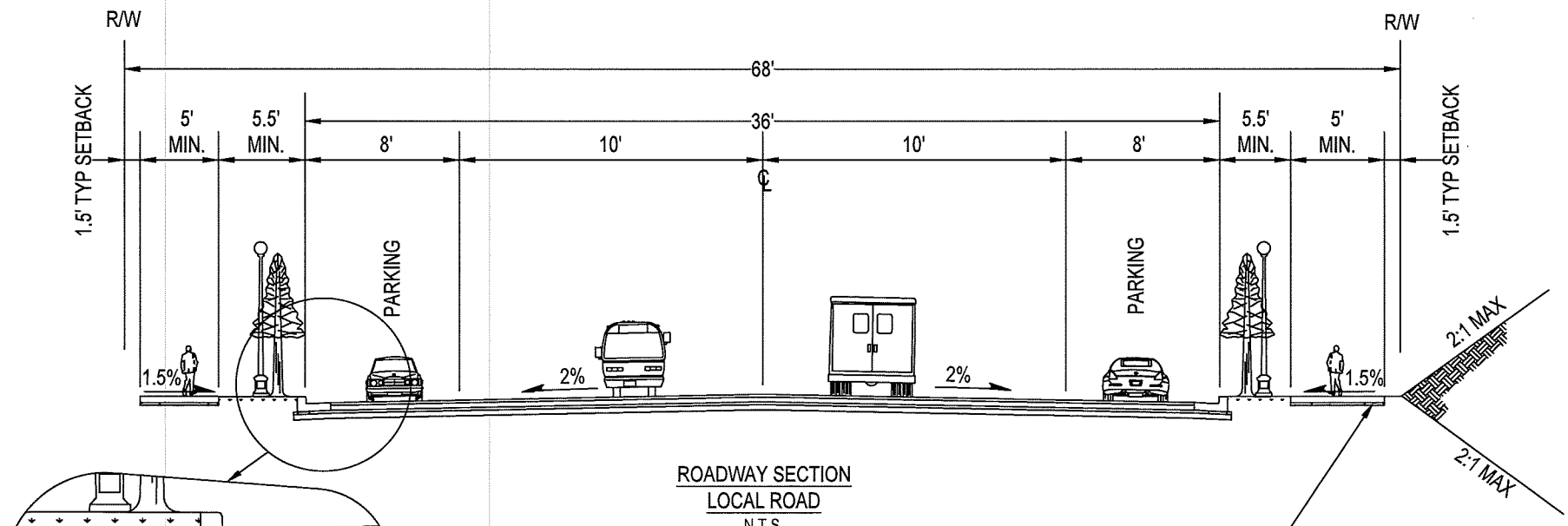
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

ROADWAY SECTION
NON–ARTERIAL ROADWAY

APPROVED BY
CITY ENGINEER _____ DATE _____

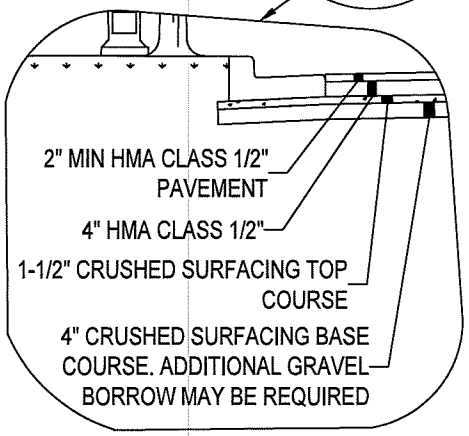
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG–XX–2015	FIG01–05A

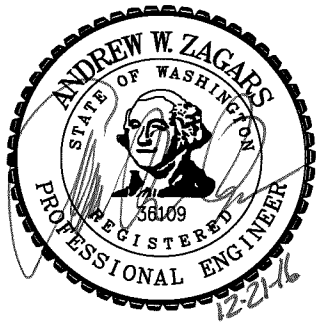
REV. NO. X



ROADWAY SECTION
LOCAL ROAD
N.T.S.

SEE STND DWG 3-06 FOR SIDEWALK DETAILS





NOTES:

1. PARKING ON BOTH SIDES OF THE ROADWAY REQUIRED FOR DEVELOPMENTS IN ZONING GREATER THAN R-4 AND IN LOCATIONS OF A HIGH DEMAND FOR PARKING.
2. SUBGRADE SHALL BE COMPACTED TO 95% INCLUDING UNDER CURB, GUTTER, AND SIDEWALK.
3. PROOF ROLL OF SUBGRADE MAY BE REQUIRED BY ENGINEER.
4. SIDEWALK WIDTH IS DETERMINED BY ADJACENT LANDUSE.

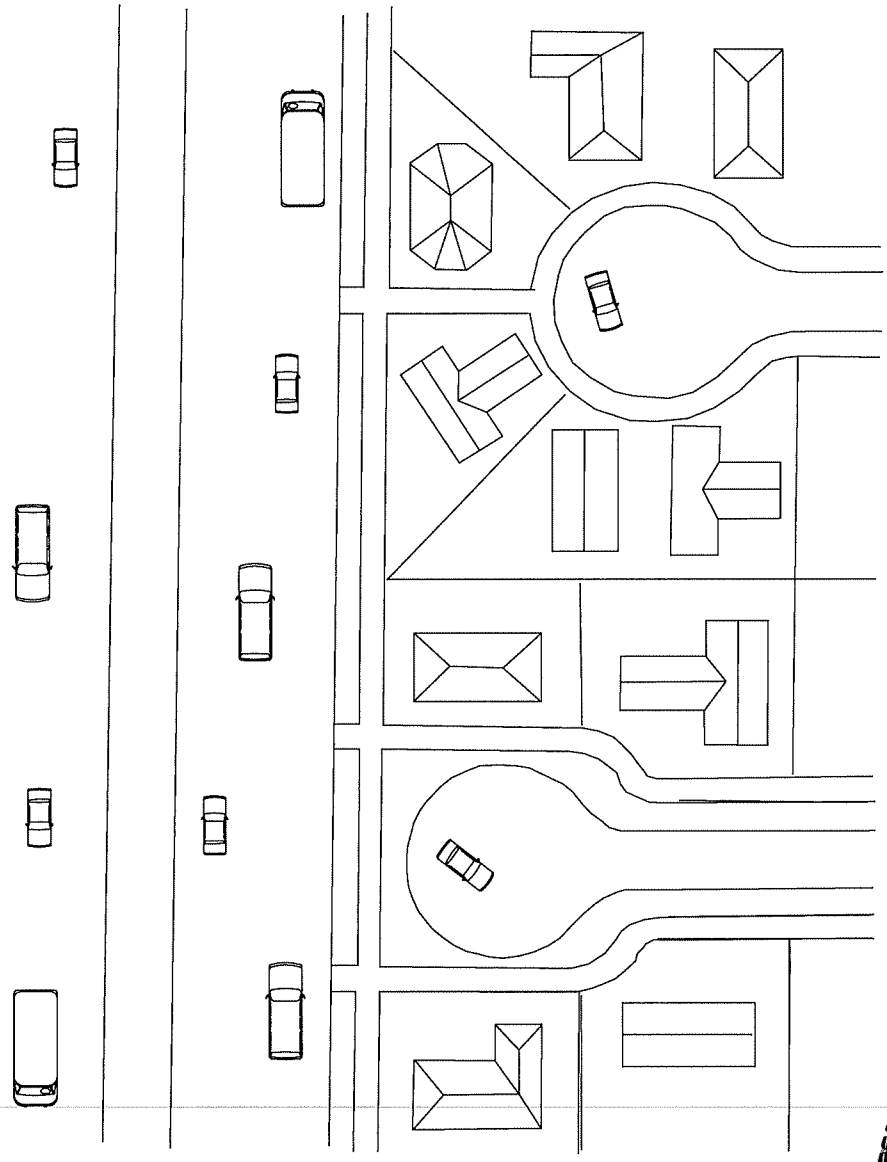
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

ROADWAY SECTION NON-ARTERIAL ROADWAY

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG01-05B

REV. NO. X



ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-16

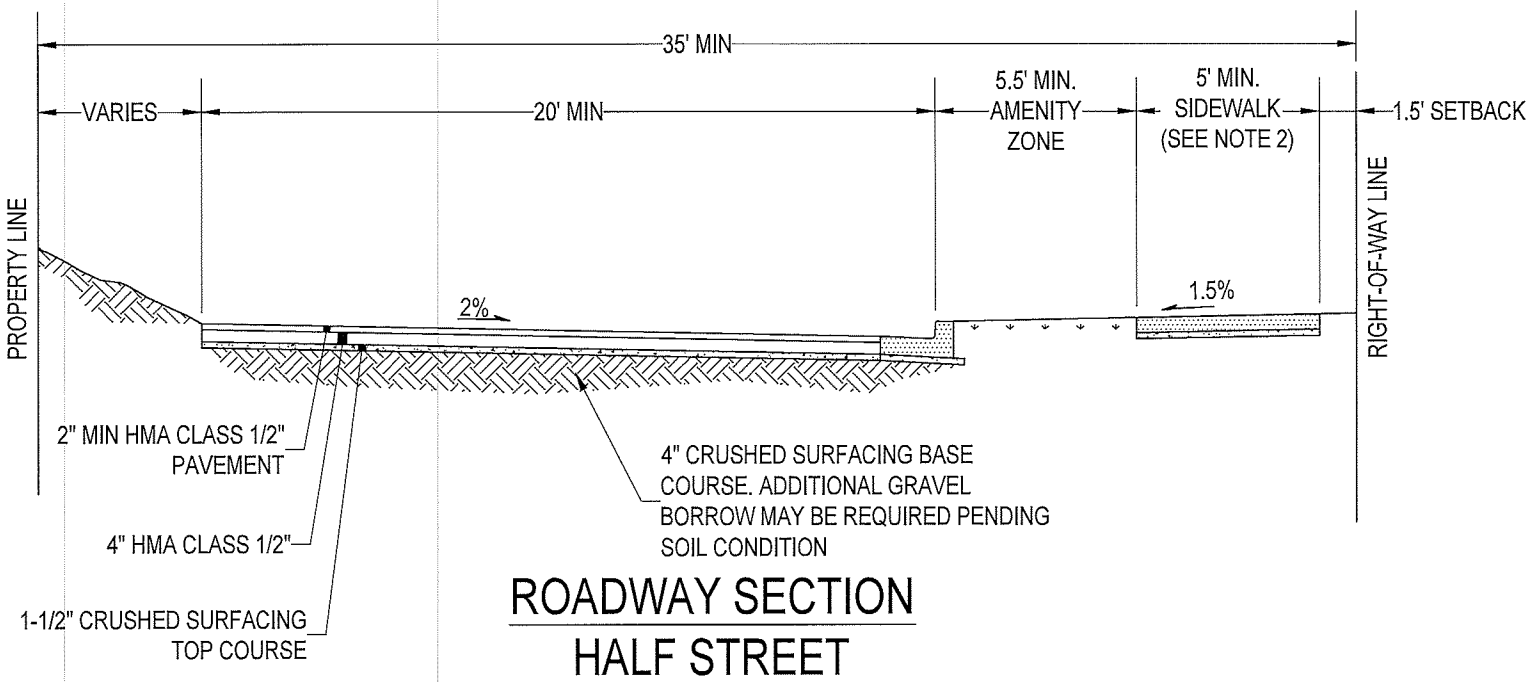
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PEDESTRIAN BIKE PATH CONNECTION
BETWEEN THROUGH STREET AND
CUL-DE-SAC

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG01-06

REV. NO. X



ROADWAY SECTION
HALF STREET

N.T.S.

NOTES:

1. EDGE OF PAVEMENT TO BE CONSTRUCTED AS SHOWN FOR CUT OR FILL SECTION AS APPROPRIATE.
2. SEE STND DWG 3-06 FOR SIDEWALK DETAILS.
3. PROOF ROLL OF SUBGRADE MAY BE REQUIRED BY ENGINEER.
4. IF PAVING SEAM IS REQUIRED, IT SHALL BE PLACED AT FUTURE CROWN LOCATION.
5. INSTALL NO PARKING SIGNS ON BOTH SIDE OF STREET PER DIRECTION OF ENGINEER.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-1

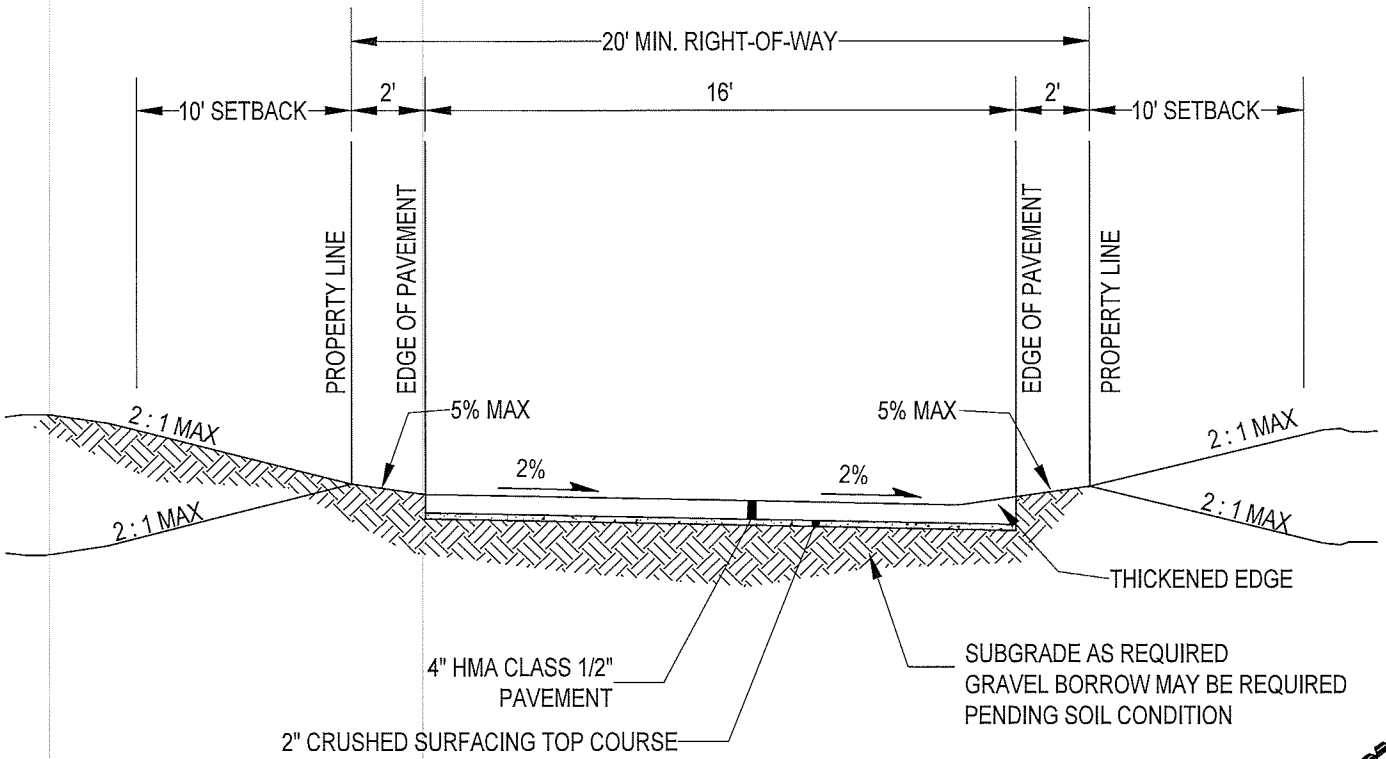
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

NON-ARTERIAL ROADWAY SECTION HALF STREET

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG01-07

REV. NO. X



ROADWAY SECTION
TYPICAL ALLEY

N.T.S.

NOTES:

1. REFER TO PROVISIONS FOR REAR AND SIDE YARD SETBACKS IN DEVELOPMENT CODE.
2. DRAINAGE TO BE COLLECTED AT LOWER END OF ALLEY.
3. PROOF ROLL OF SUBGRADE MAY BE REQUIRED BY ENGINEER.
4. ALL UTILITY LIDS TO BE ADJUSTED TO GRADE.
5. FOR USE IN NEW DEVELOPMENT.
6. INSTALL NO PARKING SIGNS ON BOTH SIDE OF STREET PER DIRECTION OF ENGINEER.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-11

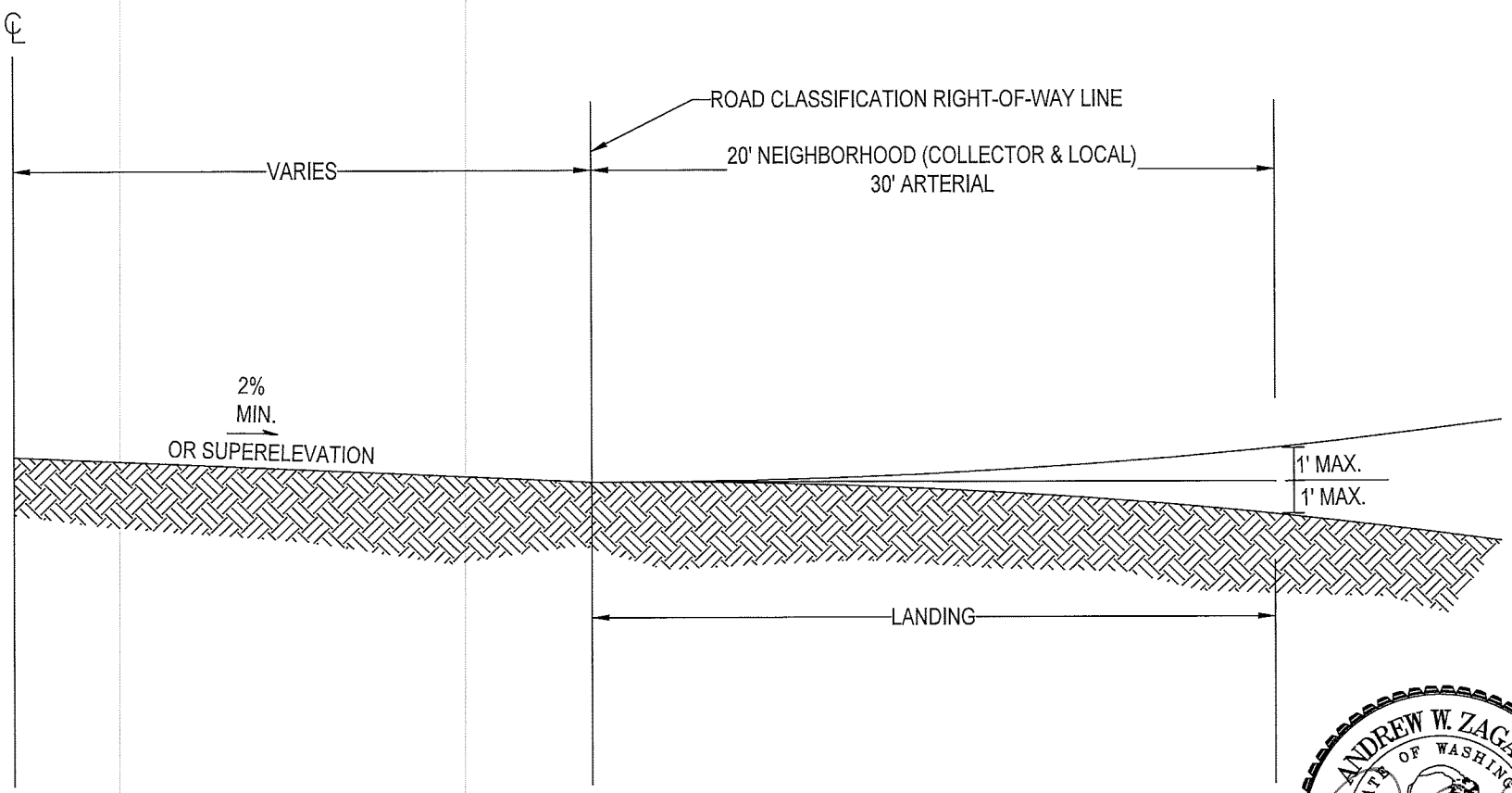
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

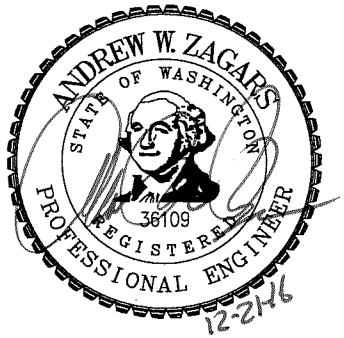
ROADWAY SECTION
TYPICAL ALLEY

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG01-08

REV. NO. X





12-2-16

CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

INTERSECTION LANDING

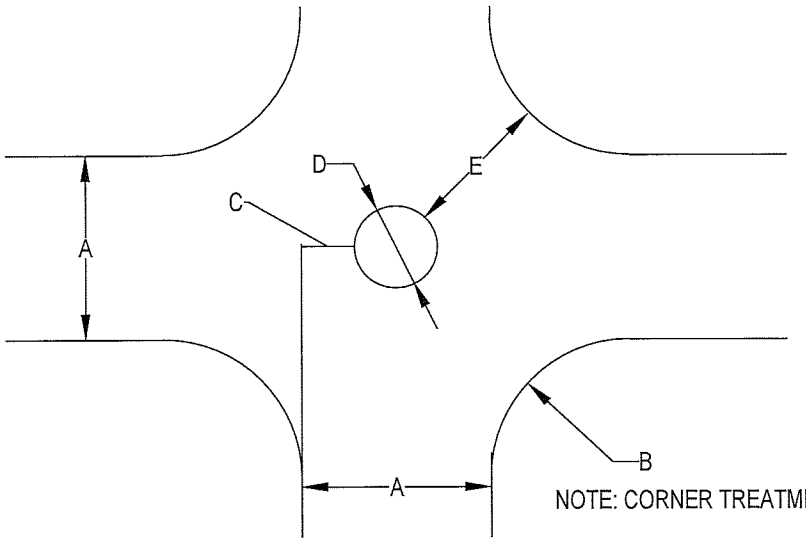
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG02-01

REV. NO. X

A STREET WIDTH	B CURB RETURN RADIUS	C SET BACK DISTANCE	D CIRCLE DIAMETER	E OPENING WIDTH
20'	<15'	RECONSTRUCT CURBS		
	15'	5.5'	9'	16'+
	18'	5.0'	10'	17'+
	20'	4.5'	11'	18'-
	25'	4.0'	12'	19'+
24'	<12'	RECONSTRUCT CURBS		
	12'	5.5'	13'	16'+
	15'	5.0'	14'	17'-
	20'	4.5'	15'	18'+
	25'	3.5'	17'	20'-
25'	<12'	RECONSTRUCT CURBS		
	12'	5.5'	14'	16'+
	15'	5.0'	15'	17'-
	18'	4.5'	16'	18'-
	20'	4.5'	16'	18'+
	25'	3.5'	18'	20'-
30'	10'	5.5'	19'	16'+
	12'	5.0'	20'	17'-
	15'	5.0'	20'	17'+
	18'	4.5'	21'	18'+
	20'	4.0'	22'	19'+
	25'	3.0'	24'	20'
32'	10'	5.5'	21'	16'+
	12'	5.0'	22'	17'-
	15'	4.5'	23'	18'-
	18'	4.0'	24'	19'-
	20'	4.0'	24'	19'+
	25'	2.5'	27'	20'
36'	10'	5.0'	26'	17'-
	12'	5.0'	26'	17'+
	15'	4.5'	27'	18'+
	18'	4.0'	28'	19'+
	20'	3.5'	29'	20'-
	25'	1.5'	33'	20'
40'	10'	5.0'	30'	17'+
	12'	4.5'	31'	18'+
	15'	4.0'	32'	19'-
	18'	3.5'	33'	20'-
	20'	3.0'	34'	20'
	25'	1.0'	38'	20'

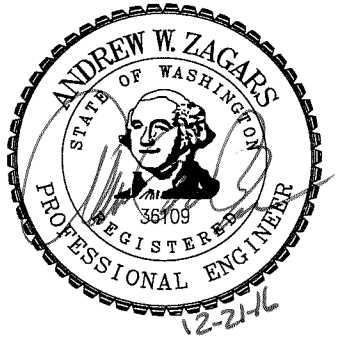
NOTE: "+" OR "-" DENOTES MINOR VARIATIONS



NOTE: CORNER TREATMENTS MAY BE REQUIRED.

INTERSECTION DIAGRAM

OPTIMUM CRITERIA	
SET BACK DISTANCE	OPENING WIDTH
5.5' MAX	16' MIN.
5.0'	17' ±
4.5'	18' ±
4.0'	19' ±
3.5' OR LESS	20'



12-21-15

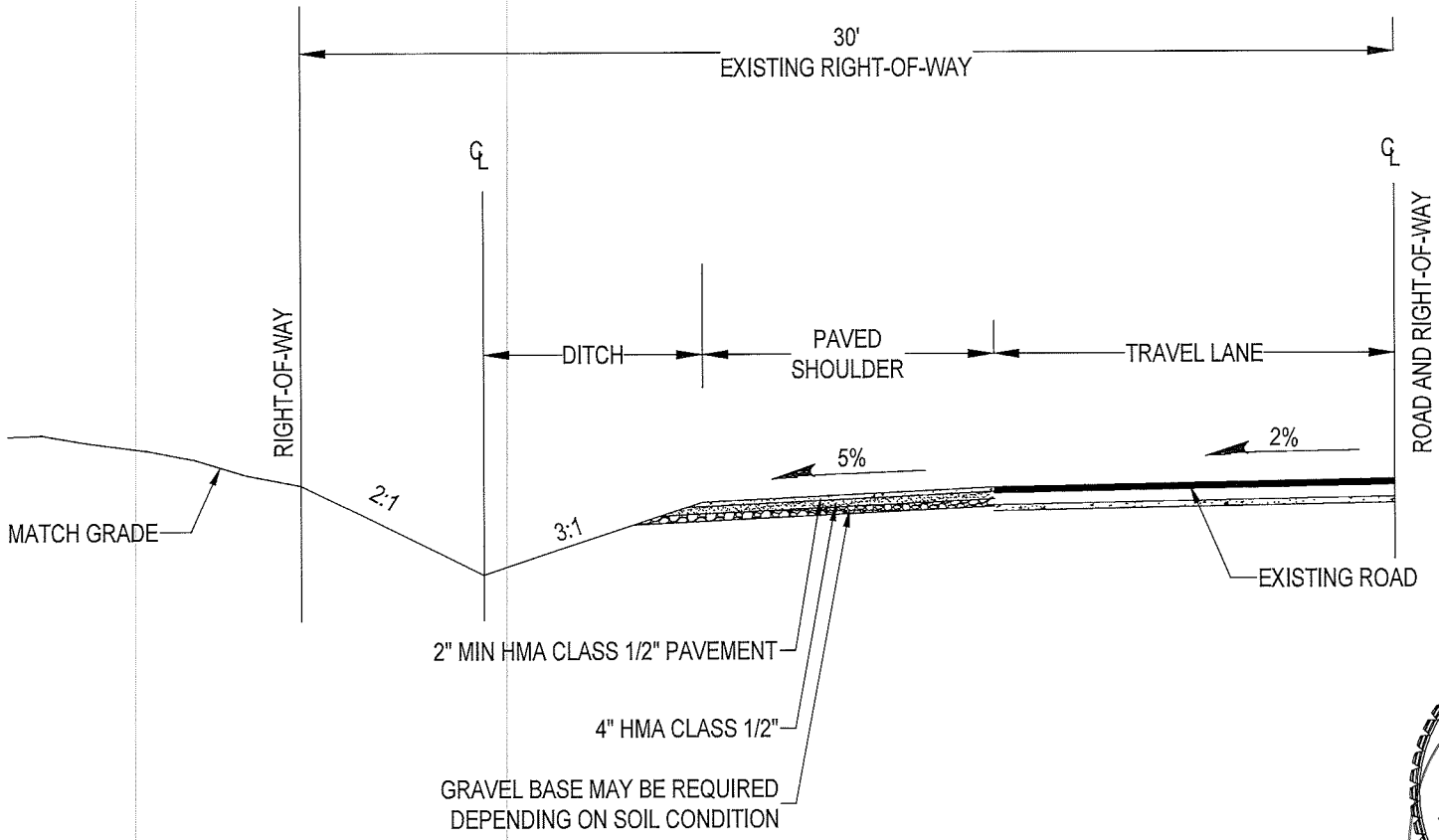
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

TRAFFIC CIRCLE

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG02-02

REV. NO. X



ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-16

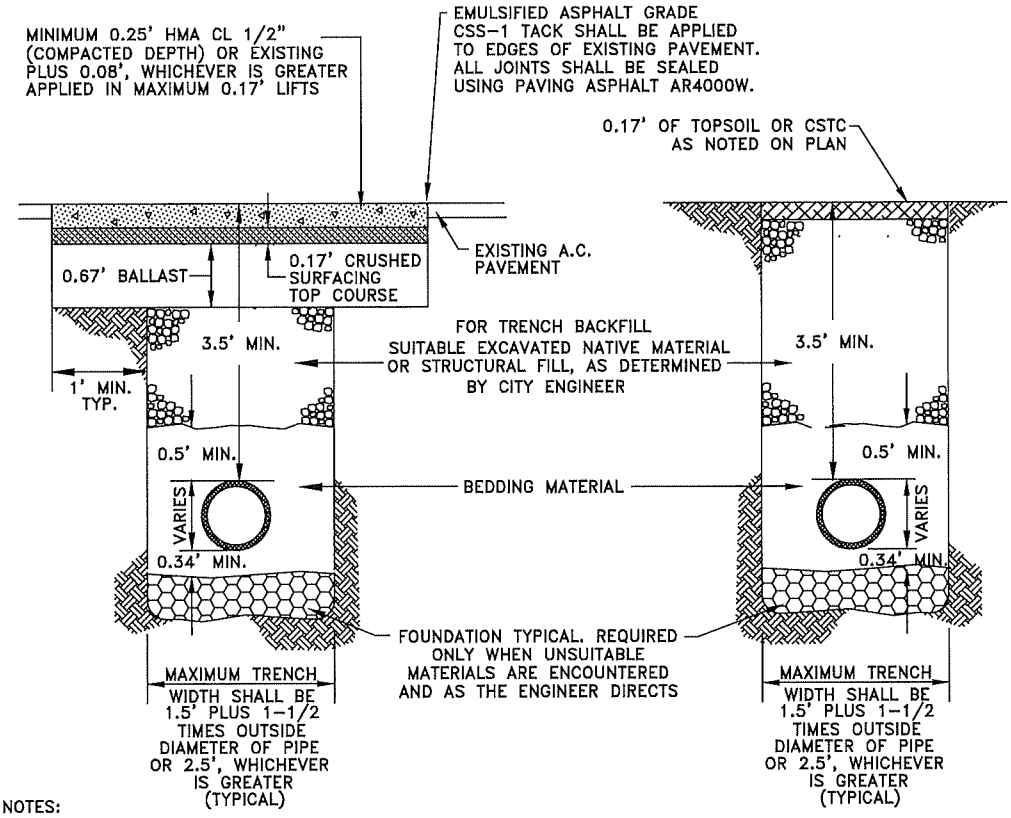
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SHOULDER TREATMENT

APPROVED BY
CITY ENGINEER _____ DATE _____

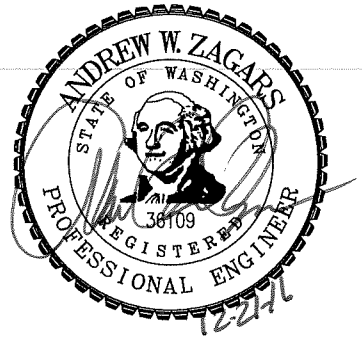
REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG02-03

REV. NO. X



NOTES:

1. DIMENSIONS SHOWN ARE MINIMUM; GREATER THICKNESS MAY BE REQUIRED BY CITY ENGINEER.
2. ALL MATERIALS EXCEPT A.C.P. AND BEDDING MATERIAL SHALL BE COMPACTED IN 6-INCH MAXIMUM LIFTS TO 95% DENSITY.
3. BEDDING SHALL CONFORM TO SECTION 9-03.16 OF STANDARD SPECIFICATIONS.
4. COMPACTION: BEDDING SHALL BE COMPACTED TO 95% MAX. AS DETERMINED BY ASTM D1557. BACKFILL SHALL BE COMPACTED TO 85% IN UNPAVED AREA, AND 95% IN PAVED OR SHOULDER AREAS AS DETERMINED BY ASTM D1557.
5. ALL MATERIALS, WORKMANSHIP, AND INSTALLATION SHALL BE IN CONFORMANCE WITH THE LATEST VERSION OF WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION.
6. KEEP TRENCH BOTTOM COMPACTED WITH UNIFORM GRADE. A BELL JOINT SHALL BE REQUIRED AT EACH JOINT FOR PROPER SUPPORT. NO TEMPORARY SUPPORTS, I.E. BLOCKS, WILL BE ALLOWED TO SUPPORT PIPE. TRENCH BOTTOM SHALL BE TO GRADE PRIOR TO PIPE INSTALLATION.



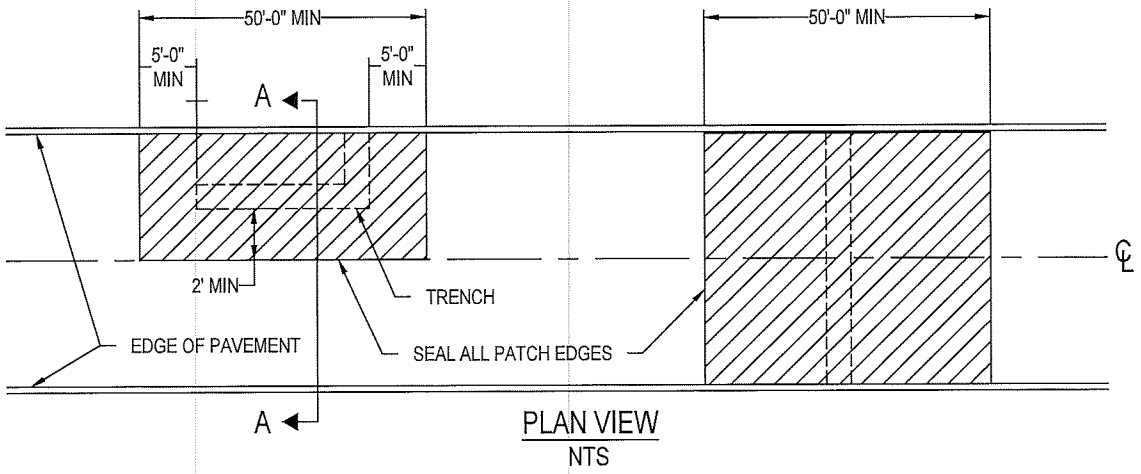
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

TRENCH-PAVEMENT RESTORATION DETAIL

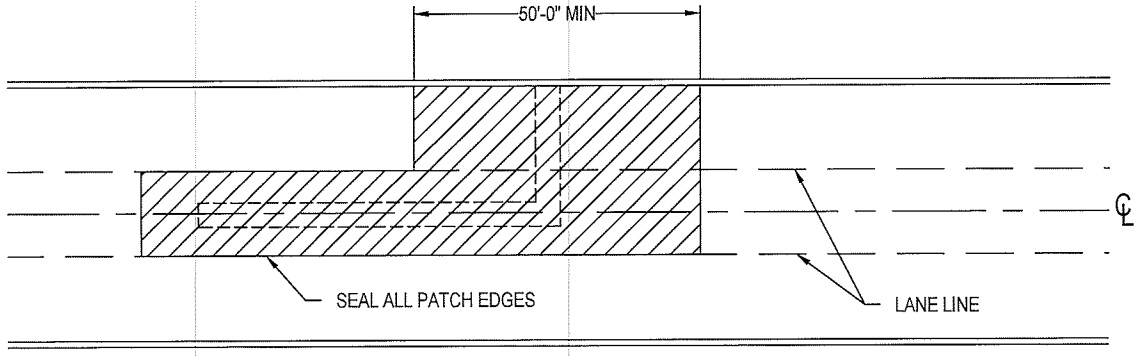
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-05a

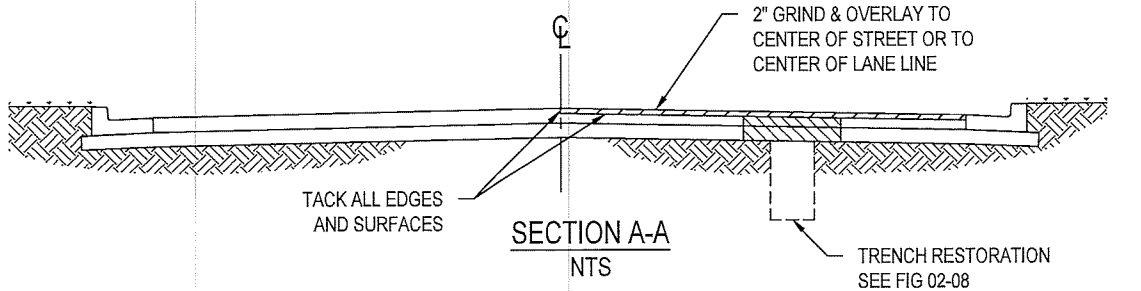
REV. NO. X



PLAN VIEW
NTS



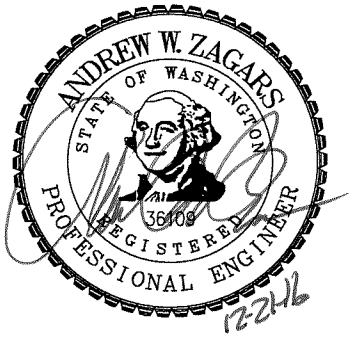
PLAN VIEW
NTS



SECTION A-A
NTS

NOTES:

1. THIS DETAIL APPLIES TO ALL PAVEMENT CUTS.
2. DIMENSIONS SHOWN ARE MINIMUM. LIMITS MAY BE INCREASED TO MATCH NEARBY PAVING LIMITS OR OTHER PATCHES.
3. OVERLAY LIMITS MAY BE REDUCED BY CITY ON PAVEMENT IN FAIR CONDITION OR WORSE. SEE PAVEMENT CONDITION MAP FOR LOCATIONS.
4. REPAIR PAVEMENT PER WSDOT STANDARD SPECIFICATIONS SECTION 5-04.
5. HMA SHALL BE PLACED BY PAVERS MEETING THE REQUIREMENTS OF SECTION 5-04.3(3). ROLLERS SHALL MEET THE REQUIREMENTS OF SECTION 5-04.3(4)
6. LOWER ALL UTILITY CASTING PRIOR TO OVERLAY. ADJUST UTILITY CASTINGS TO FINISH GRADE AND RESTORE CHANNELIZATION AND LOOP DETECTORS.



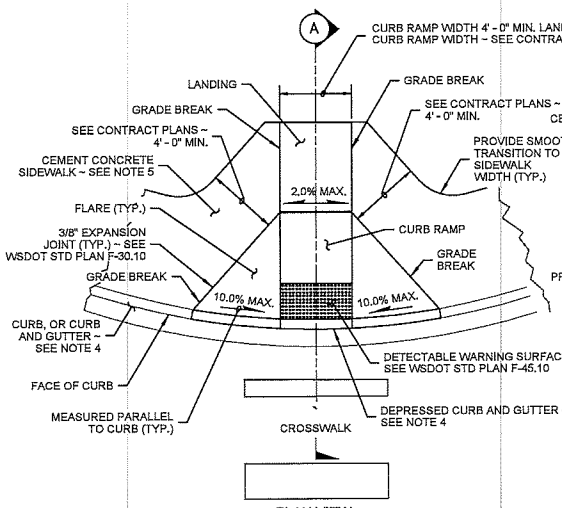
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

HMA PAVEMENT OVERLAY FOR TRENCH REPAIR

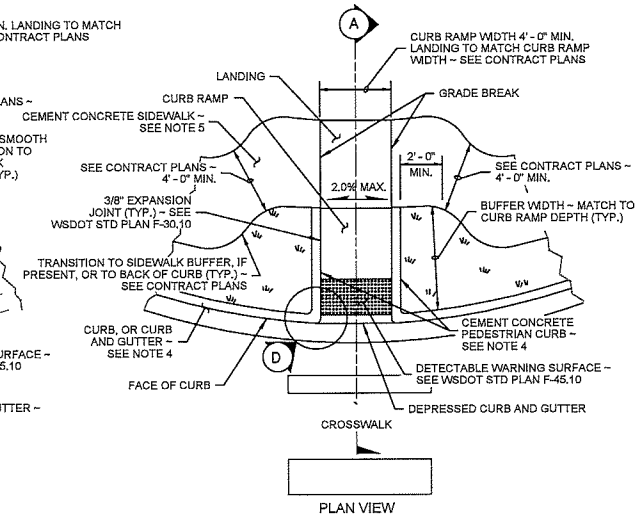
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	JG	XXX	AUG-XX-2015	FIG02-05b

REV. NO. X



PLAN VIEW
TYPE PERPENDICULAR A



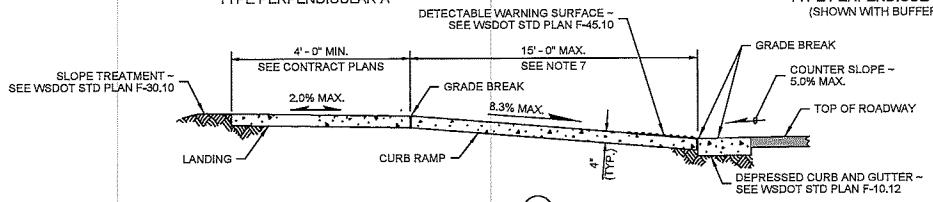
PLAN VIEW
TYPE PERPENDICULAR B
(SHOWN WITH BUFFER)

NOTES

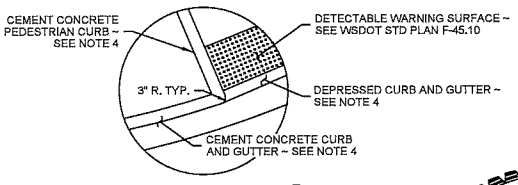
1. Provide a separate Curb Ramp for each marked or unmarked crosswalk. Curb Ramp location shall be placed within the width of the associated crosswalk or as shown in the Contract Plans.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances in front of the Curb Ramp or on any part of the Curb Ramp or Landing.
4. See the Contract Plans for the curb design specified. See WSDOT STD Plan F-10.12 for Depressed Curb and Gutter, and Pedestrian Curb details.
5. See STD DWG 3-09 for Cement Concrete Sidewalk details. See Contract Plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type ___" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalk.
7. The Curb Ramp maximum running slope shall not require the ramp length to exceed 15-feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15-foot maximum length, the running slope of the Curb Ramp shall as flat as feasible.
8. Curb Ramp, Landing, and Flares shall receive broom finish. See WSDOT STD Specifications 8-14.

LEGEND

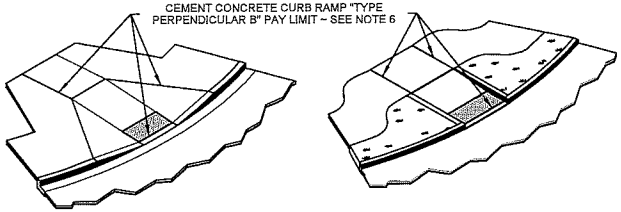
SLOPE IN EITHER DIRECTION



SECTION (A)

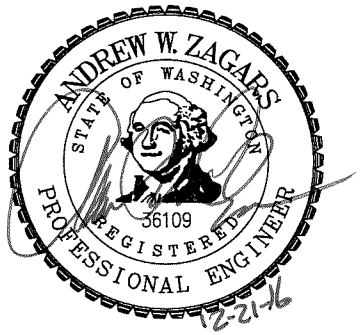


CURB RADIUS DETAIL (D)



ISOMETRIC VIEW
TYPE PERPENDICULAR A PAY LIMIT

ISOMETRIC VIEW
TYPE PERPENDICULAR B PAY LIMIT



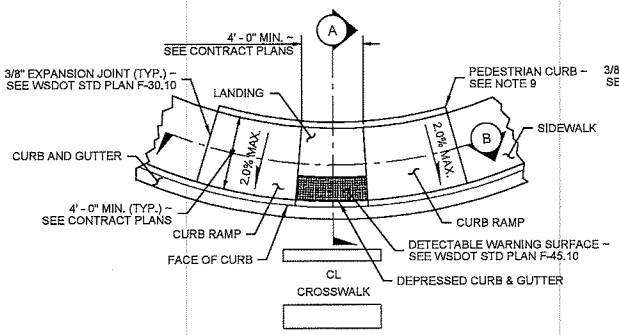
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PERPENDICULAR CURB RAMP

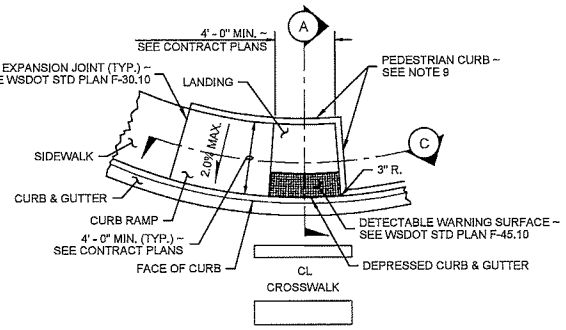
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-06

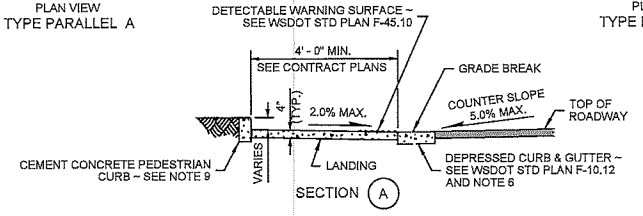
REV. NO. X



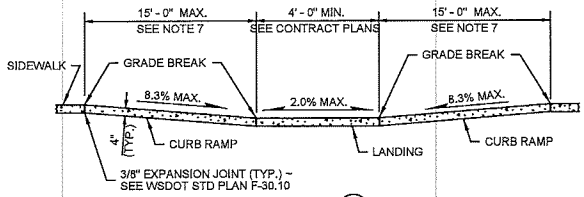
PLAN VIEW
TYPE PARALLEL A



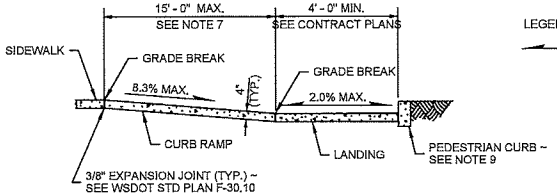
PLAN VIEW
TYPE PARALLEL B



SECTION (A)



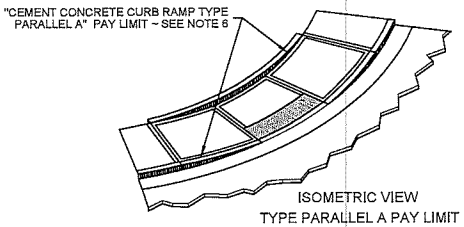
SECTION (B)



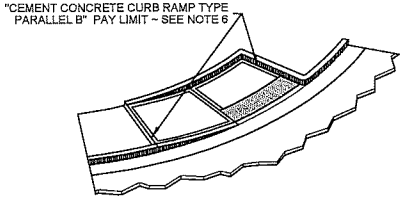
SECTION (C)

LEGEND

SLOPE IN EITHER DIRECTION



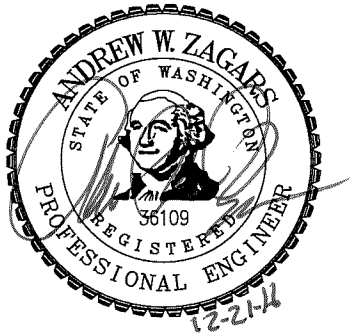
ISOMETRIC VIEW
TYPE PARALLEL A PAY LIMIT



ISOMETRIC VIEW
TYPE PARALLEL B PAY LIMIT

NOTES

1. Provide a separate Curb Ramp for each marked or unmarked crosswalk. Curb Ramp location shall be placed within the width of the associated crosswalk, or as shown in the Contract Plans.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances in front of the Curb Ramp or on any part of the Curb Ramp or Landing.
4. See Contract Plans for the curb design specified. See WSDOT STD Plan F-10.12 for Depressed Curb and Gutter, and Pedestrian Curb details.
5. See STD DWG 3-09 for Cement Concrete Sidewalk Details. See Contract Plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type __" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalks.
7. The Curb Ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15-foot max. length, the running slope of the curb ramp shall be as flat as feasible.
8. Curb Ramp, Landing, and Flares shall receive broom finish. See WSDOT STD Specifications 8-14.
9. Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or Landing will be at the same elevation as the Curb Ramp or Landing and there will be no material to retain.



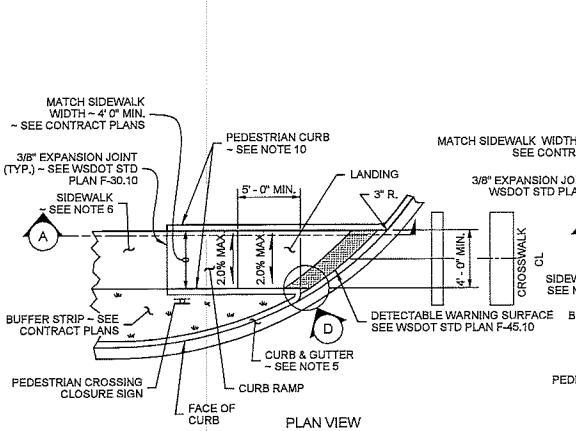
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PARALLEL CURB RAMP

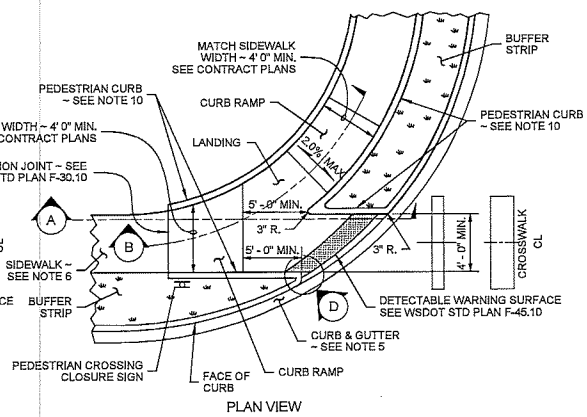
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-07

REV. NO. X



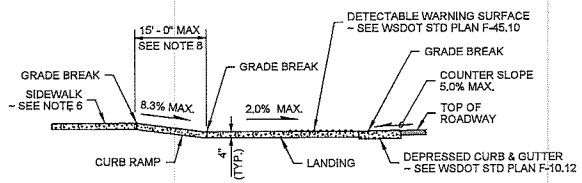
PLAN VIEW
TYPE SINGLE DIRECTION A



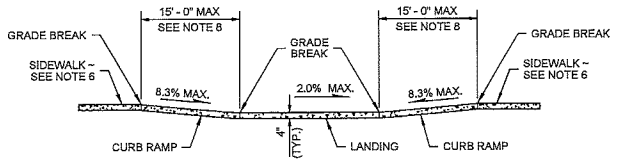
PLAN VIEW
TYPE SINGLE DIRECTION B

NOTES

1. This plan is to be used where pedestrian crossing in one direction is not permitted.
2. Curb ramp location shall be placed within the width of the associated crosswalk, or as shown in the Contract Plans.
3. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
4. Do not place gratings, junction boxes, access covers or other appurtenances in front of the curb ramp or on any part of the curb ramp or landing.
5. See the Contract Documents for the curb design specified. See WSDOT STD Plan F-10.12 for Depressed Curb and Gutter and Pedestrian Curb details.
6. See STD DWG 3-09 for Cement Concrete Sidewalk Details. See contract plans for width and placement of sidewalk.
7. The bid item "Cement Concrete Curb Ramp Type ___" does not include the adjacent Curb or (Curb and Gutter), Depressed Curb and Gutter, Pedestrian Curb or Sidewalk, or the pedestrian crossing closure sign.
8. The curb ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15 foot maximum length, the running slope of the curb ramp shall be as flat as feasible.
9. Curb ramps and landings shall receive broom finish. See WSDOT STD Specifications 8-14.
10. Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or landing will be at the same elevation as the Curb Ramp or Landing and there will be no material to retain.



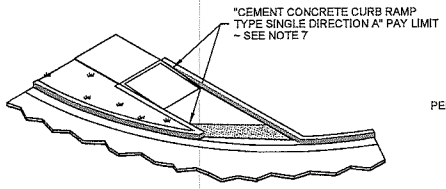
SECTION (A)



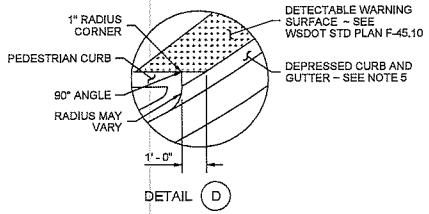
SECTION (B)

LEGEND

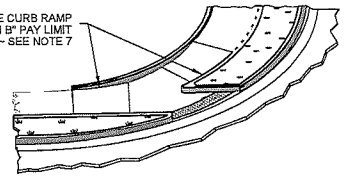
SLOPE IN EITHER DIRECTION



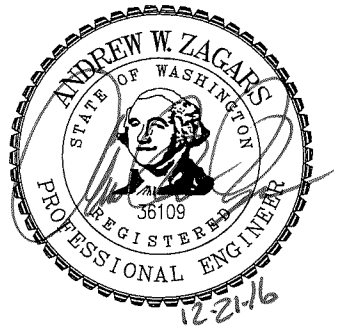
ISOMETRIC VIEW
TYPE SINGLE DIRECTION A
PAY LIMIT



DETAIL (D)



ISOMETRIC VIEW
TYPE SINGLE DIRECTION B
PAY LIMIT



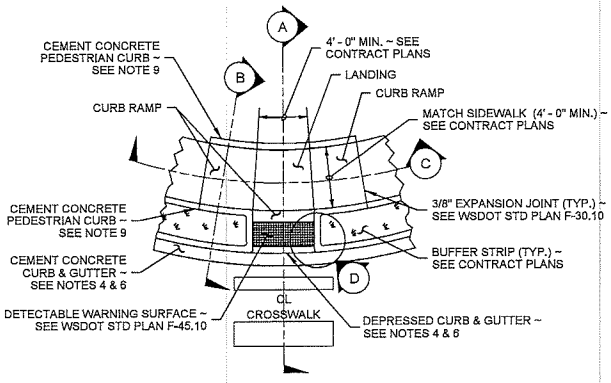
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SINGLE DIRECTION CURB RAMP

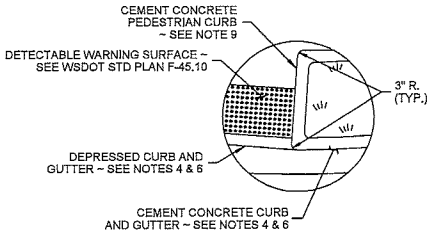
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-08

REV. NO. X



PLAN VIEW
TYPE COMBINATION
WITH BUFFER



DETAIL (D)

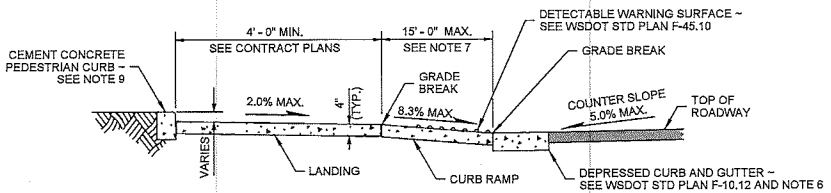
CURB RADIUS DETAIL

NOTES

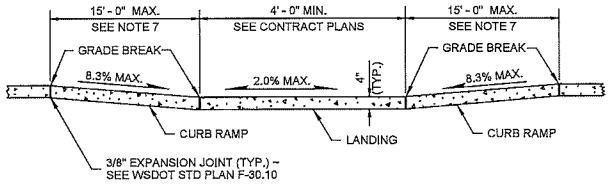
1. Provide a separate Curb Ramp for each marked or unmarked crosswalk. Curb Ramp location shall be placed within the width of the associated crosswalk or as shown in the Contract Plans.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances in front of the Curb Ramp or on any part of the Curb Ramp or Landing.
4. See Contract Plans for the curb design specified. See WSDOT STD Plan F-10.12 for Depressed Curb, Gutter and Pedestrian Curb details.
5. See STD DWG 3-09 for Cement Concrete Sidewalk Details. See Contract Plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type ___" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalks.
7. The Curb Ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15-foot max. length, the running slope of the Curb Ramp shall be as flat as feasible.
8. Curb Ramp, Landing and Flares shall receive broom finish. See WSDOT STD Specifications 8-14.
9. Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or Landing will be at the same elevation as the Curb Ramp or Landing and there will not be material to retain.

LEGEND

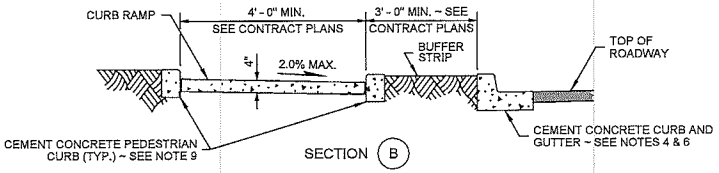
SLOPE IN EITHER DIRECTION



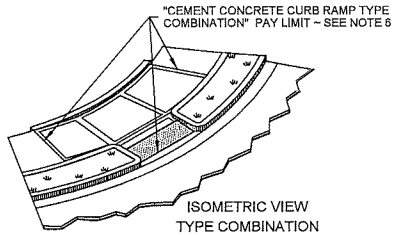
SECTION (A)



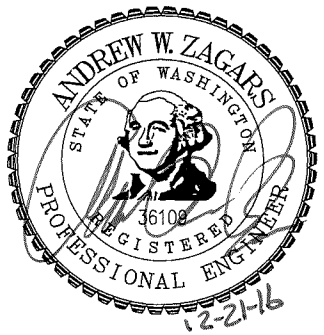
SECTION (C)



SECTION (B)



ISOMETRIC VIEW
TYPE COMBINATION
PAY LIMIT



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

COMBINATION CURB RAMP

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-09

REV. NO. X

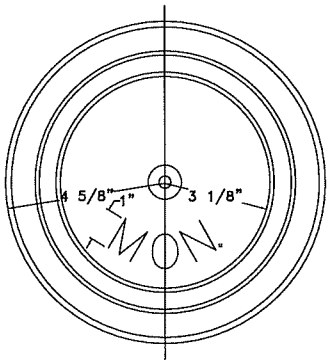
NOTES:

THE CASTINGS SHALL BE GRAY-IRON CASTINGS, ASTM DESIGNATION A 48, CLASS 40. THE COVER AND SEAT SHALL BE MACHINED SO AS TO HAVE PERFECT CONTACT AROUND THE ENTIRE CIRCUMFERENCE AND FULL WIDTH OF BEARING SURFACE.

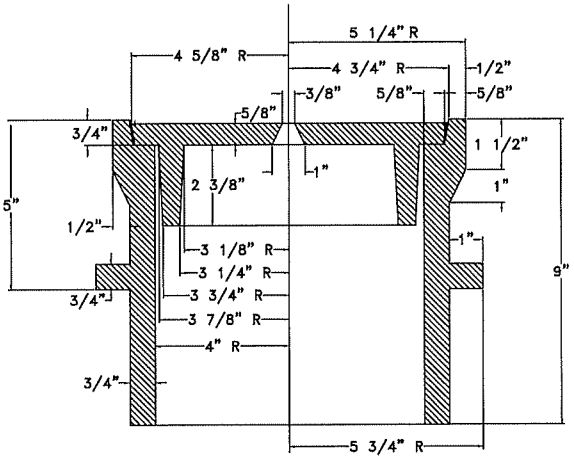
WHEN THE MONUMENT CASE AND COVER ARE PLACED IN CEMENT CONCRETE PAVEMENT THE CONCRETE BASE WILL BE NECESSARY.

APPROXIMATE WEIGHTS:

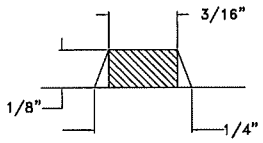
CASE	60 LBS.
COVER	19 LBS.
TOTAL	79 LBS.



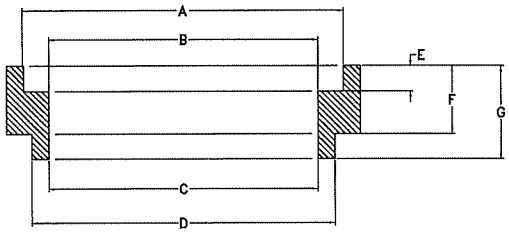
PLAN OF COVER



SECTION



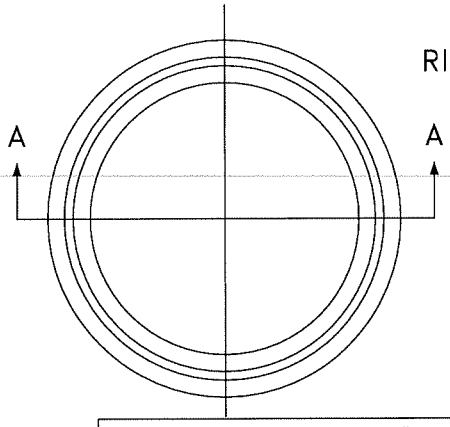
SECTION OF LETTER



SECTION A-A

PLAN

RISER RING



SIZE			
DIM	1-1/2"	2"	3"
A	10-1/2"	10-1/2"	10-1/2"
B	9-1/2"	9-1/2"	9-1/2"
C	8"	8"	8"
D	9"	9"	9"
E	3/4"	3/4"	3/4"
F	1-1/2"	2"	3"
G	2-1/4"	2-3/4"	3-3/4"

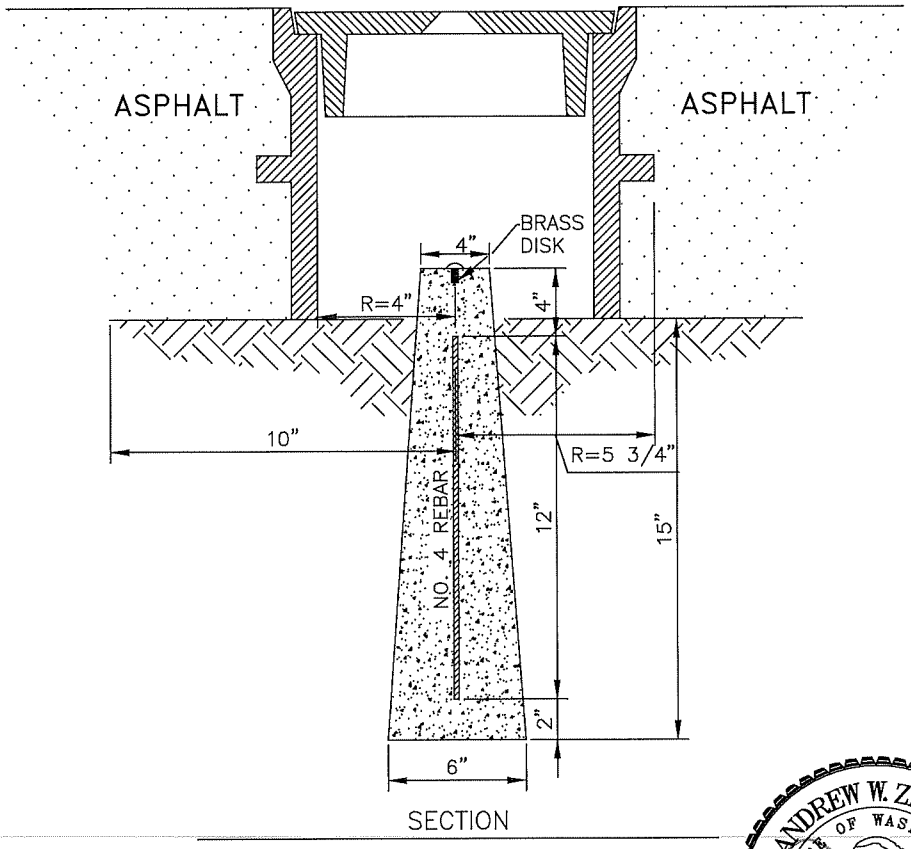
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

MONUMENT CASE AND COVER WITH RISER

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-11a

REV. NO. X



SECTION

NOTES

1. ASPHALT SHOULD BE PLACED IN LIFTS NO LARGER THAN 4".
2. MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE CASTING AT 28 DAYS – 3000#.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36169
REGISTERED
PROFESSIONAL ENGINEER
12-2-16

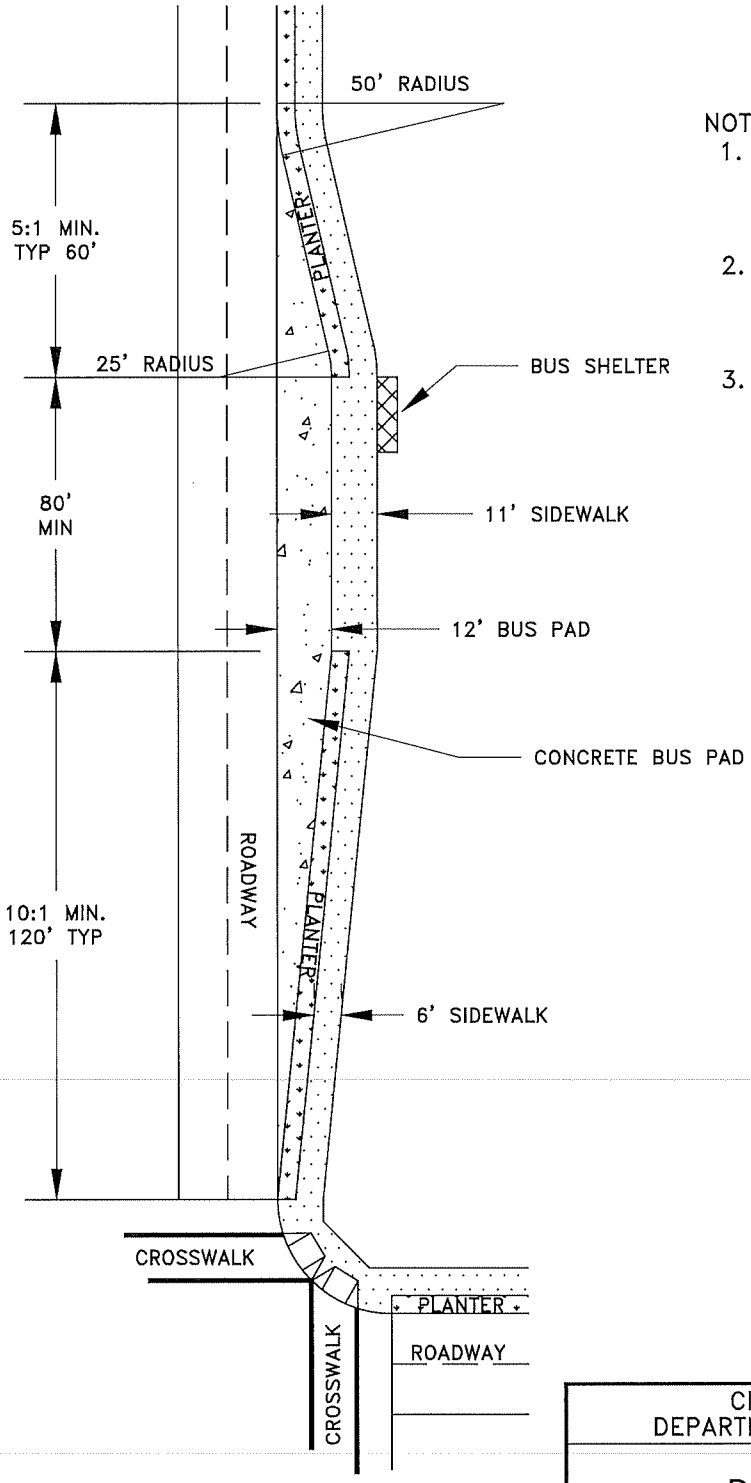
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

MONUMENT CASE AND COVER

APPROVED BY
CITY ENGINEER _____ DATE _____

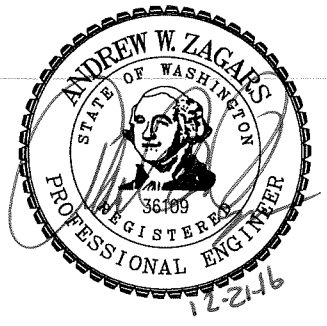
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-11b

REV. NO. X



NOTE:

1. SEE KING COUNTY METRO STANDARDS FOR BUS PAD AND BUS SHELTER INFORMATION.
2. BUS TURNOUTS SHALL BE LOCATED DOWNSTREAM OF A SIGNALIZED INTERSECTION.
3. LENGTH OF THE TURNOUT SHALL BE REVIEWED AT THE TIME OF DESIGN BASED ON PROPOSED USAGE.



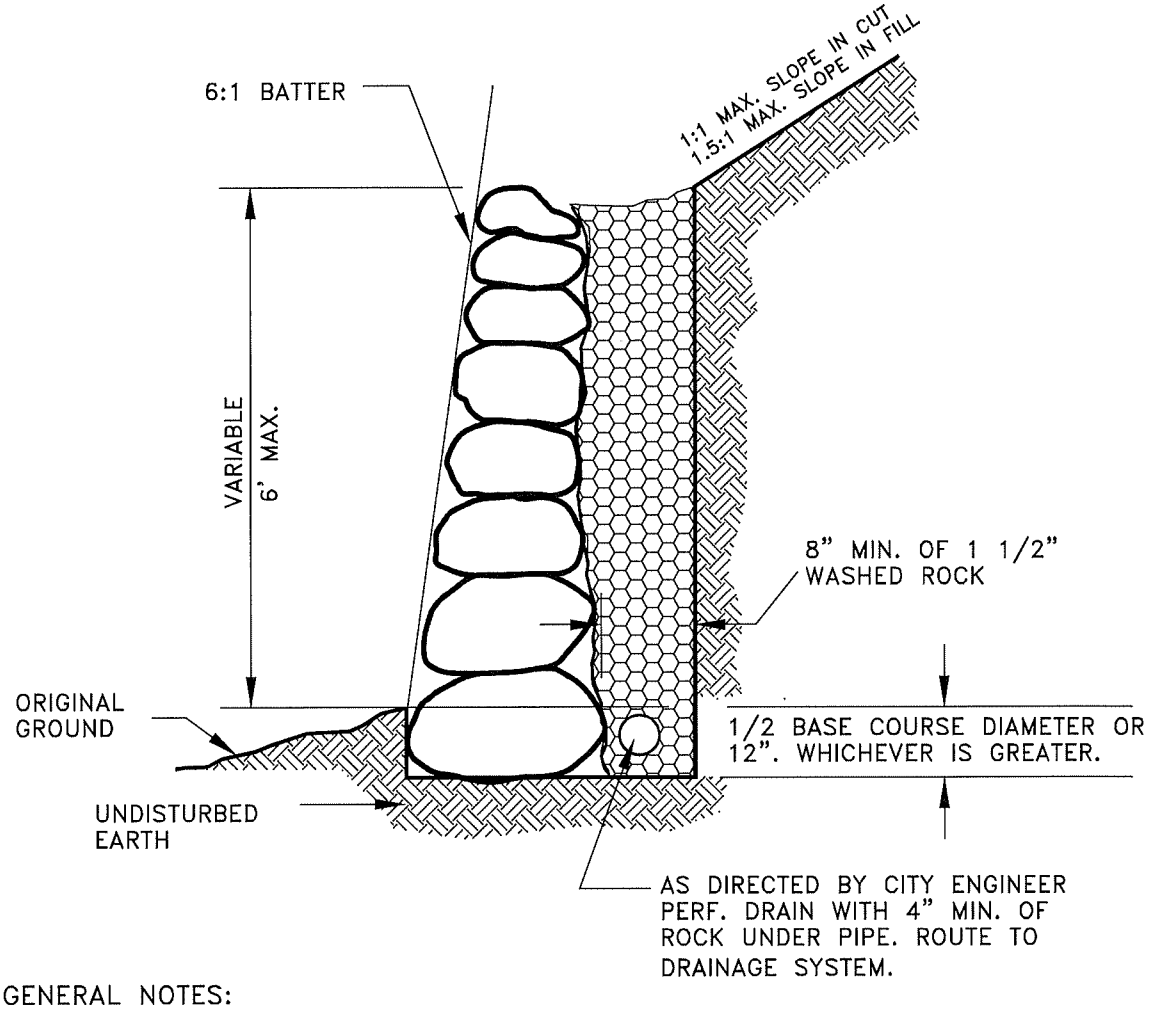
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

BUS TURNOUT

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-14

REV. NO. X



GENERAL NOTES:

1. Rockeries higher than 5' shall be constructed of rocks of graduated sizes from 5-man to 2-man from bottom to top. Rockeries of 5' or lower shall be constructed of 3-man to 2-man from bottom to top. Rock size catagories shall include:

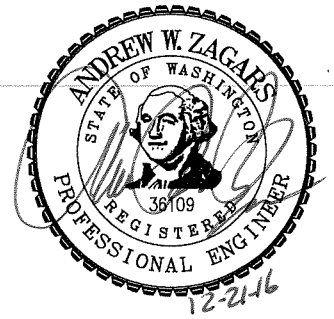
   Two-man rocks (300 to 600 pounds), 13 inches in least dimension;

   Three-man rocks (800 to 1200 pounds), 16 inches in least dimension;

   Four-man rocks (1500 to 2200 pounds), 18 inches in least dimension;

   Five-man rocks (2400 to 3400 pounds), 24 inches in least dimension.

2. The rockery shall be installed with a smooth face.
3. The long dimension of the rocks shall extend into the earth to provide maximum stability.
4. The rock shall be placed so as to lock into two rocks in the lower tier.
5. Call for inspection prior to base course being placed (for verification of rockery height, foundation material and rock size).
6. Design varying from those indicated shall carry the seal of a civil or geotechnical engineer experienced in soil mechanics.



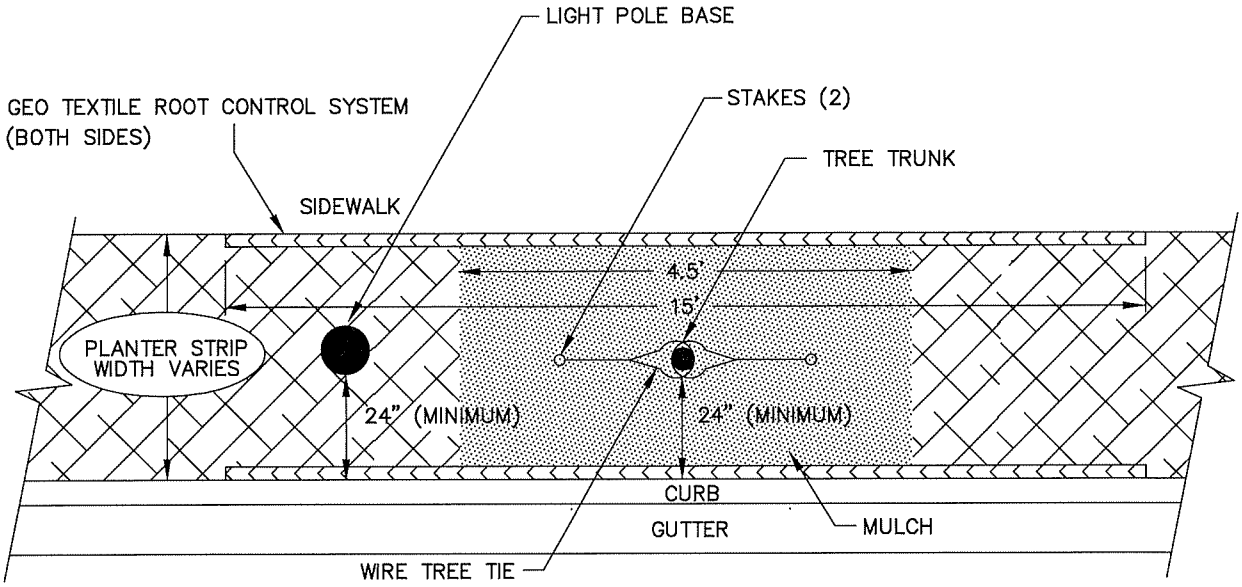
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

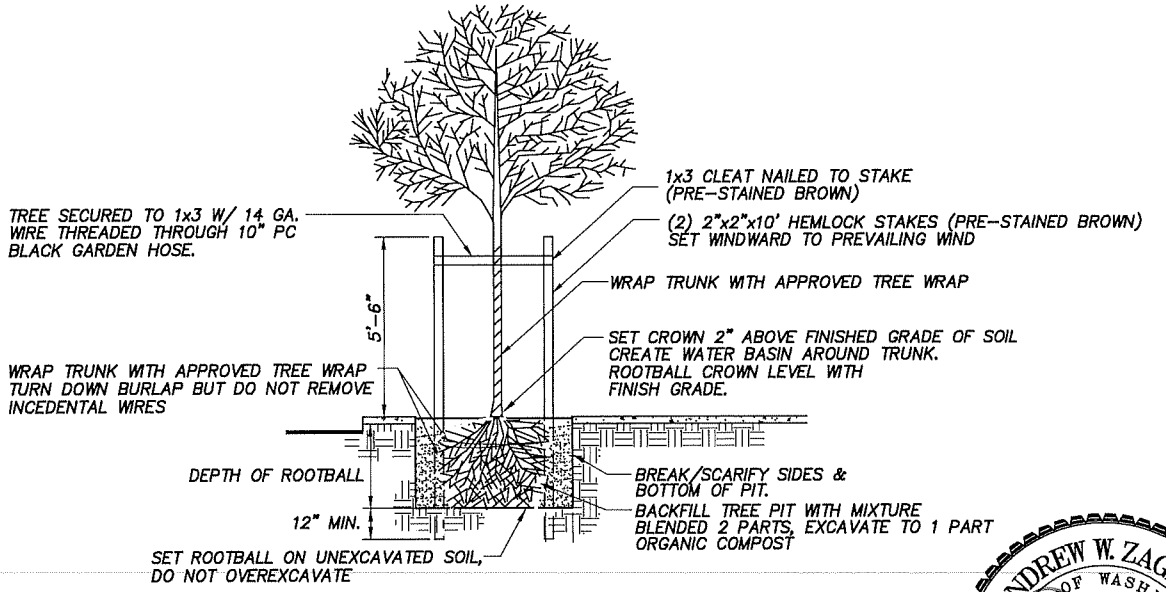
ROCK RETAINING WALL

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-15

REV. NO. X





STREET TREE SECTION
N.T.S.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-15

TOPSOILING NOTES

1.) ALL PLANT BEDS TO RECIEVE A UNIFORM LAYER OF PREPARED PLANTING MIX, 4" DEEP AND ROTOTILLED INTO SUBSOIL TO A DEPTH OF 8". PLANTING MIX TO BE EQUAL PARTS SANDYLOAM, PEAT HUMUS AND ORGANIC COMPOST

2.) BACKFILL FOR TREE PITS SHALL BE A UNIFORM BLENDED MIXTURE OF 2 PARTS EXCAVATE AND 1 PART ORGANIC COMPOST.

3.) ORGANIC COMPOST SHALL BE STEERCO, GRO-CO, CEDAR GROW COMPOST, NUTRI MULCH OR OTHER EQUAL POST CONSUMER RECYCLED HORTICULTURAL COMPOST PRODUCTS.

CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PLANTER STRIP DETAIL

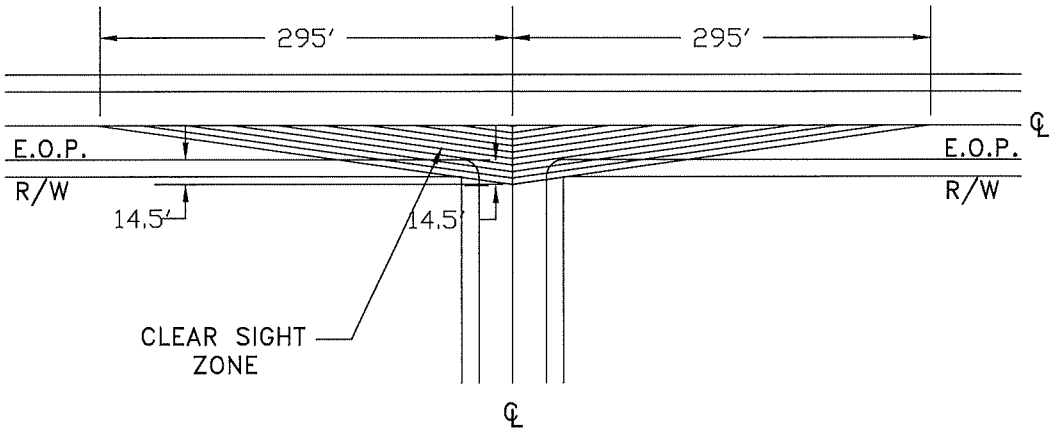
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
			AUG-XX-2015	FIG02-18

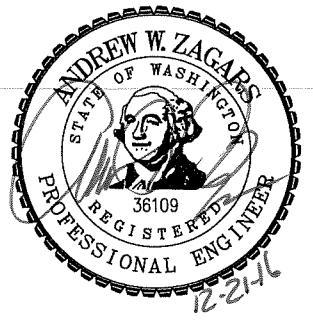
REV. NO. X

STOP CONTROLLED INTERSECTIONS

EXAMPLE: MAJOR STREET SPEED LIMIT = 20 M.P.H.



SIGHT DISTANCE (FT.)		
	(A.)	(B.)
SPEED LIMIT	ARTERIAL STREET	LOCAL STREET
20 MPH	295	295
25 MPH	355	355
30 MPH	415	415
35 MPH	470	470
40 MPH	530	530
50 MPH	590	590



GENERAL NOTES:

1. CRITERIA FOR SIGHT DISTANCES ARE BASED ON THE CURRENT AASHTO STANDARDS.

CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SIGHT OBSTRUCTION

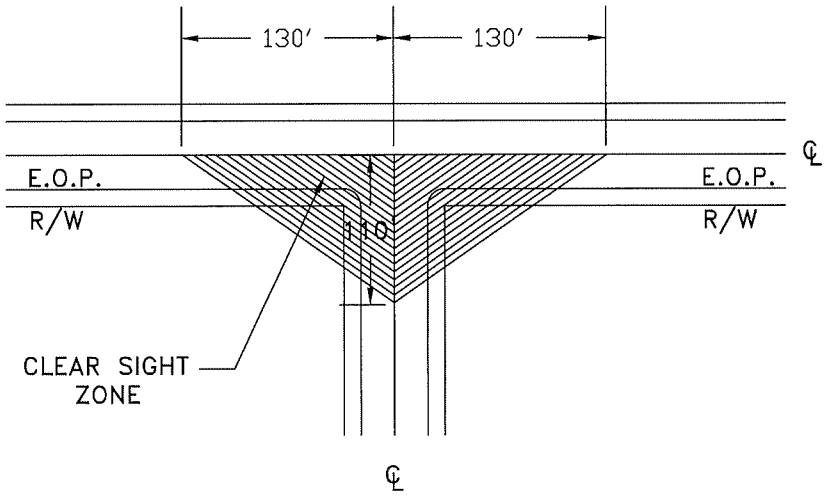
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-19A

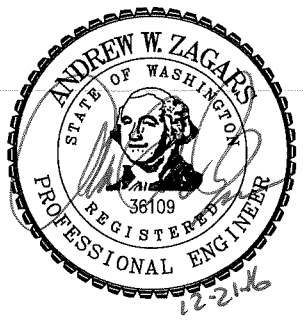
REV. NO. X

UNCONTROLLED INTERSECTIONS

EXAMPLE: MAJOR STREET SPEED LIMIT = 30 M.P.H.
MINOR STREET SPEED LIMIT = 25 M.P.H.



SIGHT DISTANCE (FT.)		
	(A.)	(B.)
SPEED LIMIT	ARTERIAL STREET	LOCAL STREET
20 MPH	90	90
25 MPH	110	110
30 MPH	130	130
35 MPH	155	155
40 MPH	180	180



12-21-16

GENERAL NOTES:

1. CRITERIA FOR SIGHT DISTANCES ARE BASED ON THE CURRENT AASHTO STANDARDS.

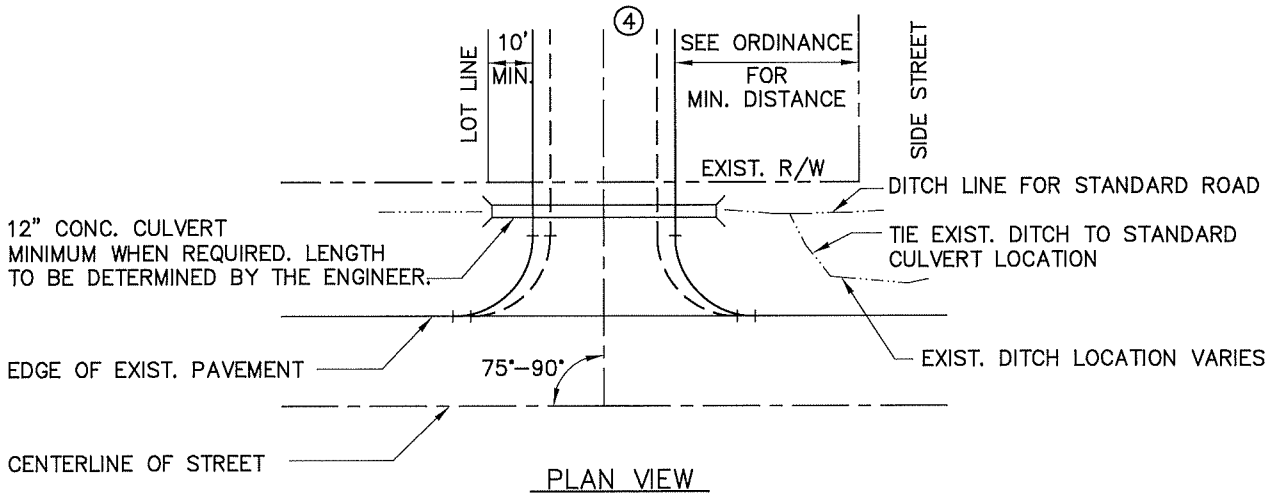
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SIGHT OBSTRUCTION

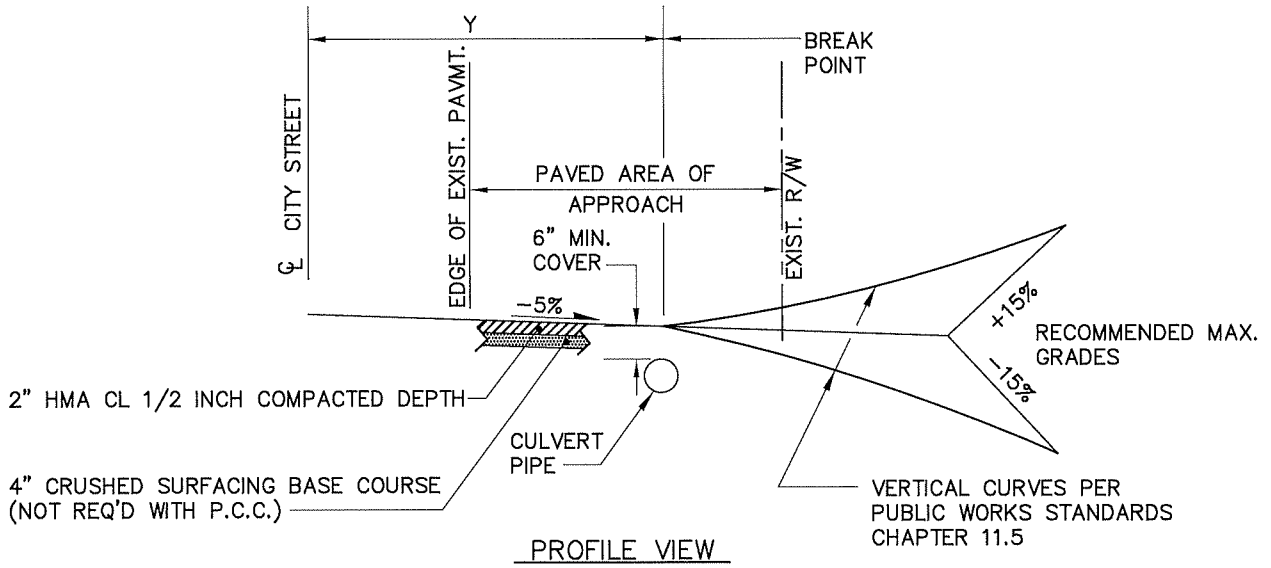
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-19B

REV. NO. X



PLAN VIEW
N.T.S.



PROFILE VIEW
N.T.S.

1. ALL MATERIALS & WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST STATE OF WASHINGTON, DEPT. OF HIGHWAYS STANDARD SPECIFI–CATIONS FOR RAOD & BRIDGE CONSTRUCTION.
2. PAVED APPROACH MAY BE 6" CONCRETE CLASS 4000 WHEN ROADWAY CURB & GUTTER IS PRESENT.
3. STORM DRAINAGE FROM THE ROAD APPROACH SHALL NOT BE PERMITTED TO DRAIN ONTO THE ROADWAY SURFACE. CATCH BASINS OR OTHER DRAINAGE DEVICES SHALL BE USED TO INTERCEPT & DIVERT THIS WATER.
4. FOLLOW ADDITIONAL INSTRUCTIONS AS DIRECTED BY THE APPROVING ENGINEER AS STATED ON THE APPROVED PERMIT.
5. SEE PUBLIC WORK STANDARDS TABLE 11.1 FOR DRIVEWAY WIDTHS.

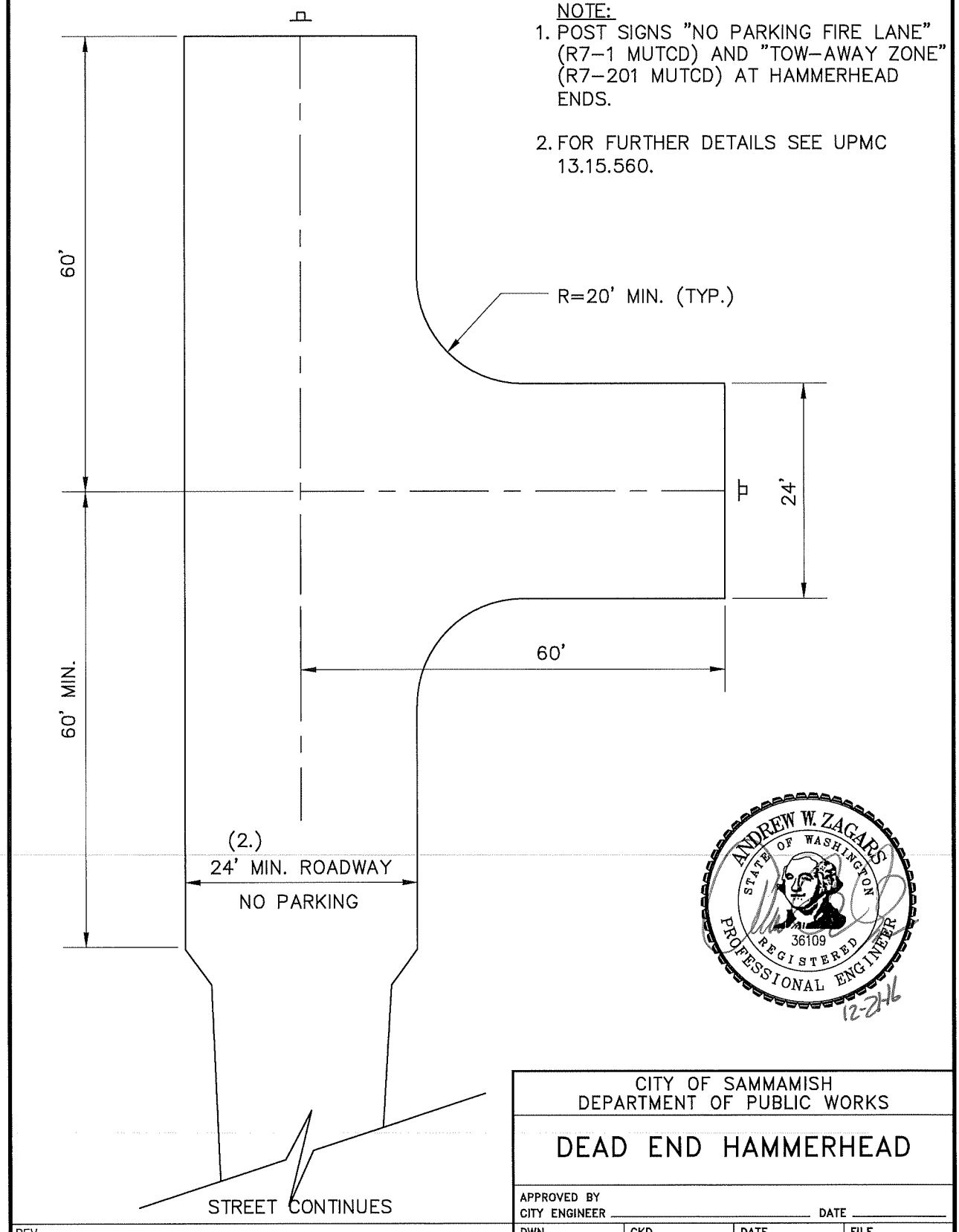
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

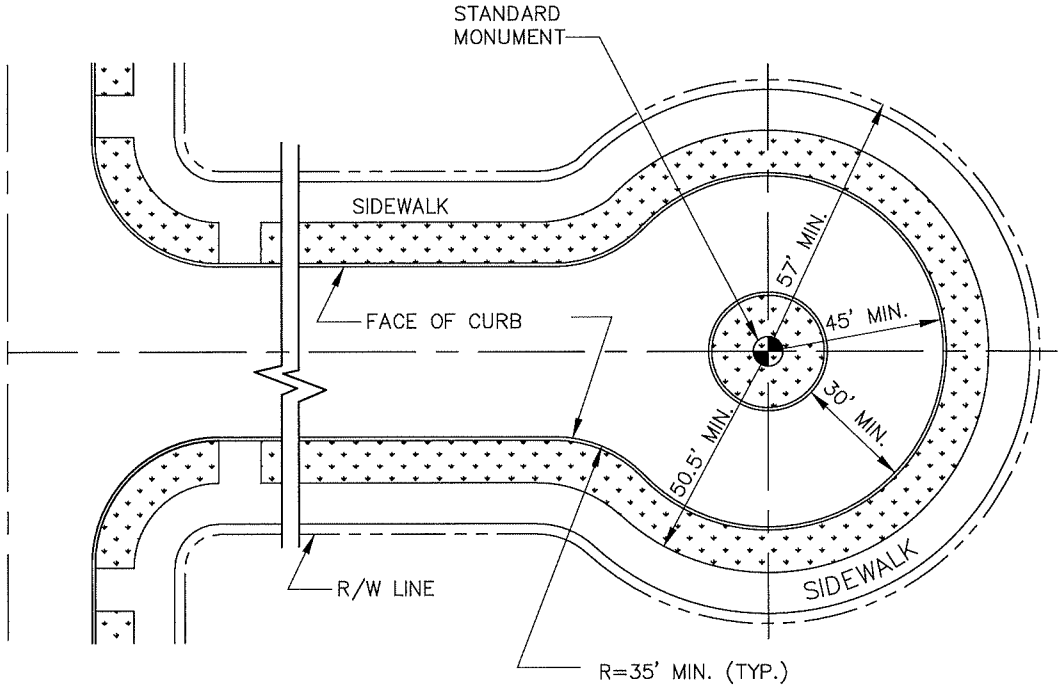
RESIDENTIAL DRIVEWAY

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG–XX–2015	FIG02–20

REV. NO. X


NOTE:
1. POST SIGNS "NO PARKING FIRE LANE" (R7-1 MUTCD) AND "TOW-AWAY ZONE" (R7-201 MUTCD) AT HAMMERHEAD ENDS.
2. FOR FURTHER DETAILS SEE UPMC 13.15.560.
60'
R=20' MIN. (TYP.)
24'
60' MIN.
60'
(2.)
24' MIN. ROADWAY
NO PARKING
STREET CONTINUES
ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-2-16
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS
DEAD END HAMMERHEAD
APPROVED BY
CITY ENGINEER
DATE
REV
DWN XXX
CKD XXX
DATE AUG-XX-2015
FILE FIG02-21
REV. NO. X



NOTES:
SEE FIG 3-08a FOR CURBS.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-16

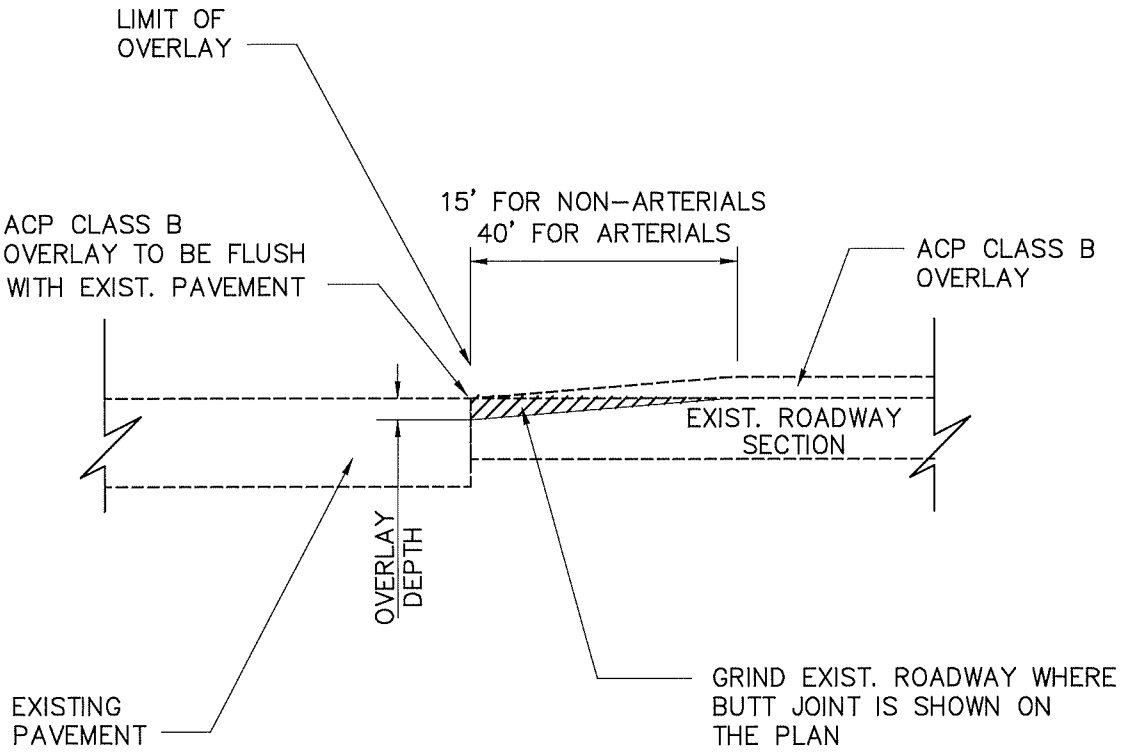
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

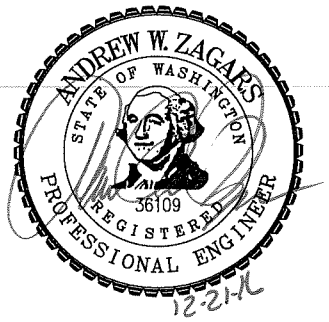
PERMANENT CUL-DE-SAC

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-22

REV. NO. X





NOTES:

1. EMULSIFIED ASPHALT GRADE CSS-1. TACK SHALL BE APPLIED TO EDGES OF EXISTING PAVEMENT. ALL JOINTS SHALL BE SEALED USING PAVING ASPHALT AR4000W.

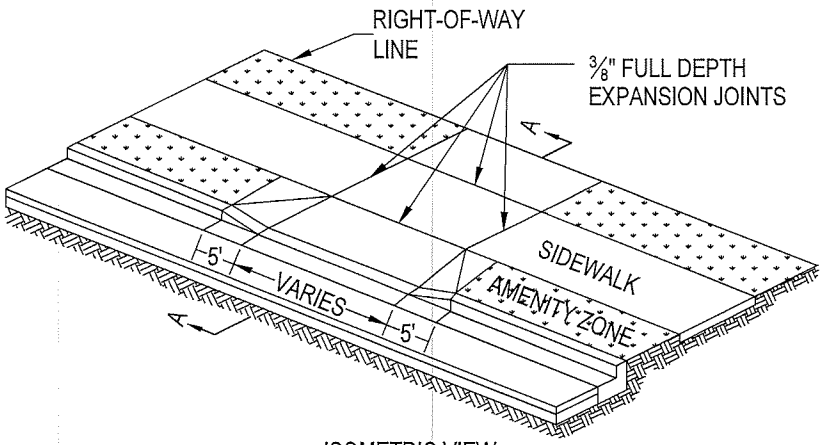
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

BUTT JOINT DETAIL

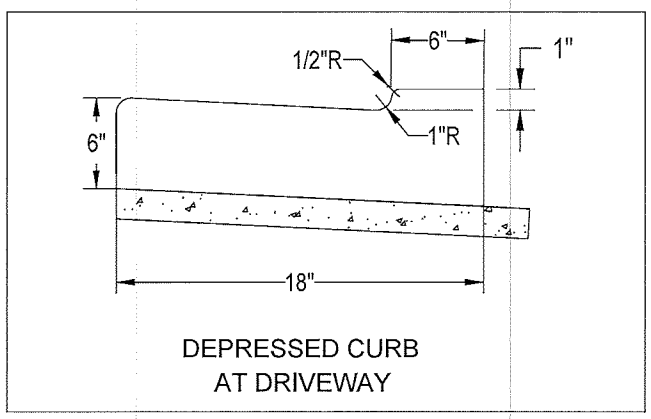
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG02-23

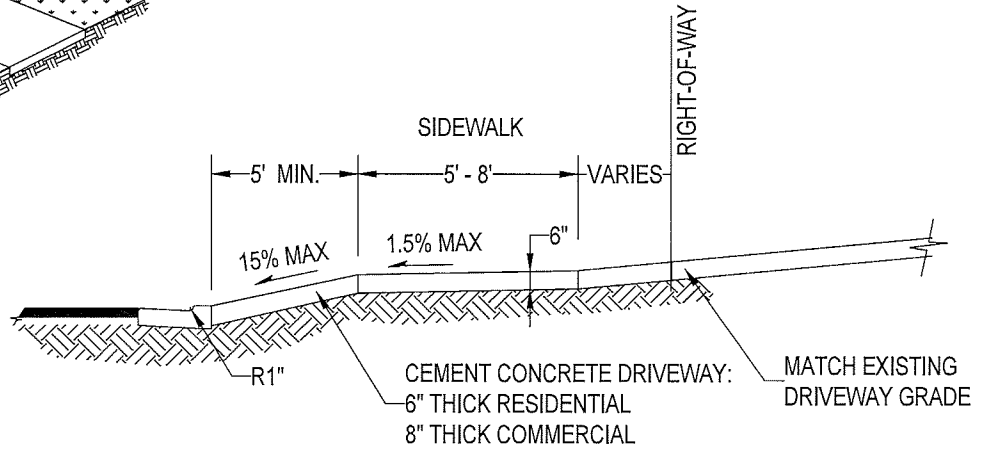
REV. NO. X



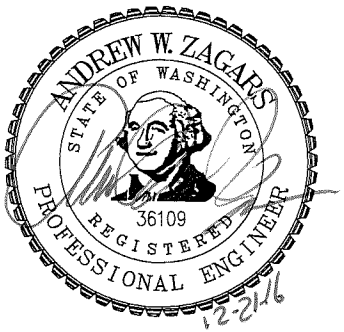
ISOMETRIC VIEW



DEPRESSED CURB
AT DRIVEWAY



SECTION A-A



NOTES:

1. MATERIAL - WSDOT CONCRETE CLASS 4000.
2. FULL DEPTH EXPANSION JOINT SHALL BE INSTALLED ON CENTER OF APROACH IF DRIVEWAY WIDTH IS 15' OR GREATER.
3. CURB SHALL BE IN COMPLIANCE WITH STD DWG 3-08a.
4. NO REBAR SHALL BE PLACED IN CURB, GUTTER, DRIVEWAY, OR SIDEWALK.

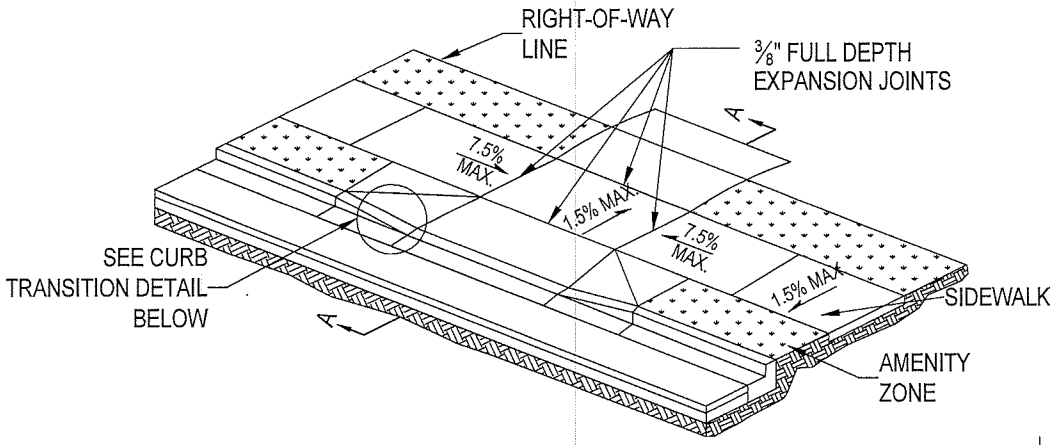
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CURB AND GUTTER SECTION DRIVEWAY APPROACH

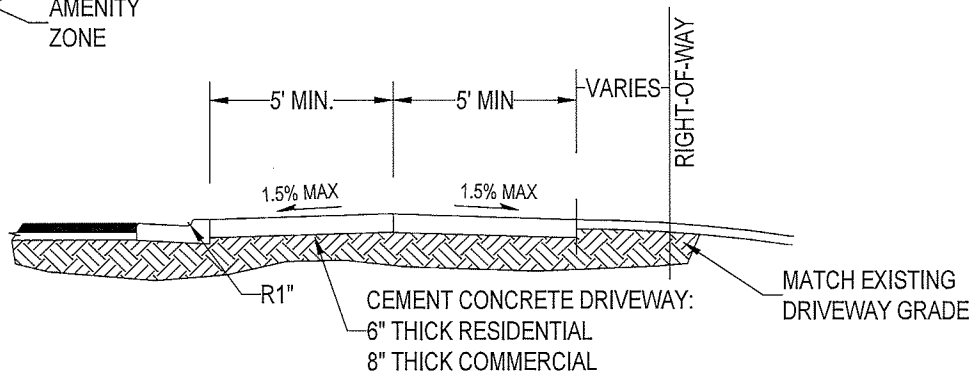
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG03-01

REV. NO. X



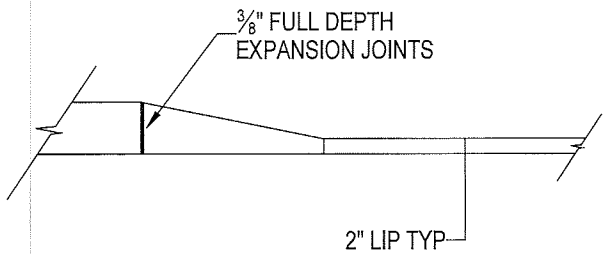
ISOMETRIC VIEW



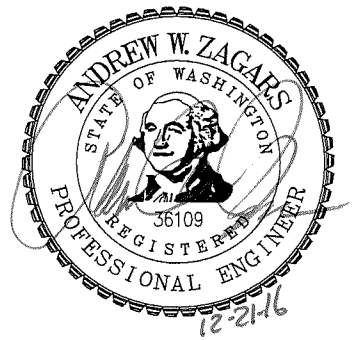
SECTION A-A

NOTES:

1. MATERIAL - WSDOT CONCRETE CLASS 4000.
2. FULL DEPTH EXPANSION JOINT SHALL BE INSTALLED IF DRIVEWAY WIDTH IS 10' OR GREATER.
3. CURB SHALL BE IN COMPLIANCE WITH STD DWG 3-08a.
4. NO REBAR SHALL BE PLACED IN CURB, GUTTER, DRIVEWAY, OR SIDEWALK.



CURB TRANSITION DETAIL



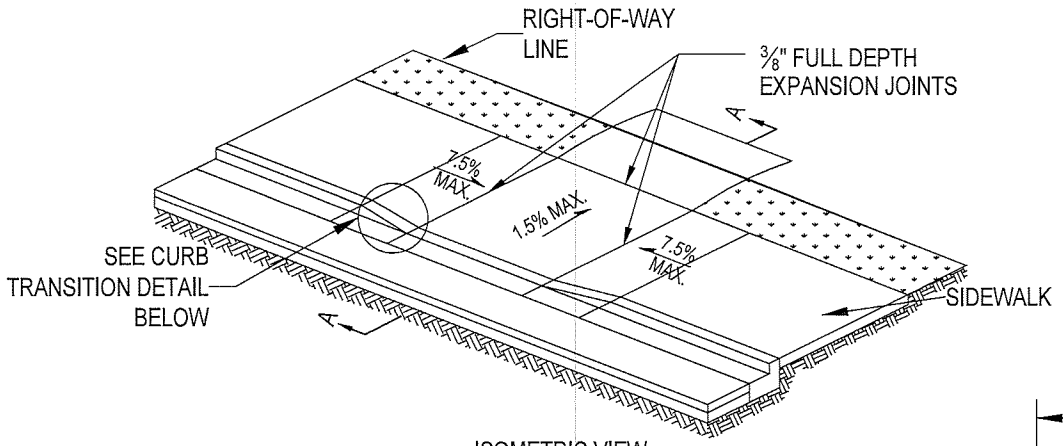
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

DRIVEWAY APPROACH: REVERSE SLOPE

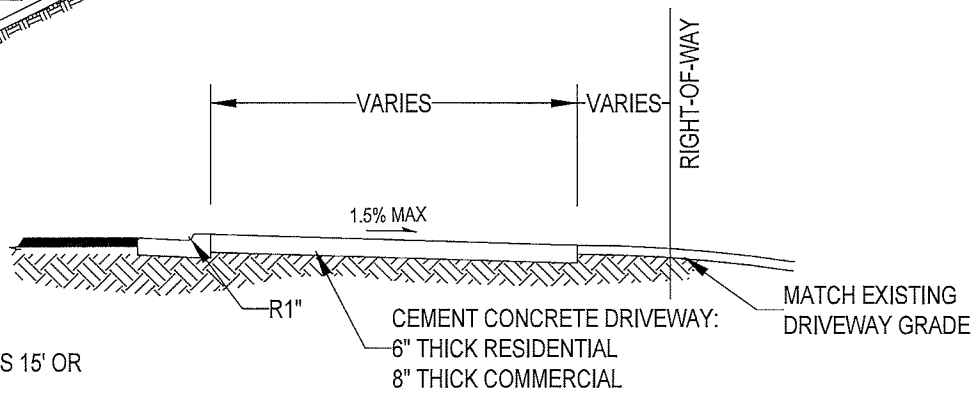
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG03-02

REV. NO. X



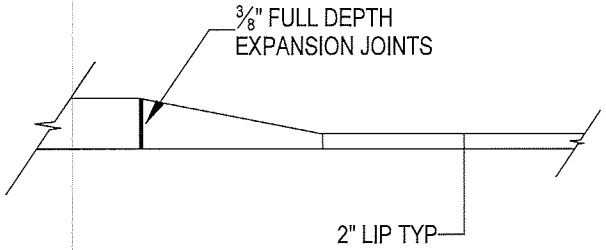
ISOMETRIC VIEW



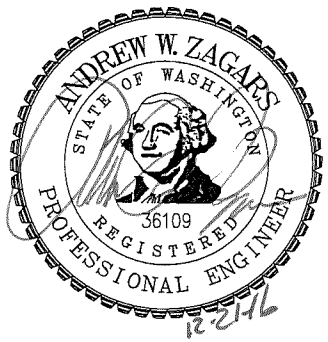
SECTION A-A

NOTES:

1. MATERIAL - WSDOT CONCRETE CLASS 4000.
2. FULL DEPTH EXPANSION JOINT SHALL BE INSTALLED IF DRIVEWAY WIDTH IS 15' OR GREATER.
3. CURB SHALL BE IN COMPLIANCE WITH STD DWG 3-08a.
4. NO REBAR SHALL BE PLACED IN CURB, GUTTER, DRIVEWAY, OR SIDEWALK.



CURB TRANSITION DETAIL



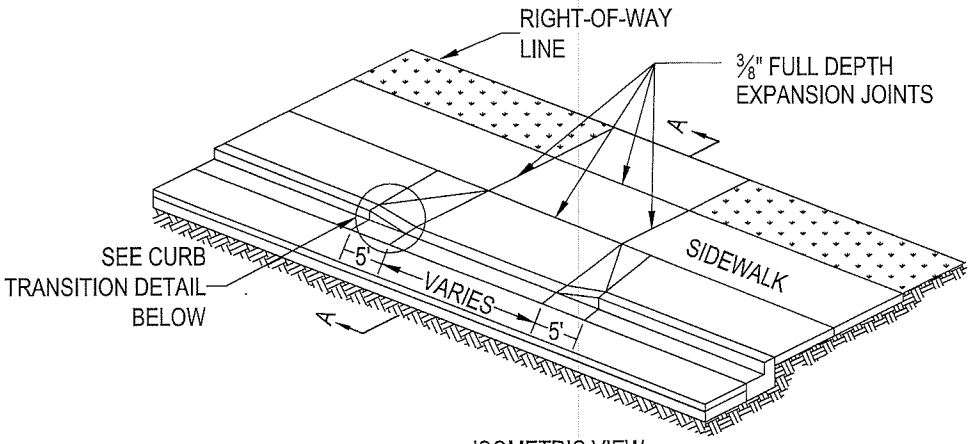
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

DRIVEWAY APPROACH: REVERSE SLOPE WITHOUT AMENITY ZONE

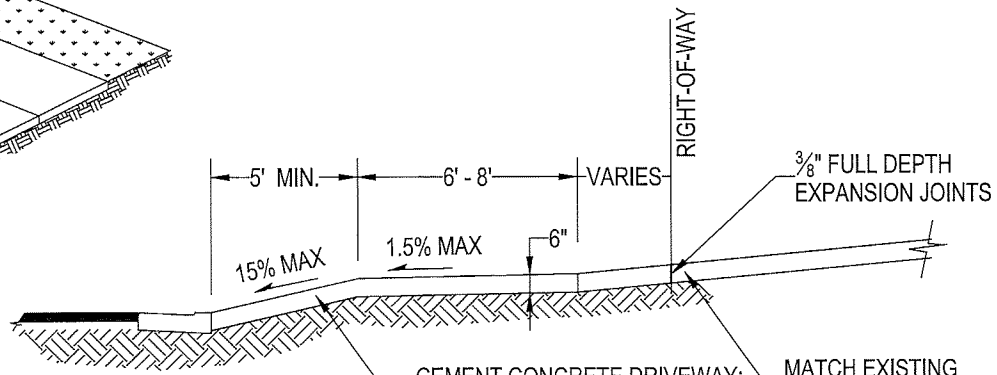
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG03-03

REV. NO. X



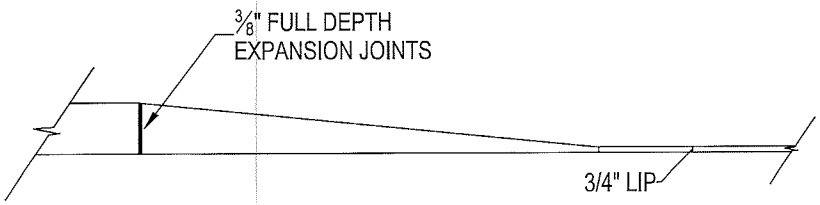
ISOMETRIC VIEW



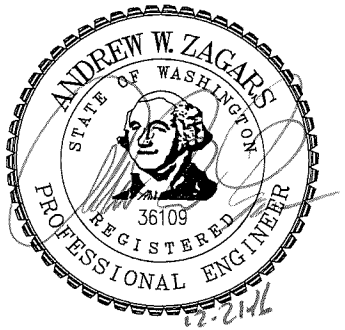
SECTION A-A

NOTES:

1. MATERIAL - WSDOT CONCRETE CLASS 4000.
2. FULL DEPTH EXPANSION JOINT SHALL BE INSTALLED IF DRIVEWAY WIDTH IS 15' OR GREATER.
3. CURB SHALL BE IN COMPLIANCE WITH STD DWG 3-12.
4. NO REBAR SHALL BE PLACED IN CURB, GUTTER, DRIVEWAY, OR SIDEWALK.



CURB TRANSITION DETAIL



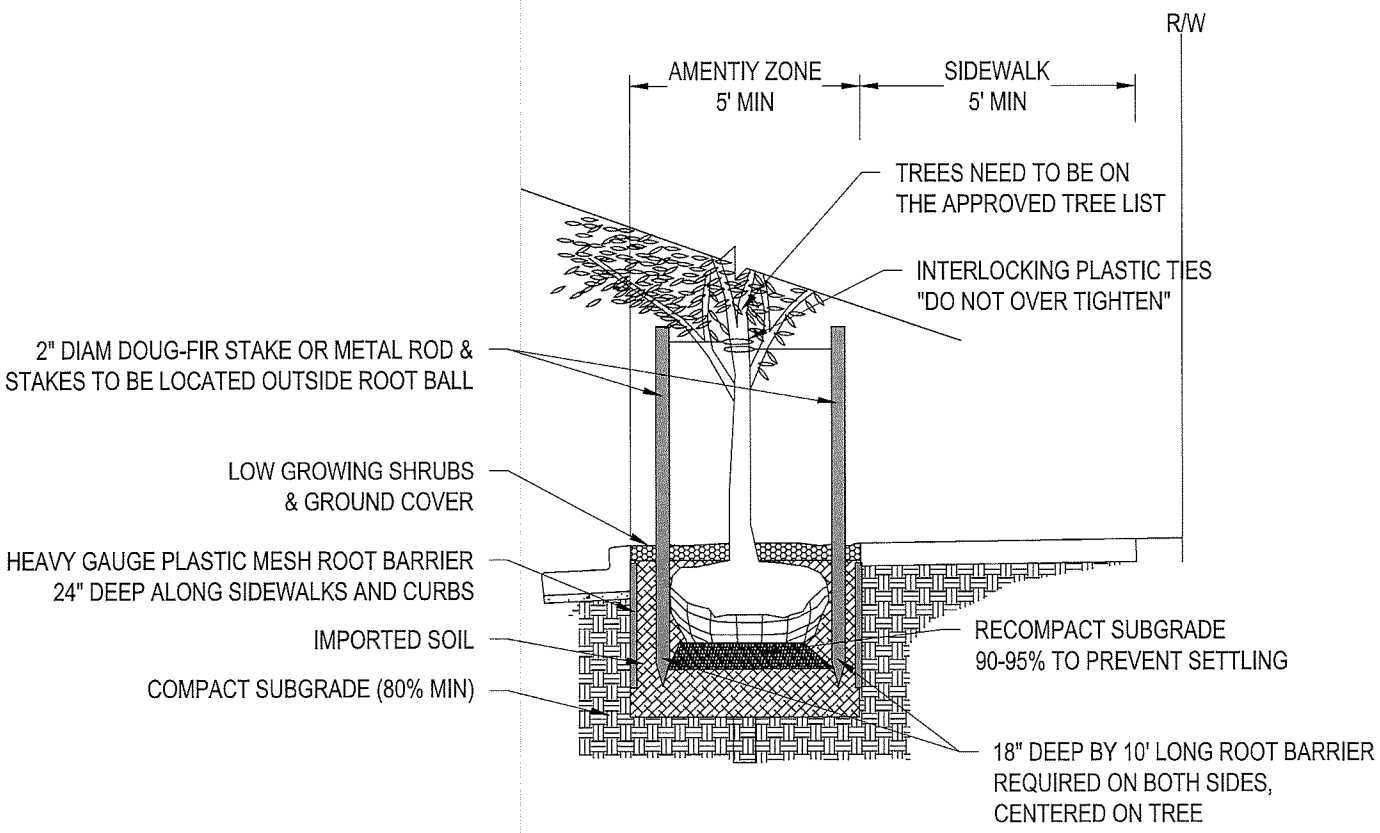
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

DRIVEWAY APPROACH WITHOUT AMENITY ZONE (8' SIDEWALK WIDTH)

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG03-04

REV. NO. X



NOTES:

1. TREE PIT SHALL NOT BE LESS THAN 2 TIMES ROOT BALL DIAM.
2. CUT ALL TIES & FOLD BACK BURLAP FROM UPPER ⅓ OF ROOT BALL.
3. WATER DAILY UNTIL ESTABLISHED, FERTILIZE & USE GROWTH HORMONE.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER

12-21-16

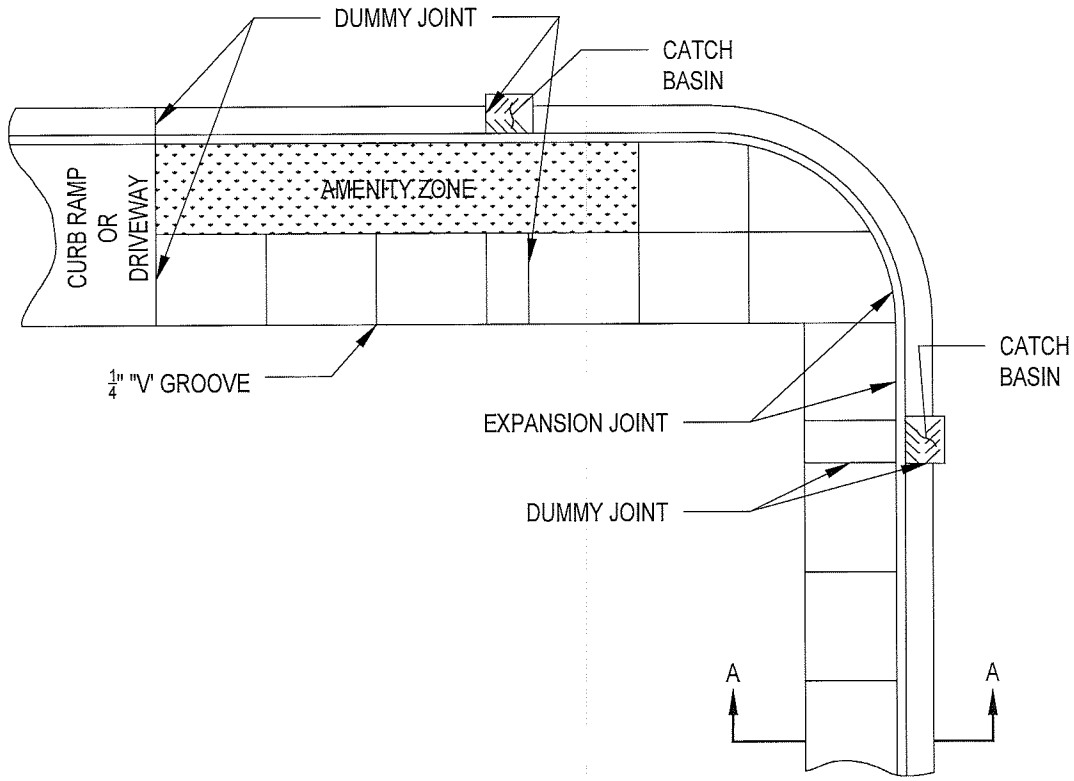
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

AMENITY ZONE

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG03-05

REV. NO. X



VERTICAL CURB & SIDEWALK

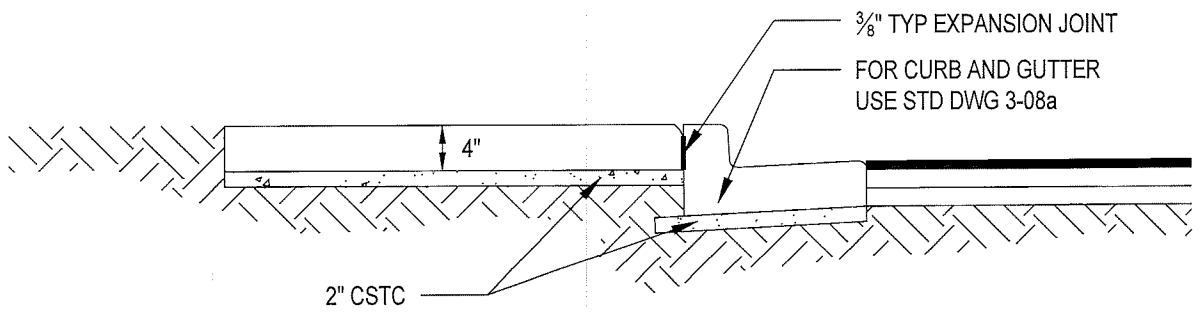
DUMMY JOINT @ MAX. 15' C-C, 10' TYP, 15' MAX

EXPANSION JOINT ALONG CURB

1/4" "V" GROOVE @ MAX. 5' C-C

NOTES:

1. CONCRETE SHALL HAVE 4" PERIMETER EDGING.
2. SIDEWALK JOINTS SHOULD MATCH EXPANSION JOINTS.



SECTION A-A

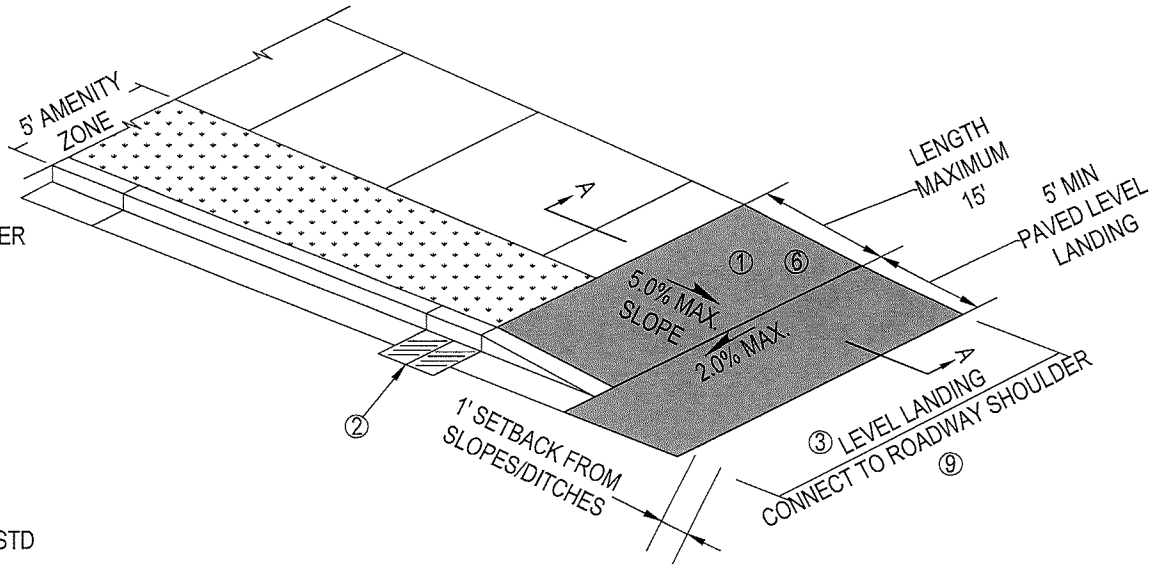
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SIDEWALK

APPROVED BY
CITY ENGINEER _____ DATE _____

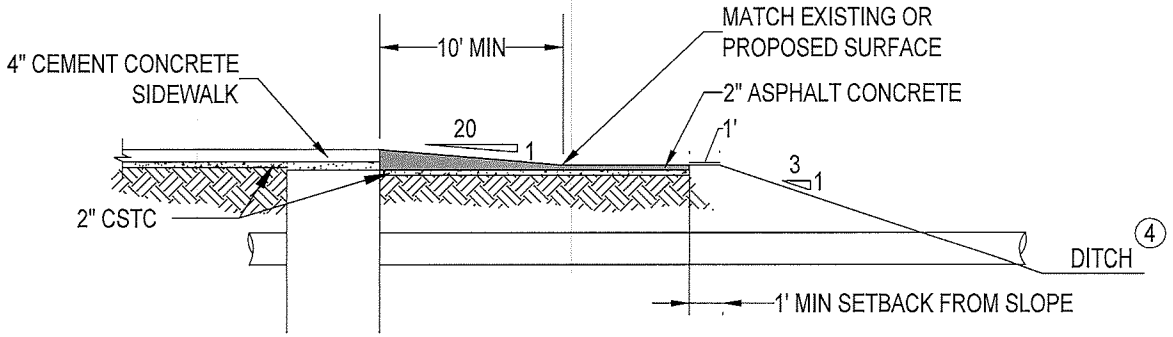
REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG03-06

REV. NO. X



NOTES:

1. RAMP, CURB TAPER, AND LEVEL LANDING ALL ASPHALT OVER 2" CSTC.
2. CATCH BASINS LOCATE AT END OF IMPROVEMENTS TO FACILITATE FUTURE EXTENSIONS/CONNECTIONS.
3. FOR WIDTHS OF PAVEMENT AND SHOULDER SEE STD DWG 1-01, 1-02, 1-03, 1-05.
4. FOR TRANSITIONS ADJACENT TO DITCHES, DITCH SLOPING (3:1 TYPICAL), 1' SETBACK & PIPE BEVEL END DESIGN (SEE STD DWG 7-01) MAY BE REQUIRED.
5. FOR CURB AND SIDEWALK JOINTS SEE STD DWG 3-06.
6. DETECTABLE WARNING PATTERN (TRUNCATED DOMES) MAY BE REQUIRED IF RAMP CROSSES TRAVEL LANE OF PUBLIC STREET OR AS SPECIFIED BY THE CITY TRAFFIC ENGINEER (SEE STD DWG 2-06).
7. CURB RADIUS REQUIRED AT INTERSECTIONS.
8. EXISTING SHOULDER MAY REQUIRE RESTORATION WITH CSTC.



SECTION A-A

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-16

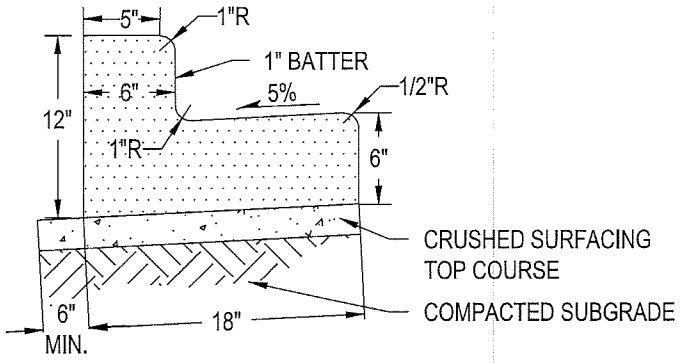
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

ASPHALT TRANSITION RAMP TO SHOULDER

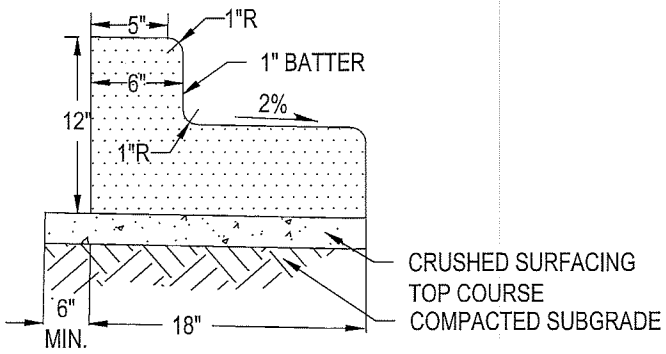
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG03-07

REV. NO. X



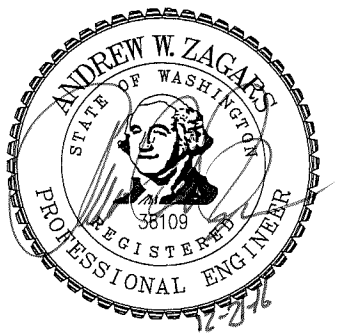
TYPE A CURB AND GUTTER



MEDIAN CURB AND GUTTER

NOTES:

1. CONSTRUCT 10 FT LONG CURB TYPE TRANSITION BETWEEN DIFFERENT CURB TYPES.



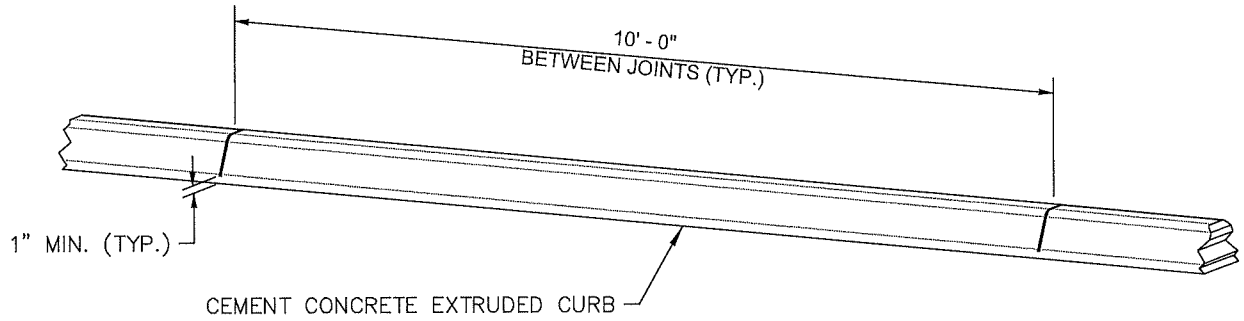
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CURBS

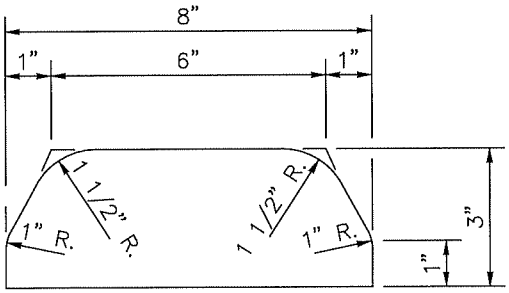
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	TTC	AWZ	AUG-XX-2015	FIG03-8a

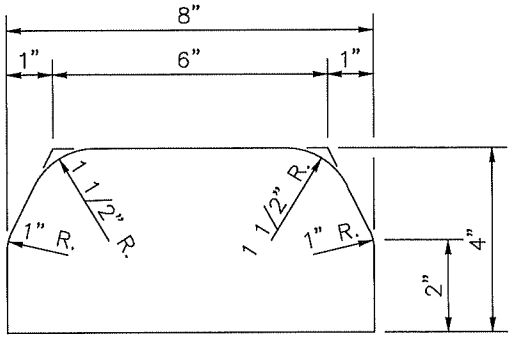
REV. NO. X



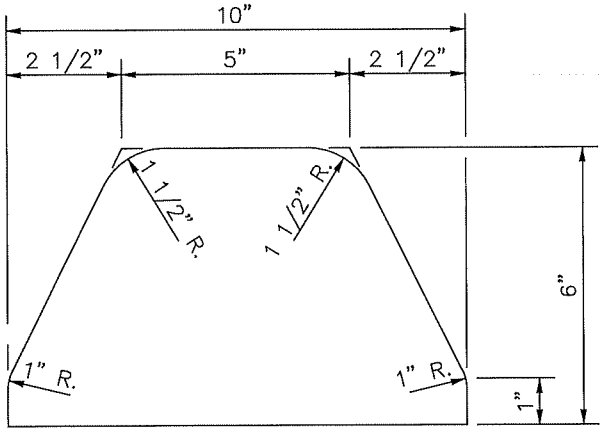
NOTES:
1. INSTALL PAVEMENT 2" BEYOND BACK OF CURB.
2. BOND EXTRUDED CURB TO EXISTING PAVEMENT WITH MORTAR PASTE.
3. JOINTS MAY BE FORMED DURING INSTALLATION USING A RIGID DIVIDER OR SAWCUT AFTER CONCRETE CURES TO MINIMUM STRENGTH.



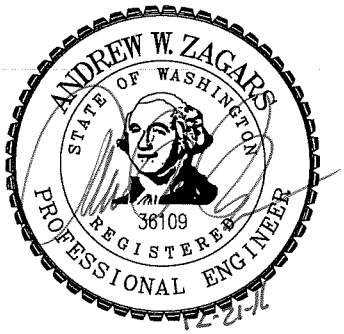
TYPE 4
(CEMENT CONCRETE)



TYPE 5
(CEMENT CONCRETE)



TYPE 6
(CEMENT CONCRETE)



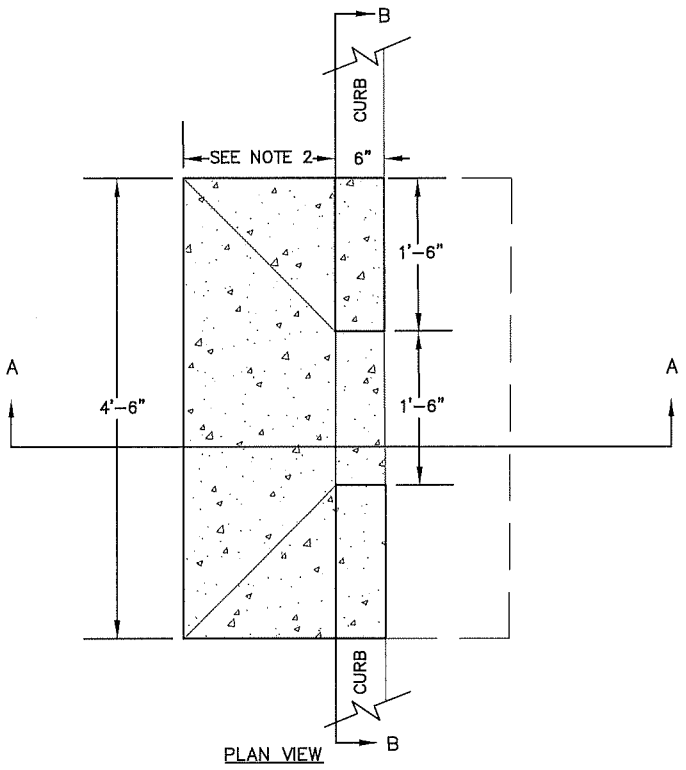
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

EXTRUDED CURB DETAIL

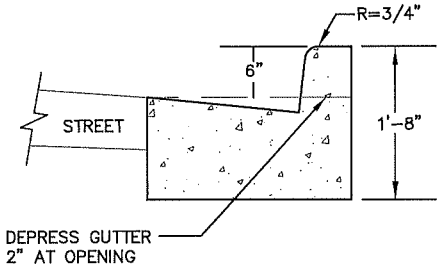
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG03-08b

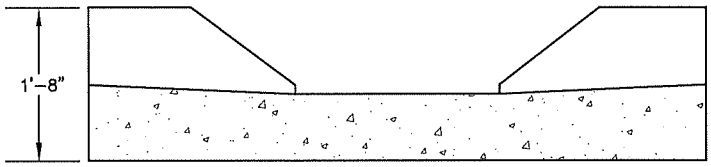
REV. NO. X



PLAN VIEW



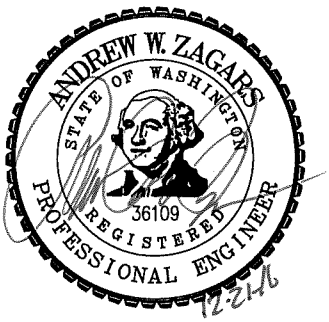
SECTION A–A



SECTION B–B

NOTES:

1. SPLASH PADS ARE REQUIRED AT ALL INLETS.
2. MATCH GUTTER PAN OF ADJACENT CURB AND GUTTER.



– NOT TO SCALE –

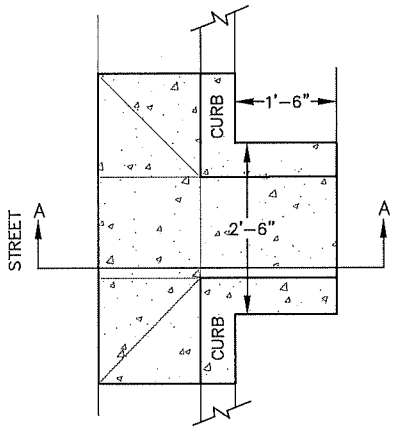
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CONCRETE CURB INLET

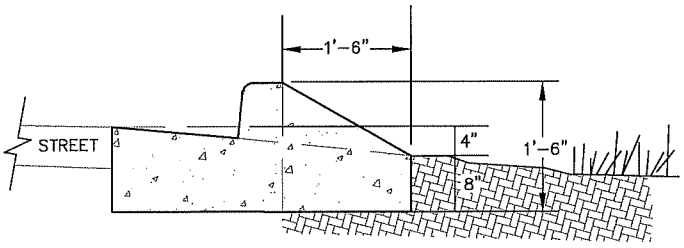
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	LG		SEPT–7–2016	3–09a

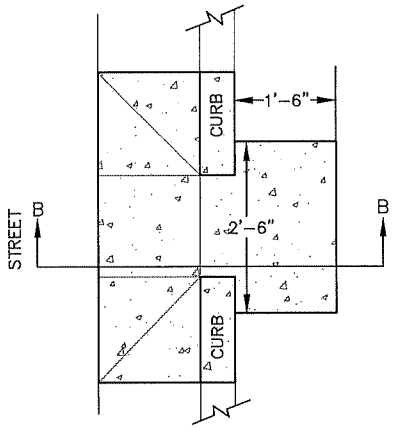
REV. NO. X



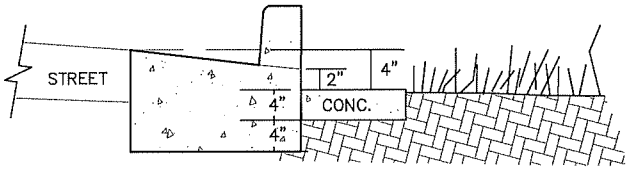
DETAIL A – WITH WINGWALLS AND CONCRETE PAD



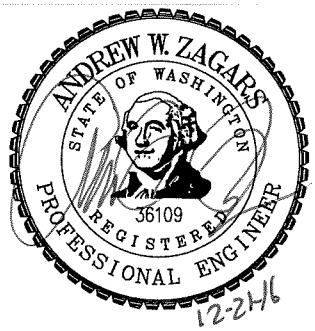
SECTION A–A



DETAIL B – WITH CONCRETE PAD ONLY



SECTION B–B



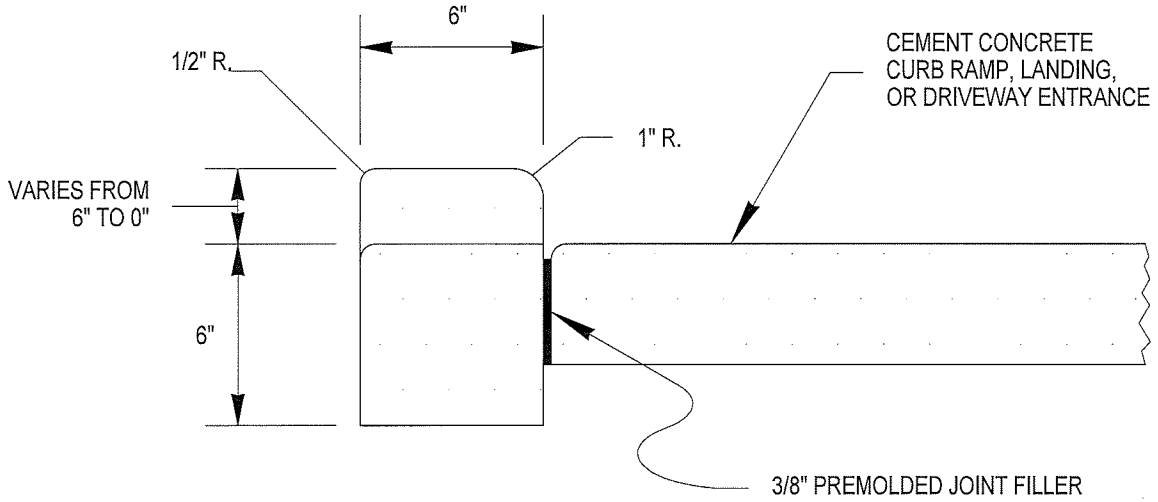
– NOT TO SCALE –

CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CONCRETE CURB INLET

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	LG		SEPT–7–2016	3–09b



ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-16

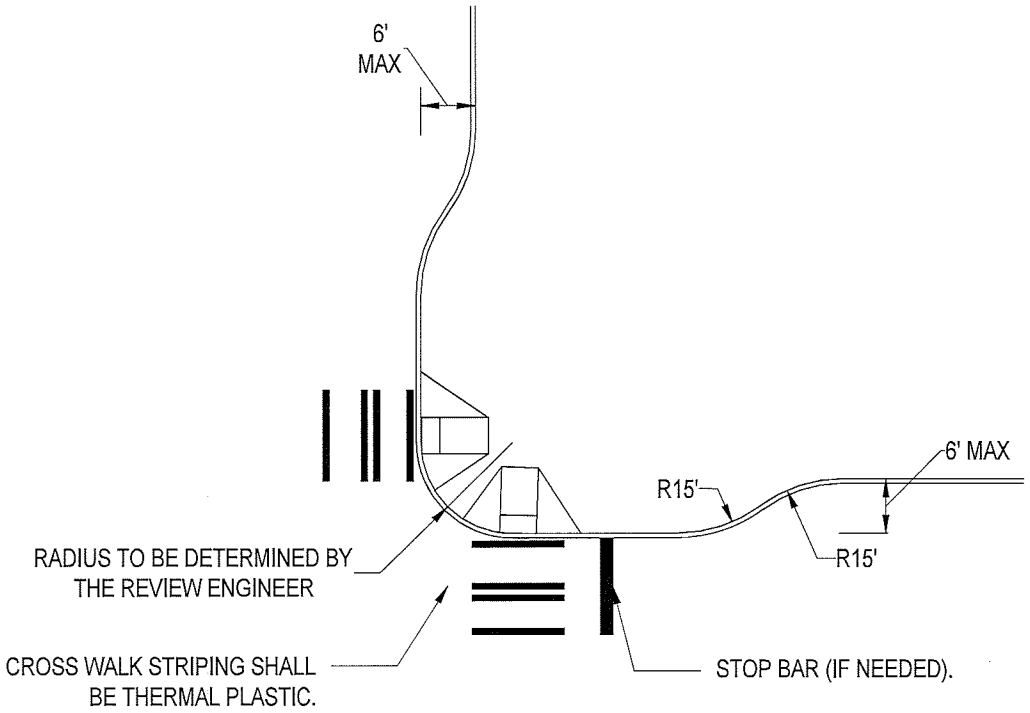
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PEDESTRIAN CURB

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG03-11

REV. NO. X



NOTES:

1. INTERSECTION RADII SHALL ACCOMMODATE DESIGN VEHICLES APPLICABLE TO STREET.
2. LENGTH OF CURB EXTENSIONS MUST RECOGNIZE SITE CONDITIONS, E.G. DRIVEWAY LOCATIONS.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-15

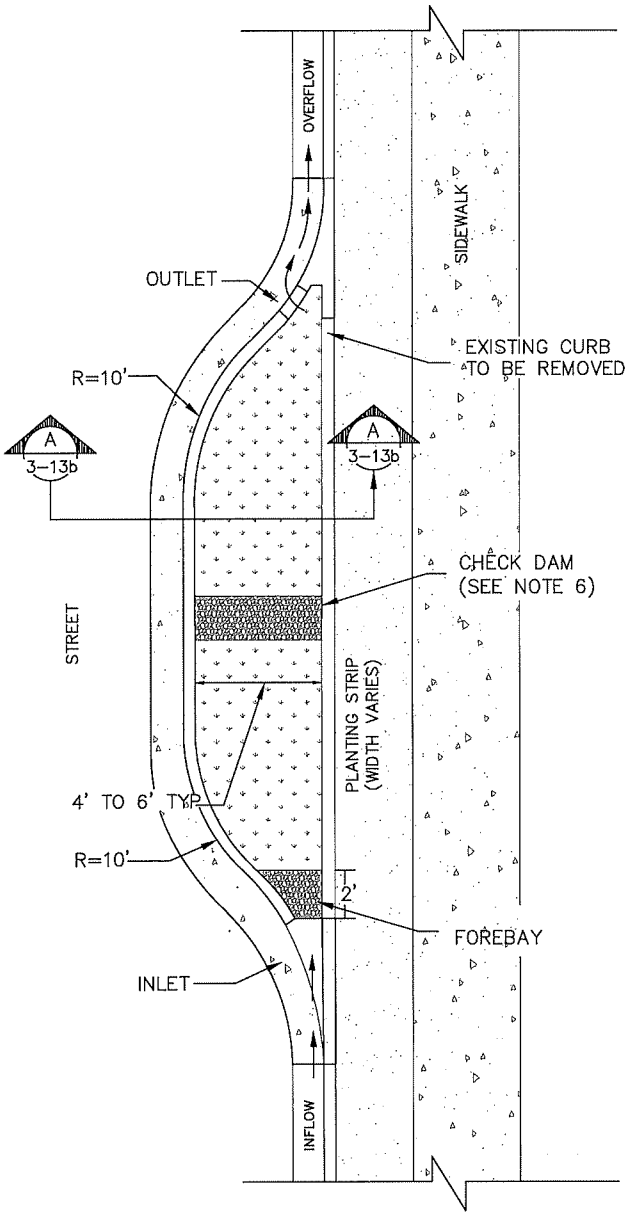
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CURB EXTENSION

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG03-12

REV. NO. X

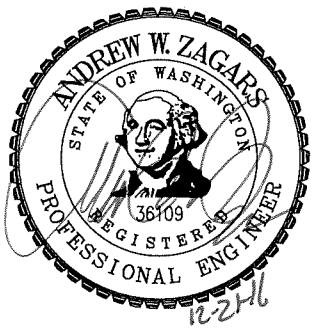


PLAN VIEW

NOTES:

1. AREA AND DEPTH OF FACILITY ARE BASED UPON ENGINEERING CALCULATIONS AND RIGHT OF WAY CONSTRAINTS.
2. LONGITUDINAL SLOPE OF PLANTER MATCHES ROAD.
3. INCLUDE BEGINNING AND ENDING STATIONS FOR EACH FACILITY. PROVIDE STATIONS AND ELEVATIONS AT EVERY INLET, OUTLET, AND CHECK DAM.
4. SIDEWALK ELEVATION MUST BE SET ABOVE INLET AND OUTLET ELEVATIONS TO ALLOW OVERFLOW TO DRAIN TO STREET BEFORE SIDEWALK.
5. INLETS AND OUTLETS REQUIRED.
6. CHECK DAMS MAY BE REQUIRED.
7. SEE CITY SURFACE WATER DESIGN MANUAL FOR FACILITY MEDIA REQUIREMENTS.
8. SPECIAL REQUIREMENTS FOR WATER LINES, METERS, AND FIRE HYDRANTS. SEE WATER DISTRICT FOR REQUIREMENTS.
9. UTILITY LINES MAY NEED TO BE SLEEVED OR RELOCATED.
10. WHERE FEASIBLE, WIDTH OF STORMWATER FACILITY SHOULD EXTEND INTO EXISTING PLANTING STRIP.

IMPORTANT: Utility conflicts and existing conditions can create major design variables. Locate utilities and survey existing conditions prior to beginning design work.



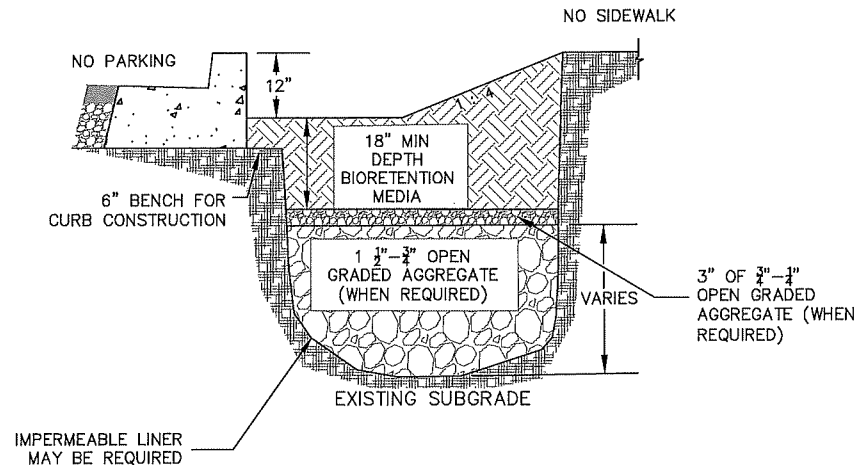
– NOT TO SCALE –

CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

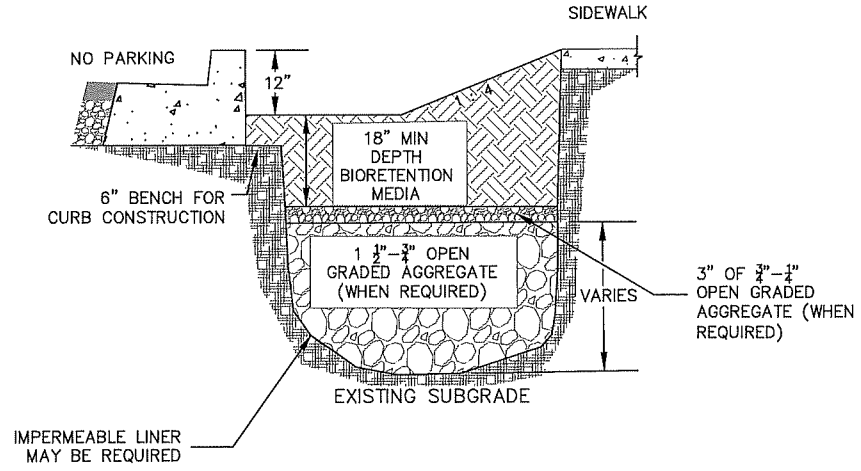
CURB EXTENSION SECTION

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	LG		SEPT-7-2016	FIG03-13A



SECTION A–A
CURB EXTENSION SECTION
WITHOUT SIDEWALK



SECTION A–A
CURB EXTENSION SECTION
WITH SIDEWALK

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-2-16

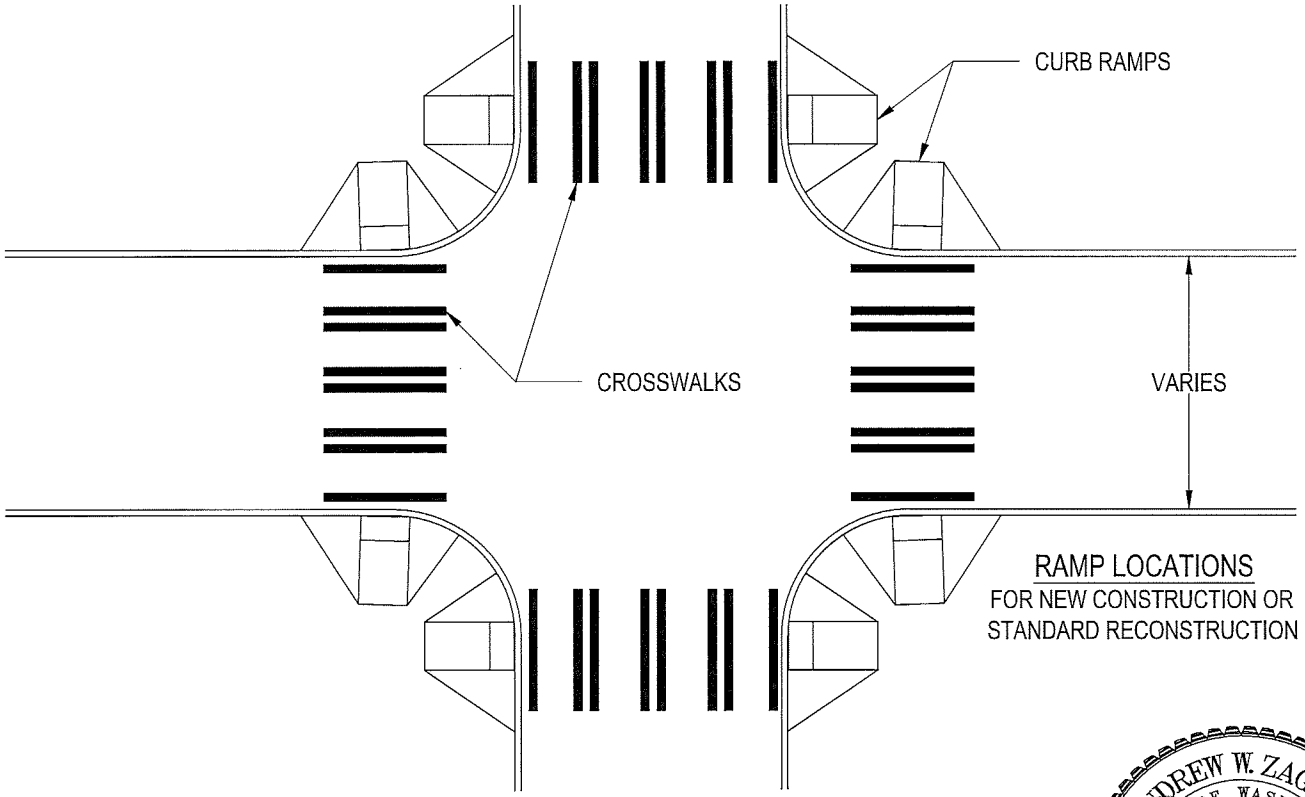
– NOT TO SCALE –

CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CURB EXTENSION SECTION

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	LG		SEPT–7–2016	FIG03–13B



RAMP LOCATIONS
FOR NEW CONSTRUCTION OR
STANDARD RECONSTRUCTION

NOTES:

1. CURB RAMP CONSTRUCTION MUST COMPLY WITH CURRENT ADA STANDARDS.
2. CONSTRUCT RAMP WITH A MINIMUM 1' CLEARANCE FROM FIXED OBJECTS SUCH AS HYDRANTS, POLES, INLETS, AND OTHER UTILITIES.
3. CONSTRUCT RAMP IN ACCORDANCE WITH FIG02-06.
4. CROSSWALKS ARE ONLY MARKED PER PLAN OR AS DIRECTED BY ENGINEER.
5. WHEN RAMPS ARE CONSTRUCTED ON ONE SIDE OF STREET, RAMPS SHALL BE CONSTRUCTED AT CORRESPONDING LOCATIONS ON OPPOSITE SIDE OF STREET.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-16

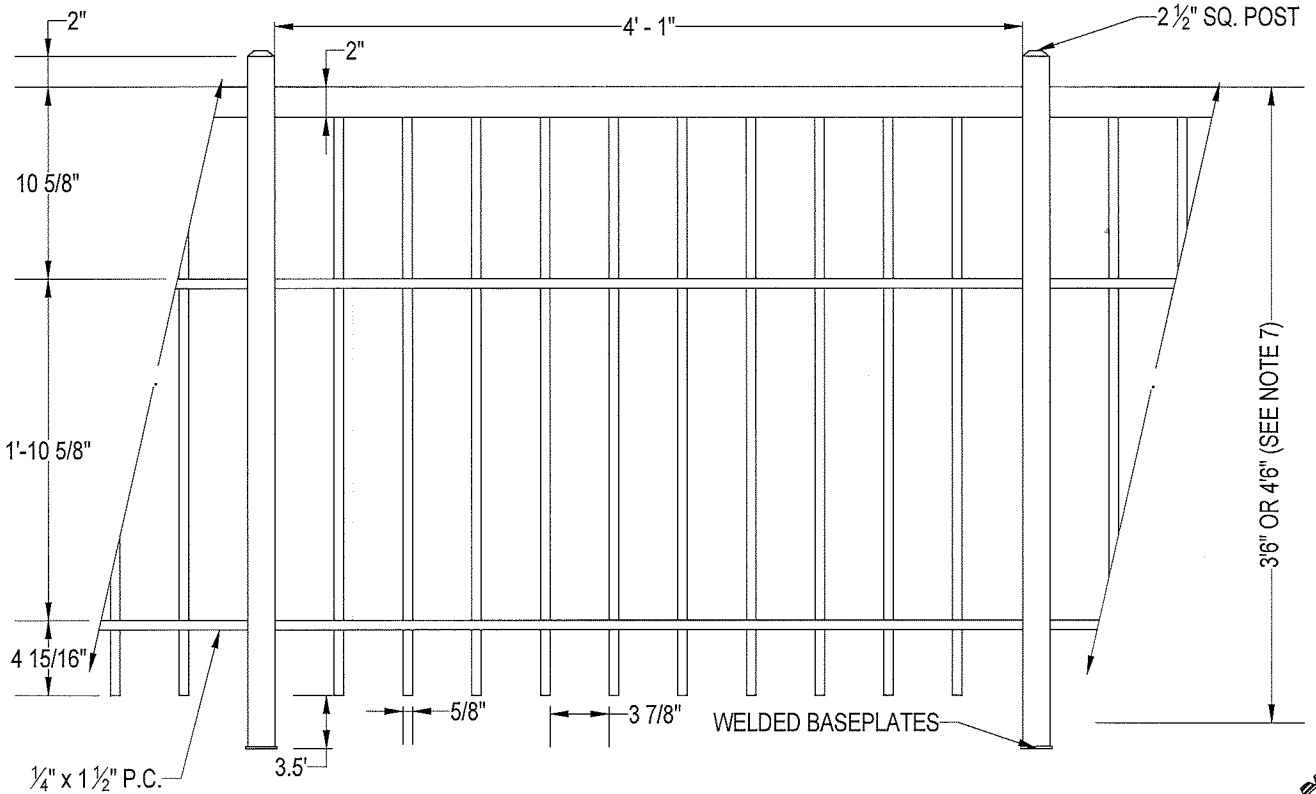
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CURB RAMP LOCATIONS

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG03-14

REV. NO. X



NOTES:

1. SHOP DRAWINGS OF RAILING SHALL BE SUBMITTED FOR APPROVAL SHOWING COMPLETE DIMENSIONS AND DETAILS OF FABRICATION AND INCLUDING AN ERECTION DIAGRAM. MATERIALS BEING USED SHALL BE SPECIFIED IN THE SHOP DRAWINGS.
2. ALL ALUMINUM PARTS SHALL BE GIVEN A CLEAR ANODIC COATING AT LEAST 0.0006 INCH THICK AND BE HOT WATER SEALED AND SHALL HAVE A UNIFORM FINISH.
3. CUTTING SHALL BE DONE BY SAWING OR MILLING AND ALL CUTS SHALL BE TRUE AND SMOOTH. FLAME CUTTING WILL NOT BE PERMITTED.
4. PIPE RAILING, PIPE BALUSTERS AND PIPE RAILING SPLICES SHALL BE ADEQUATELY WRAPPED TO ENSURE SURFACE PROTECTION DURING HANDLING AND TRANSPORTATION TO THE JOB SITE.
5. WELDING OF ALUMINUM SHALL BE IN ACCORDANCE WITH THE LATEST AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.
6. ALLOW FOR EXPANSION AT APPROXIMATELY EVERY FOURTH POST.
7. TOP OF RAIL:
   3 FEET 6 INCHES FOR PEDESTRIAN USES
   4 FEET 6 INCHES FOR COMBINED BICYCLE AND PEDESTRIAN USES
8. 50LB RAIL LOADING PER IBC, CURRENT EDITION.
9. ALL CONCEALED FASTENERS THROUGHOUT.
10. MILD STEEL.
11. BLACK POWDER COATED.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-2-16

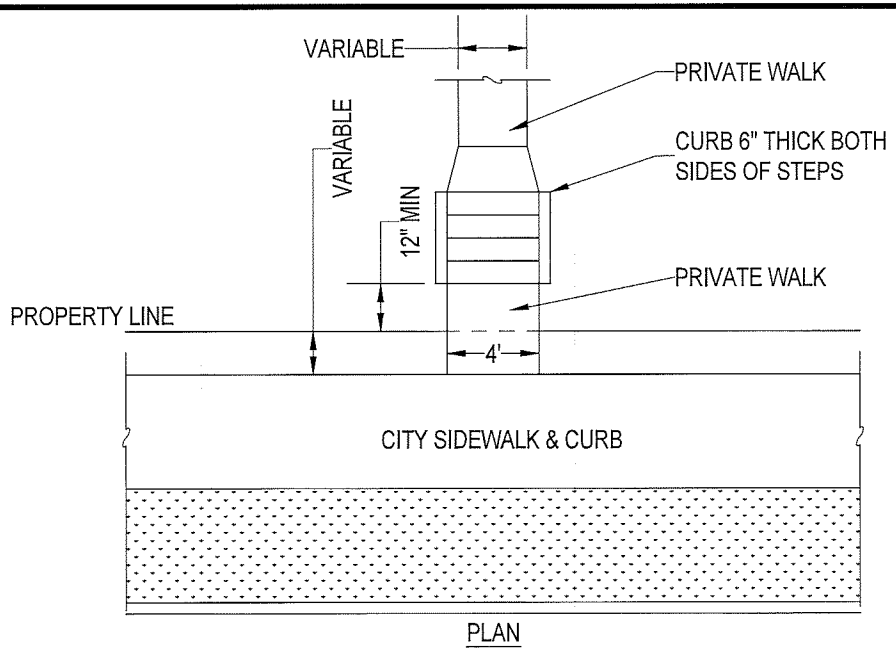
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PEDESTRIAN RAILING

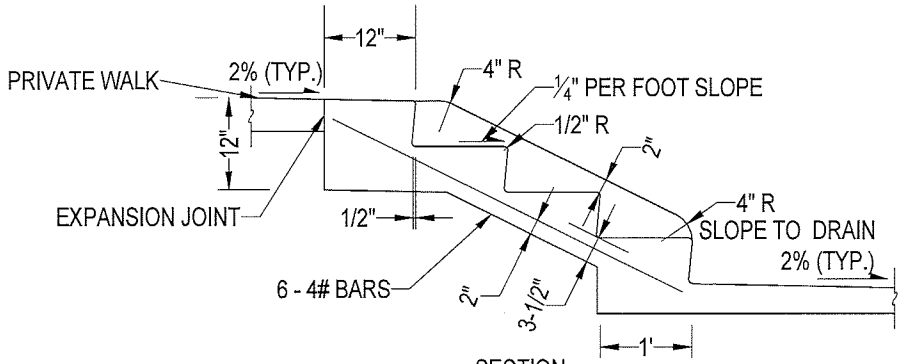
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG03-15

REV. NO. X



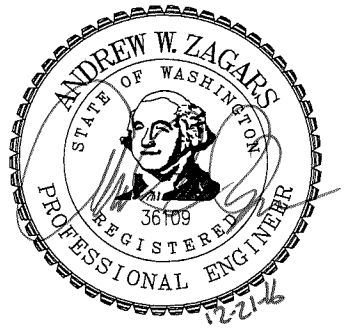
PLAN



SECTION

NOTES:

1. STEPS SHALL BE A MINIMUM OF 4'-0" WIDE, CURB TO CURB, PLUS 6" CURBS ON EACH SIDE.
2. CEMENT CONCRETE SHALL BE CLASS 4000psi TROWEL FINISH.
3. NUMBER OF STEPS SHALL SUIT INDIVIDUAL CONDITIONS, WITH TREAD AND RISER DIMENSIONS TO SUIT THE GRADE.
4. RISERS SHALL BE 5" MINIMUM, 7" MAXIMUM: TREAD SHALL BE 11" MINIMUM, 12" MAXIMUM.
5. HANDRAIL REQUIRED ON BOTH SIDES PER IBC.
6. ALL STEPS SHALL BE UNIFORM HEIGHT & DEPTH.



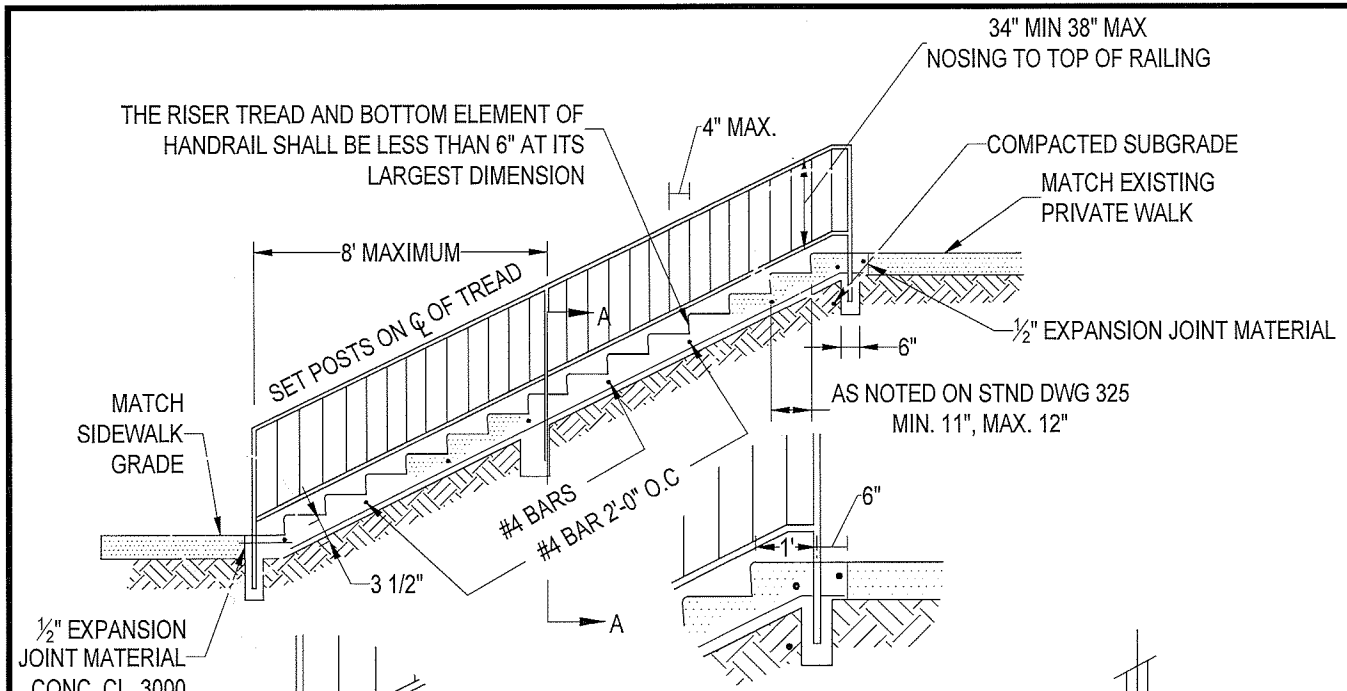
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

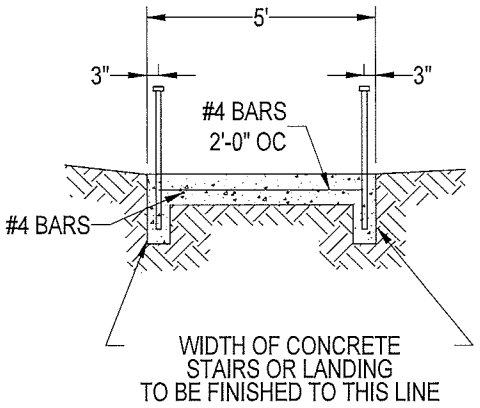
STAIRS

APPROVED BY
CITY ENGINEER _____ DATE _____

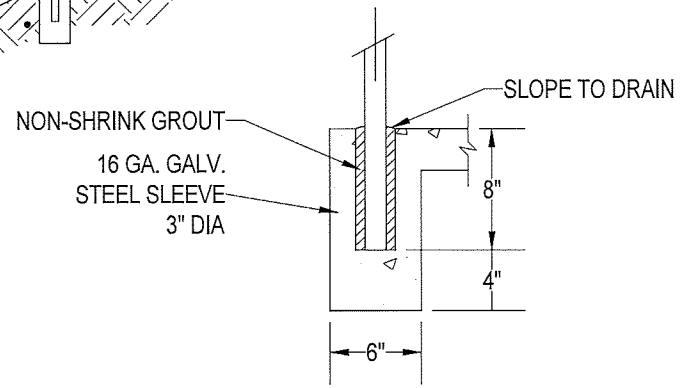
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG03-16

REV. NO. X





SECTION A-A



POST DETAIL

NOTES:

1. CEMENT CONCRETE STEPS AND CURBS SHALL BE CONSTRUCTED AS SHOWN ON STD DWG 3-16.
2. HEIGHT OF RAILING SHALL BE 36" MINIMUM, 38" MAXIMUM TOP OF NOSING TO TOP OF RAILING.
3. PEDESTRIAN RAILING SHALL BE CONSTRUCTED AS SHOWN ON STD DWG 3-15.
4. CLEAR SPACE BETWEEN BALUSTERS SHALL BE A MAXIMUM OF 4".
5. ALL STEPS SHALL HAVE HANDRAIL ON BOTH SIDES.

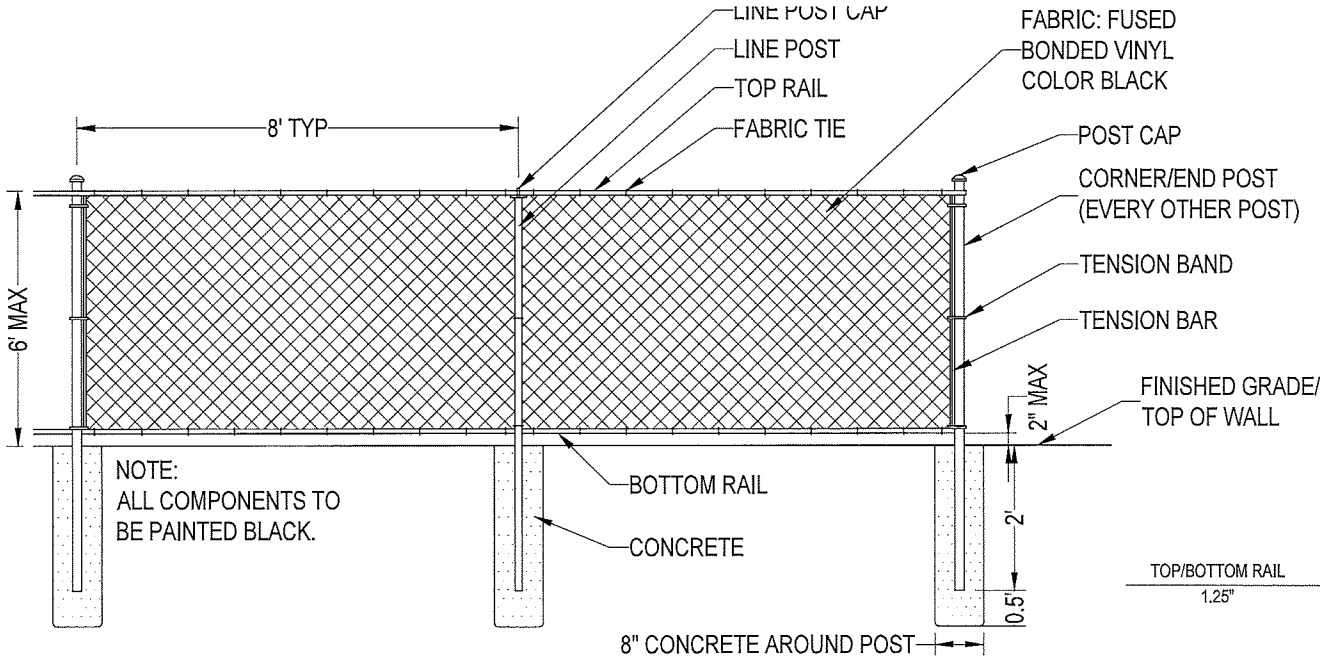
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CEMENT CONCRETE STAIRWAY

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG03-17

REV. NO. X

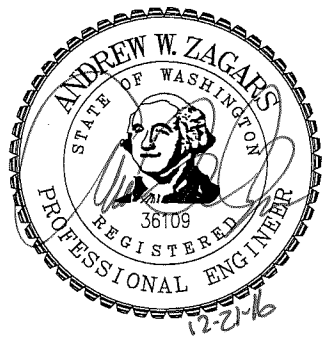


PIPE SCHEDULE
(ALL DIMENSION I.D.)

TOP/BOTTOM RAIL	CORNER/ END POST	LINE POST
1.25"	2.5"	2"

NOTES:

1. RAILING SHALL BE ALUMINUM PIPE RAIL OR APPROVED EQUIVALENT. INSTALLATION PER MANUFACTURER'S RECOMMENDATIONS.
2. SHOP DRAWINGS OF RAILING SHALL BE SUBMITTED FOR APPROVAL SHOWING COMPLETE DIMENSIONS AND DETAILS OF FABRICATION AND INCLUDING AN ERECTION DIAGRAM. MATERIALS BEING USED SHALL BE SPECIFIED IN THE SHOP DRAWINGS.
3. ALL ALUMINUM PARTS SHALL BE GIVEN A BLACK ANODIC COATING AT LEAST 0.0006 INCH THICK AND BE HOT WATER SEALED AND SHALL HAVE A UNIFORM FINISH.
4. WIRE FABRIC SHALL BE GIVEN A BLACK FUSED BONDED VINYL COATING TO MATCH FINISHED POSTS.
5. CUTTING SHALL BE DONE BY SAWING OR MILLING AND ALL CUTS SHALL BE TRUE AND SMOOTH. FLAME CUTTING WILL NOT BE PERMITTED.
6. ALL MATERIALS SHALL BE ADEQUATELY WRAPPED TO ENSURE SURFACE PROTECTION DURING HANDLING AND TRANSPORTATION TO THE JOB SITE.
7. ANY WELDING OF ALUMINUM SHALL BE IN ACCORDANCE WITH THE LATEST AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.
8. RAILS, POSTS AND FORMED ELBOWS SHALL BE A.S.T.M B-241 OR B-429 ALLOY, 6063-T6 SCHEDULE 40 (STD. PIPE). BRACKETS, ENDCAPS AND OTHER FITTINGS SHALL BE A.S.T.M. 6063-T5. SPLICES AND REINFORCING SLEEVES SHALL BE DRAWN ALUMINUM TUBING 6063-T832.
9. TOP OF RAIL: 3 FEET 6 INCHES MIN FOR PEDESTRIAN USES
   4 FEET 6 INCHES MIN FOR COMBINED BICYCLE AND PEDESTRIAN USES



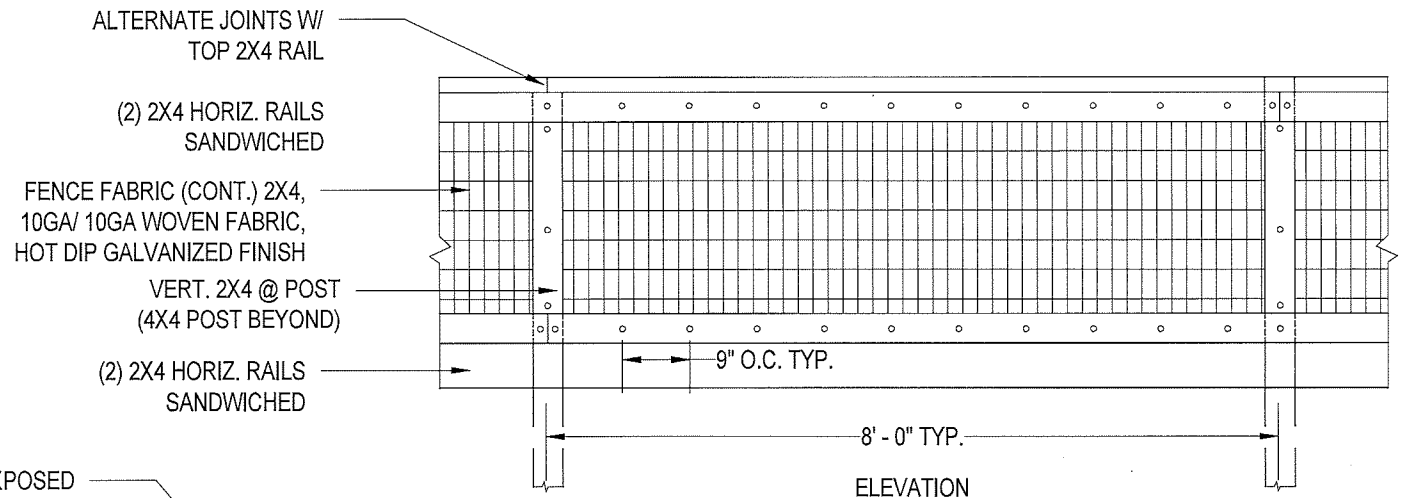
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CHAIN LINK FENCE

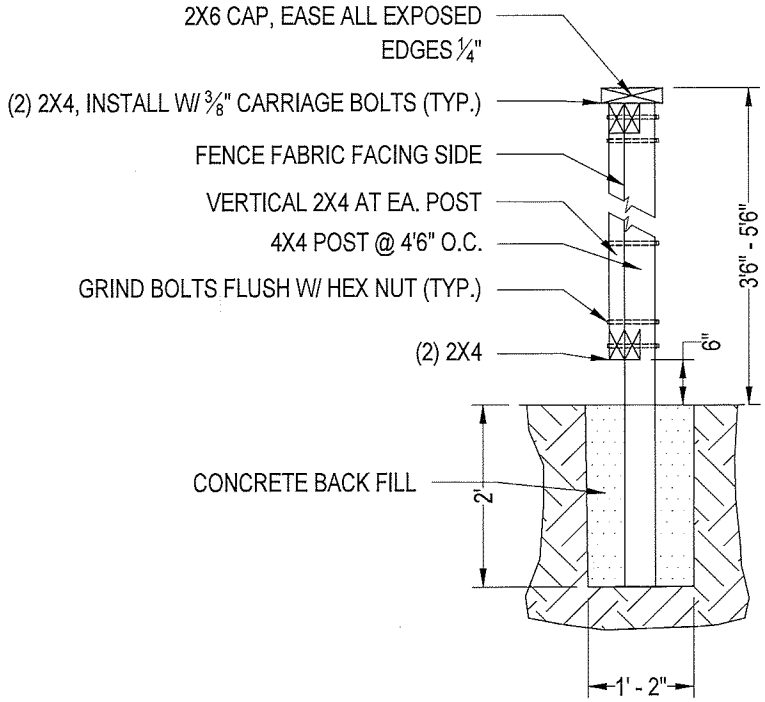
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG03-18

REV. NO. X



ELEVATION

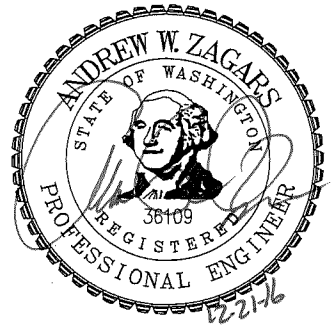


SECTION

NOTE:

1. ALL LUMBER SHALL BE PRESSURE-TREATED LP-22 OF AS APPROVED BY OWNER. FASTEN ALL MATERIALS W/ 12d GALVANIZED COMMON NAILS UNLESS OTHERWISE INDICATED.
2. BREAKS IN FENCING SHALL BE INSTALLED AT 100' MINIMUM INTERVALS IN LOCATIONS OF KNOWN WILDLIFE CORRIDORS.

NOTE: DIAGONAL BRACE RAILS (4x4) TO BE INSTALLED AT ALL END SECTIONS, TOP OF BRACE AT TOP OF END SECTION/CORNER.



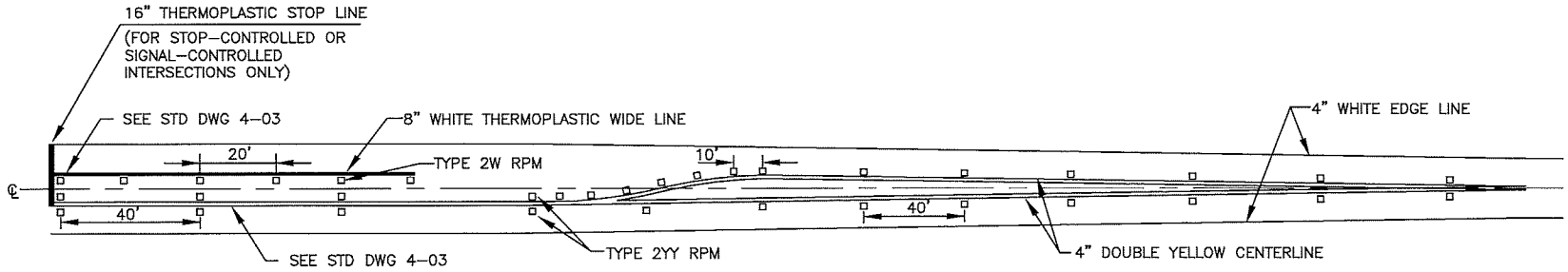
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

GREENBELT FENCE

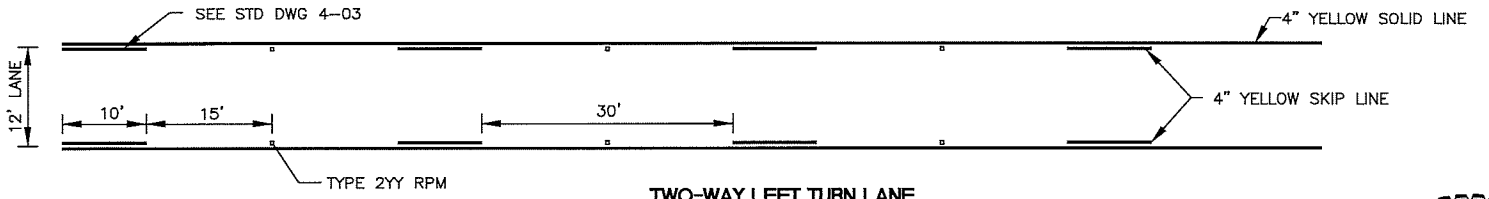
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG03-20

REV. NO. X



LEFT TURN LANE AND MEDIAN



TWO-WAY LEFT TURN LANE

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-14

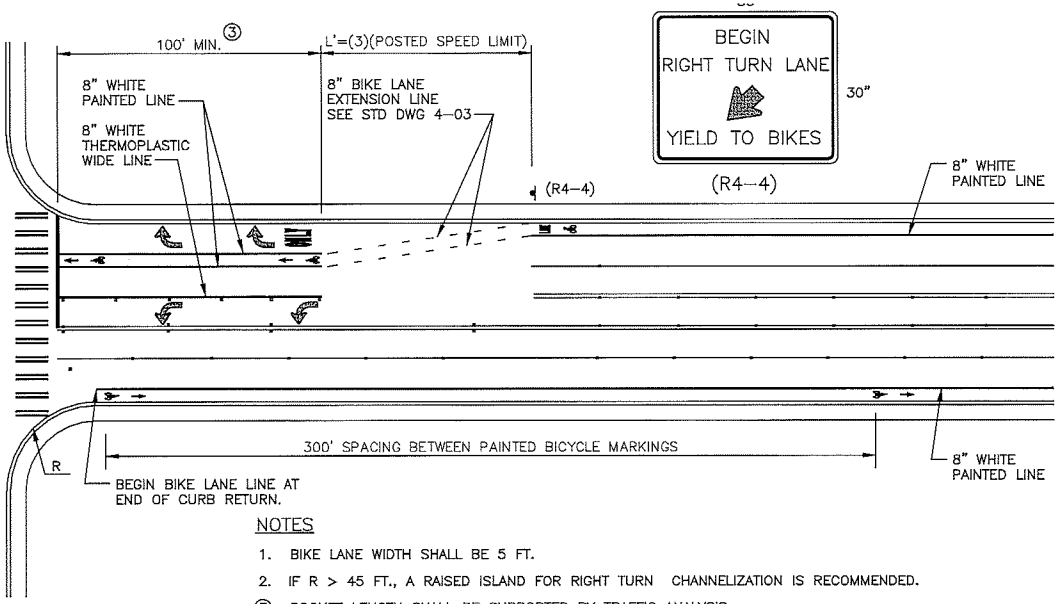
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CHANNELIZATION – LEFT TURN LANES

APPROVED BY
CITY ENGINEER _____ DATE _____

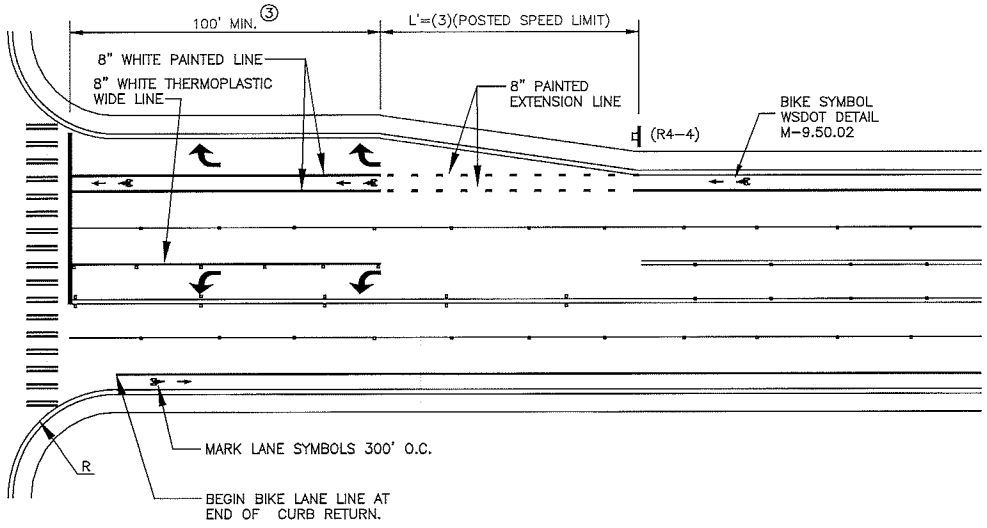
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG–XX–2015	FIG04–01

REV. NO. X

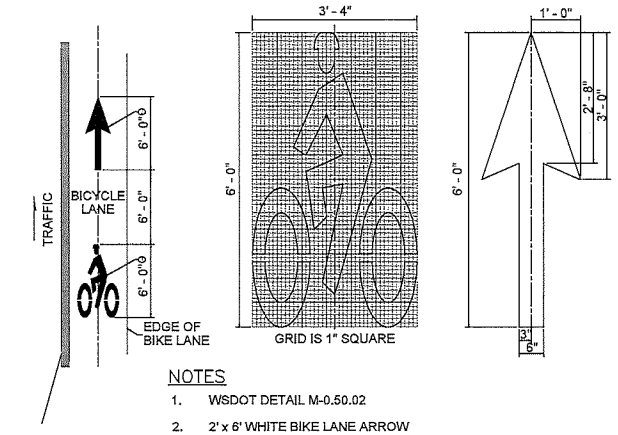


NOTES

1. BIKE LANE WIDTH SHALL BE 5 FT.
2. IF R > 45 FT., A RAISED ISLAND FOR RIGHT TURN CHANNELIZATION IS RECOMMENDED.
3. ③ POCKET LENGTH SHALL BE SUPPORTED BY TRAFFIC ANALYSIS
4. PLACE R3-18 SIGN IF THE BIKE LANE TERMINATES AT OR BEFORE THE APPROACHING INTERSECTION.
5. RIGHT TURN LANES, LEFT TURN LANES, AND TWO-WAY LEFT TURN LANES SHALL BE 12 FT. IN WIDTH.
6. TURN LANE ARROWS SHALL BEGIN AT THE START OF THE TURN LANE AND 40 FT. BEHIND THE STOP LINE. IF NEEDED LONGER LANES MAY BE REQUIRED. ADDITIONAL ARROWS 150 FT. APART.



NOT TO SCALE



NOTES

1. WSDOT DETAIL M-0.50.02
2. 2' x 6' WHITE BIKE LANE ARROW
3. BIKE RIDER SYMBOL

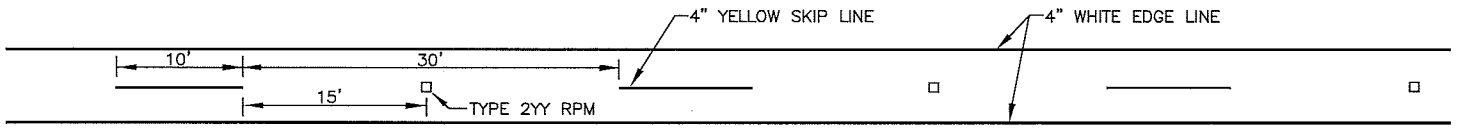
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CHANNELIZATION – VEHICLE AND BICYCLES

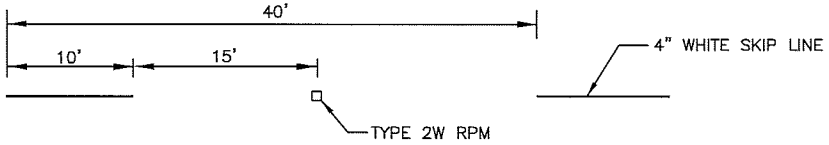
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG04-02

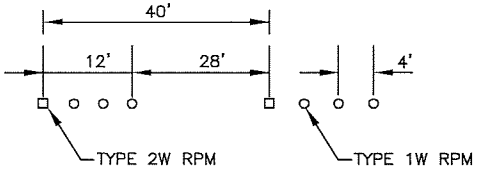
REV. NO. X



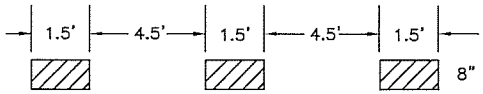
SINGLE LANE TWO-WAY TRAFFIC



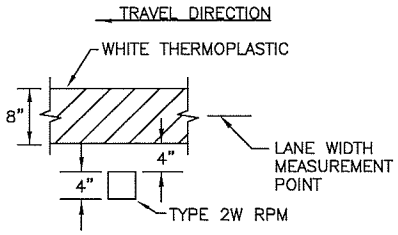
LANE SEPARATION



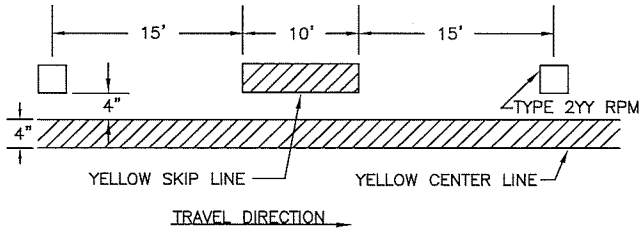
TRAVEL DIRECTION
ALTERNATE LANE MARKINGS



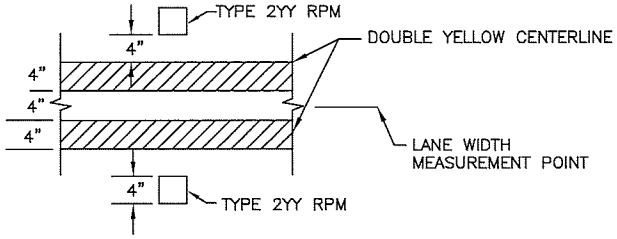
LANE EXTENSION LINE



WIDE LINE



TWO-WAY LEFT TURN LANE



CENTERLINE

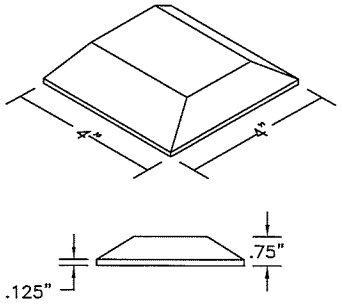
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PAVEMENT MARKINGS

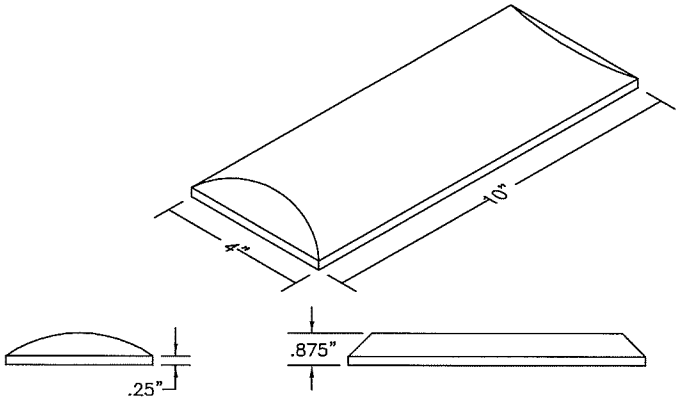
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG04-03A

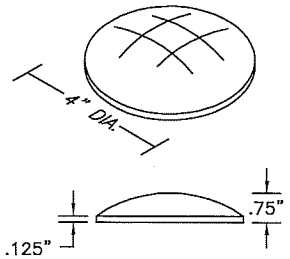
REV. NO. X



TYPE 2 RPM

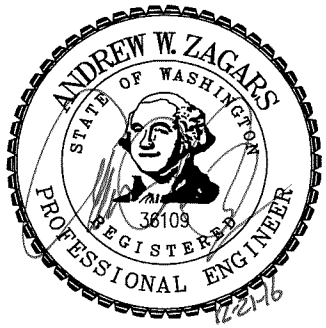


TYPE 3 RPM



TYPE 1 RPM

RAISED PAVEMENT MARKER COLORS	
TYPE 1W	NONREFLECTORIZED WHITE
TYPE 1Y	NONREFLECTORIZED YELLOW
TYPE 2W	REFLECTORIZED WHITE – ONE SIDE ONLY
TYPE 2Y	REFLECTORIZED YELLOW – ONE SIDE ONLY
TYPE 2YY	REFLECTORIZED YELLOW – BOTH SIDES



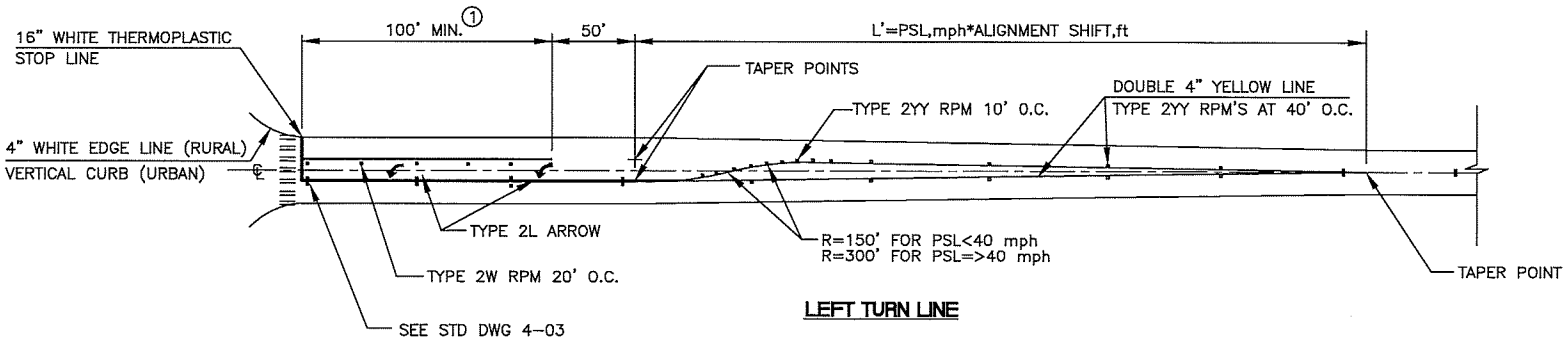
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

RAISED PAVEMENT MARKERS

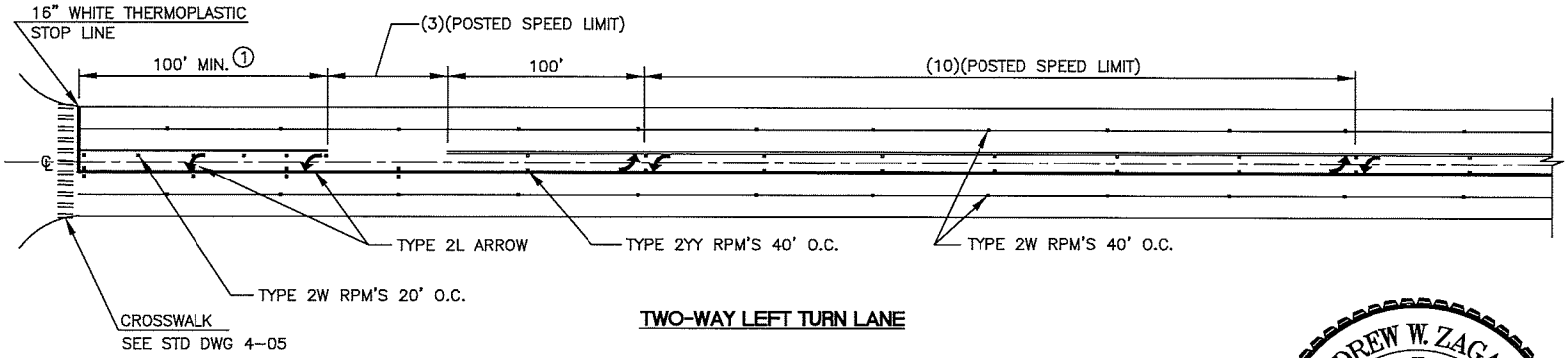
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG04-03B

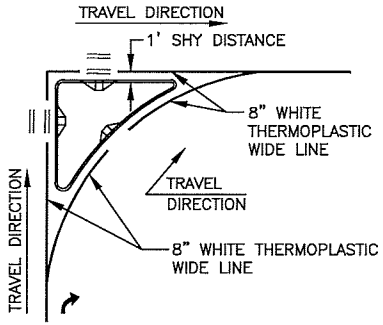
REV. NO. X



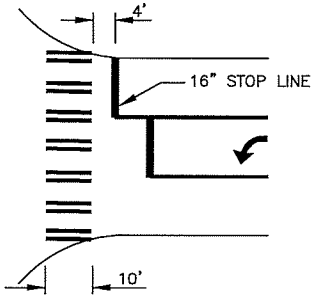
LEFT TURN LINE



TWO-WAY LEFT TURN LANE



ISLAND LINE DETAIL
(RAISED ISLAND IS OPTIONAL)

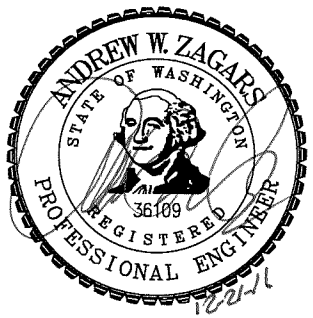


CROSSWALK AND STOP LINE

NOTES

① POCKET LENGTHS SHALL BE SUPPORTED BY TRAFFIC ANALYSIS.

PSL = POSTED SPEED LIMIT



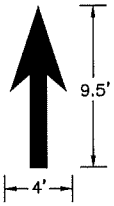
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

INTERSECTION APPROACH STRIPING

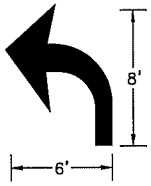
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG04-04

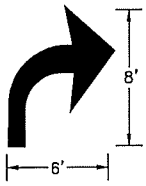
REV. NO. X



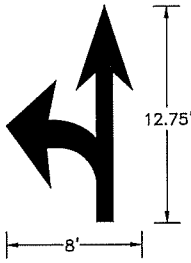
TYPE 1
THRU ARROW



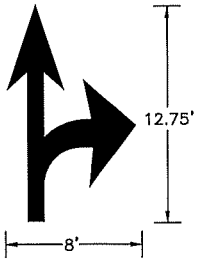
TYPE 2L
LEFT TURN ARROW



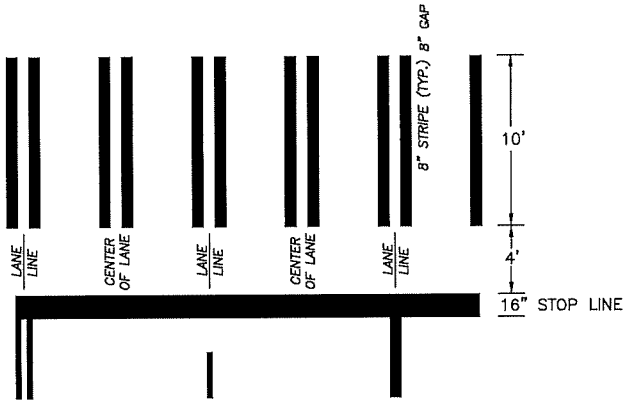
TYPE 2R
RIGHT TURN ARROW



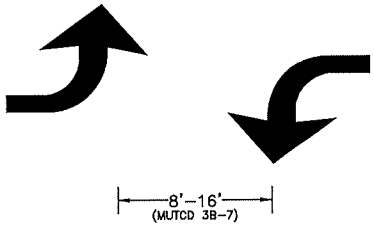
TYPE 3L
LEFT/THRU ARROW



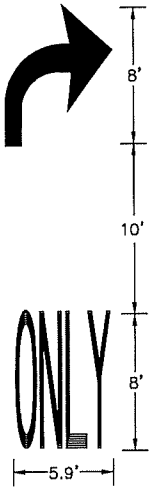
TYPE 3R
RIGHT/THRU ARROW



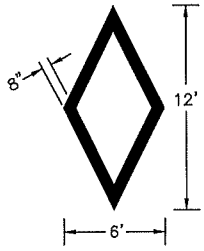
CROSSWALK STRIPING



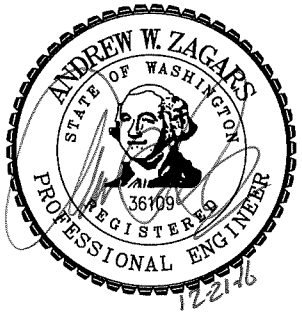
TWO WAY LEFT TURN LANE
ARROW SPACING



DROP LANE



HIGH OCCUPANCY VEHICLE (HOV)



NOTES

1. ALL PAVEMENT SYMBOLS SHALL BE THERMOPLASTIC.

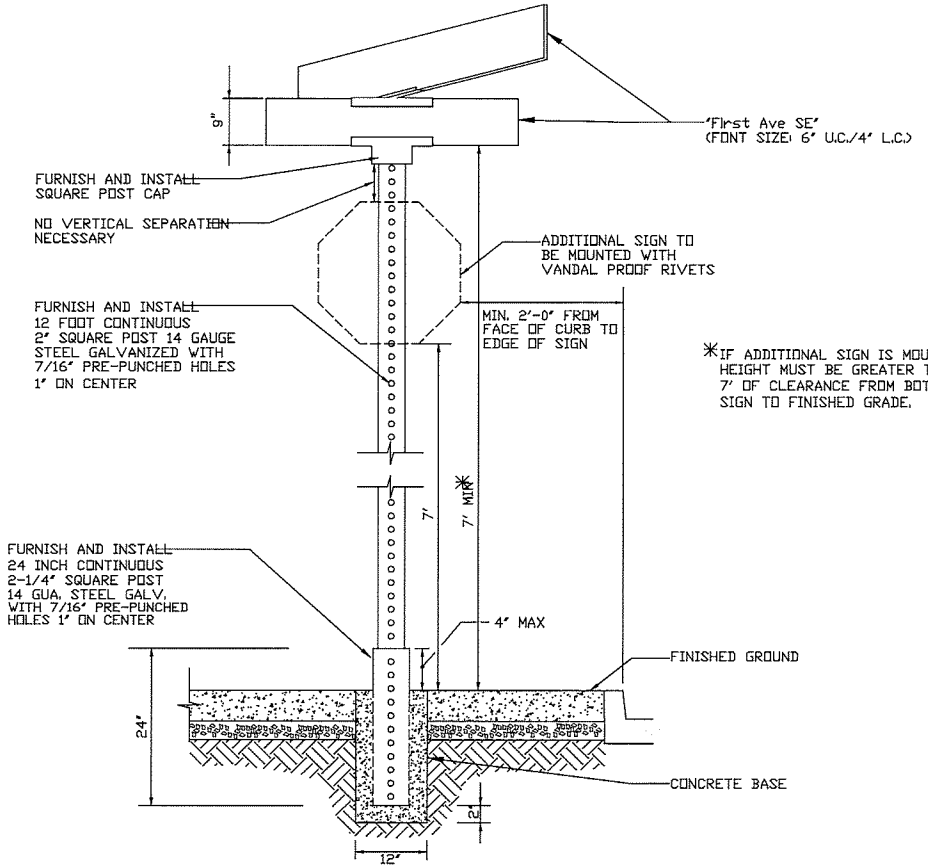
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PAVEMENT SYMBOLS

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG04-05

REV. NO. X



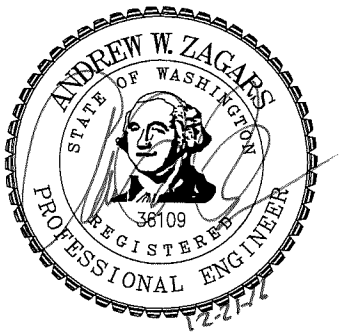
*IF ADDITIONAL SIGN IS MOUNTED ON POLE, HEIGHT MUST BE GREATER TO ALLOW FOR 7' OF CLEARANCE FROM BOTTOM OF SECOND SIGN TO FINISHED GRADE.

STREET SIGN INSTALLATION DETAIL

NOT TO SCALE

NOTES:

1. ALL EXISTING SIGNS THAT ARE TO BE RELOCATED SHALL BE INSTALLED ON NEW POSTS AND HARDWARE.
2. 2" TELESPARE GALVANIZED POSTS
3. 2 1/4" TELESPARE GALVANIZED ANCHORS, 24" LONG
4. SET ANCHORS 20" DEEP, WRAP ANCHORS AND SET IN CONCRETE. BOLTS TO BE 2" ABOVE FINISHED GRADE
5. SIGNS TO BE V.I.P. (DIAMOND GRADE)
6. SIGNS TO BE ATTACHED WITH VANDAL PROOF RIVETS
7. D-3'S TO BE E.G. BACKGROUND DIAMOND GRADE LETTERING
8. D-3'S TO BE MOUNTED WITH ALUMINUM CAPS AND CROSS BRACKETS
9. WHITE LEGEND ON GREEN BACKGROUND



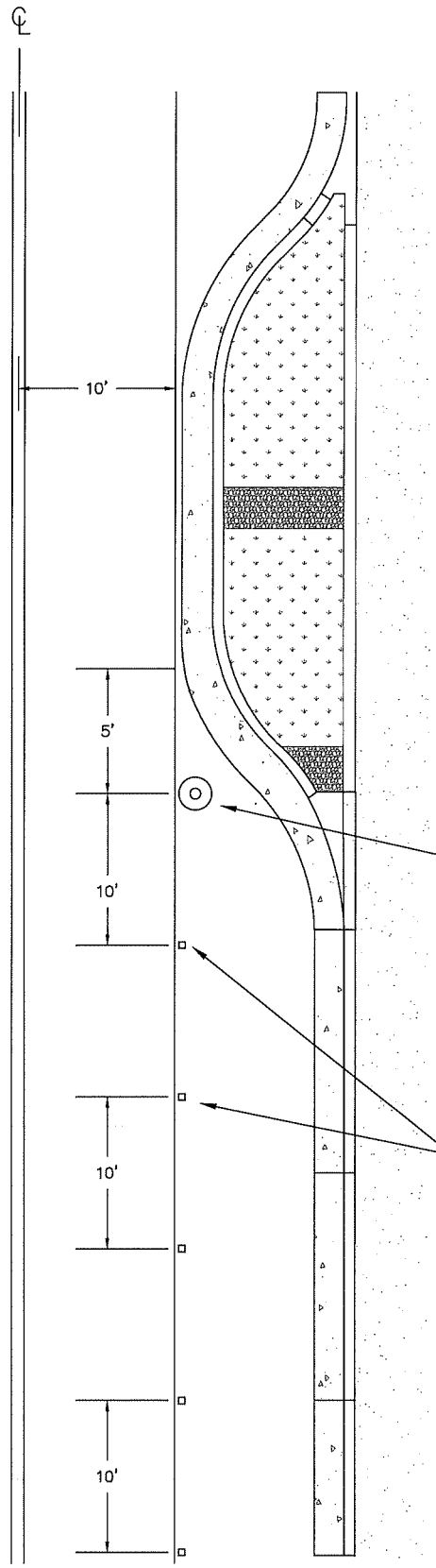
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

STREET SIGN INSTALLATION

APPROVED BY
CITY ENGINEER _____ DATE _____

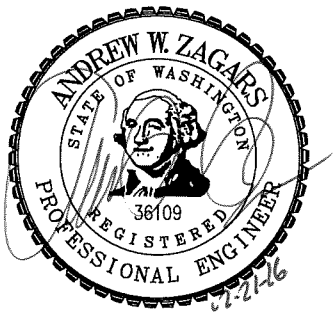
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG04-06

REV. NO. X



NOTES:

1. 5 – TYPE 2 WHITE RPMS (10' O.C.) FOLLOWING THE DELINEATOR. SEE FIG04–03B FOR RMP DIMENSIONS.
2. COORDINATE WITH THE TRAFFIC ENGINEER ABOUT ADDITIONAL ROADWAY CHANNELIZATION.



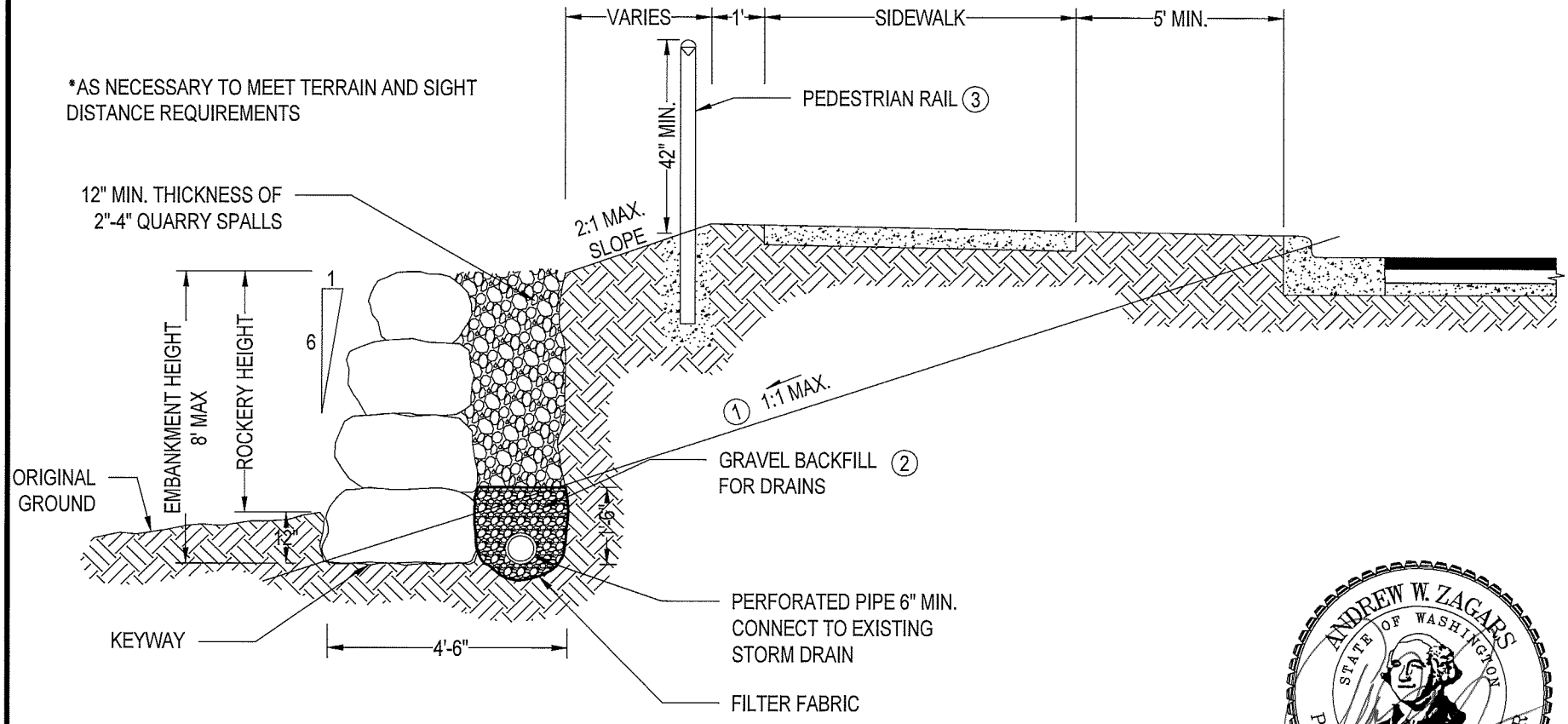
– NOT TO SCALE –

CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CURB EXTENSION/CHICANE CHANNELIZATION

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	LG		NOV–9–2016	FIG04–07



NOTES:

(1.) FLATTER SLOPE MAY BE REQUIRED IN LESS STABLE SOIL.

(2.) SEE WSDOT/APWA STD SPECIFICATION 9-03.12[4].

(3.) A PEDESTRIAN RAIL, PER STD DWG 3-15, IS REQUIRED WHEN ROCKERY HEIGHT IS 2'-6" OR GREATER. THE USAGE OF A CHAIN LINK FENCE MAY BE APPROVED.

4. TRAFFIC BARRIERS MAY BE REQUIRED ON ROADS WITH SPEED LIMITS OF 30 MPH OR GREATER, WHERE ROCKERY HEIGHTS EXCEED 6'. SEE CHAPTER 1610 OF THE CURRENT WSDOT DESIGN MANUAL.

5. ALL ROCKERIES OVER 4' IN HEIGHT ON PUBLIC OR PRIVATE PROPERTY SHALL REQUIRE STRUCTURAL REVIEW.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER

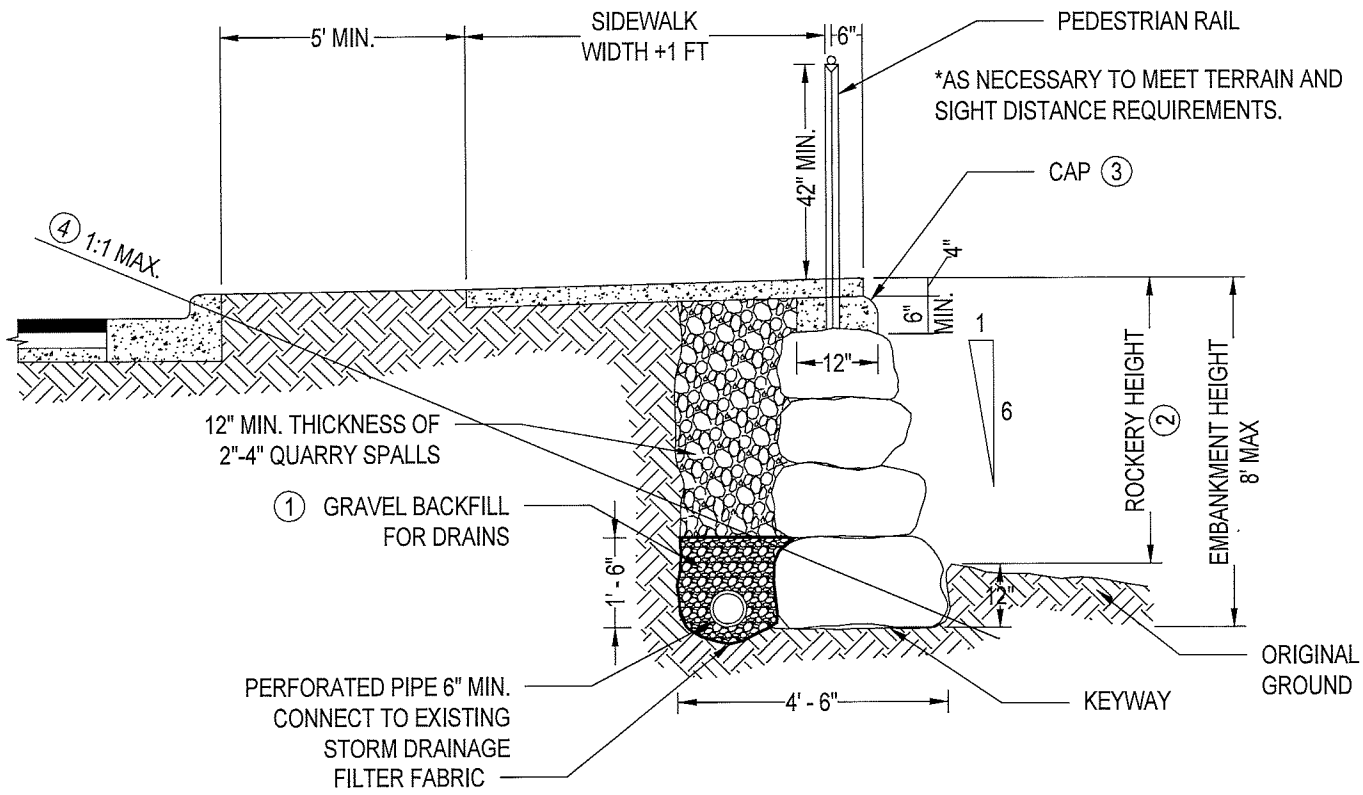
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

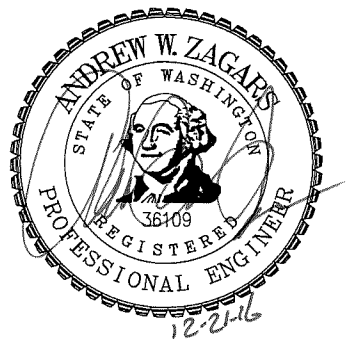
ROCK FACING – FILL SECTION

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG05-01

REV. NO. X





NOTES:

(1.) WSDOT/APWA STD SPECIFICATION 9-03.12[4].

(2.) A PEDESTRIAN RAIL, PER STD DWG 3-15, IS REQUIRED WHEN ROCKERY HEIGHT IS 2'-6"' OR GREATER. THE USAGE OF A CHAIN LINK FENCE MAY BE APPROVED.

(3.) CAP SHALL BE CONCRETE CLASS 3000.

(4.) FLATTER SLOPE MAY BE REQUIRED IN LESS STABLE SOILS.

5. TRAFFIC BARRIERS MAY BE REQUIRED ON ROADS WITH SPEED LIMITS OF 30 MPH OR GREATER, WHERE HEIGHTS EXCEED 6'. SEE CHAPTER 1610 OF THE CURRENT WSDOT DESIGN MANUAL.

6. ALL ROCKERIES OVER 4' IN HEIGHT ON PUBLIC OR PRIVATE PROPERTY SHALL REQUIRE STRUCTURAL REVIEW.

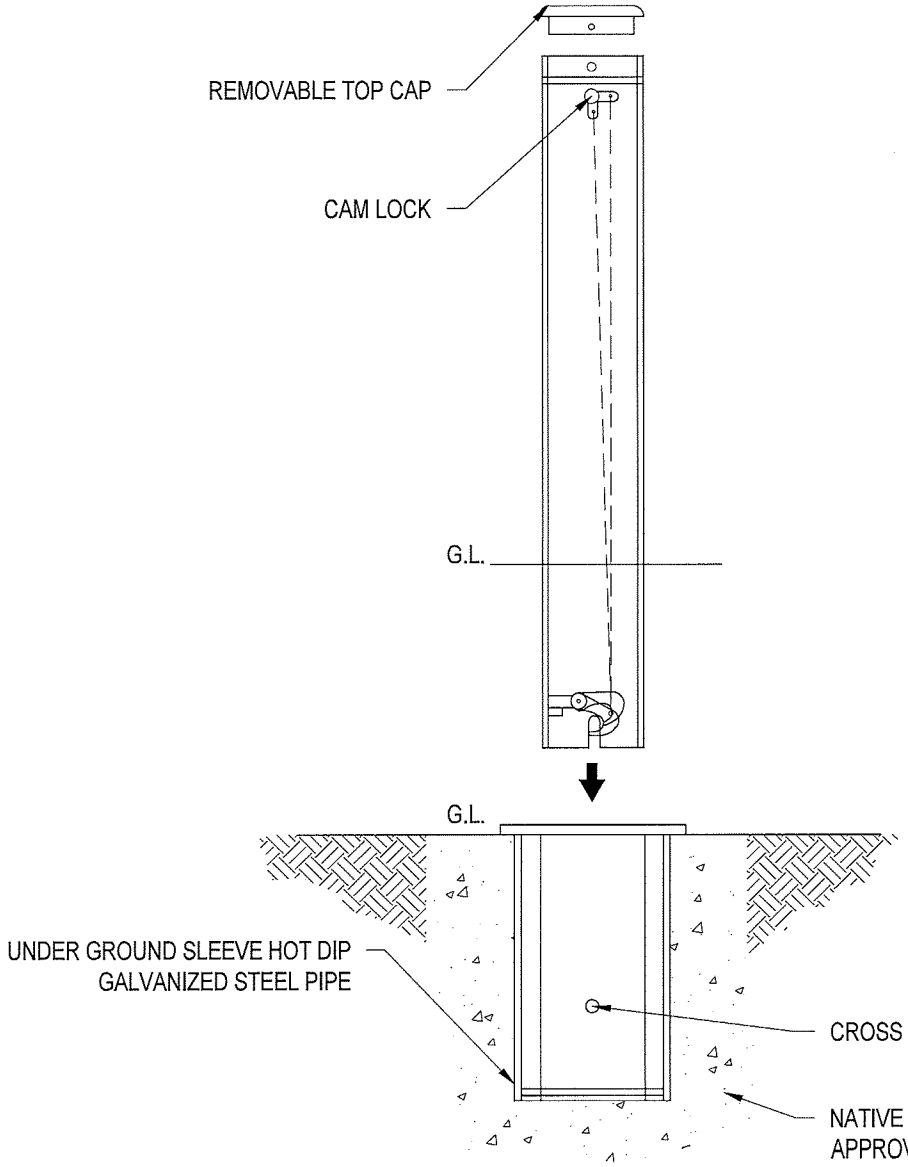
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

ROCK FACING UNDER SIDEWALK

APPROVED BY
CITY ENGINEER _____ DATE _____

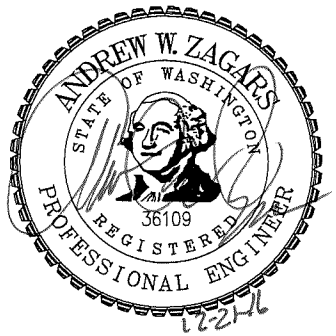
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG05-02

REV. NO. X



NOTES:

1. NUTS, BOLTS, AND WASHERS CONFORM TO ASTM A307.
2. ALL STEEL PIPES SHALL BE GALVANIZED.
3. CONCRETE SHALL BE CLASS C.
4. BOLLARD PLACEMENT SHALL BE APPROVED BY THE DIRECTOR OR DESIGNEE.



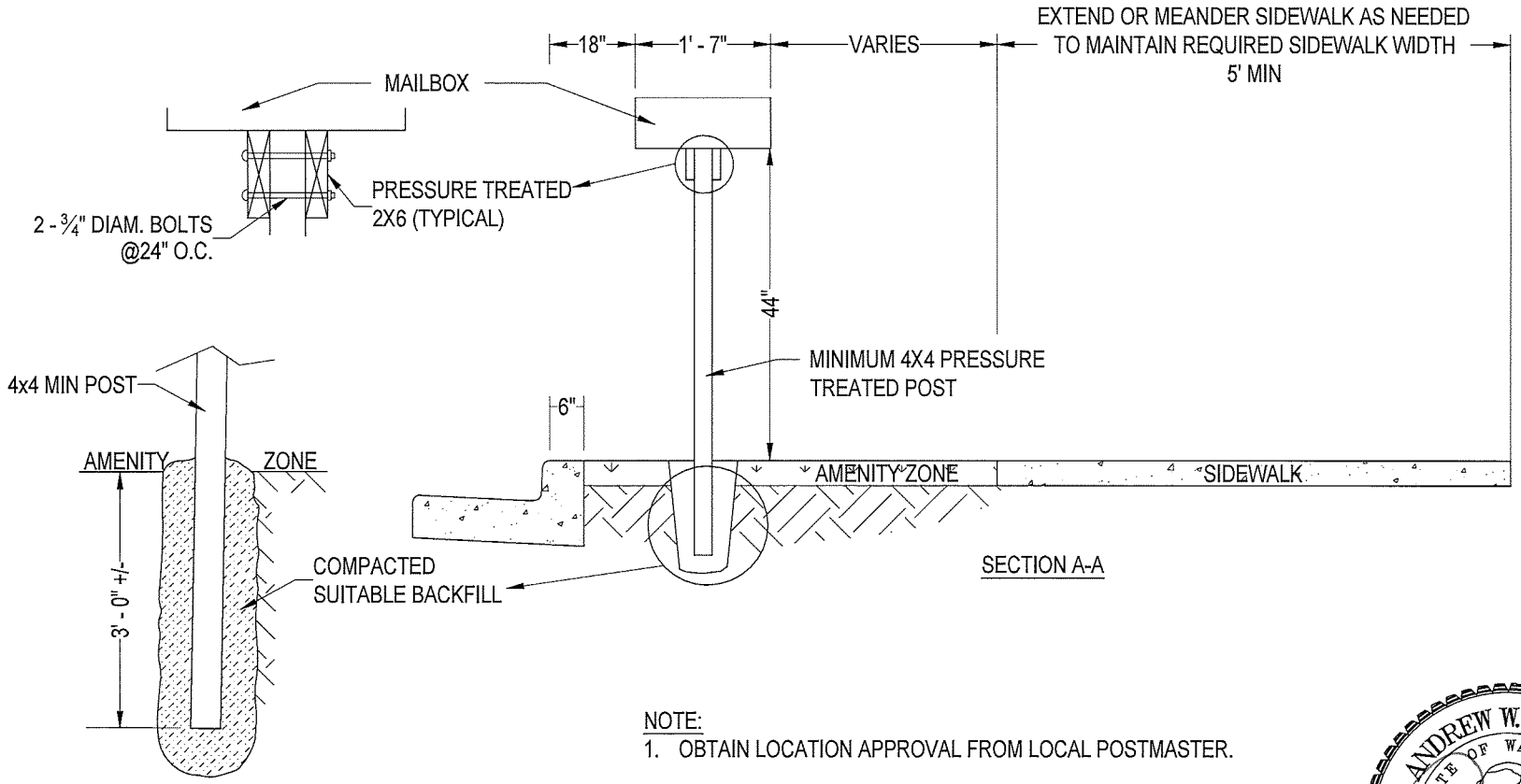
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

BOLLARDS

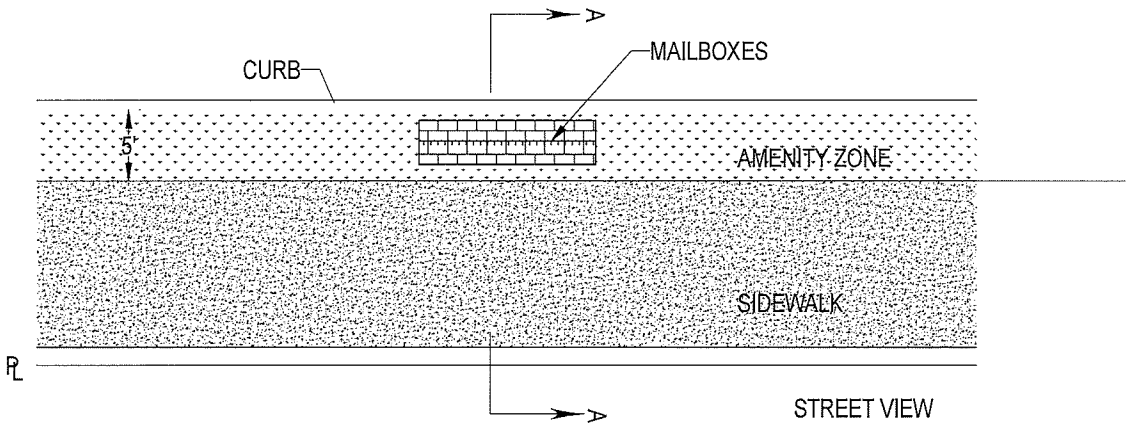
APPROVED BY
CITY ENGINEER _____ DATE _____

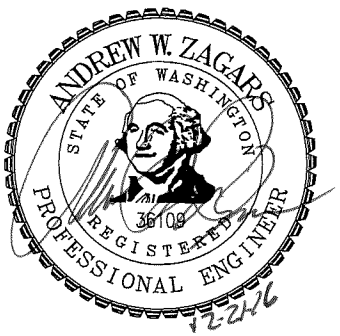
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG05-03

REV. NO. X



NOTE:
1. OBTAIN LOCATION APPROVAL FROM LOCAL POSTMASTER.





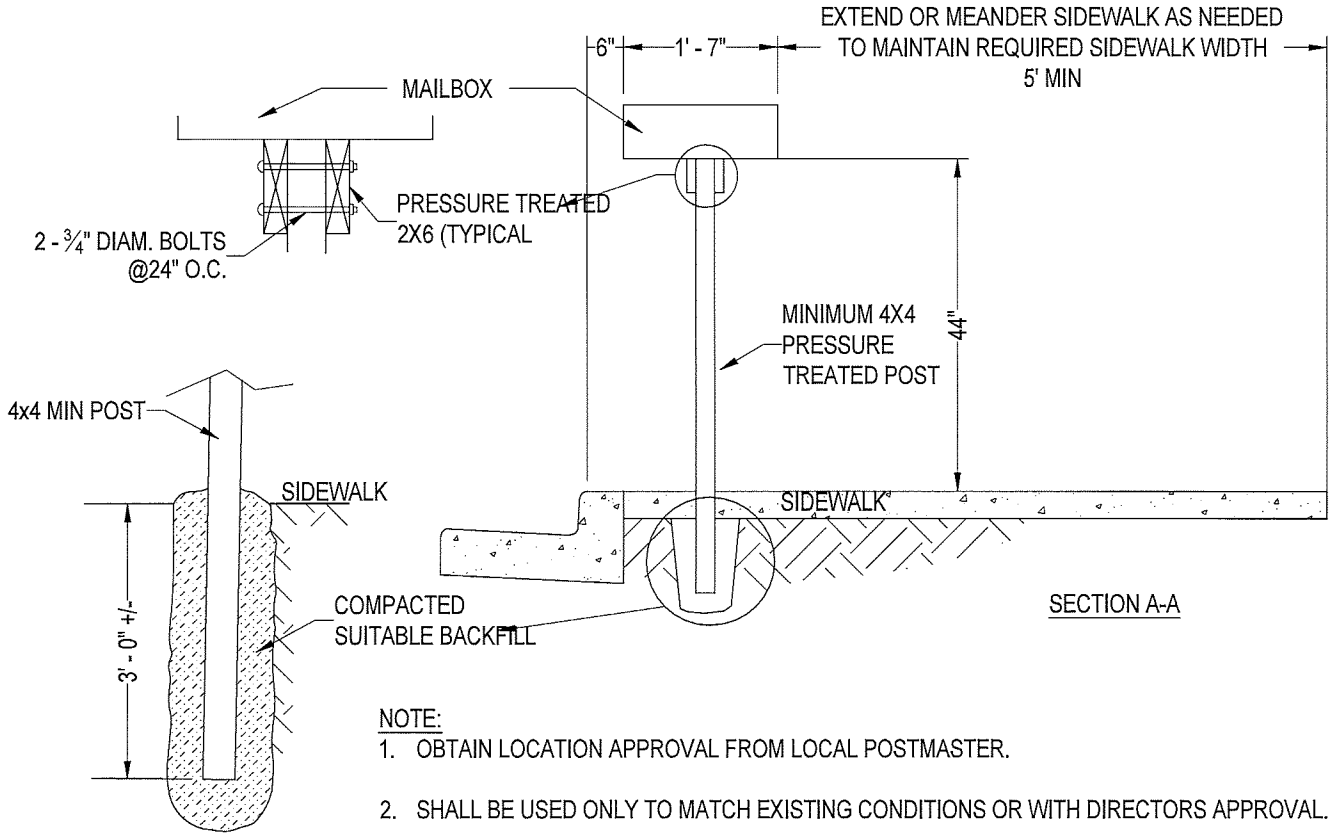
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

MAILBOX STAND
NON–ARTERIAL

APPROVED BY
CITY ENGINEER _____ DATE _____

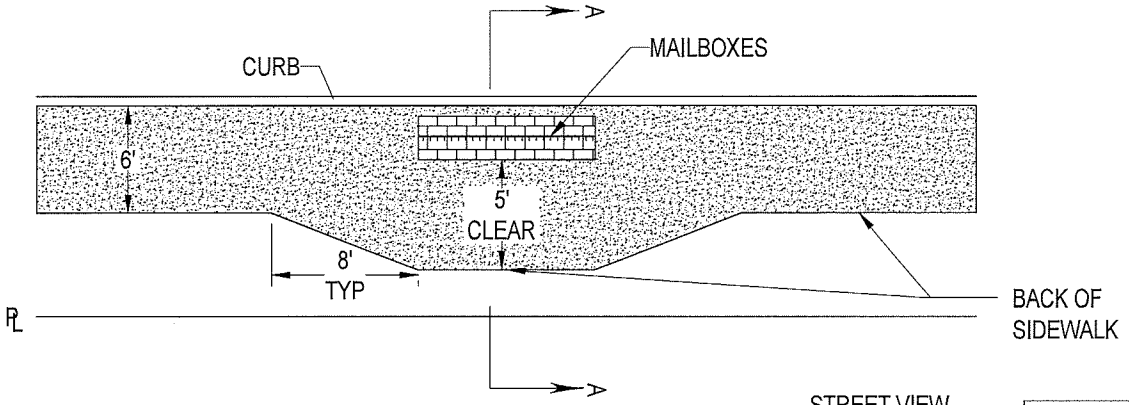
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG–XX–2015	FIG05–04

REV. NO. X

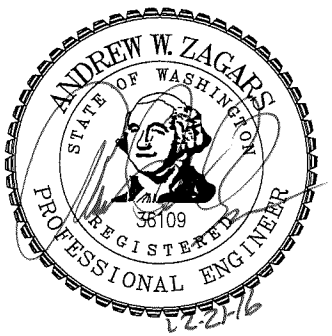


NOTE:

1. OBTAIN LOCATION APPROVAL FROM LOCAL POSTMASTER.
2. SHALL BE USED ONLY TO MATCH EXISTING CONDITIONS OR WITH DIRECTORS APPROVAL.



STREET VIEW



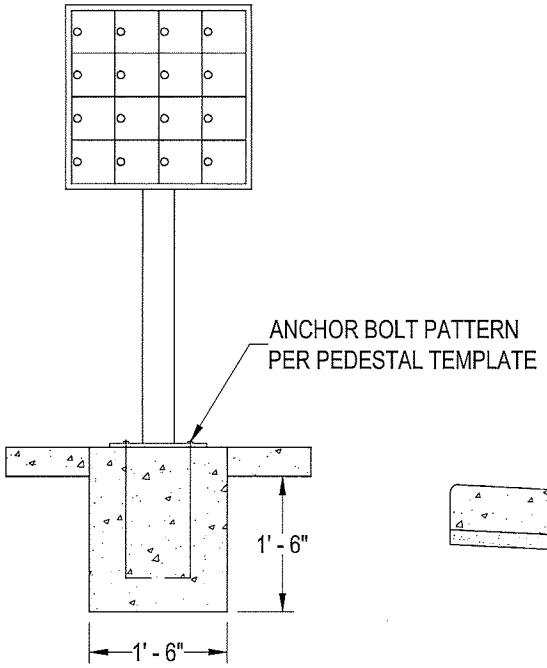
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

MAILBOX STAND WITHOUT AMENITY ZONE

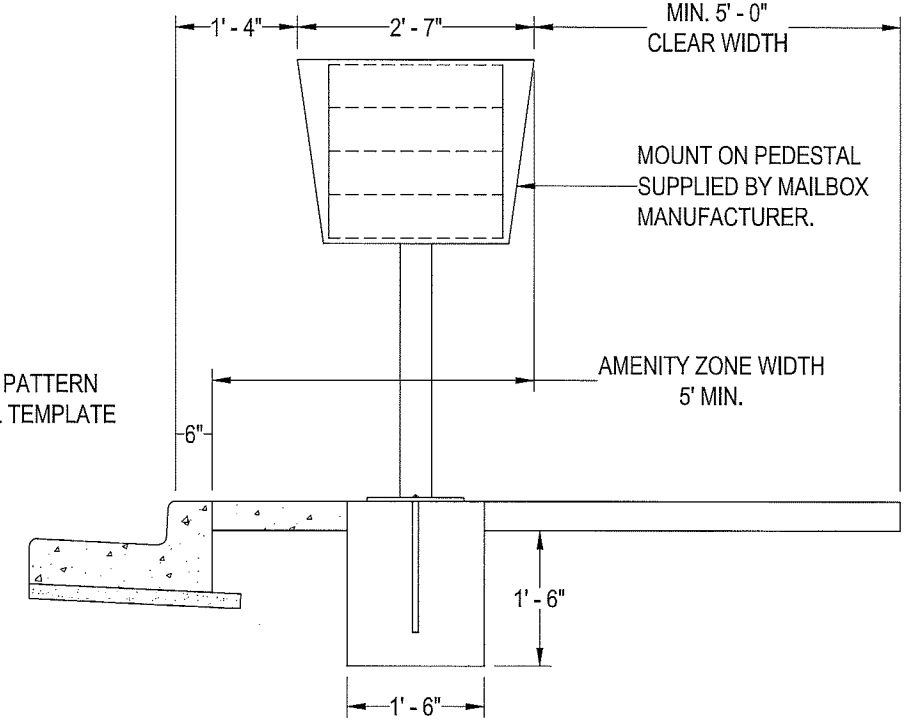
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG05-05

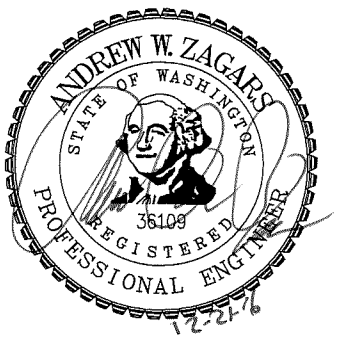
REV. NO. X



FRONT VIEW



SIDE VIEW



NOTES:

1. OBTAIN LOCATION APPROVAL FROM LOCAL POSTMASTER.
2. USE PEDESTAL MOUNTED 4C MAILBOX.

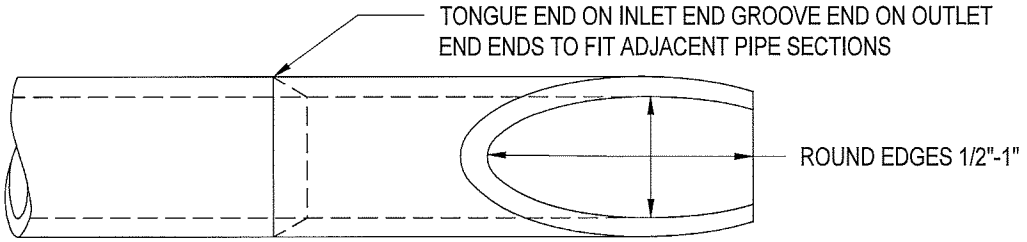
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

NEIGHBORHOOD DELIVERY & COLLECTION BOX UNIT INSTALLATION

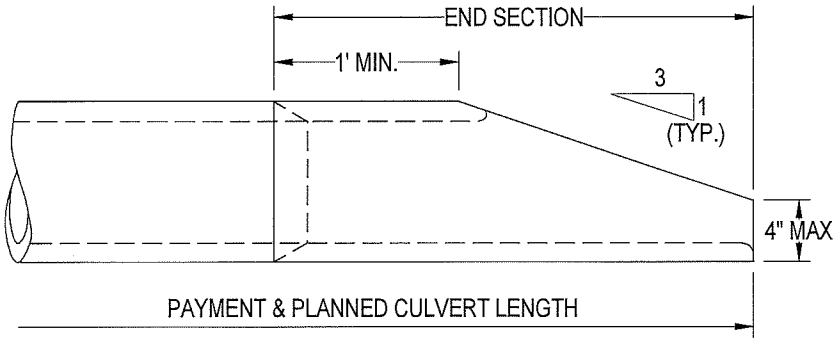
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG05-06

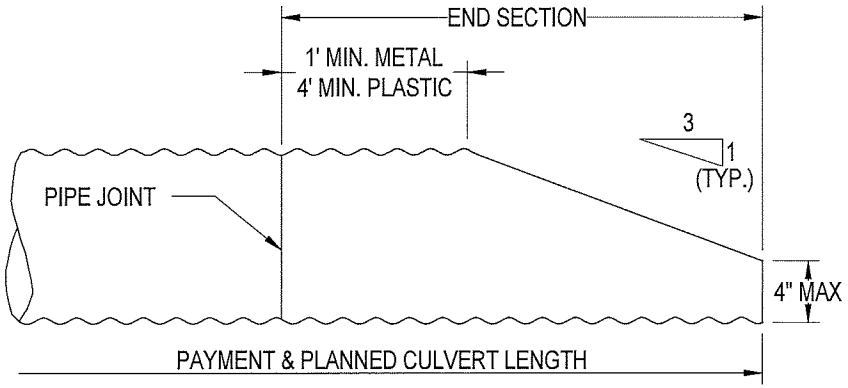
REV. NO. X



PLAN



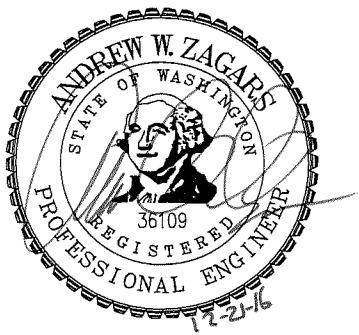
ELEVATION CONCRETE PIPE



METAL & PLASTIC PIPE

NOTES:

1. SIDE SLOPE SHALL BE WARPED TO MATCH THE BEVELED PIPE END. WHEN CULVERT IS ON SKEW, BEVELED END SHALL BE ROTATED TO CONFORM TO SLOPE. IF SLOPE DIFFERS FROM 3:1, PIPE SHALL BE BEVELED TO MATCH SLOPE.
2. TRASH RACK MAY BE REQUIRED BY DIRECTOR OR DESIGNEE. (SEE STD DWG 7-02 FOR DETAILS).
3. INLET/OUTLET PROTECTION SHALL BE REQUIRED.



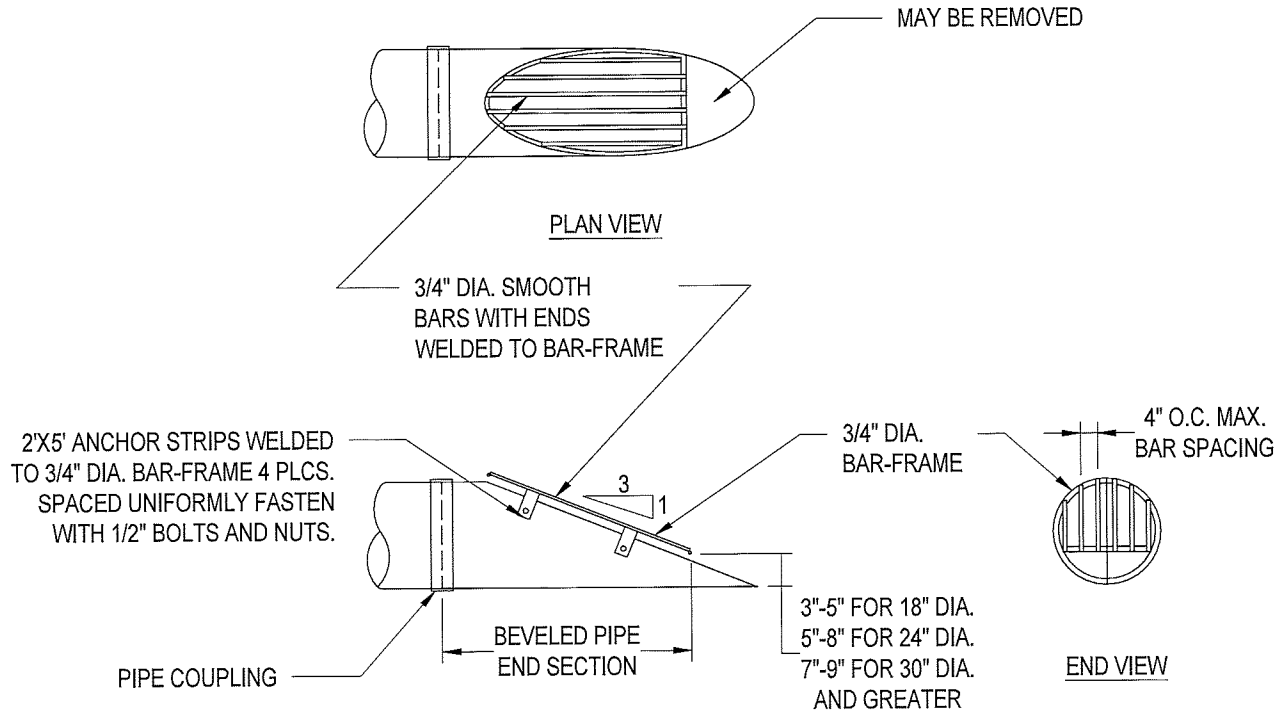
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

BEVELED END PIPE SECTION

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-01

REV. NO. X



PLAN VIEW

NOTES:

1. CMP END-SECTION SHOWN. FOR CONCRETE PIPE BEVELED END-SECTION, SEE STD DWG 7-01.
2. ALL PARTS MUST BE ALUMINUM OR STAINLESS STEEL.
3. TRASH RACKS REQUIRED ON ALL PIPES 18" TO 36" IN DIAMETER ENTERING A CLOSED SYSTEM.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-2016

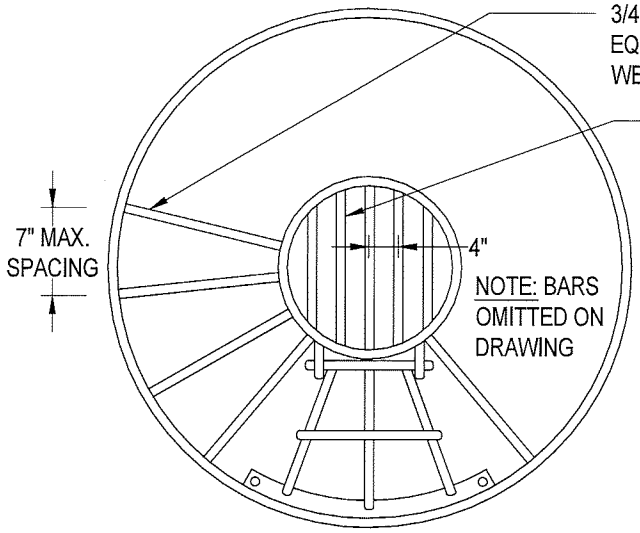
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

TRASH RACK
(DEBRIS CAGE) – PIPE END

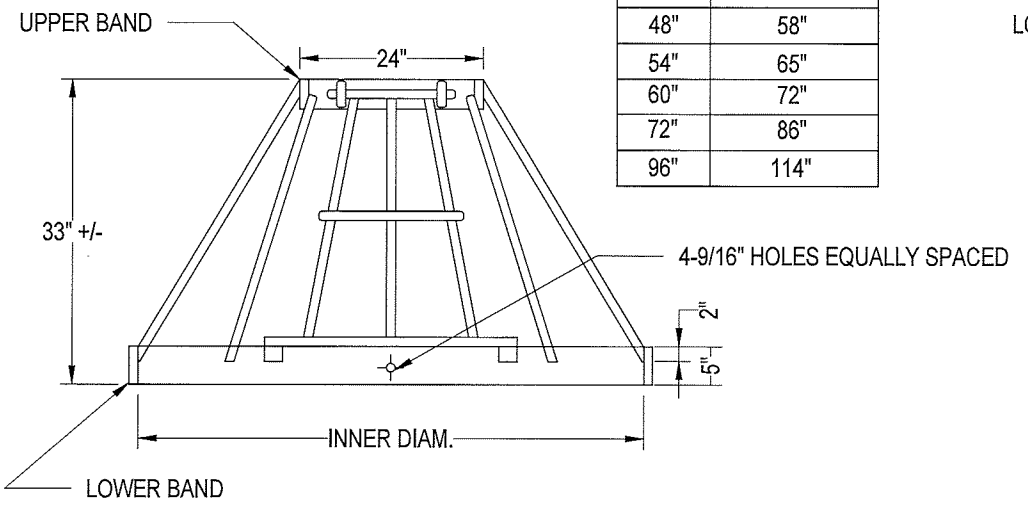
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-02

REV. NO. X



PLAN

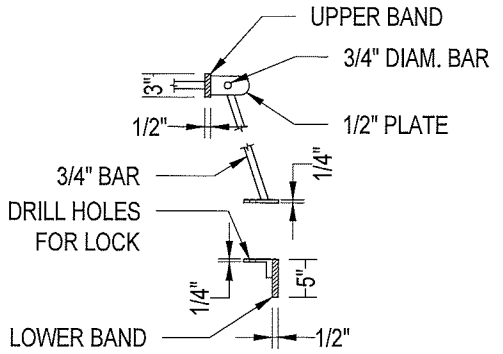


ELEVATION

CB	INNER DIAM.
48"	58"
54"	65"
60"	72"
72"	86"
96"	114"

NOTES:

1. ALL STEEL IN PLATES, BARS AND BANDS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A38.
2. DEBRIS CAGE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 (AASHTO M111).



ENTRY GATE DETAIL

CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

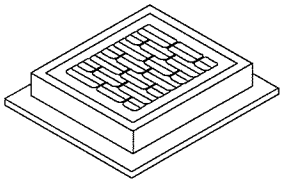
TRASH RACK (DEBRIS CAGE) – CONICAL

APPROVED BY
CITY ENGINEER _____ DATE _____

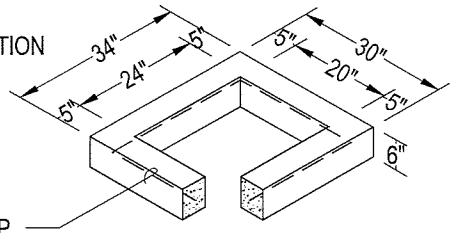
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-03

REV. NO. X

FRAME AND GRATE
SEE STD DWGS 7-16
& 7-18 FOR DETAILS

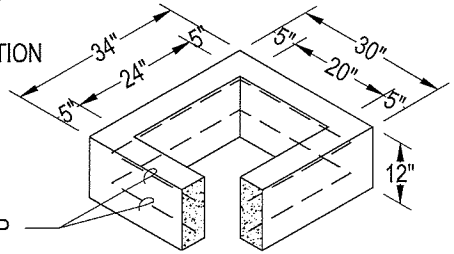


6" RISER SECTION

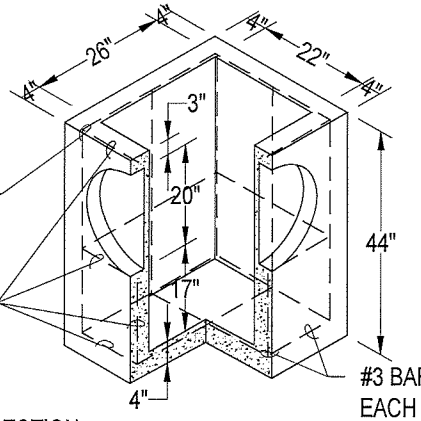


1 #3 BAR HOOP

12" RISER SECTION



2 #3 BAR HOOP



#3 BAR EACH CORNER

#3 BAR EACH SIDE

#3 BAR EACH WAY

PRECAST BASE SECTION
(MEASUREMENT AT THE
TOP OF THE BASE)

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.

2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.

3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.

4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.

5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.

6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIAM. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.

7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".

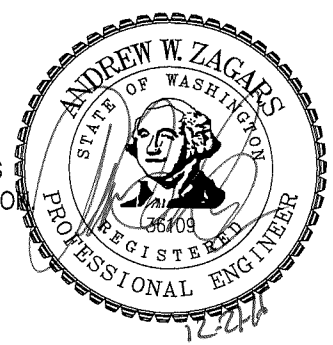
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.

9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH WSDOT /APWA STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION A-A-60005. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.

10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.

11. FOR CATCH BASINS IN PARKING LOTS REFER TO WSDOT STANDARD PLAN B-5.60-01.

12. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

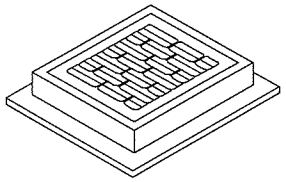
CATCH BASIN TYPE 1

APPROVED BY
CITY ENGINEER _____ DATE _____

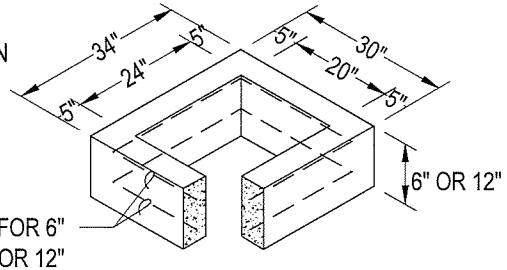
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-04

REV. NO. X

FRAME AND GRATE
SEE STD DWGS 7-16
& 7-18 FOR DETAILS

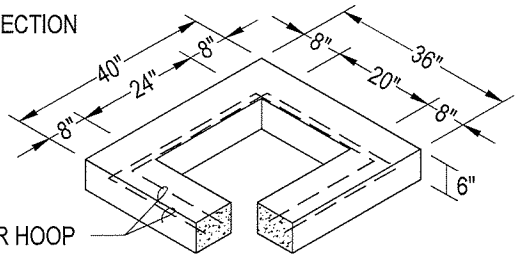


RISER SECTION



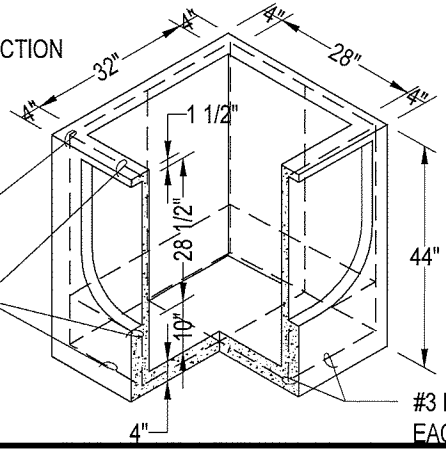
1 #3 BAR HOOP FOR 6"
2 #3 BAR HOOP FOR 12"

6" REDUCING SECTION



2 #3 BAR HOOP

PRECAST BASE SECTION



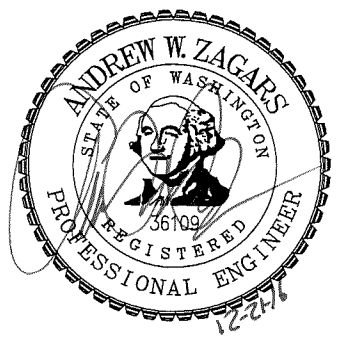
#3 BAR EACH CORNER

#3 BAR EACH SIDE

#3 BAR EACH WAY

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIAM. OF 26". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH WSDOT/APWA STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION A-A-60005. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. FOR CATCH BASINS IN PARKING LOTS REFER TO WSDOT STANDARD PLAN B-5.60-01.
12. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.



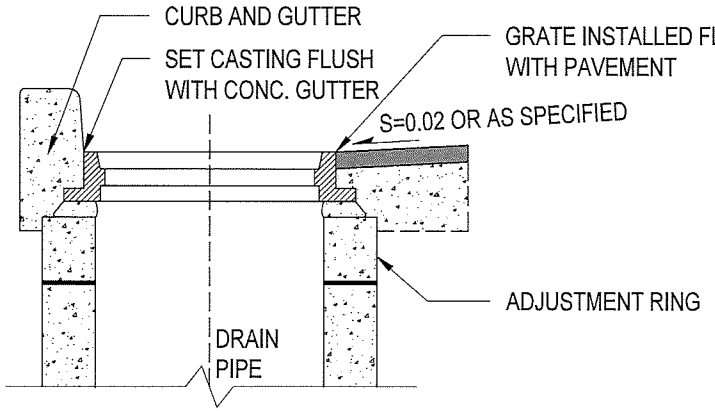
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CATCH BASIN TYPE 1-L

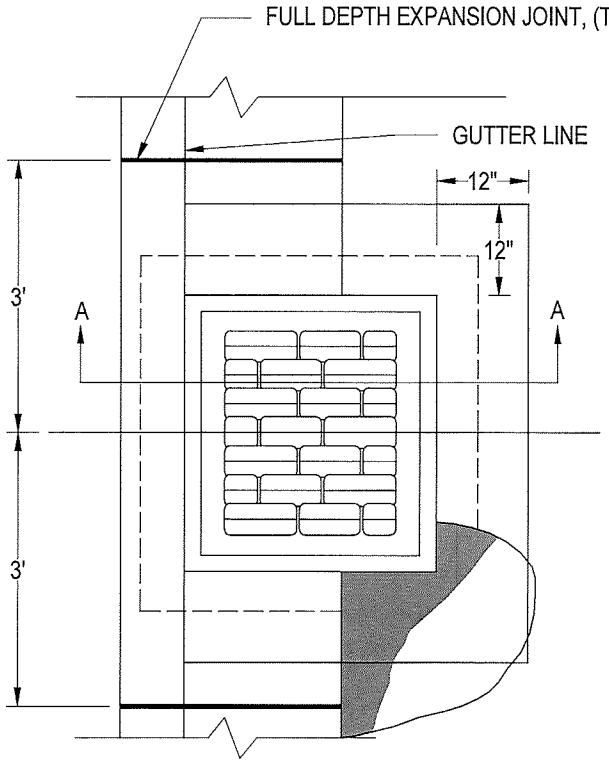
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-05

REV. NO. X



SECTION A-A



PLAN VIEW

NOTES:

1. AN APPROVED MATERIAL WHICH WILL PREVENT BONDING OF THE CURB TO FRAME, GRATE OR C.B. SHALL BE USED.

2. GROUT ALL JOINTS INSIDE AND OUTSIDE.

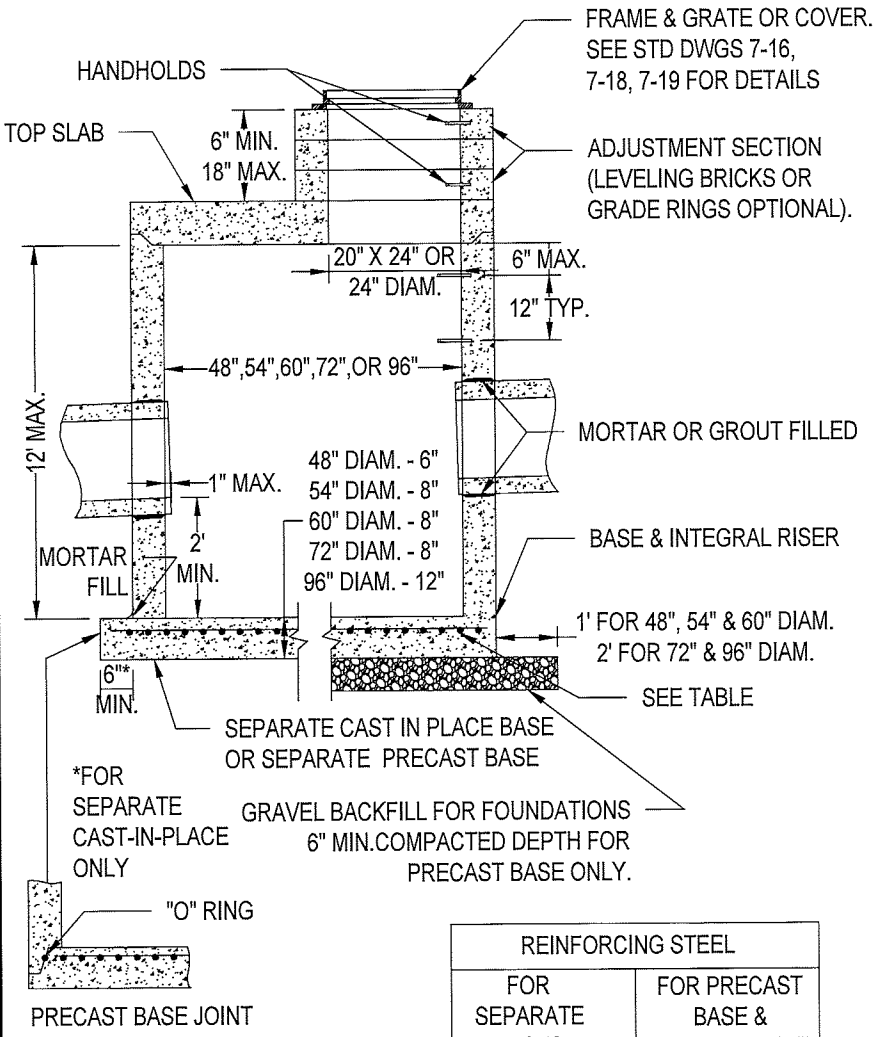
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CATCH BASIN INSTALLATION

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-06

REV. NO. X



REINFORCING STEEL			
FOR SEPARATE BASES		FOR PRECAST BASE & INTEGRAL RISER	
DIAM.	SQ. IN./FT.	DIAM.	SQ. IN./FT.
48"	0.23	48"	0.15
54"	0.19	54"	0.19
60"	0.25	60"	0.25
72"	0.35	72"	0.24
96"	0.39	96"	0.29

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTMC478 (AASHTO M199) AND ASTM C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN CATCH BASIN SHALL HAVE 6" MIN. CLEARANCE. SEE STD DWG 7-08, CATCH BASIN DETAILS. HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36" FOR 48" CATCH BASIN, 42" FOR 54" C.B., 48" FOR 60" C.B., 60" FOR 72" C.B., 84" FOR 96" C.B. MIN. DISTANCE BETWEEN HOLES SHALL BE 8" FOR 48", 54", AND 60" C.B.; 12" FOR 72" AND 96" C.B.
6. CATCH BASIN FRAMES AND GRATES OR COVERS SHALL BE IN ACCORDANCE WITH STD DWGS 7-16, 7-18, & 7-19 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION A-A-60005. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.
8. MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING LADDER, STEPS, HANDRAILS AND TOP SLABS, SEE STD DWG 7-08.
10. SEE THE WSDOT STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.
11. IF PIPE IS SMOOTH WALL PLASTIC, NOT CONCRETE, A SAND COLLAR IS REQUIRED.

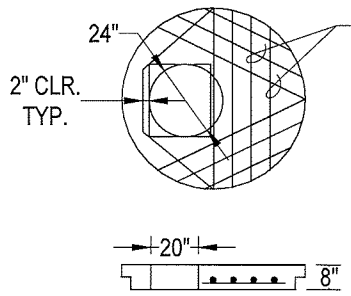
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CATCH BASIN TYPE 2 – 48", 54", 60", 72" & 96"

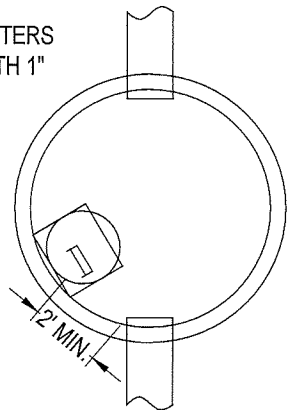
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-07

REV. NO. X



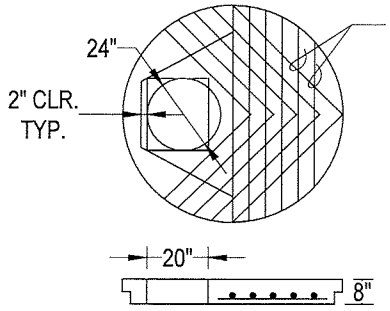
48", 54" & 60" TOP SLAB



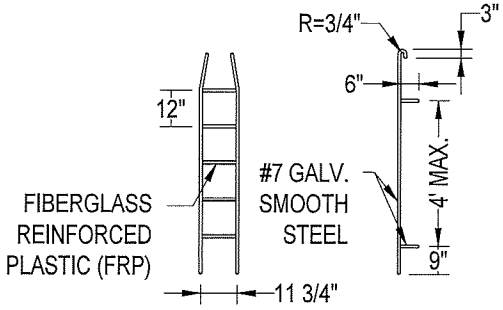
TYPICAL ORIENTATION FOR ACCESS AND STEPS

NOTES:

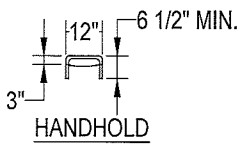
1. PROPRIETARY CATCH BASIN HANDHOLDS AND STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO SEC. R, ASTM C478, AASHTO M-199 AND MEET ALL WISHA REQUIREMENTS.
2. CATCH BASIN STEP/HANDHOLD LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY CATCH BASIN SHALL BE SIMILAR. PENETRATION OF OUTER WALL BY A LEG IS PROHIBITED.
3. HANDHOLDS AND STEPS SHALL HAVE "DROP" RUNGS AS SHOWN ON DETAIL OR PROTUBERANCES TO PREVENT SIDEWAYS SLIP.
4. SLAB OPENING MAY BE 24" X 20" OR 24" DIAM.
5. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497.
6. LADDERS OR STEPS SHALL EXTEND TO WITHIN 16" OF BOTTOM OF CATCH BASIN.
7. HANGING LADDERS SHALL BE PERMANENTLY FASTENED AT TOP BY HANGING ON STEP OR BY BOLTING OR EMBEDDING IN CONCRETE. EACH SHALL BE EMBEDDED AT BOTTOM IN BASE.
8. ADDITIONAL SAFETY FEATURES MAY BE REQUIRED.



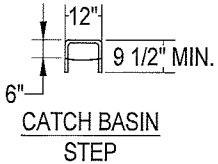
72" TOP SLAB



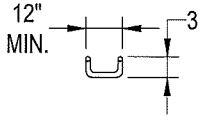
PREFABRICATED LADDER



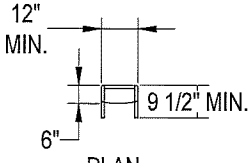
HANDHOLD



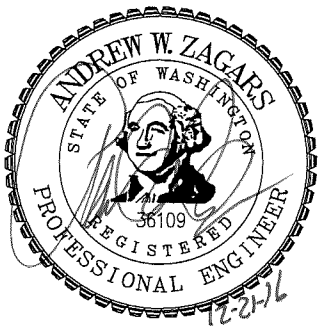
CATCH BASIN STEP

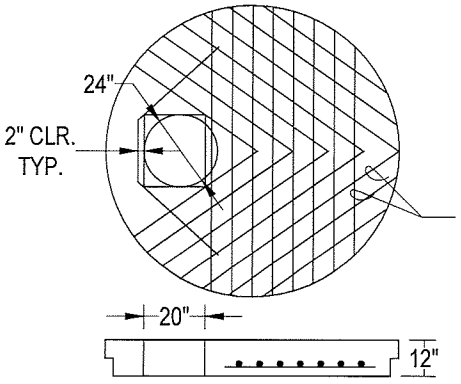


ELEVATION

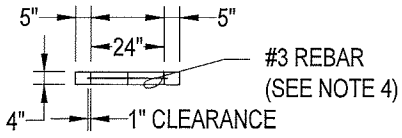


PLAN





96" TOP SLAB



GRADE RING

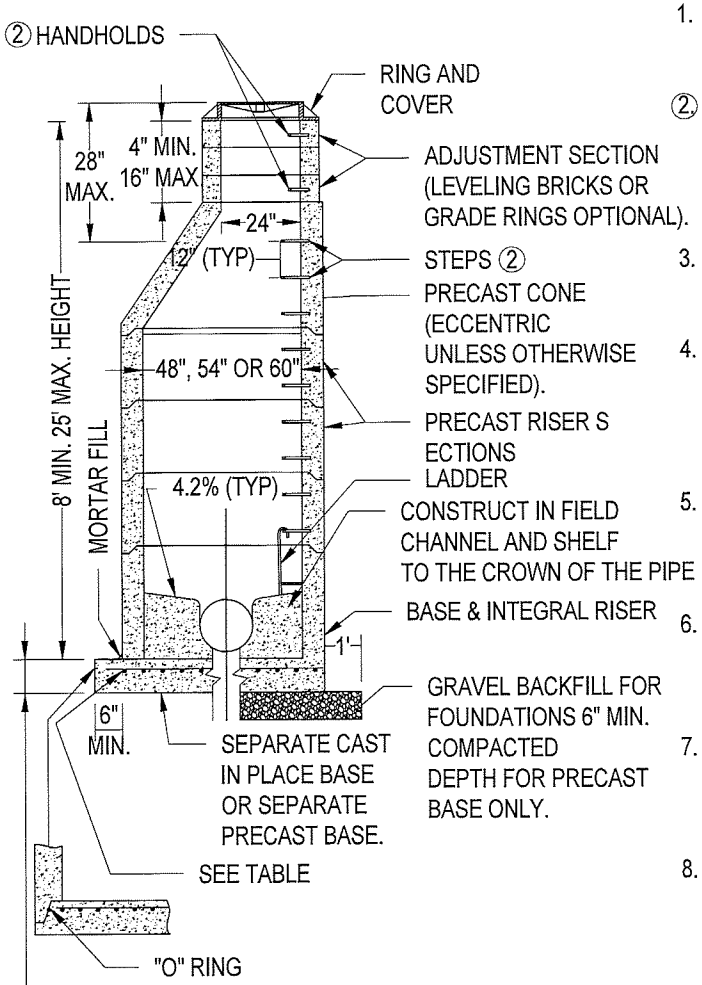
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CATCH BASIN – TYPE 2 DETAILS

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-08

REV. NO. X



PRECAST BASE JOINT	REINFORCING STEEL			
	FOR SEPARATE BASES		FOR PRECAST BASE & INTEGRAL RISER	
	DIAM.	SQ. IN./FT.	DIAM.	SQ. IN./FT.
48"DIAM.-6", 54"DIAM.-8", 60"DIAM.-8"	48"	0.23	48"	0.15
	54"	0.19	54"	0.19
	60"	0.25	60"	0.25

NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.

② HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE STD DWG 7-12, "MANHOLE DETAILS." HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HAND HOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.

3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000.

4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS MANHOLE WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36" FOR 48" MANHOLE, 42" FOR 54" MANHOLE, 48" FOR 60" M.H. MIN. DISTANCE BETWEEN HOLES SHALL BE 8".

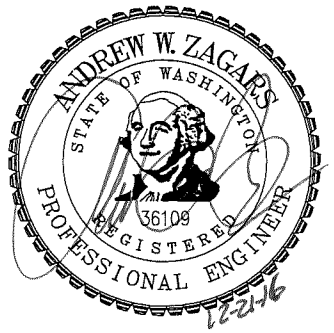
6. MANHOLE RINGS AND COVERS SHALL MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION A-A-60005. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.

7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.

8. FOR HEIGHTS OF 12' OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT. FOR HEIGHTS OVER 12', MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 POUNDS PER SQUARE FOOT.

9. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE STD DWG 7-12, "MANHOLE DETAILS".

10. SEE THE WSDOT STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.



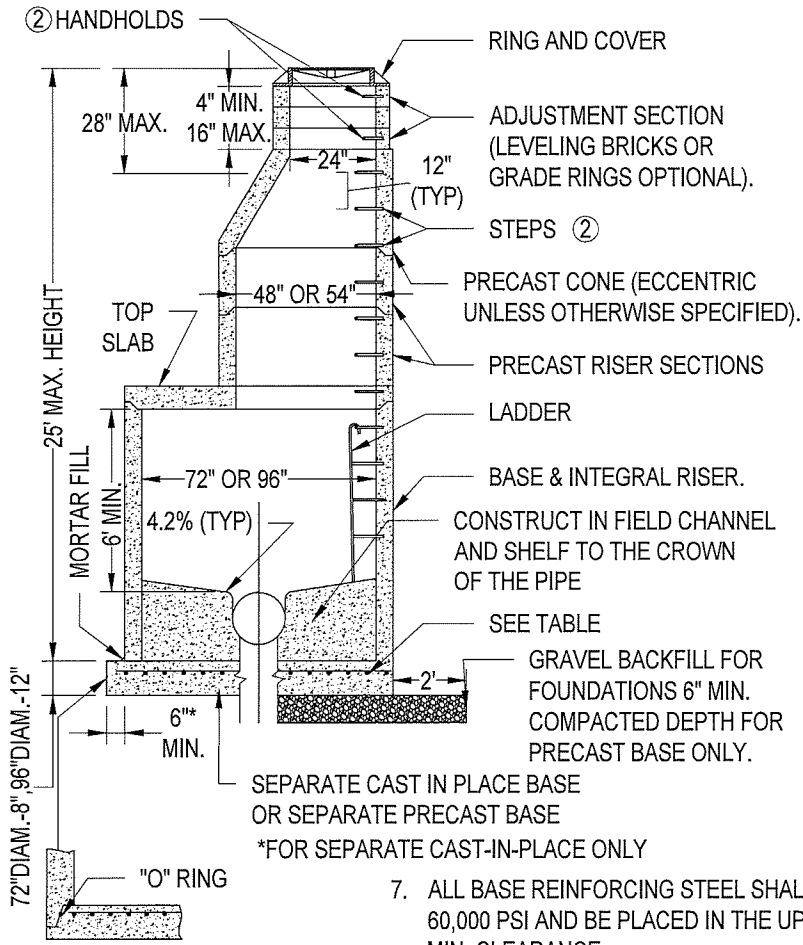
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

MANHOLE TYPE 1– 48", 54" & 60"

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG–XX–2015	FIG07–09

REV. NO. X



NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.

② HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE STD DWG 7-12, "MANHOLE DETAILS." HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HAND HOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.

3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000.

4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS MANHOLE WALL THICKNESS. MAX. HOLE SIZE SHALL BE 60" FOR 72" MANHOLE, 84" FOR 96" MANHOLE. MIN. DISTANCE BETWEEN HOLES SHALL BE 12".

6. MANHOLE RINGS AND COVERS SHALL MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION A-A-60005. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.

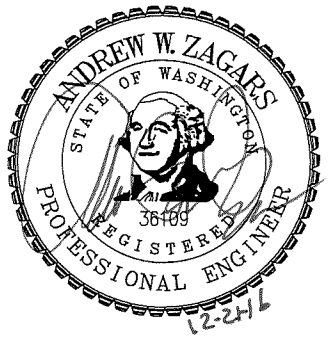
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.

8. FOR HEIGHTS OF 12' OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT. FOR HEIGHTS OVER 12', MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 POUNDS PER SQUARE FOOT.

9. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE STD DWG 7-12, "MANHOLE DETAILS".

10. SEE THE WSDOT STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.

REINFORCING STEEL			
FOR SEPARATE BASES		FOR PRECAST BASE & INTEGRAL RISER	
DIAM.	SQ. IN./FT.	DIAM.	SQ. IN./FT.
72"	0.35	72"	0.24
96"	0.39	96"	0.29



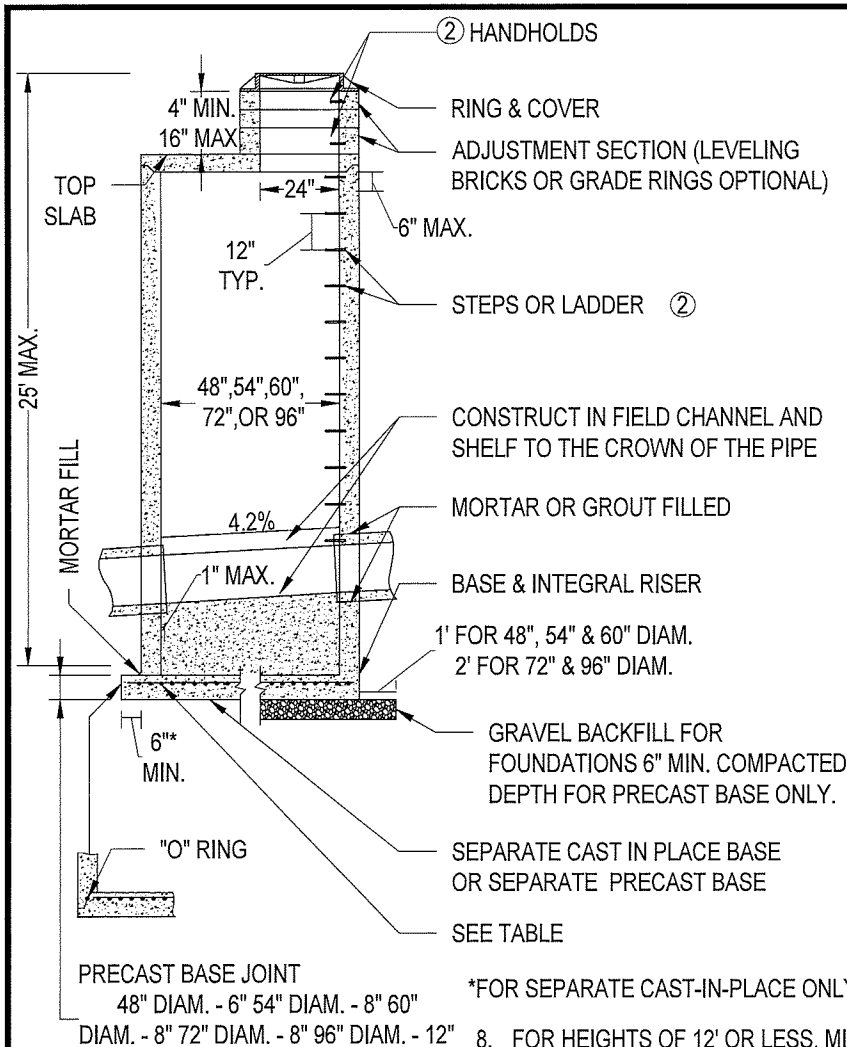
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

MANHOLE TYPE 2 – 72" & 96"

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-10

REV. NO. X



*FOR SEPARATE CAST-IN-PLACE ONLY

REINFORCING STEEL			
FOR SEPARATE BASES		FOR PRECAST BASE & INTEGRAL RISER	
DIAM.	SQ. IN./FT.	DIAM.	SQ. IN./FT.
48"	0.23	48"	0.15
54"	0.19	54"	0.19
60"	0.25	60"	0.25
72"	0.35	72"	0.24
96"	0.39	96"	0.29

NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.

② HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE STD DWG 7-12, "MANHOLE DETAILS." HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HAND HOLD BETWEEN THE LAST STEP AND THE TOP OF THE MANHOLE.

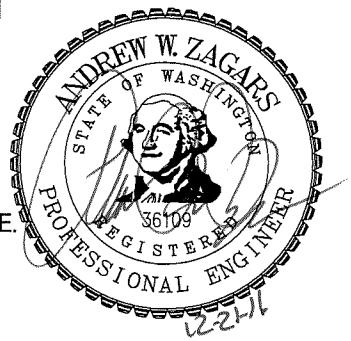
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000.

4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

5. KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS MANHOLE WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36" FOR 48" M.H., 42" FOR 54" M.H., 48" FOR 60" M.H., 60" FOR 72" M.H., 84" FOR 96" M.H. MIN. DISTANCE BETWEEN HOLES SHALL BE 8" FOR 48", 54", AND 60" M.H., 12" FOR 72" AND 96" M.H.

6. MANHOLE RINGS AND COVERS SHALL MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION A-A-60005. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.

7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.



8. FOR HEIGHTS OF 12' OR LESS, MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT. FOR HEIGHTS OVER 12', MIN. SOIL BEARING VALUE SHALL EQUAL 3,800 POUNDS PER SQUARE FOOT.

9. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE STD DWG 7-12, "MANHOLE DETAILS".

10. SEE THE WSDOT STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.

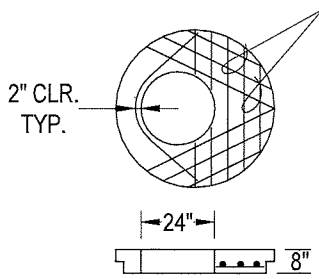
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

MANHOLE TYPE 3 – 48", 54", 60", 72" & 96"

APPROVED BY
CITY ENGINEER _____ DATE _____

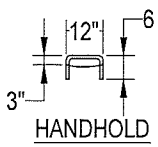
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-11

REV. NO. X

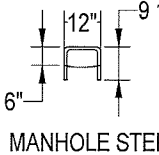


48", 54", & 60" TOP SLAB

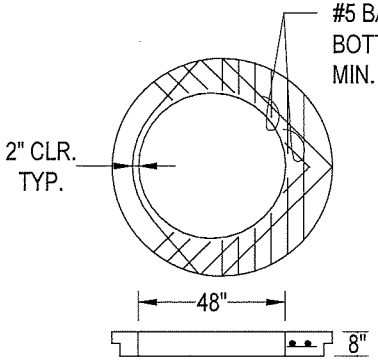
*ALL STEPS & RUNGS 1" DIAM. GALV. REBAR OR COPOLYMER PROPYLENE.



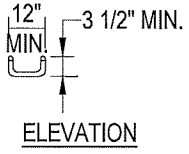
HANDHOLD



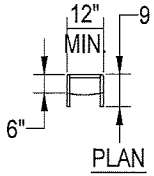
MANHOLE STEP



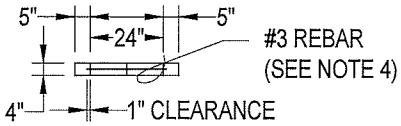
72" TOP SLAB



ELEVATION



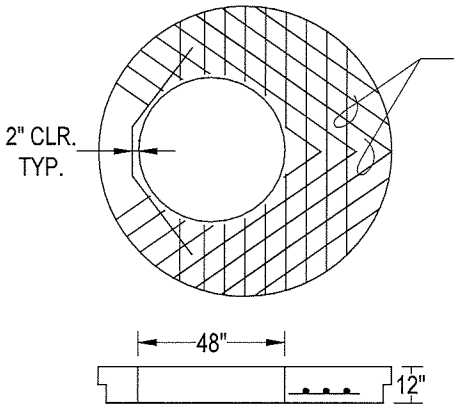
PLAN



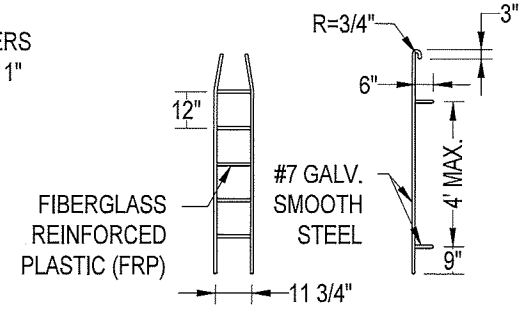
GRADE RING

NOTES:

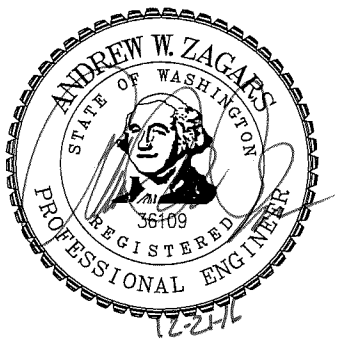
1. PROPRIETARY MANHOLE HANDHOLDS AND STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO SEC. R, ASTM C478, AASHTO M199 AND MEET ALL WISHA REQUIREMENTS.
2. MANHOLE STEP/HANDHOLD LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY MANHOLE SHALL BE SIMILAR. PENETRATION OF OUTER WALL BY A LEG IS PROHIBITED.
3. HANDHOLDS AND STOPS SHALL HAVE "DROP" RUNGS OR PROTUBERANCES TO PREVENT SIDEWAYS SLIP.
4. LADDERS OR STEPS SHALL EXTEND TO WITHIN 16" OF BOTTOM OF MANHOLE.
5. HANGING LADDERS SHALL BE PERMANENTLY FASTENED AT TOP BY HANGING ON STEP OR BY BOLTING OR EMBEDDING IN CONCRETE. EACH SHALL BE EMBEDDED AT BOTTOM IN BASE.
6. ADDITIONAL SAFETY FEATURES MAY BE REQUIRED.



96" TOP SLAB



PREFABRICATED LADDER



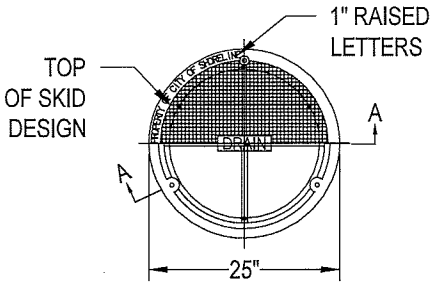
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

MANHOLE DETAILS

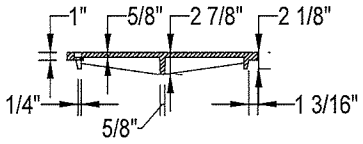
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-12

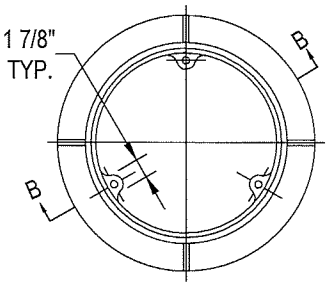
REV. NO. X



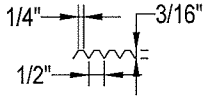
PLAN



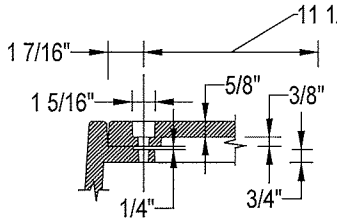
SECTION A-A



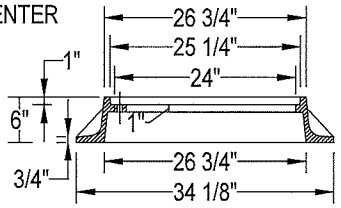
PLAN



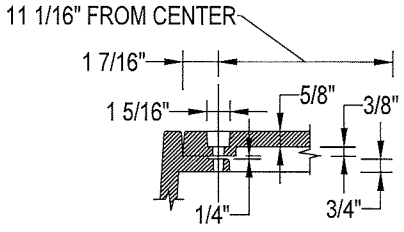
COVER SKID DESIGN DETAIL



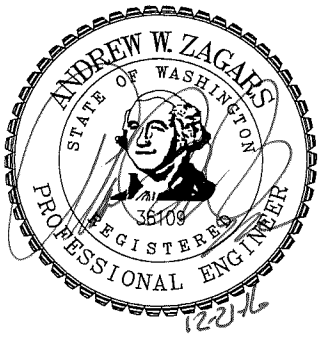
BOLT-DOWN DETAIL



SECTION B-B



BOLT-DOWN DETAIL



NOTES:

1. USE WITH THREE LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG. DRILL HOLES SPACED 120° AT 11 1/16" RADIUS.
2. MATERIAL SHALL BE DUCTILE IRON ASTM A536 GRADE 80-55-06 OR CAST IRON ASTM A48 CLASS 30.
3. A 2-FOOT ASPHALT PAVEMENT SURFACE SHALL BE PLACED AROUND THE OUTSIDE PERIMETER OF THE FRAME AND LID IN LOCATIONS IN UNPAVED AREAS.

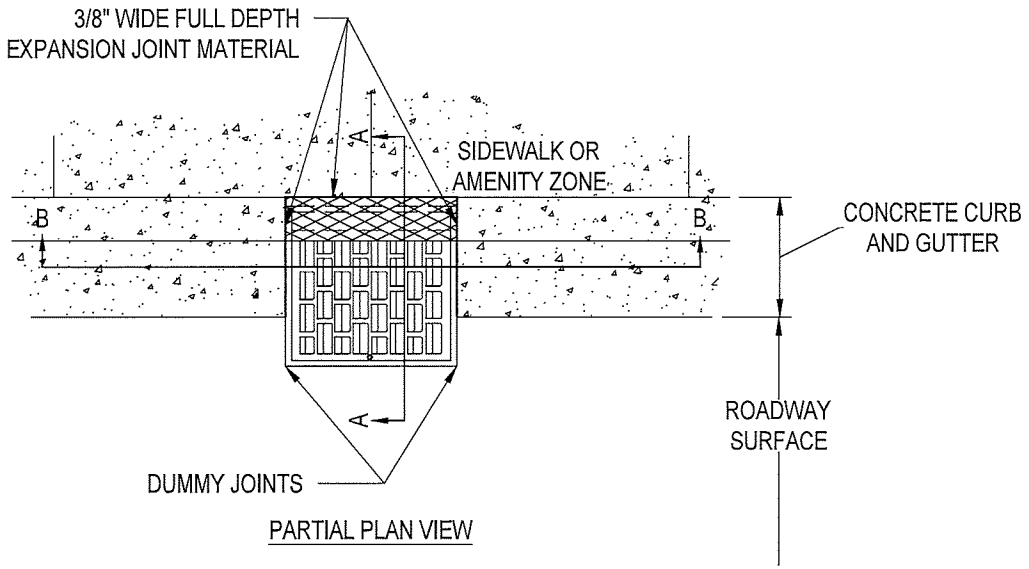
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

LOCKING MANHOLE COVER AND INSTALLATION

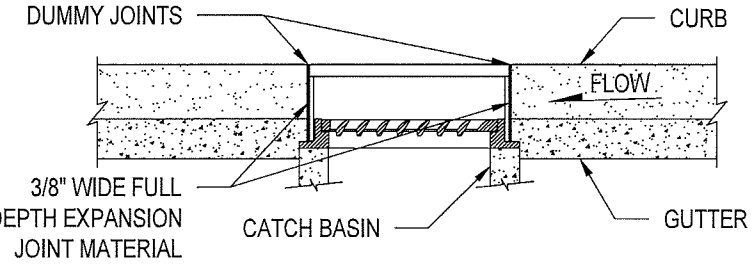
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-13

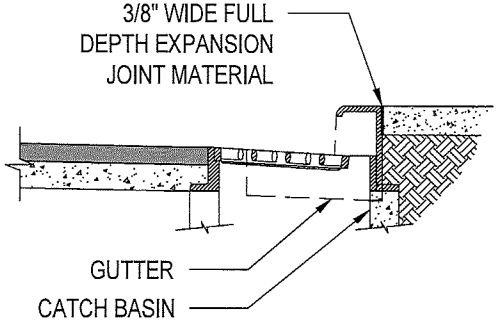
REV. NO. X



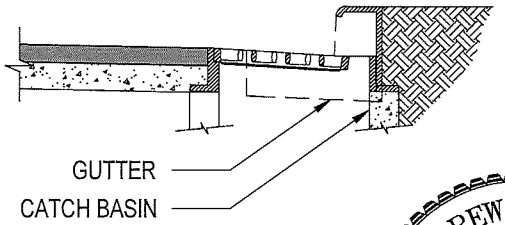
PARTIAL PLAN VIEW



SECTION B-B

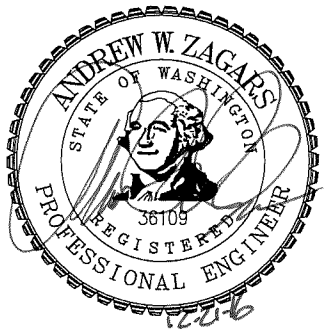


INLET WITH SIDEWALK



INLET WITH AMENITY ZONE

SECTION A-A



NOTE:

1. SET TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
2. SEE STD DWG 7-16 FOR TYPE OF GRATE USE.
3. SEE STD DWG 7-15 FOR FRAME DETAIL.
4. SEE STD DWG 7-06 FOR CATCH BASIN INSTALLATION.

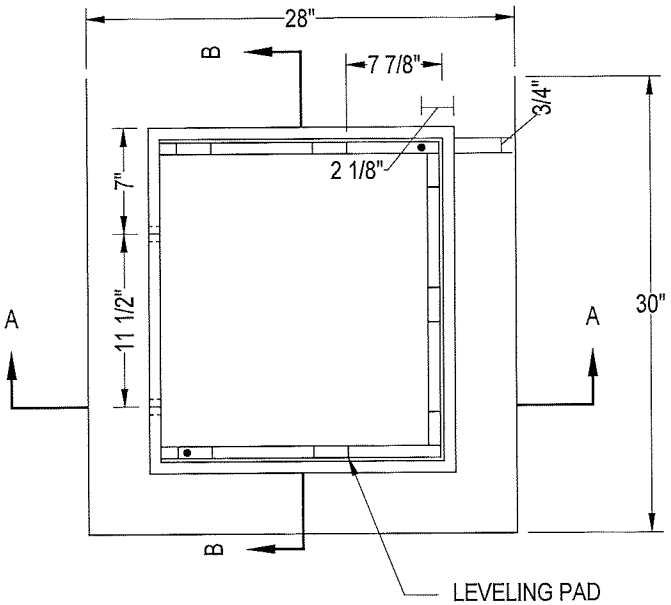
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

THROUGH-CURB INLET AND VERTICAL CURB INSTALLATION

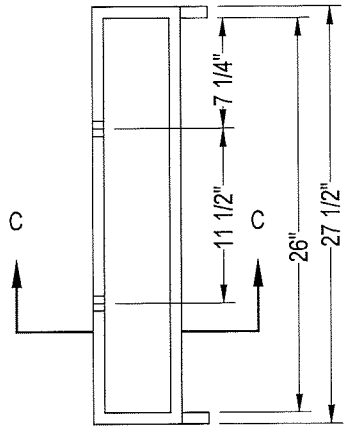
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-14

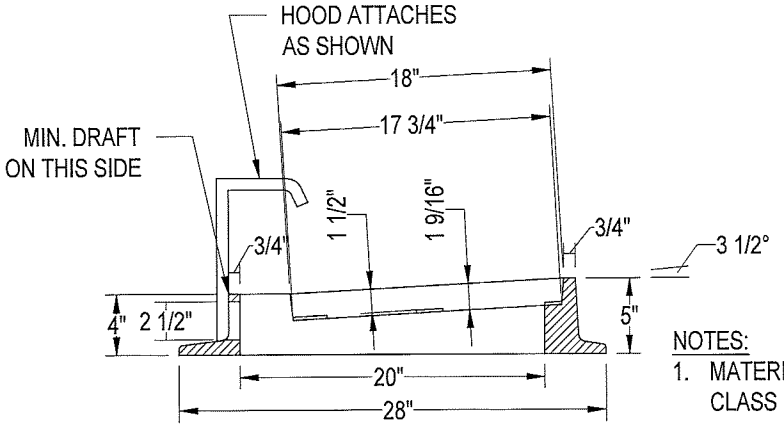
REV. NO. X



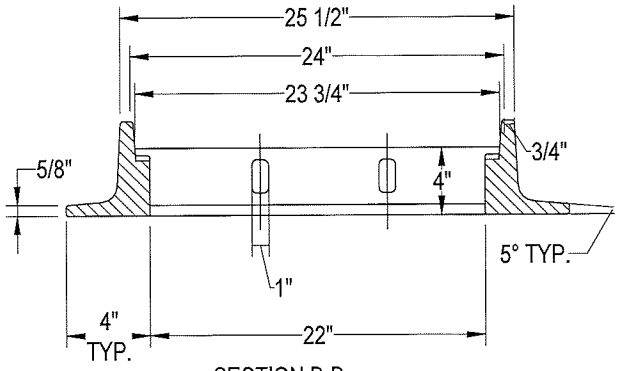
PLAN



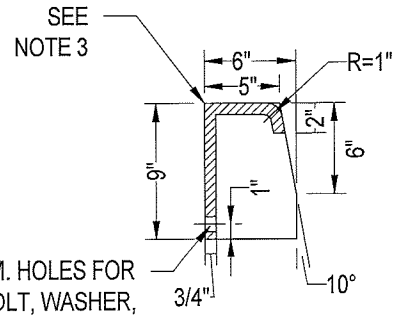
HOOD DETAIL



SECTION A-A



SECTION B-B

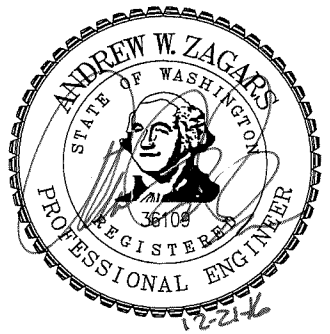


2 - 1" DIAM. HOLES FOR
3/4" BOLT, WASHER,
& NUT, SEE NOTE 4

SECTION C-C

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE STD DWG 7-16 FOR VANED GRATE.
3. PATTERN ON TOP SURFACE OF HOOD SHALL BE 3/16" NON-SKID.
4. BOLT, WASHER, & NUT SHALL BE GALVANIZED OR EROSION RESISTANT.



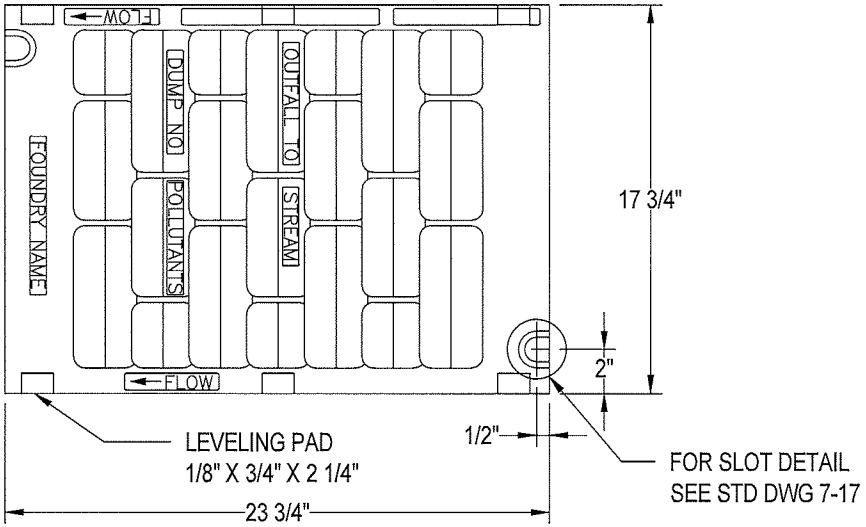
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

THROUGH–CURB INLET FRAME

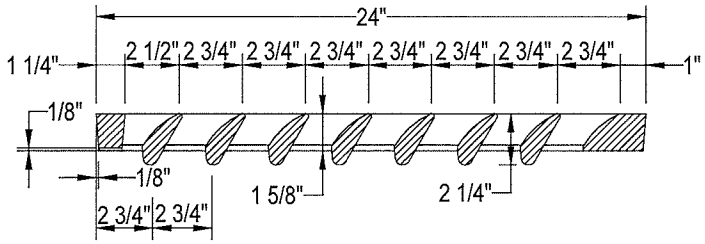
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG–XX–2015	FIG07–15

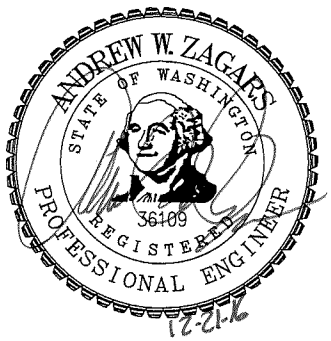
REV. NO. X



PLAN



ELEVATION



NOTES:

1. SELF-LOCK VANED GRATE MANUFACTURER SUBJECT TO APPROVAL BY THE DIRECTOR OR DESIGNEE.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG.
3. MATERIAL SHALL BE DUCTILE IRON ASTM A536 GRADE 80-55-06.
4. "OUTFALL TO STREAM DUMP NO POLLUTANTS" MAY BE LOCATED ON THE BORDER AREA.

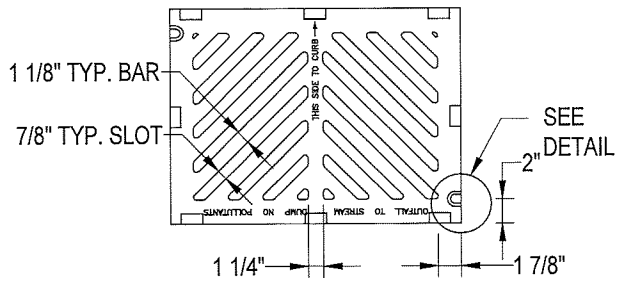
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

VANED GRATE

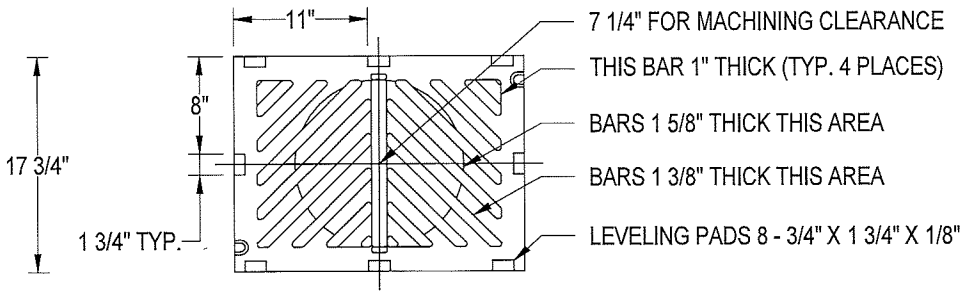
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-16

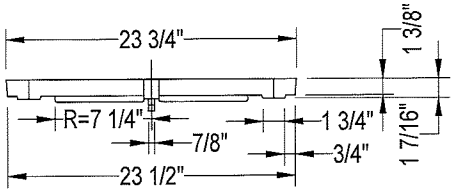
REV. NO. X



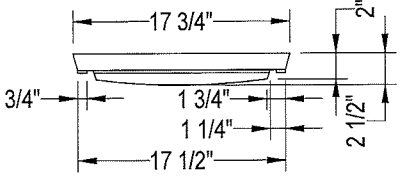
TOP VIEW



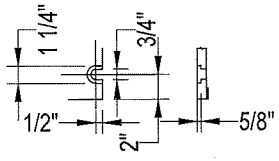
BOTTOM VIEW



SIDE VIEW



END VIEW



SLOT DETAIL

SEE NOTE ①

NOTES:

① SLOT FORMED AND RECESSED FOR 5/8"-11 NC X 2" SOCKET HEAD (ALLEN HEAD) CAP SCREW.

2. ALL CASTINGS SHALL HAVE A BITUMINOUS COATING.

3. GRATE SHALL BE CAST IRON PER ASTM A48 CLASS 30 UNLESS OTHERWISE SPECIFIED.

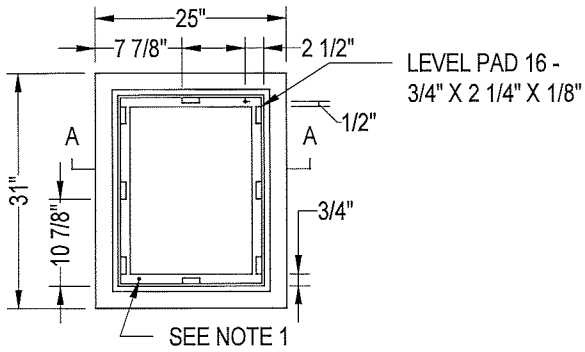
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

STANDARD GRATE

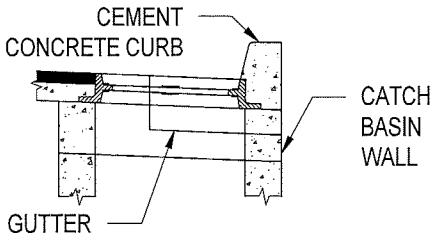
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-17

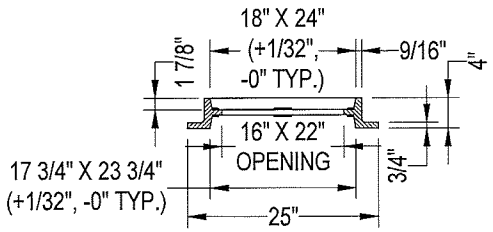
REV. NO. X



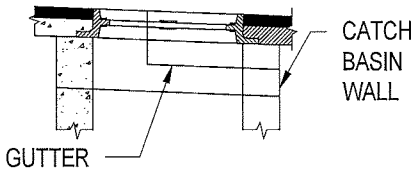
PLAN



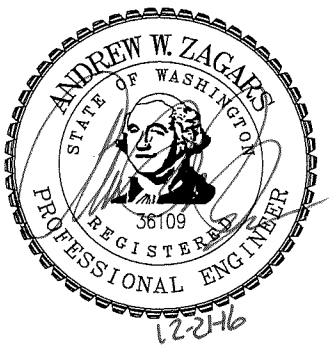
CURB



SECTION A-A



NO CURB



NOTES:

1. TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG WHEN USED WITH SOLID COVER (STND DWG 7-19) OR WHEN SPECIFIED BY ENGINEER.
2. FRAME MATERIAL SHALL BE CAST IRON PER ASTM A48 CLASS 30.
3. SET FRAME TO GRADE & CONSTRUCT ROAD & GUTTER TO BE FLUSH WITH FRAME.

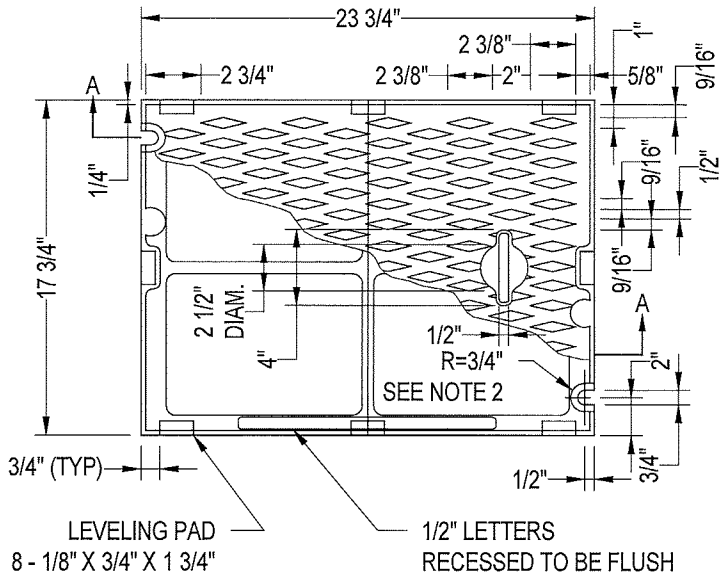
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

STANDARD FRAME INSTALLATION

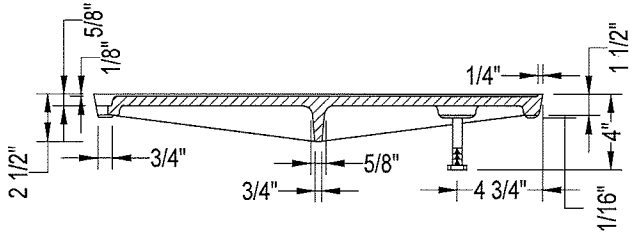
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-18

REV. NO. X



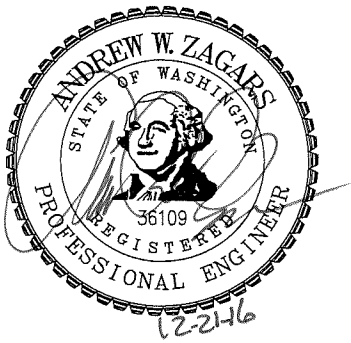
PLAN COVER



SECTION A-A

NOTES:

1. USE WITH FRAME (SEE STD DWG 7-18) DRILLED & TAPPED FOR LOCKING BOLTS.
2. FOR FRAME AND GRATES WITHIN THE TRAVEL LANE USE, FOUR LOCKING BOLTS.
3. USE WITH TWO LOCKING 5/8"-11 NC STAINLESS STEEL TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG.
4. MATERIAL SHALL BE CAST IRON PER ASTM A48 CLASS 30.



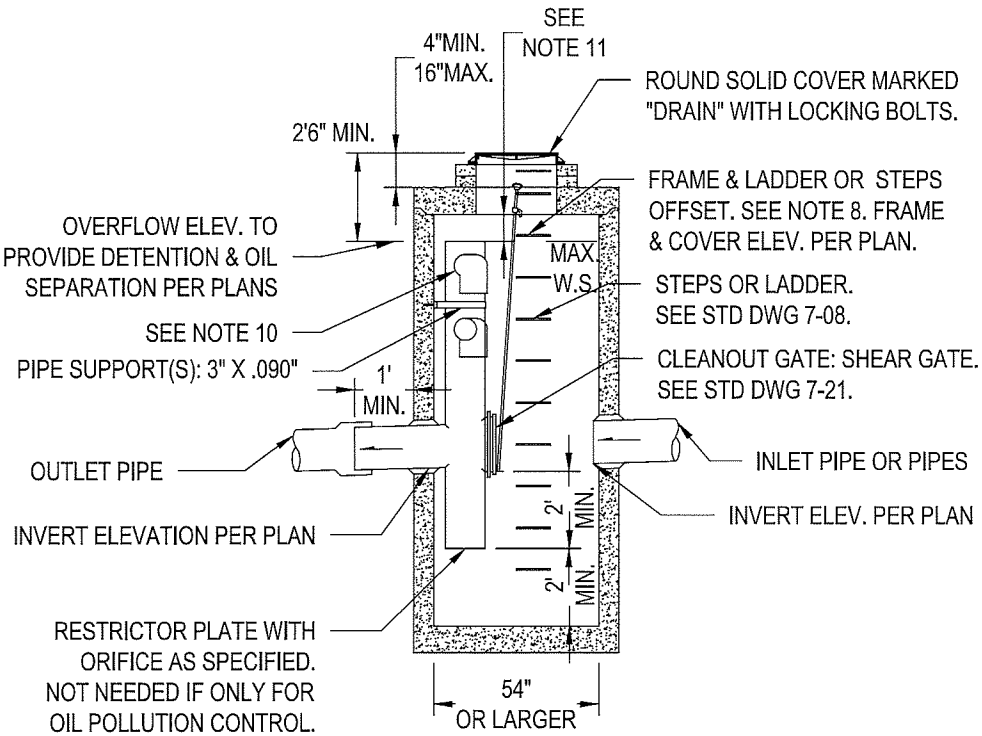
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SOLID COVER

APPROVED BY
CITY ENGINEER _____ DATE _____

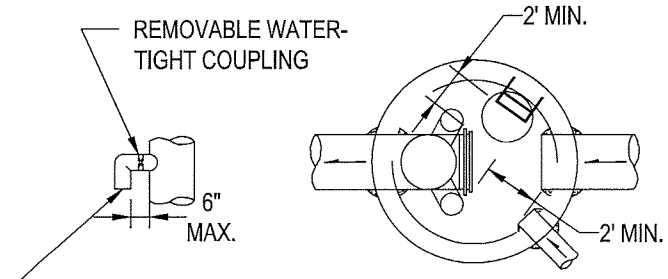
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-19

REV. NO. X



CATCH BASIN TYPE 2

DIAM. AS REQUIRED
SEE STD DWG 7-07.

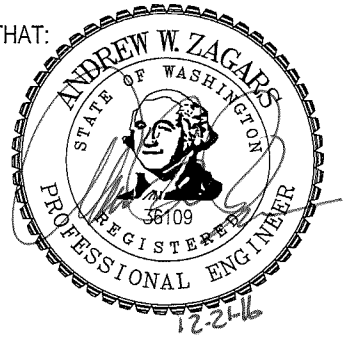


ELBOW DETAIL

PLAN

NOTES:

1. PIPE SIZES AND SLOPES: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. EXCEPT AS SHOWN OR NOTED, UNITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS FOR CATCH BASIN TYPE 2, 54" MIN. DIAM.
4. PIPE SUPPORTS AND RESTRICTOR/SEPARATOR SHALL BE OF SAME MATERIAL, AND BE ANCHORED AT 3' MAX. SPACING BY 5/8" DIAM. STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED 2" IN WALL.
5. THE RESTRICTOR/SEPARATOR SHALL BE FABRICATED FROM .060" ALUMINUM, OR .064" ALUMINIZED STEEL.
6. OUTLET SHALL BE CONNECTED TO CULVERT OR SEWER PIPE WITH A STANDARD COUPLING BAND FOR CORRUGATED METAL PIPE, OR GROUTED INTO THE BELL OF CONCRETE PIPE.
7. THE VERTICAL RISER STEM OF THE RESTICTOR/SEPARATOR SHALL BE THE SAME DIAM. AS THE HORIZONTAL OUTLET PIPE, WITH AN 8" MIN. DIAM.
8. FRAME AND LADDER OR STEPS OFFSET SO THAT:
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE.
   C. FRAME IS CLEAR OF CURB.
9. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE: OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS 1/4".
10. MULTI-ORIFICE ELBOWS MAY BE LOCATED AS SHOWN OR ALL ON ONE SIDE OF RISER TO ASSURE LADDER CLEARANCE.
11. 6" MIN. DEPENDING ON DESIGN SPECIFICATION.



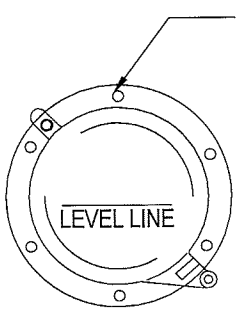
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

FLOW RESTRICTOR (TEE)

APPROVED BY
CITY ENGINEER _____ DATE _____

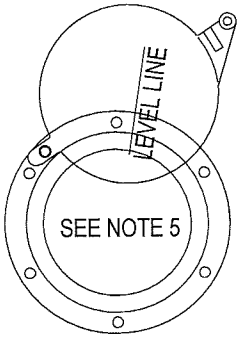
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-20

REV. NO. X

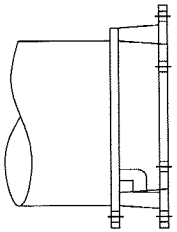


SIX EVENLY SPACED HOLES ON 10 3/8" BOLT CIRCLE FOR BOLTING TO FLANGE CONNECTION.

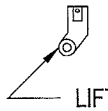
FRONT



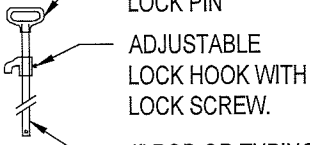
MAXIMUM OPENING OF GATE



SIDE



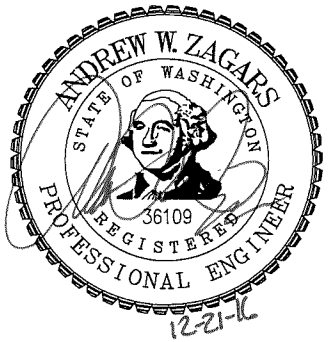
LIFT HANDLE SHALL BE ATTACHED PER MANUFACTURER'S RECOMMENDATIONS



LIFT HANDLE

NOTES:

1. SHEAR GATE SHALL BE ALUMINUM ALLOY PER ASTM B-26-ZG-32a OR CAST IRON ASTM A48 CLASS 308 AS REQUIRED.
2. GATE SHALL BE 8" DIAMETER UNLESS OTHERWISE SPECIFIED.
3. GATE SHALL BE JOINED TO TEE SECTION BY BOLTING (THROUGH FLANGE) OR WELDED.
4. LIFT ROD: AS SPECIFIED BY MANUFACTURER WITH HANDLE EXTENDING TO WITHIN 1 FOOT OF COVER & ADJUSTABLE HOOK LOCK FASTENED TO FRAME OR UPPER HANDHOLD.
5. GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITED HINGE MOVEMENT, STOP TAB, OR SOME OTHER DEVICE.
6. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE.
7. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT.
8. FLANGE MOUNTING BOLTS SHALL BE 3/8" DIAMETER STAINLESS STEEL.
9. ALTERNATIVE CLEANOUT/SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SOECIFICATIONS ABOVE AND HAVE A SIX BOLT, 10 3/8" BOLT CIRCLE FOR BOLTING TO THE FLANGE CONNECTION.



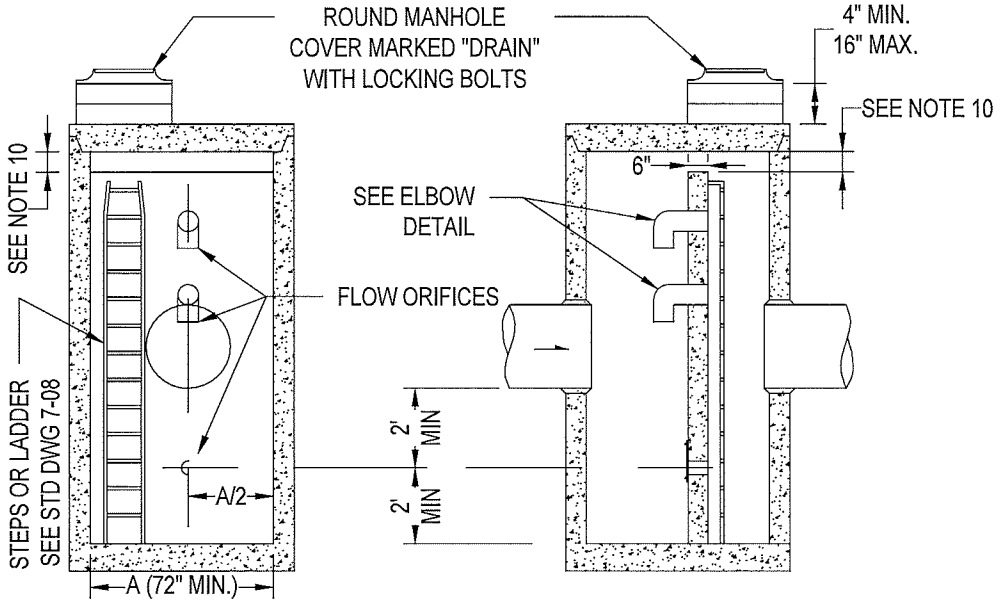
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

FROP-T SHEAR GATE DETAIL

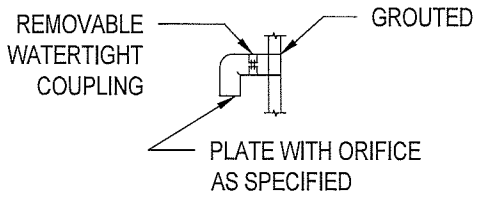
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-21

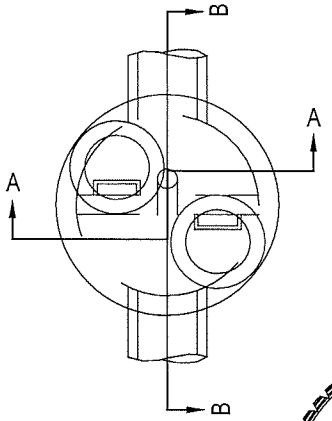
REV. NO. X



ELEVATION



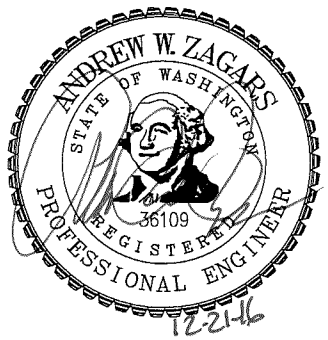
ELBOW DETAIL



PLAN

NOTES:

1. PIPE SIZE, SLOPES, AND ALL ELEVATIONS: PER PLANS.
2. OUTLET CAPACITY: NOT LESS THAN COMBINED INLETS.
3. CATCH BASIN: TYPE 2 TO BE CONSTRUCTED IN ACCORDANCE WITH STD DWG 7-07 & AASHTO M199 UNLESS OTHERWISE SPECIFIED.
4. COVERS: ROUND, SOLID MARKED "DRAIN" WITH LOCKING BOLTS.
5. ORIFICES: SIZED & LOCATED AS REQUIRED, WITH LOWEST ORIFICE MIN 2" FROM BASE.
6. BAFFLE WALL SHALL HAVE #4 REINFORCEMENT BAR AT 12" SPACING EACH WAY.
7. PRECAST BAFFLE WALL SHALL BE KEYED & GROUTED IN PLACE.
8. BOTTOM ORIFICE PLATE TO BE 1/4" MIN GALVANIZED STEEL & ATTACHED WITH 1/2" STAINLESS STEEL BOLTS. OMIT ORIFICE PLATE ID ONLY FOR OIL SEPARATION.
9. THE RESTRICTOR/SEPARATOR SHALL BE FABRICATED FROM .060" ALUMINUM, OR .064" ALUMINIZED STEEL.
10. 6" MIN. DEPENDING ON DESIGN SPECIFICATION.



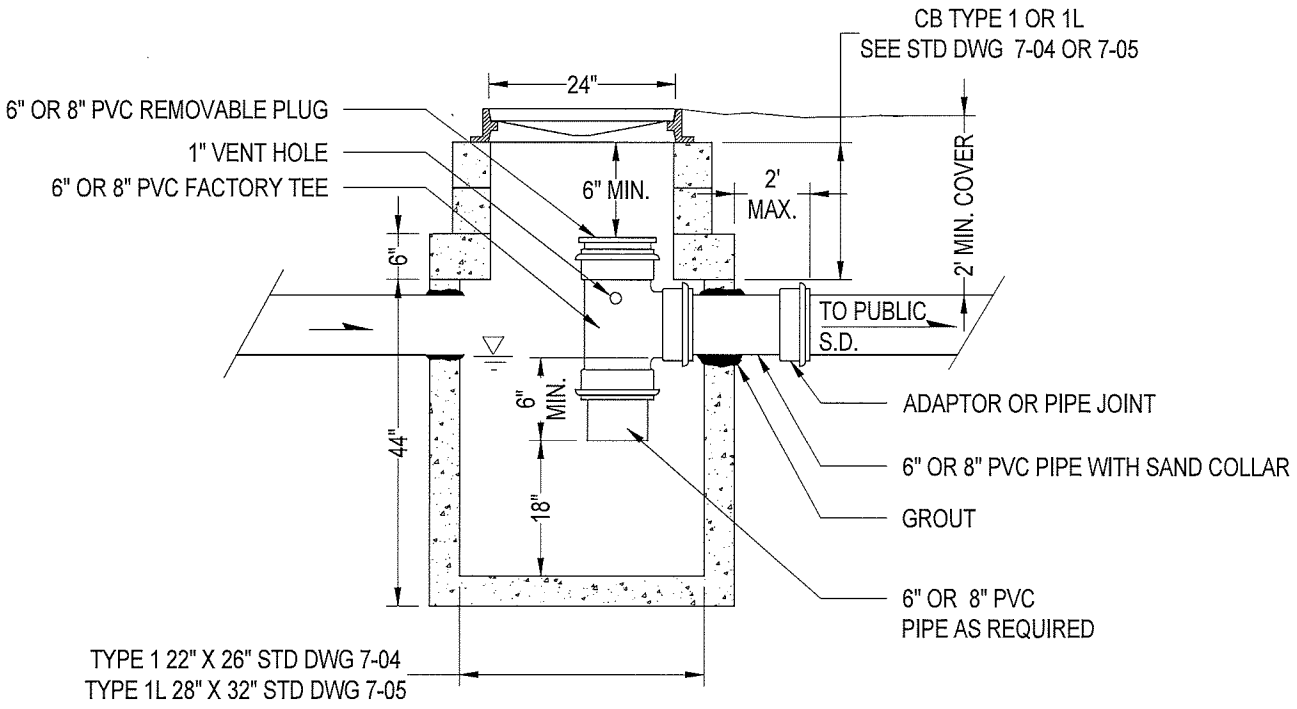
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

FLOW RESTRICTOR (BAFFLE)

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-22

REV. NO. X



NOTE:

1. MAX. RIM EL. INV. EL. DIFFERANCE GREATER THAN 5' SEE STD DWG 7-15.

2. GROUT ALL JOINTS INSIDE AND OUTSIDE.

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-15

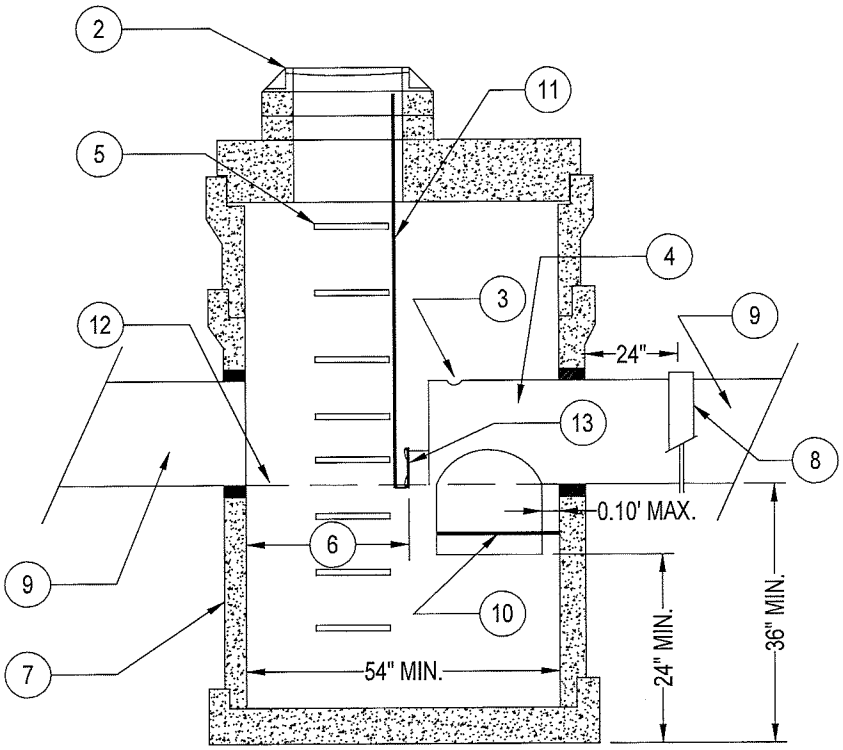
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

FLOATABLE MATERIAL SEPARATOR – 6" OR 8" PIPE

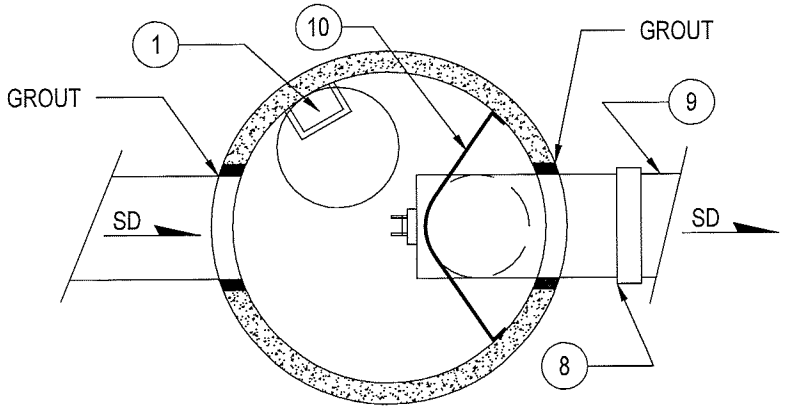
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-23

REV. NO. X



ELEVATION



PLAN

NOTES:

1. INSTALL MANHOLE ACCESS SO THAT LIFT GATE IS VISIBLE THROUGH OPENING AND STEPS CLEAR INLET AND RESTRICTOR UNIT.
2. INSTALL SOLID LID WITH LOCKING COVER, FOR MANHOLES OR WHEN IT IS TO BE A CATCH BASIN THEN USE STD DWG 7-06.
3. 1" VENT HOLE.
4. SEPARATOR ASSEMBLY.
5. POLYPROPYLENE LADDER OR STEPS: SEE STD DWG 7-08.
6. MIN CLEARANCE: 36" FOR OUTLETS OF 24" AND LARGER 18" FOR OUTLETS OF 18" AND SMALLER.
7. 54" TYPE 2 CB OR LARGER.
8. BAND STRAP WITH GASKET.
9. SEE PLAN AND SPECIFICATIONS FOR SIZE AND TYPE OF PIPE ENTERING AND EXITING CB.
10. SECURE SEPARATOR TO CB WITH 8 STAINLESS STEEL STRAP. BOLT TO CB WALL WITH STAINLESS STEEL ANCHOR BOLTS AND TACK WELD TO SEPARATOR UNIT.
11. SHEAR GATE LIFT HANDLE SEE STD DWG 7-21.
12. INV. EL.: SEE PLANS AND SPECIFICATIONS.
13. SHEAR LATE CLEAN OUT, 8" MIN. DIA., 12" DIA. FOR 24" DIA. AND LARGER OUTLET PIPE.
14. GROUT ALL JOINTS INSIDE AND OUTSIDE.

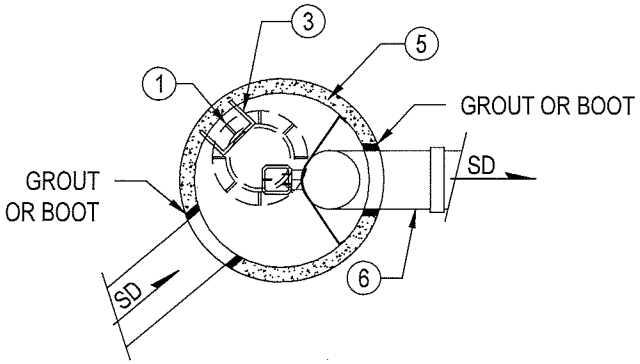
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

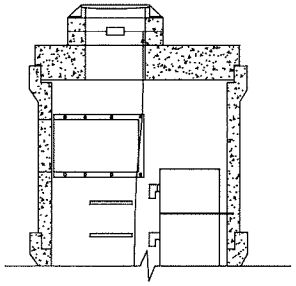
FLOATABLE MATERIAL SEPARATOR – 12" & LARGER

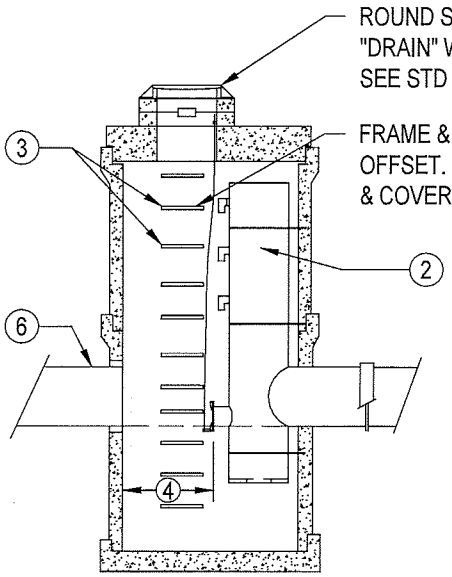
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-24

REV. NO. X







ELEVATION

NOTES:

1. INSTALL 1-24" DIA. MH. ACCESS PER STD DWG 7-12, SO THAT THE LIFT GATE IS VISIBLE AND THE STEPS ARE CLEAR AND DIRECTLY ACCESSIBLE.
2. FLOW RESTRICTOR UNIT - SEE STD DWG 7-20.
3. POLYPROPLENE PLASTIC STEP OR LADDER, SEE STND DWG 7-08. OFFSET STEPS OR LADDER FROM FRAME SO THAT:
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE.
   C. FRAME IS CLEAR OF CURB.
4. MIN CLEARANCE: 36" FOR OUTLETS OF 24" AND LARGER 18" FOR OUTLETS OF 18" AND SMALLER.
5. 54" OR 60" TYPE 2 CB.
6. SEE PLAN AND SPECIFICATIONS FOR SIZE AND TYPE OF PIPES ENTERING AND EXITING CB.

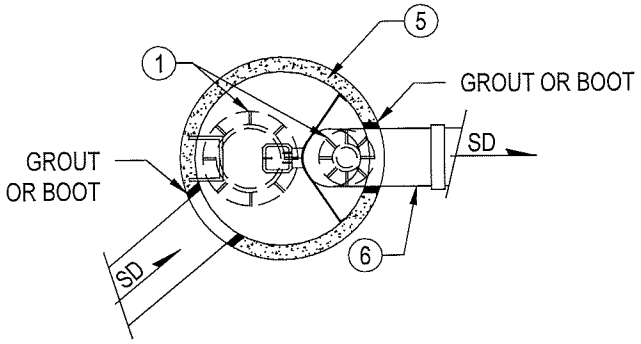
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CONTROL STRUCTURE – 54" DIAMETER

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-25

REV. NO. X



NOTES:

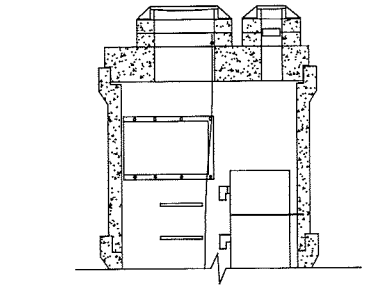
1. INSTALL 1-18" AND 1-24" DIA. MH. ACCESS PER STD DWG 7-12, SO THAT THE LIFT GATE IS VISIBLE AND THE STEPS ARE CLEAR AND DIRECTLY ACCESSIBLE.

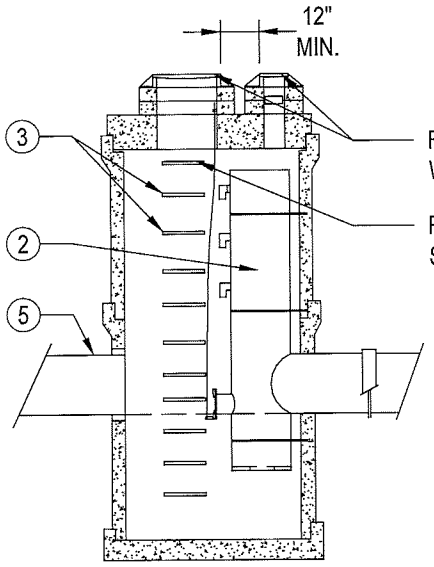
2. FLOW RESTRICTOR UNIT - SEE STD DWG 7-20.

3. POLYPROPLENE PLASTIC STEP OR LADDER, SEE STND DWG 7-08. OFFSET STEPS OR LADDER FROM FRAME SO THAT:
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE.
   C. FRAME IS CLEAR OF CURB.

4. 70" TYPE 2 CB OR LARGER.

5. SEE PLAN AND SPECIFICATIONS FOR SIZE AND TYPE OF PIPES ENTERING AND EXITING CB.

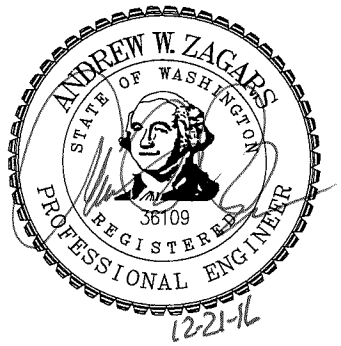




ROUND SOLID COVER MARKED "DRAIN" WITH LOCKING BOLTS SEE STD DWG 7-13.

FRAME & LADDER OR STEPS OFFSET. SEE NOTE 3. FRAME & COVER ELEV. PER PLAN.

ELEVATION



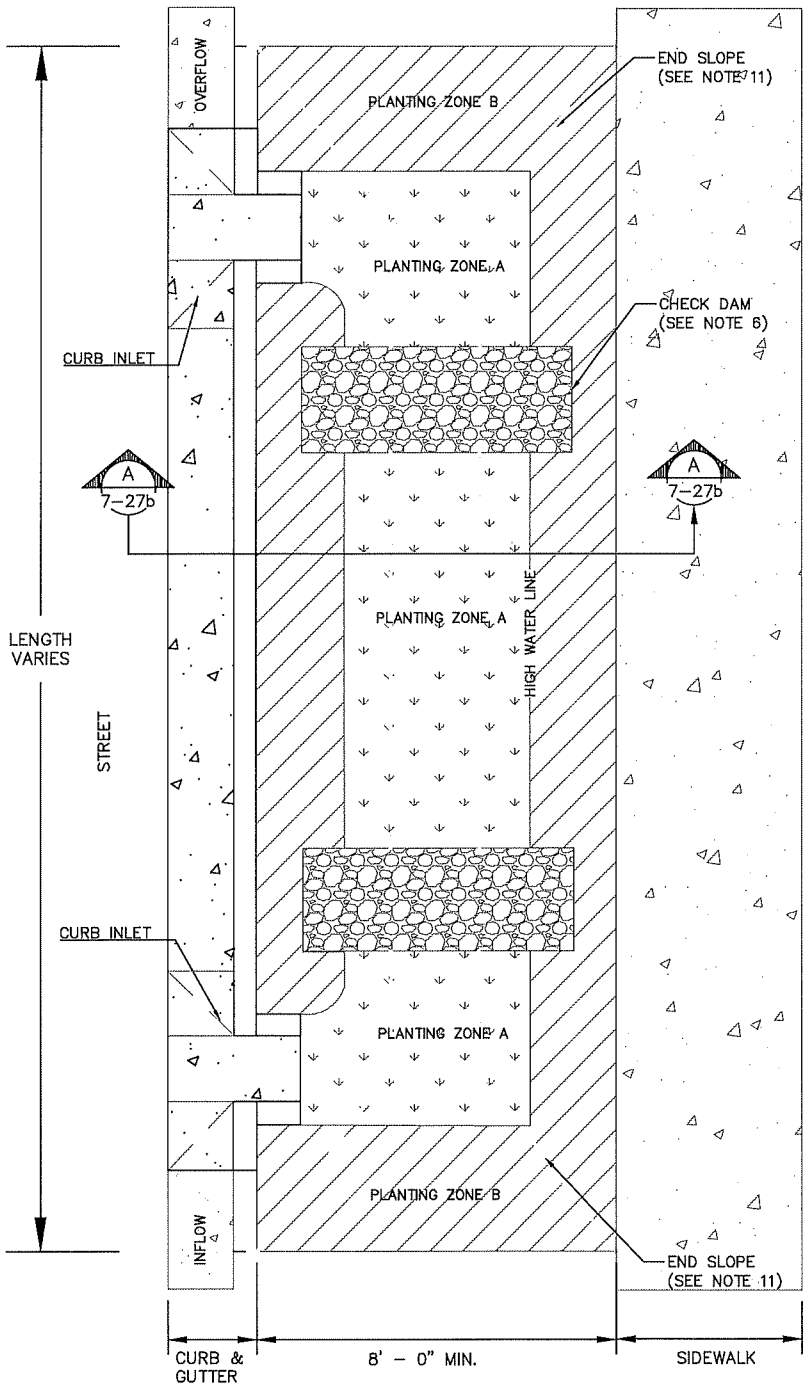
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

CONTROL STRUCTURE – 72" DIAMETER OR LARGER

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG07-26

REV. NO. X

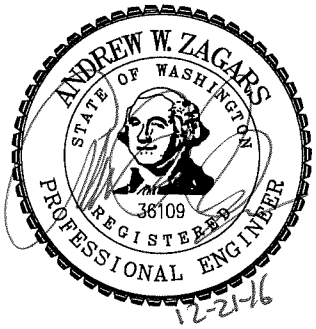


PLAN VIEW

NOTES:

1. AREA AND DEPTH OF FACILITY ARE BASED UPON ENGINEERING CALCULATIONS AND RIGHT OF WAY CONSTRAINTS.
2. LONGITUDINAL SLOPE OF SWALE MATCHES ROAD.
3. INCLUDE BEGINNING AND ENDING STATIONS FOR EACH FACILITY. PROVIDE STATIONS AND ELEVATIONS AT EVERY INLET, OUTLET, AND CHECK DAM.
4. SIDEWALK ELEVATION MUST BE SET ABOVE INLET AND OUTLET ELEVATIONS TO ALLOW OVERFLOW TO DRAIN TO STREET BEFORE SIDEWALK.
5. SEE SHEET 3-09a FOR CURB INLET DETAILS.
6. CHECK DAMS MAYBE REQUIRED.
7. SEE CITY SURFACE WATER DESIGN MANUAL FOR FACILITY MEDIA REQUIREMENTS.
8. SPECIAL REQUIREMENTS FOR WATER LINES, METERS, AND FIRE HYDRANTS, SEE WATER DISTRICT REQUIREMENTS.
9. UTILITY LINES MAY NEED TO BE SLEEVED OR RELOCATED.
10. CURB AND GUTTER STANDARD DRAWING.
11. END SLOPES OF SWALE SHALL BE A MINIMUM OF 1:3.
12. 24" DEEP ROOT BARRIER REQUIRED WITH TREE PLANTINGS.

IMPORTANT: Utility conflicts and existing conditions can create major design variables. Locate utilities and survey existing conditions prior to beginning design work.



-NOT TO SCALE-

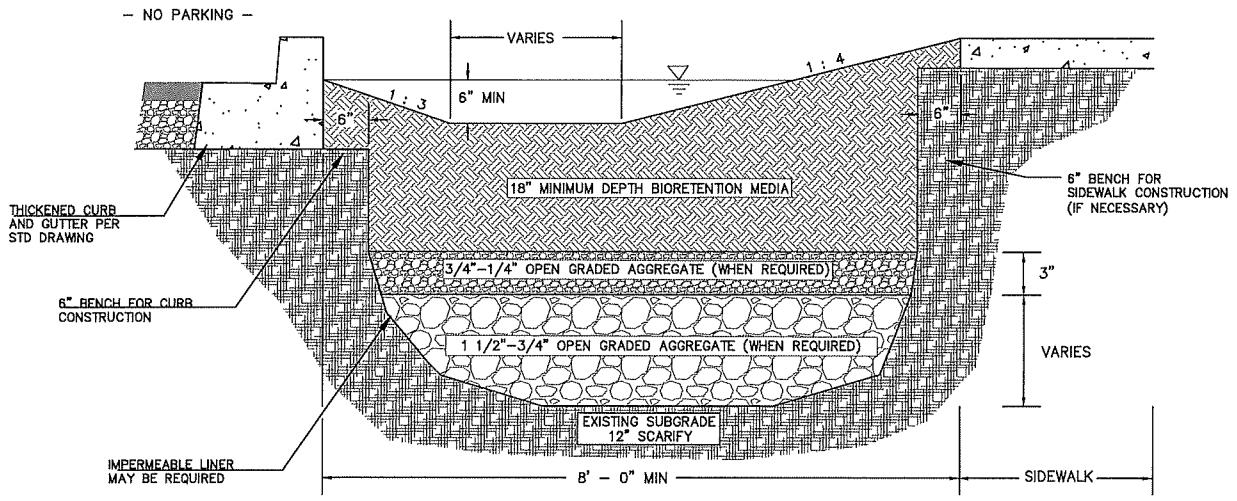
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SWALE
BIORETENTION

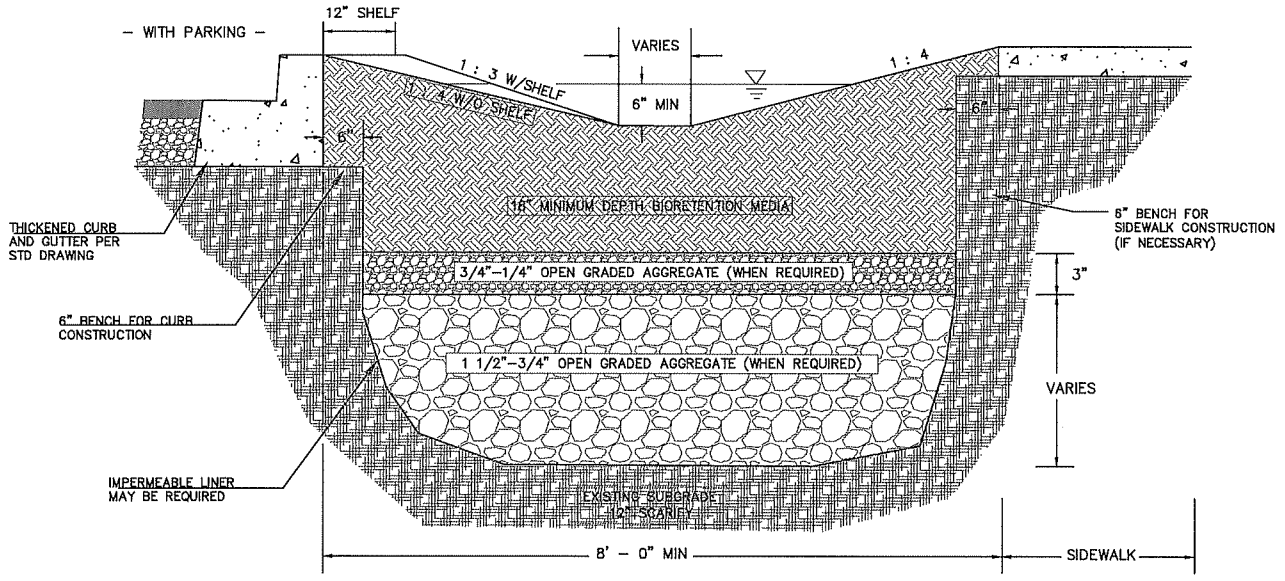
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	LG		SEPT-7-2016	7-27a

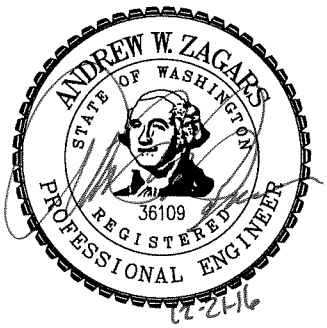
REV. NO. X



SECTION A–A
BIORETENTION WITHOUT PARKING



SECTION A–A
BIORETENTION WITH PARKING



–NOT TO SCALE–

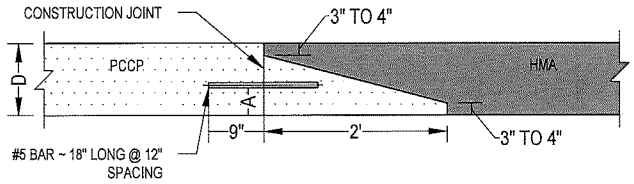
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SWALE SECTION
BIORETENTION

APPROVED BY
CITY ENGINEER _____ DATE _____

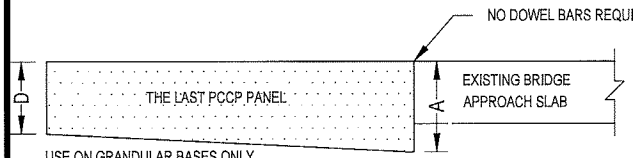
REV	DWN	CKD	DATE	FILE
	LG		SEPT–7–2016	7–27b

REV. NO. X



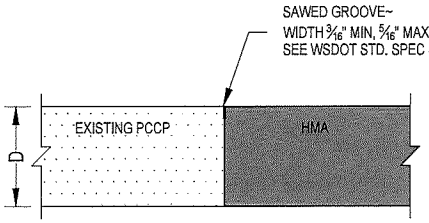
ELEVATION VIEW
HMA TRANSITION DETAIL

SLAB THICKNESS (D)	A
12"	5"
D	D/2 - 1"

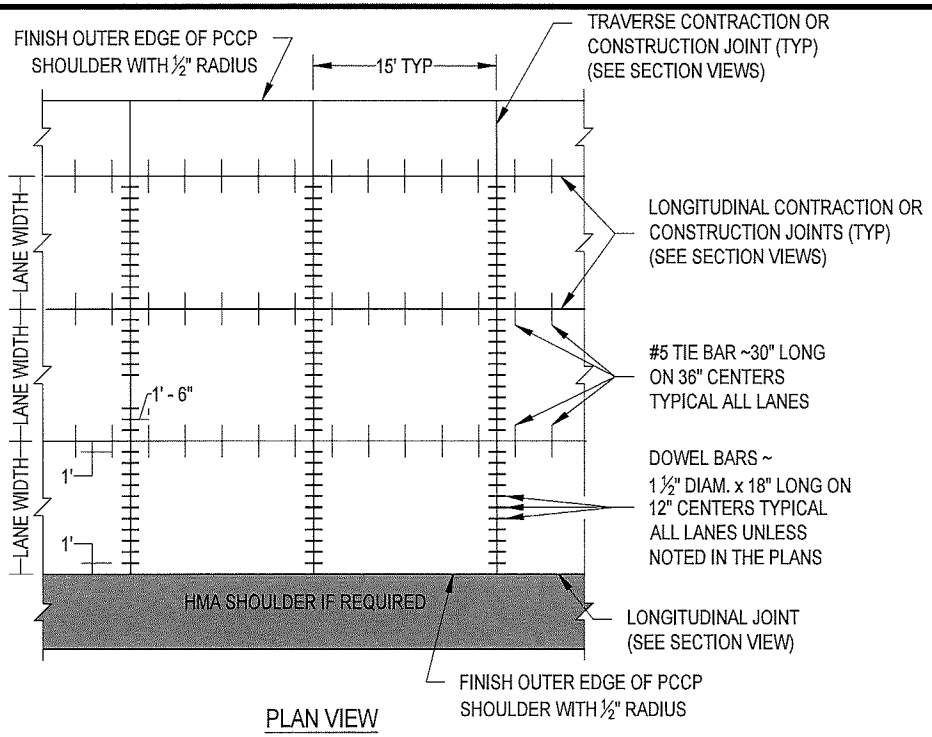


ELEVATION VIEW
EXISTING APPROACH SLAB
TRANSITION DETAIL

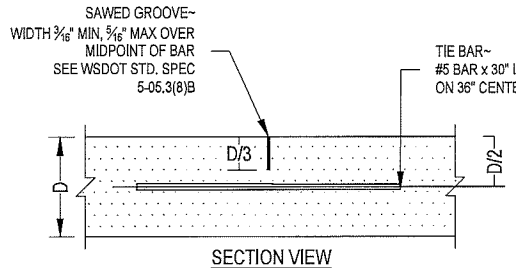
SLAB THICKNESS (D)	A
12"	15"
D	1.25" - D



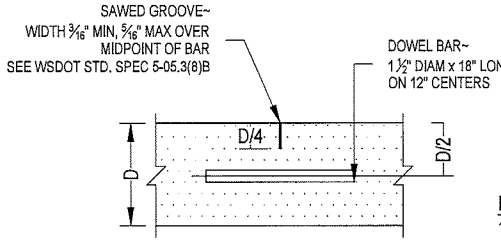
SECTION VIEW
PCCP TO HMA
LONGITUDINAL JOINT



PLAN VIEW

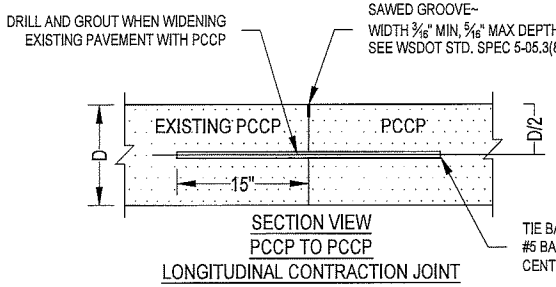


SECTION VIEW
LONGITUDINAL CONTRACTION JOINT

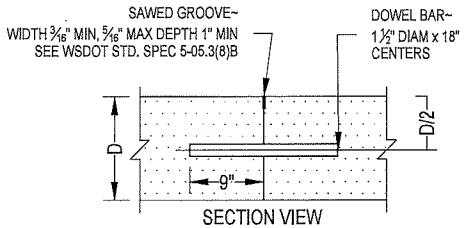


SECTION VIEW
TRAVERSE CONTRACTION JOINT

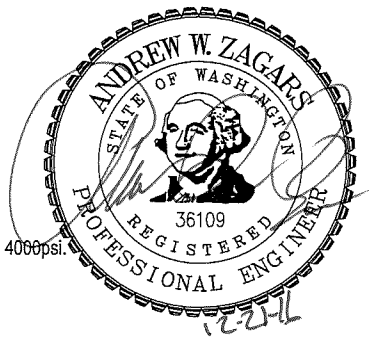
NOTES:
1. MATERIAL - WSDOT CONCRETE CLASS 4000psi.



SECTION VIEW
PCCP TO PCCP
LONGITUDINAL CONTRACTION JOINT



SECTION VIEW
TRAVERSE CONSTRUCTION JOINT



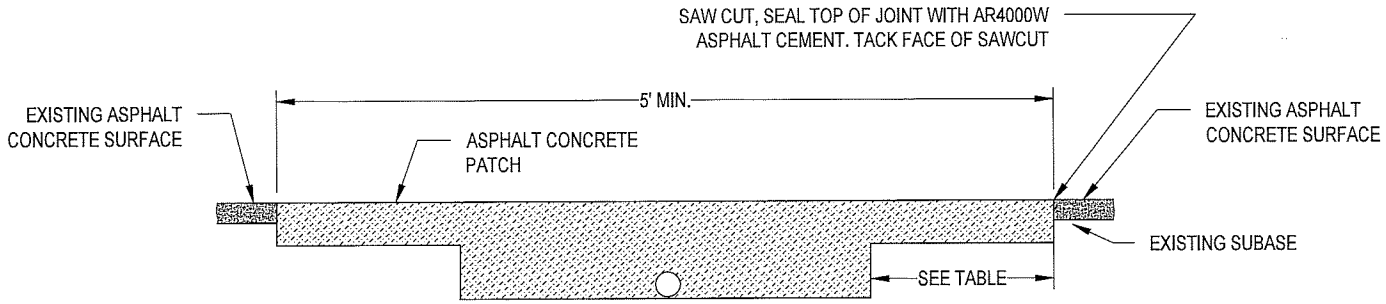
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

RIGID PAVEMENT RESTORATION DETAILS

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG08-01

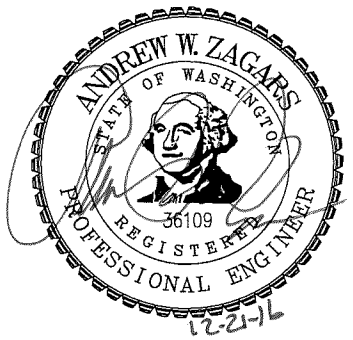
REV. NO. X



NOTES:

1. ASPHALT CONCRETE MIX SHALL BE HMA CL 1/2 INCH.
2. ASPHALT PATCHING AND TRENCH BACKFILL PER STD DWG 02-05A.
3. SAW CUTS LIMITS MAY BE REVISED BASED UPON EXISTING CONDITIONS. PATCH MAY NEED TO EXTEND TO CONFIDENT ASPHALT.
4. SAWCUTS NEED TO BE NEAT AND CLEAN PRIOR TO PAVING.

PAVEMENT CUT DIMENSIONS	
TRENCH DEPTH (FT)	MINIMUM CUT BEYOND TRENCH (FT) ALL FOUR SIDES
10	2.5
12	3.0
14	3.5
16	4.0
18	4.5
20	5.0
PAVEMENT LESS THAN 5 YEARS OLD	ADDITIONAL RESTORATION WORK MAY BE REQUIRED



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

FLEXIBLE PAVEMENT PATCHING

APPROVED BY
CITY ENGINEER _____ DATE _____

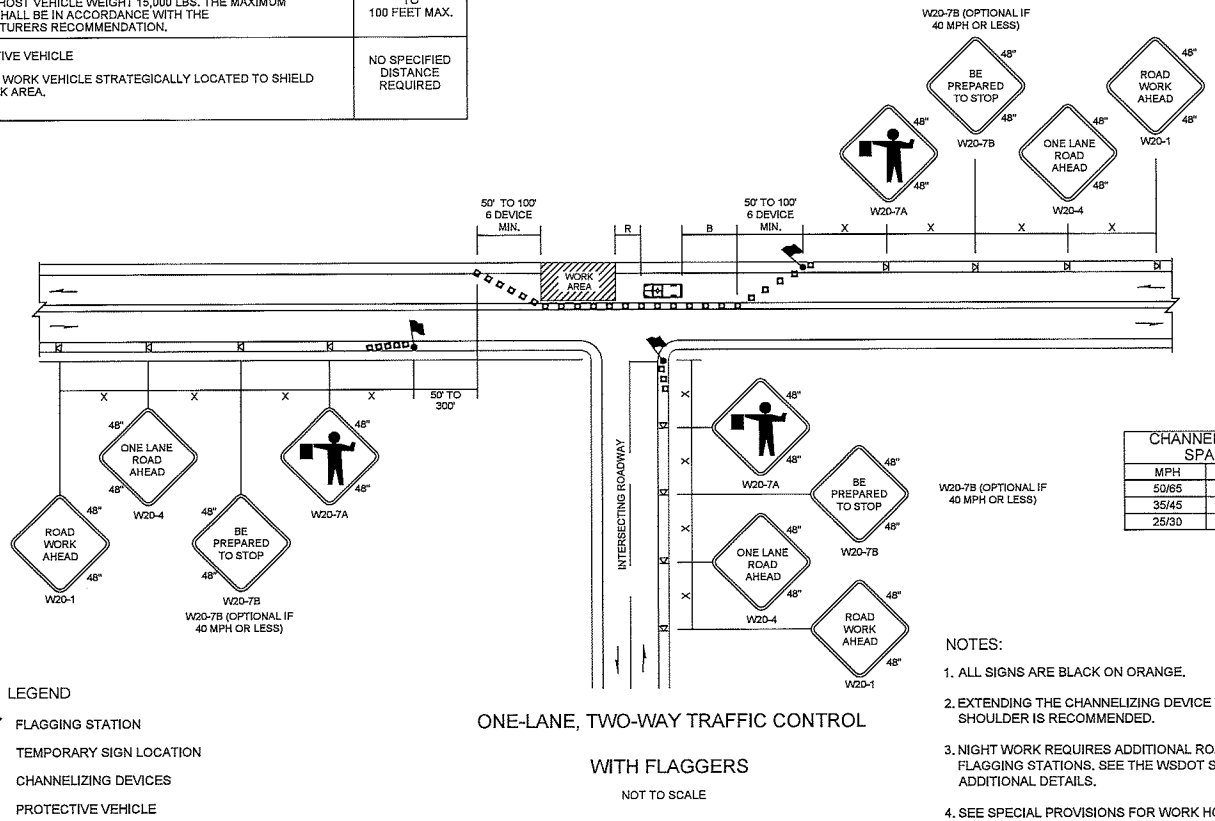
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG08-02

REV. NO. X

BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (FEET)	155	200	250	305	360	425	495	570	645	-
BUFFER VEHICLE ROLL AHEAD DISTANCE = R										
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.									30 FEET MIN. TO 100 FEET MAX.	
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.									NO SPECIFIED DISTANCE REQUIRED	

SIGN SPACING = X (1)		
RURAL HIGHWAYS	60 / 65 MPH	800' ±
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.



CHANNELIZATION DEVICE SPACING (FEET)		
MPH	TAPER	TANGENT
50/65	10 TO 20	80
35/45	10 TO 20	60
25/30	10 TO 20	40

LEGEND

- FLAGGING STATION
- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- PROTECTIVE VEHICLE

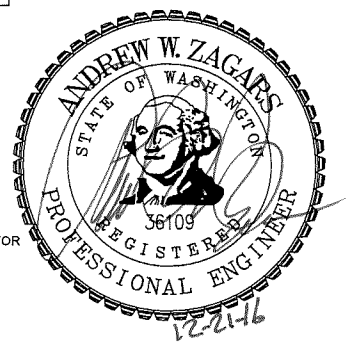
ONE-LANE, TWO-WAY TRAFFIC CONTROL

WITH FLAGGERS

NOT TO SCALE

NOTES:

1. ALL SIGNS ARE BLACK ON ORANGE.
2. EXTENDING THE CHANNELIZING DEVICE TAPER ACROSS SHOULDER IS RECOMMENDED.
3. NIGHT WORK REQUIRES ADDITIONAL ROADWAY LIGHTING AT FLAGGING STATIONS. SEE THE WSDOT STD SPECIFICATIONS FOR ADDITIONAL DETAILS.
4. SEE SPECIAL PROVISIONS FOR WORK HOUR RESTRICTIONS.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

ONE-LANE, TWO-WAY TRAFFIC CONTROL WITH FLAGGERS

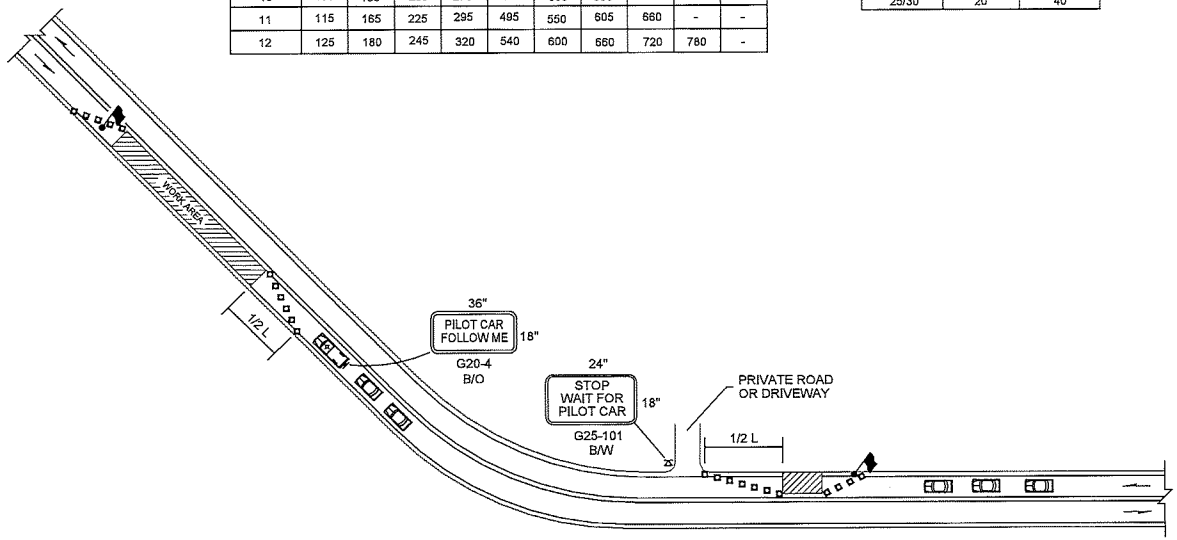
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-01

REV. NO. X

MINIMUM TAPER LENGTH = L (feet)										
LANE WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	295	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	780	-

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50/55	40	80
35/45	30	60
25/30	20	40

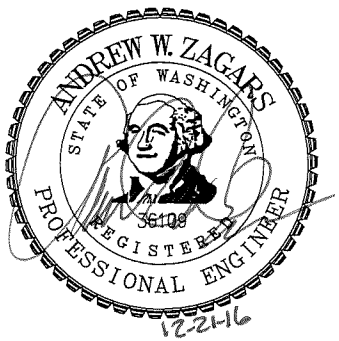


LEGEND

- FLAGGING STATION
- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- PILOT VEHICLE
- MOTORIST VEHICLE

NOTES:

1. SEE STD DWG 9-01 FOR ADDITIONAL SIGNING AND FLAGGING DETAILS NOT SHOWN.
2. CHANNELIZING DEVICES ARE RECOMMENDED ALONG CENTERLINE TO SEPARATE TRAFFIC FROM WORK OPERATION. DEVICES ARE REQUIRED AT TAPERS TO SHIFT TRAFFIC MOVEMENT BETWEEN LANES AND TO PROTECT FLAGGING STATIONS.
3. SIGN G25-101 IS RECOMMENDED FOR NON-STOP SIGN CONTROLLED APPROACHES SUCH AS PRIVATE ROADS AND DRIVEWAYS. THIS SIGN IS NOT REQUIRED TO BE ALUMINUM SUBSTRATE AND CAN BE MADE OF ALTERNATIVE MATERIALS.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PILOT CAR OPERATION

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-02

REV. NO. X

MINIMUM LANE CLOSURE TAPER LENGTH = L (feet)										
LANE WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	295	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	780	840

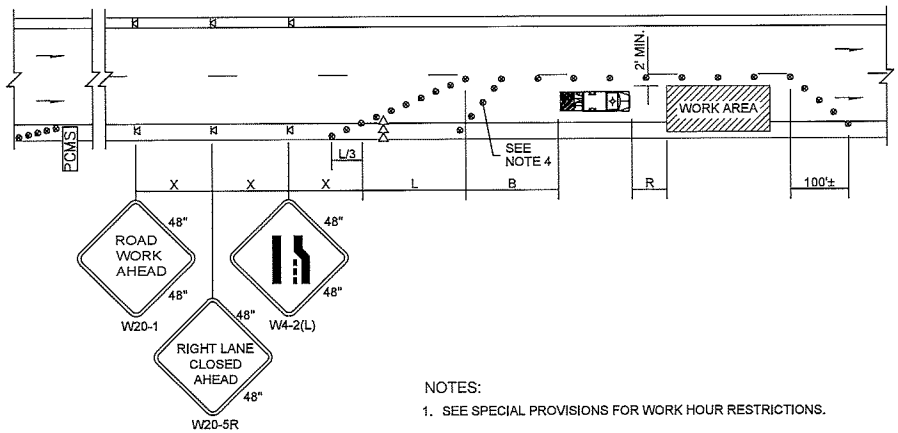
MINIMUM SHOULDER TAPER LENGTH = L/3 (feet)										
SHOULDER WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
8'	40	40	60	90	120	130	150	160	170	190
10'	40	60	90	90	150	170	190	200	220	240
USE A MINIMUM 3 DEVICES TAPER FOR SHOULDER LESS THEN 8'.										

SIGN SPACING = X (1)		
FREEWAYS & EXPRESSWAYS	55 / 70 MPH	1500' ±
RURAL HIGHWAYS	60 / 65 MPH	800' ±
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS & URBAN ARTERIALS RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305	360	425	495	570	645	730
BUFFER VEHICLE ROLL AHEAD DISTANCE = R										
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.									30 FEET MIN. TO 100 FEET MAX.	

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50/70	40	80
35/45	30	60
25/30	20	40



PCMS	
1	2
RIGHT LANE CLOSURE	1 MILE AHEAD
2.0 SEC	2.0 SEC

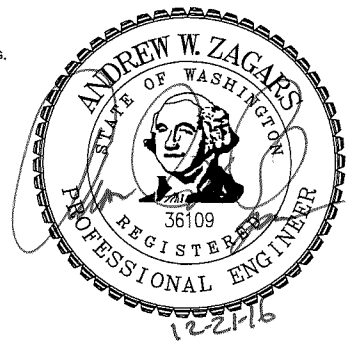
FIELD LOCATE 1 MILE ± IN ADVANCE OF LANE CLOSURE SIGNING.

LEGEND

- TEMPORARY SIGN LOCATION
- TRAFFIC SAFETY DRUM
- SEQUENTIAL ARROW SIGN
- TRANSPORTABLE ATTENUATOR
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN

NOTES:

1. SEE SPECIAL PROVISIONS FOR WORK HOUR RESTRICTIONS.
2. EXTEND DEVICE TAPER AT L/3 ACROSS SHOULDER.
3. DEVICES SHALL NOT ENCROACH INTO THE ADJACENT LANE.
4. USE TRANSVERSE DEVICES IN CLOSED LANE EVERY 1000' (FT) (RECOMMENDED).
5. DEVICE SPACING FOR THE DOWNSTREAM TAPER SHALL BE 20' (FT).
6. ALL SIGNS ARE BLACK ON ORANGE.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SINGLE–LANE CLOSURE FOR MULTI–LANE ROADWAYS

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG–XX–2015	FIG09–03

REV. NO. X

MINIMUM LANE CLOSURE TAPER LENGTH = L (feet)										
LANE WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	295	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	780	840

MINIMUM SHOULDER TAPER LENGTH = L/3 (feet)										
SHOULDER WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
8'	40	40	60	90	120	130	150	160	170	190
10'	40	60	90	90	150	170	190	200	220	240
USE A MINIMUM 3 DEVICES TAPER FOR SHOULDER LESS THEN 8'.										

SIGN SPACING = X (1)		
FREEWAYS & EXPRESSWAYS	55 / 70 MPH	1500' ±
RURAL HIGHWAYS	60 / 65 MPH	800' ±
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS & URBAN ARTERIALS RESIDENTAL & BUSINESS DISTREICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)

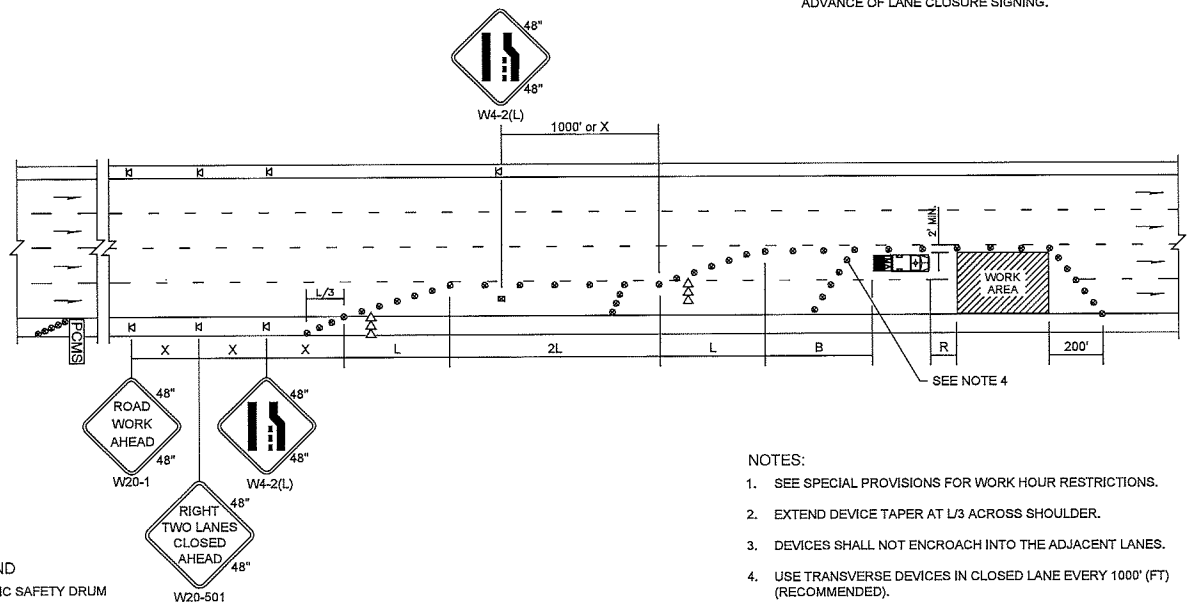
(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50/70	40	80
35/45	30	60
25/30	20	40

BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305	360	425	495	570	645	730
BUFFER VEHICLE ROLL AHEAD DISTANCE = R										
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.										30 FEET MIN. TO 100 FEET MAX.

PCMS	
1	2
2 LANES CLOSED AHEAD	WATCH FOR SLOW TRAFFIC
2.0 SEC	2.0 SEC

FIELD LOCATE 1 MILE IN ADVANCE OF LANE CLOSURE SIGNING.

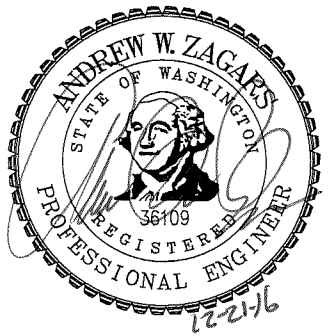


LEGEND

- TRAFFIC SAFETY DRUM
- TEMPORARY SIGN LOCATION
- SEQUENTIAL ARROW SIGN
- TRANSPORTABLE ATTENUATOR
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN
- TEMPORARY SIGN LOCATION (5' (FT) MOUNTING HEIGHT)

NOTES:

1. SEE SPECIAL PROVISIONS FOR WORK HOUR RESTRICTIONS.
2. EXTEND DEVICE TAPER AT L/3 ACROSS SHOULDER.
3. DEVICES SHALL NOT ENCROACH INTO THE ADJACENT LANES.
4. USE TRANSVERSE DEVICES IN CLOSED LANE EVERY 1000' (FT) (RECOMMENDED).
5. DEVICE SPACING FOR THE DOWNSTREAM TAPER SHALL BE 20' (FT).
6. ALL SIGNS ARE BLACK ON ORANGE.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

DOUBLE-LANE CLOSURE FOR MULTI-LANE ROADWAYS

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-04

REV. NO. X

SIGN SPACING = X (1)		
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

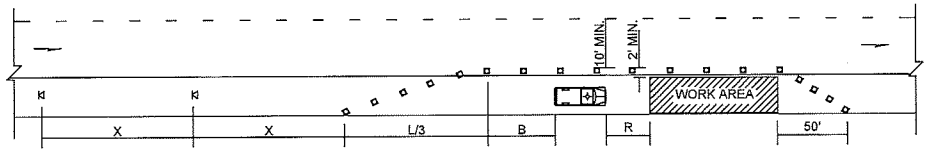
MINIMUM SHOULDER TAPER LENGTH = L/3 (feet)										
SHOULDER WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
8'	40	40	60	80	-	-	-	-	-	-
10'	40	60	90	90	-	-	-	-	-	-

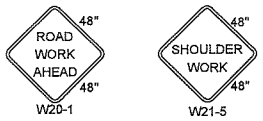
USE A 3 DEVICES TAPER FOR SHOULDERS LESS THEN 8'

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
35/40	30	60
25/30	20	40

BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305						

BUFFER VEHICLE ROLL AHEAD DISTANCE = R	
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.	30 FEET MIN. TO 100 FEET MAX.
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.	NO SPECIFIED DISTANCE REQUIRED



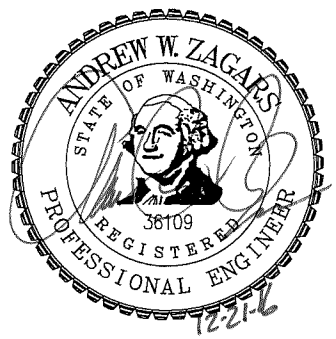


LEGEND

- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- PROTECTIVE VEHICLE

NOTES:

1. DEVICE SPACING FOR THE DOWNSTREAM TAPER SHALL BE 20' (FT).
2. ALL SIGNS ARE BLACK ON ORANGE.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SHOULDER CLOSURE – LOW SPEED (40 MPH OR LESS)

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-05

REV. NO. X

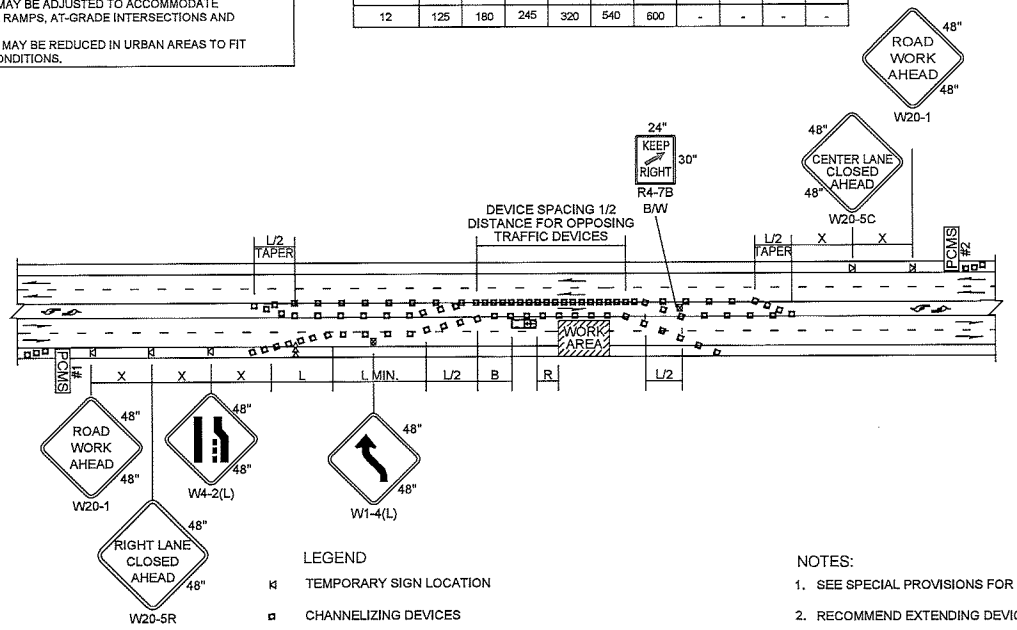
SIGN SPACING = X (1)		
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS & URBAN ARTERIALS RESIDENTAL & BUSINESS DISTREICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

MINIMUM TAPER LENGTH = L (feet)										
LANE WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	-	-	-	-
11	115	165	225	295	495	550	-	-	-	-
12	125	180	245	320	540	600	-	-	-	-

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50	40	80
35/45	30	60
25/30	20	40

BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305	360	425	-	-	-	-
BUFFER VEHICLE ROLL AHEAD DISTANCE = R										
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.										30 FEET MIN. TO 100 FEET MAX.
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.										NO SPECIFIED DISTANCE REQUIRED



PCMS #1	
1	2
RIGHT LANE CLOSURE	1 MILE AHEAD
2.0 SEC	2.0 SEC

FIELD LOCATE IN ADVANCE OF TEMPORARY SIGNS.

PCMS #2	
1	2
CENTER LANE CLOSED	NNO LEFT TURNING
2.0 SEC	2.0 SEC

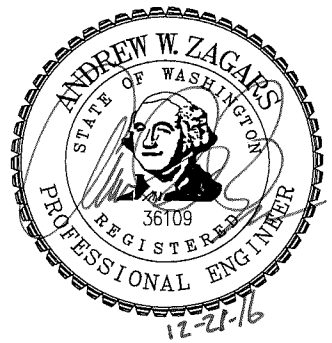
FIELD LOCATE IN ADVANCE OF TEMPORARY SIGNS.

LEGEND

- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- SEQUENTIAL ARROW SIGN
- PROTECTIVE VEHICLE
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN
- TEMPORARY SIGN LOCATION (5' MOUNTING HEIGHT)

NOTES:

1. SEE SPECIAL PROVISIONS FOR WORK HOUR RESTRICTIONS.
2. RECOMMEND EXTENDING DEVICE TAPER (L/3) ACROSS SHOULDER.
3. FOR POSTED SPEED LIMITS OF 30 MPH OR LESS, USE SIGN W1-3 IN LIEU OF SIGN W1-4.
4. ALL SIGNS ARE BLACK ON ORANGE UNSLESS OTHERWISE DESIGNATED.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

RIGHT LANE CLOSURE WITH SHIFT – 5 LANE ROADWAY

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG–XX–2015	FIG09–06

REV. NO. X

BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305	360	425	-	-	-	-

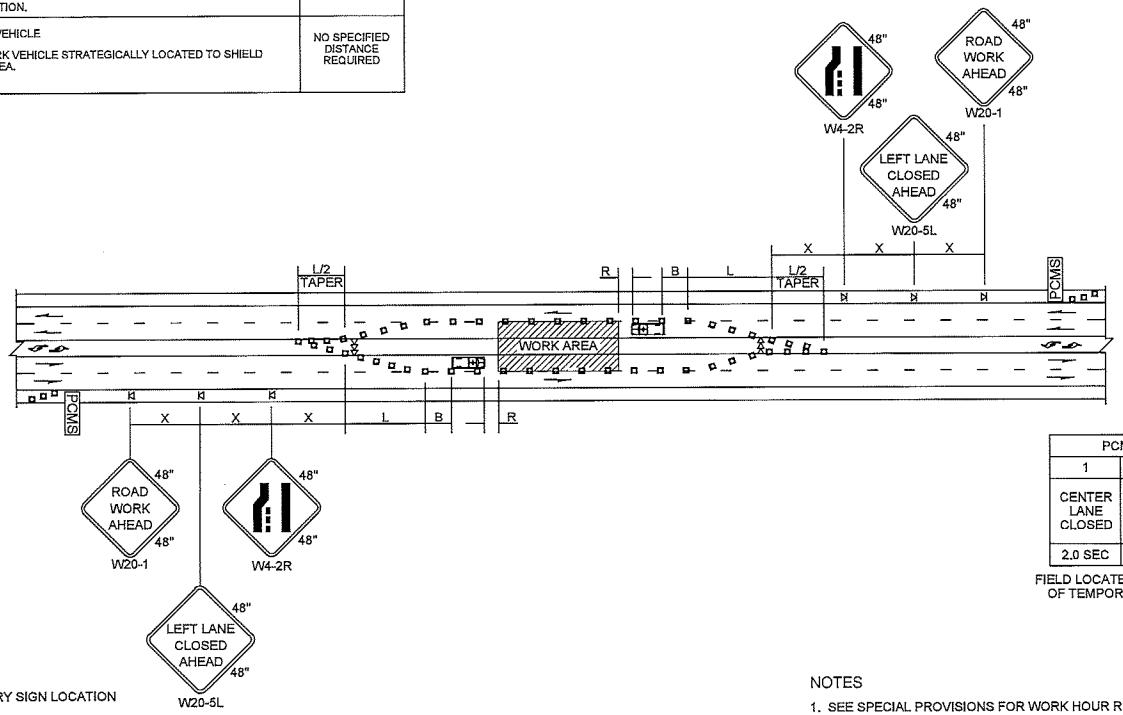
BUFFER VEHICLE ROLL AHEAD DISTANCE = R	
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.	30 FEET MIN. TO 100 FEET MAX.
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.	NO SPECIFIED DISTANCE REQUIRED

SIGN SPACING = X (1)		
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS & URBAN ARTERIALS RESIDENTAL & BUSINESS DISTREICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

MINIMUM TAPER LENGTH = L (feet)										
LANE WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	-	-	-	-
11	115	165	225	295	495	550	-	-	-	-
12	125	180	245	320	540	600	-	-	-	-

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50	40	80
35/45	30	60
25/30	20	40



PCMS	
1	2
CENTER LANE CLOSED	NNO LEFT TURNING
2.0 SEC	2.0 SEC

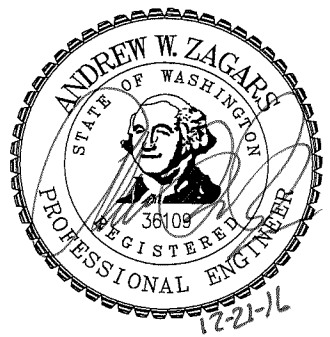
FIELD LOCATE IN ADVANCE OF TEMPORARY SIGNS.

LEGEND

- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- SEQUENTIAL ARROW SIGN
- PROTECTIVE VEHICLE
- PCMS PORTABLE CHANGEABLE MESSAGE SIGN

NOTES

1. SEE SPECIAL PROVISIONS FOR WORK HOUR RESTRICTIONS.
2. ALL SIGNS ARE BLACK ON ORANGE.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

LEFT LANE AND CENTER TURN LANE CLOSURE – 5 LANE ROADWAY

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-07

REV. NO. X

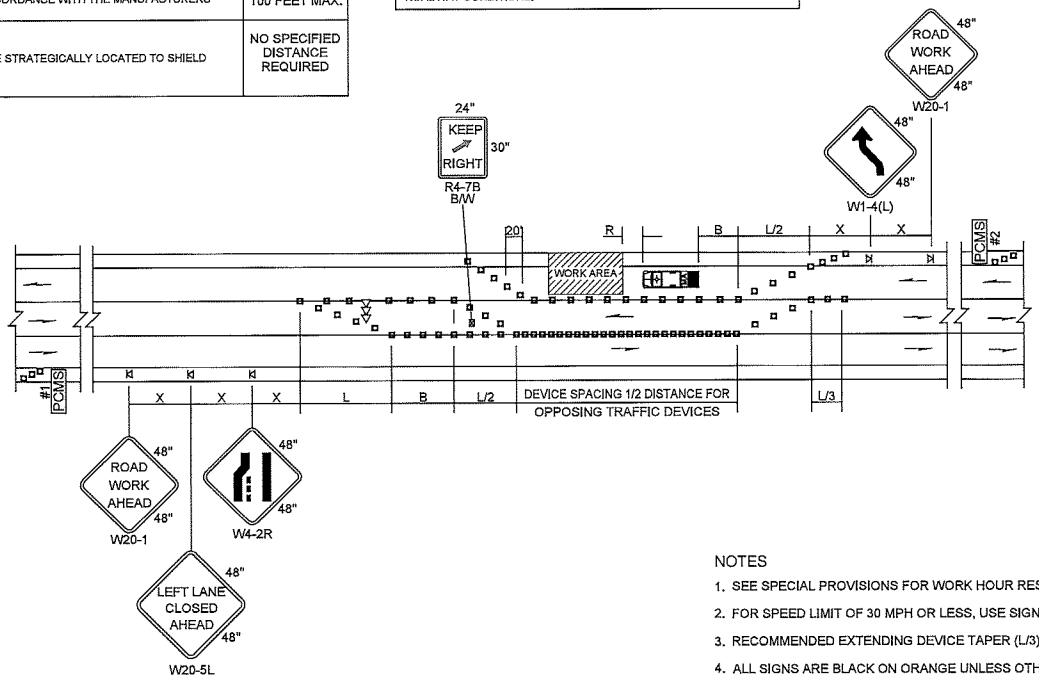
BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305	360	425	495	570	645	-
BUFFER VEHICLE ROLL AHEAD DISTANCE = R										
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.								30 FEET MIN. TO 100 FEET MAX.		
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.								NO SPECIFIED DISTANCE REQUIRED		

SIGN SPACING = X (1)		
RURAL HIGHWAYS	60 / 65 MPH	800' ±
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS & URBAN ARTERIALS RESIDENTAL & BUSINESS DISTREICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

MINIMUM TAPER LENGTH = L (feet)										
LANE WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	295	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	780	-

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50/60	40	80
35/45	30	60
25/30	20	40



PCMS #1	
1	2
LEFT LANE CLOSURE	1 MILE AHEAD
2.0 SEC	2.0 SEC

FIELD LOCATE IN ADVANCE OF TEMPORARY SIGNS.

PCMS #2	
1	2
LANE SHIFTS LEFT	1 MILE AHEAD
2.0 SEC	2.0 SEC

FIELD LOCATE IN ADVANCE OF TEMPORARY SIGNS.

LEGEND

- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- SEQUENTIAL ARROW SIGN
- TRANSPORTABLE ATTENUATOR
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN
- TEMPORARY SIGN LOCATION (5' MOUNTING HEIGHT)

NOTES

1. SEE SPECIAL PROVISIONS FOR WORK HOUR RESTRICTIONS.
2. FOR SPEED LIMIT OF 30 MPH OR LESS, USE SIGN W1-3 IN LIEU OF SIGN W1-4.
3. RECOMMENDED EXTENDING DEVICE TAPER (L/3) ACROSS SHOULDER.
4. ALL SIGNS ARE BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED.

CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

LANE SHIFT – THREE LANE ROADWAY

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-08

REV. NO. X

SIGN SPACING = X (1)		
FREEWAYS & EXPRESSWAYS	55 / 70 MPH	1500' ±
RURAL HIGHWAYS	60 / 65 MPH	800' ±
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS & URBAN ARTERIALS RESIDENTAL & BUSINESS DISTREICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)

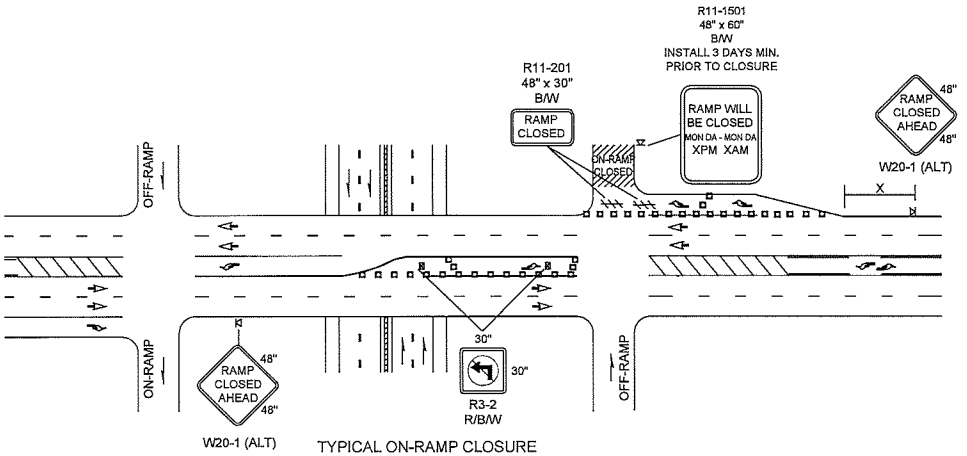
(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

MINIMUM SHOULDER TAPER LENGTH = L/3 (feet)										
SHOULDER WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
8'	40	40	60	90	120	130	150	160	170	190
10'	40	60	90	90	150	170	190	200	220	240
USE A MINIMUM 3 DEVICES TAPER FOR SHOULDER LESS THEN 8'.										

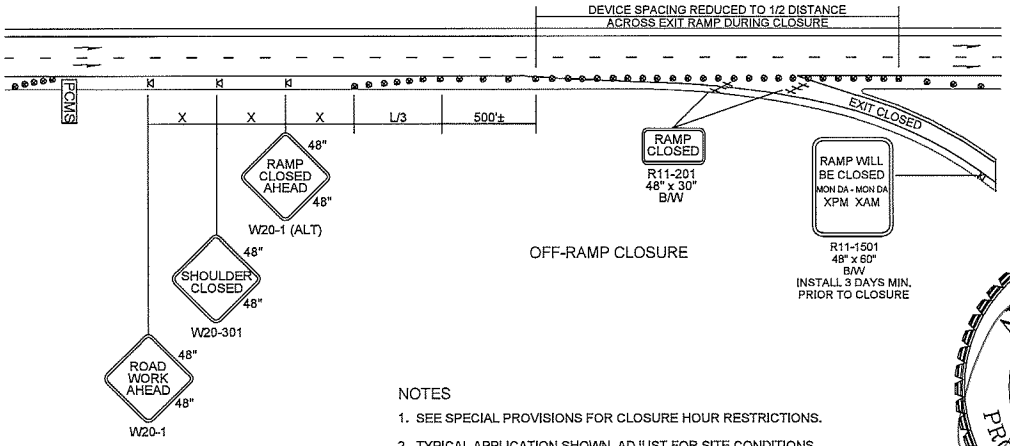
CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50/70	40	80
35/45	30	60
25/30	20	40

PCMS	
1	2
EXIT XXX CLOSED	USE EXIT XXX
2.0 SEC	2.0 SEC

FIELD LOCATE



TYPICAL ON-RAMP CLOSURE



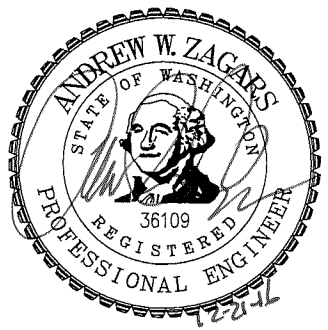
OFF-RAMP CLOSURE

LEGEND

- TYPE 3 BARRICADE
- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- TRAFFIC SAFETY DRUM
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN
- TEMPORARY SIGN LOCATION (5' MOUNTING HEIGHT)

NOTES

1. SEE SPECIAL PROVISIONS FOR CLOSURE HOUR RESTRICTIONS.
2. TYPICAL APPLICATION SHOWN. ADJUST FOR SITE CONDITIONS.
3. ALL SIGNS ARE BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SHORT TERM RAMP CLOSURES

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-09

REV. NO. X

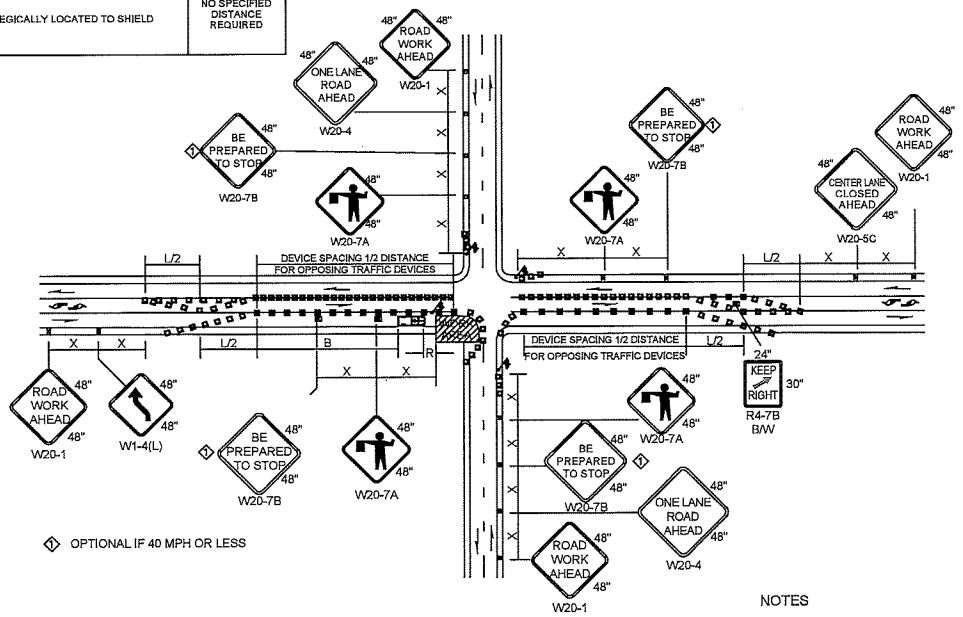
BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305	360	425	495	570	645	-
BUFFER VEHICLE ROLL AHEAD DISTANCE = R										
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.										30 FEET MIN. TO 100 FEET MAX.
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.										NO SPECIFIED DISTANCE REQUIRED

MINIMUM TAPER LENGTH = L (feet)										
LANE WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	295	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	-	-

SIGN SPACING = X (1)		
RURAL HIGHWAYS	60 / 65 MPH	800' ±
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS & URBAN ARTERIALS RESIDENTAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50/70	40	80
35/45	30	50
25/30	20	40

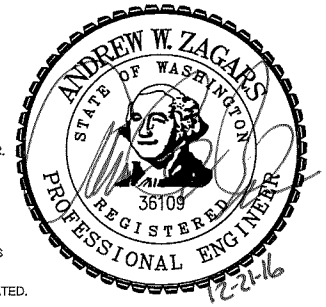


LEGEND

- FLAGGING STATION
- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- PROTECTIVE VEHICLE - RECOMMENDED
- TEMPORARY SIGN LOCATION (5' MOUNTING HEIGHT)

NOTES

1. RECOMMEND EXTENDING DEVICE TAPER (L/3) ACROSS SHOULDER.
2. IF A SIGNAL IS PRESENT, IT SHALL BE SET TO "RED FLASH MODE" OR TURNED OFF DURING FLAGGING OPERATIONS.
3. FOR SPEED LIMIT OF 30 MPH OR LESS USE SIGN W1-3 IN LIEU OF SIGN W1-4.
4. MAINTAIN A MINIMUM OF ONE ACCESS POINT FOR EACH BUSINESS WITHIN WORK AREA LIMITS.
5. ALL SIGNS ARE BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

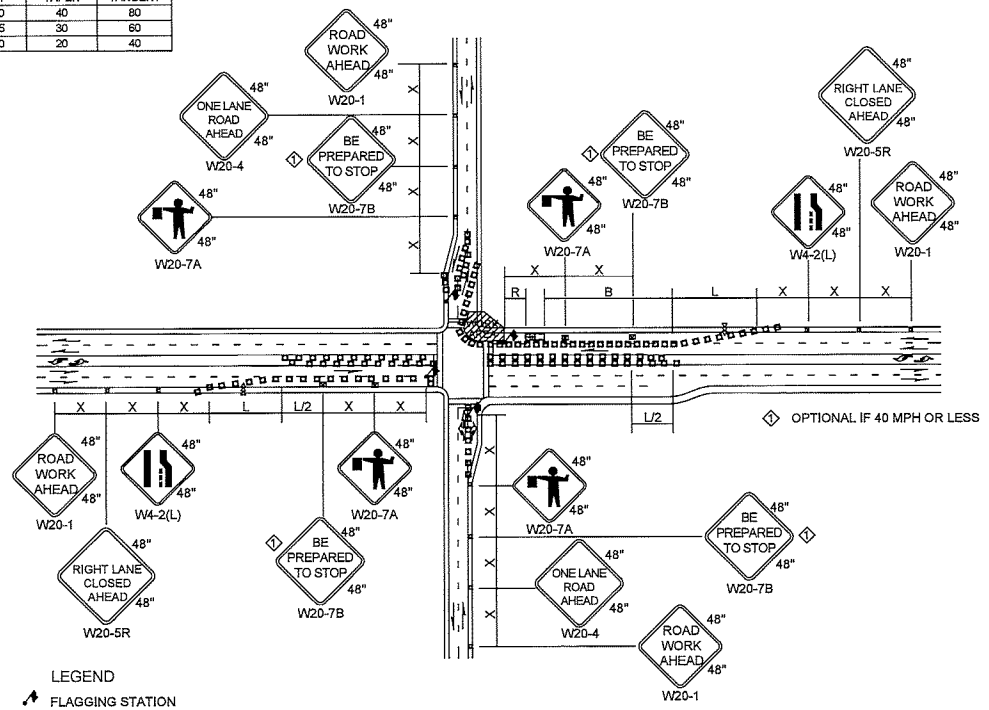
INTERSECTION LANE CLOSURE – THREE LANE ROADWAY

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-10

REV. NO. X

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50/70	40	80
35/45	30	60
25/30	20	40



BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305	360	425	495	570	645	-
BUFFER VEHICLE ROLL AHEAD DISTANCE = R										
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.									30 FEET MIN. TO 100 FEET MAX.	
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.									NO SPECIFIED DISTANCE REQUIRED	

MINIMUM TAPER LENGTH = L (feet)										
LANE WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	295	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	-	-

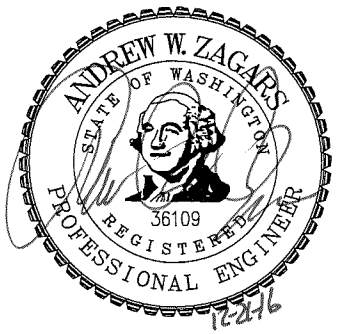
SIGN SPACING = X (1)		
RURAL HIGHWAYS	60 / 65 MPH	800' ±
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS & URBAN ARTERIALS RESIDENTAL & BUSINESS DISTREICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)
(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS. (2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.		

LEGEND

- FLAGGING STATION
- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- SEQUENTIAL ARROW SIGN
- PROTECTIVE VEHICLE - RECOMMENDED
- TEMPORARY SIGN LOCATION (5' MOUNTING HEIGHT)

NOTES

1. RECOMMEND EXTENDING DEVICE TAPER (L/3) ACROSS SHOULDER.
2. IF A SIGNAL IS PRESENT, IT SHALL BE SET TO "RED FLASH MODE" OR TURNED OFF DURING FLAGGING OPERATIONS.
3. MAINTAIN A MINIMUM OF ONE ACCESS POINT FOR EACH BUSINESS WITHIN WORK AREA LIMITS.
4. ALL SIGNS ARE BLACK ON ORANGE.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

INTERSECTION LANE CLOSURE – FIVE LANE ROADWAY

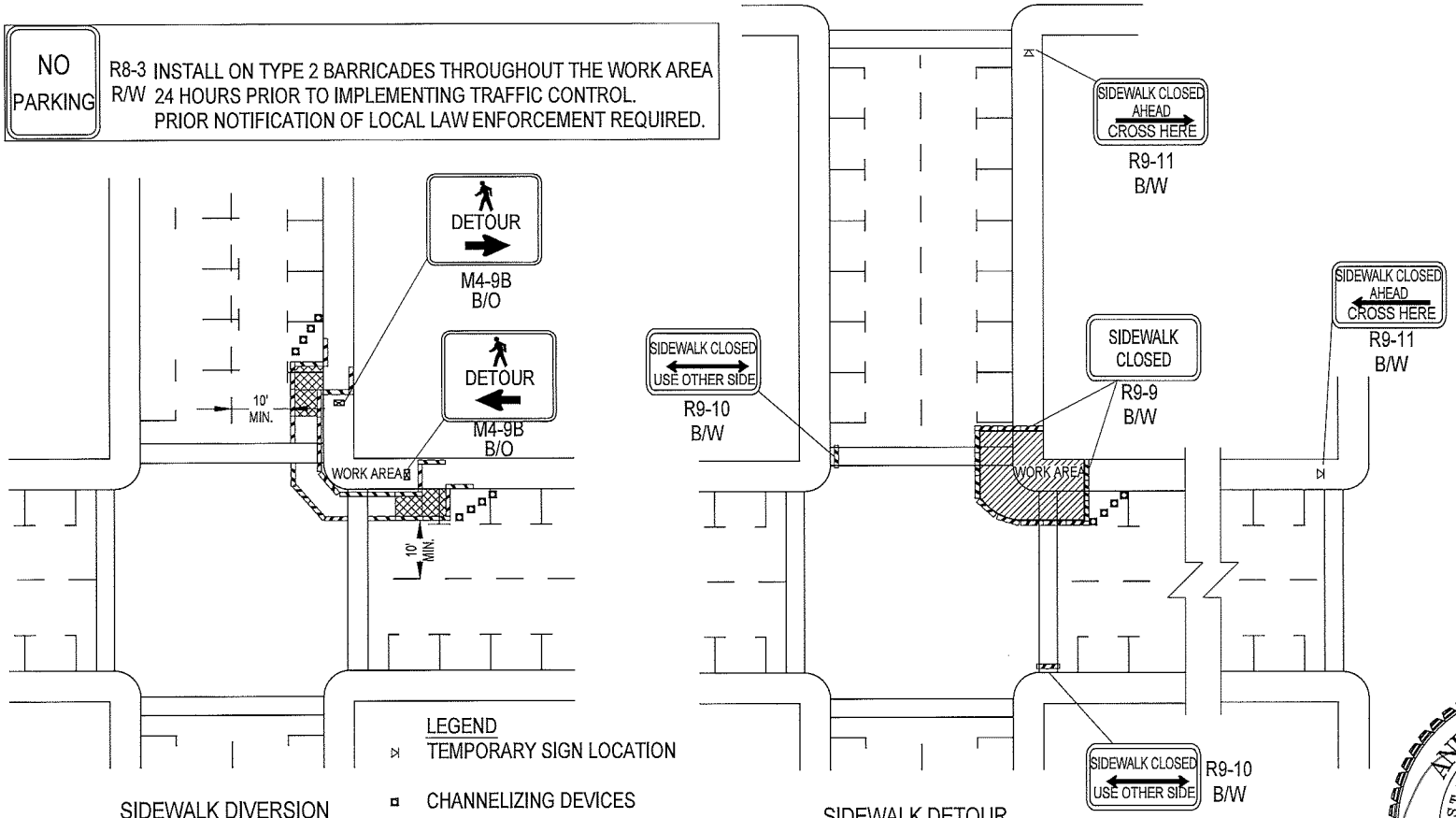
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-11

REV. NO. X

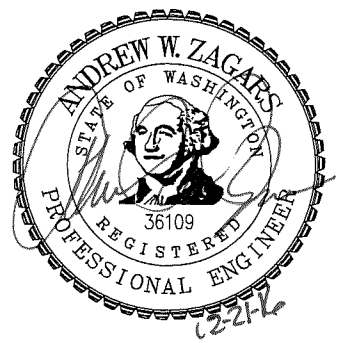
NO PARKING

R8-3 R/W INSTALL ON TYPE 2 BARRICADES THROUGHOUT THE WORK AREA 24 HOURS PRIOR TO IMPLEMENTING TRAFFIC CONTROL. PRIOR NOTIFICATION OF LOCAL LAW ENFORCEMENT REQUIRED.



NOTES:

1. CONTROLS SHOWN ARE FOR PEDESTRIAN TRAFFIC ONLY.
2. A 60" PEDESTRIAN PATH WIDTH SHOULD BE MAINTAINED (48" IS THE MINIMUM).
3. CONTACT AND COORDINATE IMPACTED TRANSIT AGENCIES PRIOR TO IMPLEMENTING ANY CLOSURES.
4. SEE STD DWG 9-13 FOR TEMPORARY PEDESTRIAN RAMP DETAILS.
5. ADA PEDESTRIAN FACILITIES MUST BE MAINTAINED, SEE WSDOT STD SPECIFICATION 1-10.2(1)B.
6. TEMPORARY PEDESTRIAN PUSH BUTTONS SHALL BE PLACED ON THE DIVERTED PATH WHEN EXISTING BUTTONS ARE NOT ACCESSIBLE TO PEDESTRIANS.



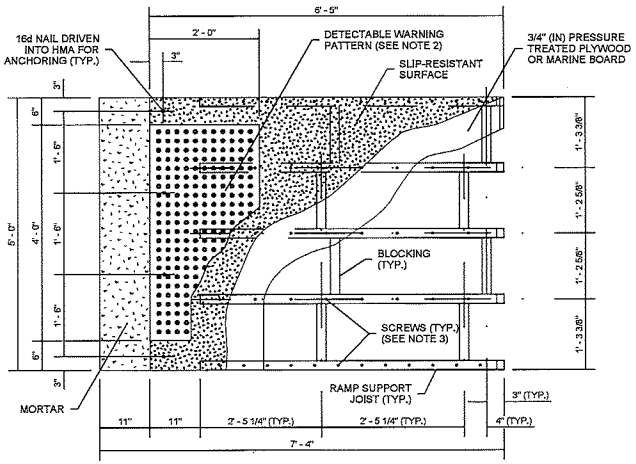
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

INTERSECTION PEDESTRIAN TRAFFIC CONTROL

APPROVED BY
CITY ENGINEER _____ DATE _____

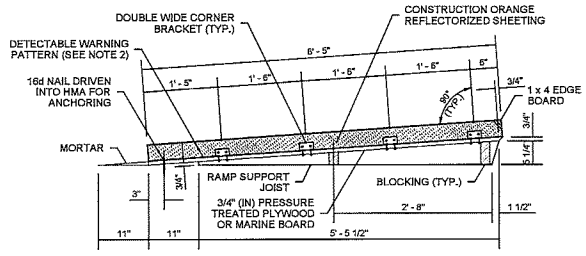
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-12

REV. NO. X



TOP VIEW

RAMP DETAIL

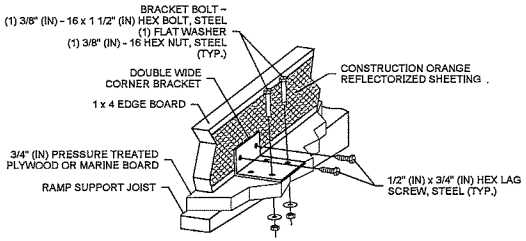


SIDE VIEW

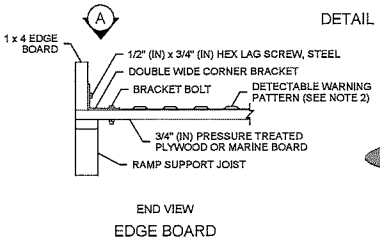
RAMP AND EDGE BOARD

NOTES

1. THIS DESIGN ASSUMES OPTIMAL CONDITIONS AND A STANDARD CURB HEIGHT OF 6" (IN). INSTALLED RAMPS SHALL BE NO STEEPER THAN 12H : 1V, AND SHALL HAVE A CROSS-SLOPE OF 2% OR LESS. USE SHIMS OR GROUT AS REQUIRED TO ADJUST FOR EXISTING CONDITIONS AND TO PREVENT ROCKING. SHIMS SHALL BE NO HIGHER THAN 1" (IN), AND SHALL BE SECURED TO THE RAMP. FOR CURBS SHORTER THAN 6" (IN), INSTALL A RAMP ON THE SIDEWALK, NO STEEPER THAN 12H : 1V, MADE OF GROUT OR AS APPROVED BY THE ENGINEER. ADJUSTMENTS TO THE RAMP DIMENSIONS SHOWN MAY BE REQUIRED TO MATCH EXISTING CONDITIONS.
2. THE DETECTABLE WARNING PATTERN SHALL BE INSTALLED ONLY WHEN THE INTENT IS TO GUIDE PEDESTRIANS DIRECTLY ACROSS THE ROADWAY (CROSSWALK). SEE WSDOT STD PLAN F-40.10 FOR DETAILS.
3. SCREWS SHALL BE USED TO SECURE THE RAMP SURFACE. SPACING SHALL BE IN ACCORDANCE WITH THE CURRENT BUILDING CODE.
4. USE A SLIP-RESISTANT TREATMENT FOR THE SURFACE OF RAMP.
5. ALL FASTENERS SHALL BE GALVANIZED.
6. DO NOT INSTALL A HAND RAILING IF USING THE EDGE BOARD OPTION.
7. RAMP AND RAMP LANDING SHALL NOT EXTEND INTO AN OPEN BIKE LANE OR TRAVEL LANE.



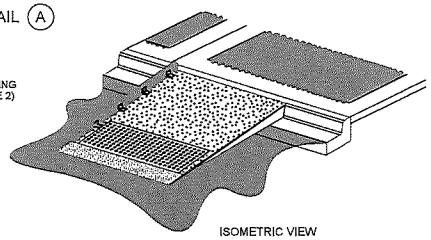
PERSPECTIVE VIEW



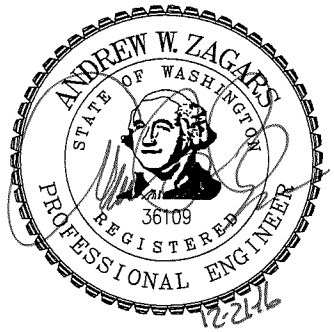
DETAIL (A)

END VIEW

EDGE BOARD ATTACHMENT DETAIL



ISOMETRIC VIEW



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

TEMPORARY PEDESTRIAN RAMP

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-13

REV. NO. X

BUFFER DATA										
LONGITUDINAL BUFFER SPACE = B										
SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH (feet)	155	200	250	305	360	425	495	570	645	730
BUFFER VEHICLE ROLL AHEAD DISTANCE = R										
TRANSPORTABLE ATTENUATOR MINIMUM HOST VEHICLE WEIGHT 15,000 LBS. THE MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION.										30 FEET MIN. TO 100 FEET MAX.

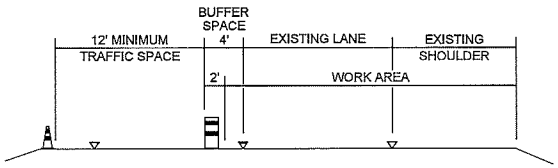
MINIMUM LANE CLOSURE TAPER LENGTH = L (feet)										
LANE WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	295	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	780	840

MINIMUM SHOULDER TAPER LENGTH = L/3 (feet)										
SHOULDER WIDTH (feet)	Posted Speed (mph)									
	25	30	35	40	45	50	55	60	65	70
8'	40	40	60	90	120	130	150	160	170	190
10'	40	60	90	90	150	170	190	200	220	240
USE A MINIMUM 3 DEVICES TAPER FOR SHOULDER LESS THEN 8'.										

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
50/70	40	80
35/45	30	60
25/30	20	40

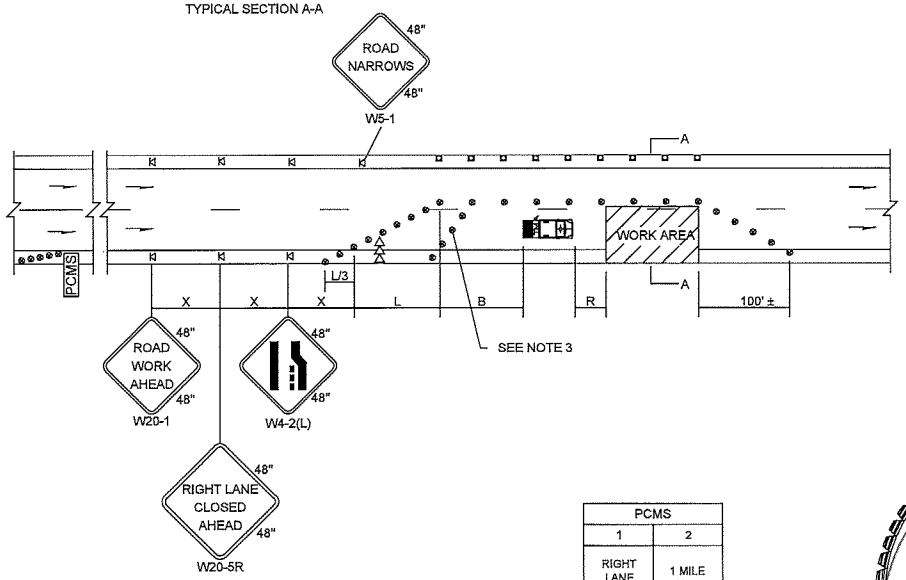
LEGEND

- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- TRAFFIC SAFETY DRUM
- SEQUENTIAL ARROW SIGN
- TRANSPORTABLE ATTENUATOR
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN



TYPICAL SECTION A-A

SIGN SPACING = X (1)		
FREEWAYS & EXPRESSWAYS	55 / 70 MPH	1500' ±
RURAL HIGHWAYS	60 / 65 MPH	800' ±
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS & URBAN ARTERIALS RESIDENTAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)
(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS. (2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.		



PCMS	
1	2
RIGHT LANE CLOSURE	1 MILE AHEAD
2.0 SEC	2.0 SEC

FIELD LOCATE 1 MILE ± IN ADVANCE OF LANE CLOSURE SIGNING.

NOTES

1. SEE SPECIAL PROVISIONS FOR WORK HOUR RESTRICTIONS.
2. RECOMMEND EXTENDING DEVICE TAPER (L/3) ACROSS SHOULDER.
3. USE TRANSVERSE DEVICES IN CLOSED LANE EVERY 1000' (RECOMMENDED).
4. ALL SIGNS ARE BLACK ON ORANGE.
5. RECOMMEND ADVANCE NOTICE FOR ANY OVER WIDTH LOADS PRIOR TO LANE CLOSURE FOR ALTERNATE ROUTES IF APPLICABLE.

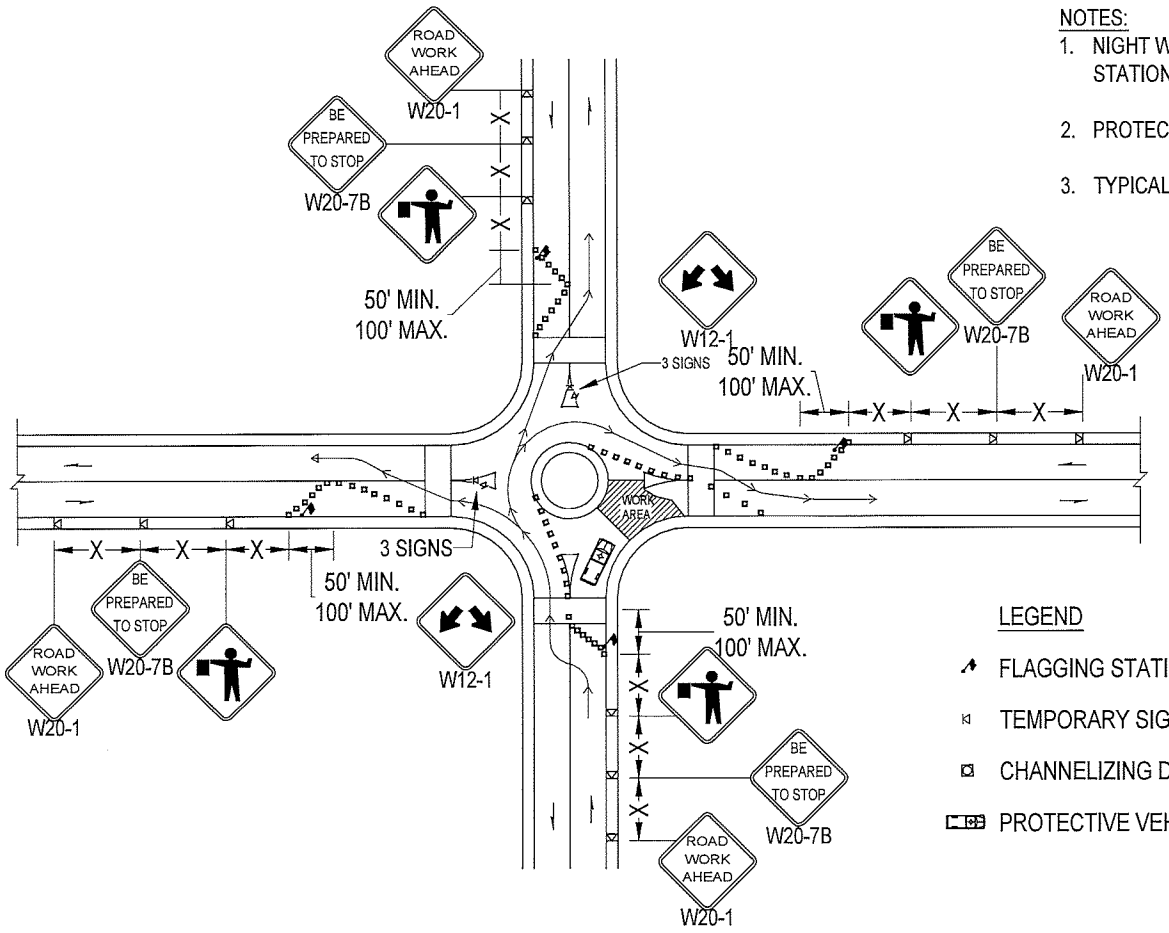
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SINGLE-LANE CLOSURE WITH SHIFT

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-14

REV. NO. X



NOTES:

1. NIGHT WORK REQUIRES ADDITIONAL ROADWAY LIGHTING AT FLAGGING STATIONS, SEE THE WSDOT STD SPECIFICATIONS FOR ADDITIONAL DETAILS.
2. PROTECTIVE VEHICLE RECOMMENDED - MAY BE A WORK VEHICLE.
3. TYPICAL APPLICATION SHOWN, ADJUST FOR SITE CONDITIONS.

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
35/ 45	30	60
25/ 30	20	40

LEGEND

- FLAGGING STATION
- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- PROTECTIVE VEHICLE - RECOMMENDED

SIGN SPACING = X (1)		
RURAL ROADS & URBAN ARTERIALS	35/ 40 MPH	350'±
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/ 30 MPH	200'± (2)
URBAN STREETS	25 MPH OR LESS	100'± (2)
(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERSECTIONS AND DRIVEWAYS. (2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.		

ANDREW W. ZAGARS
STATE OF WASHINGTON
36109
REGISTERED
PROFESSIONAL ENGINEER
12-21-15

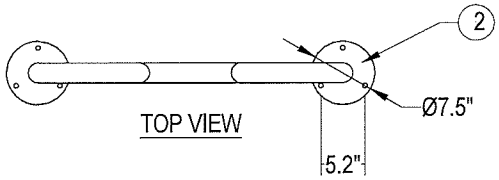
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

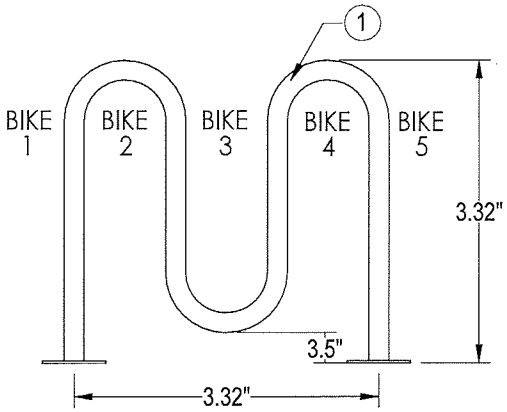
TYPICAL ROUNDABOUT FLAGGING OPERATION

APPROVED BY
CITY ENGINEER _____ DATE _____

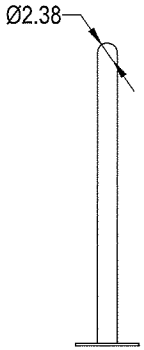
REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-15

REV. NO. X

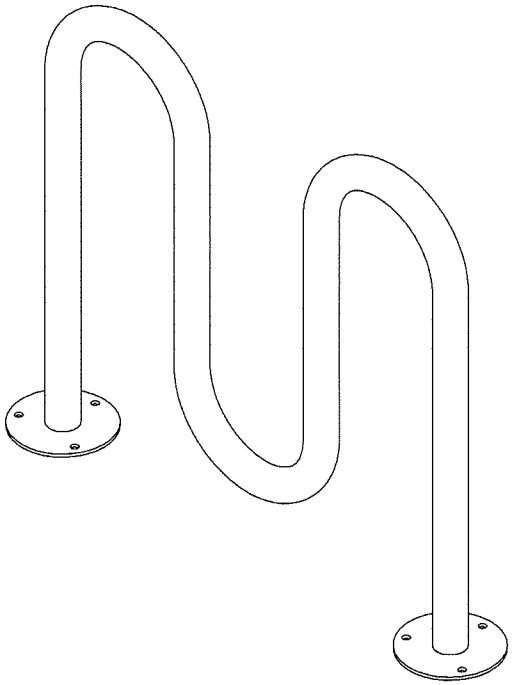




FRONT VIEW

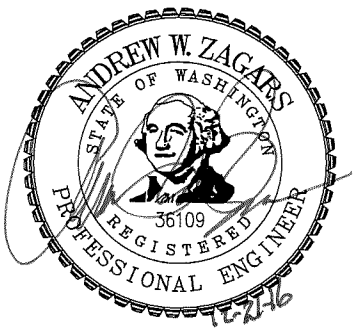


RIGHT SIDE VIEW



MATERIALS LIST:

1. TUBING - Ø 2 3/8" x 0.154" WALL STEEL TUBING
2. SURFACE PLAT - Ø 7 1/2" x 1/4" THICK STEEL PLATE WITH THREE Ø 9/16" MOUNTING HOLES
3. MOUNTED WITH SIX Ø 1/2" x 4-5" STAINLESS STEEL ANCHOR BOLTS



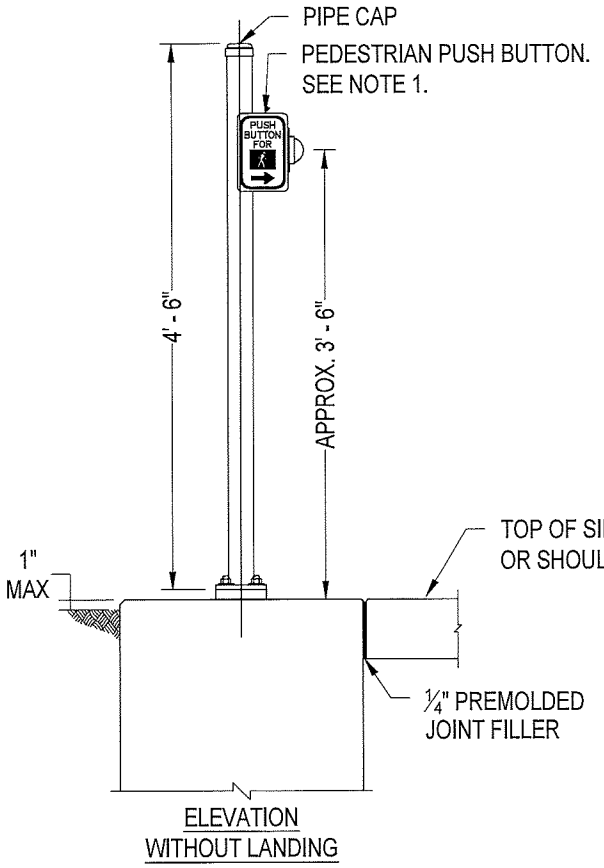
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

BIKE RACK

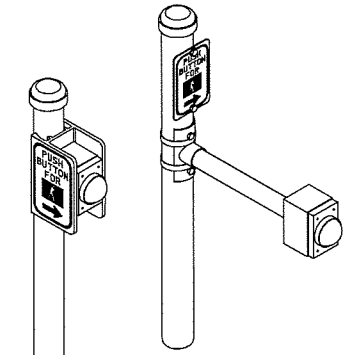
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-16

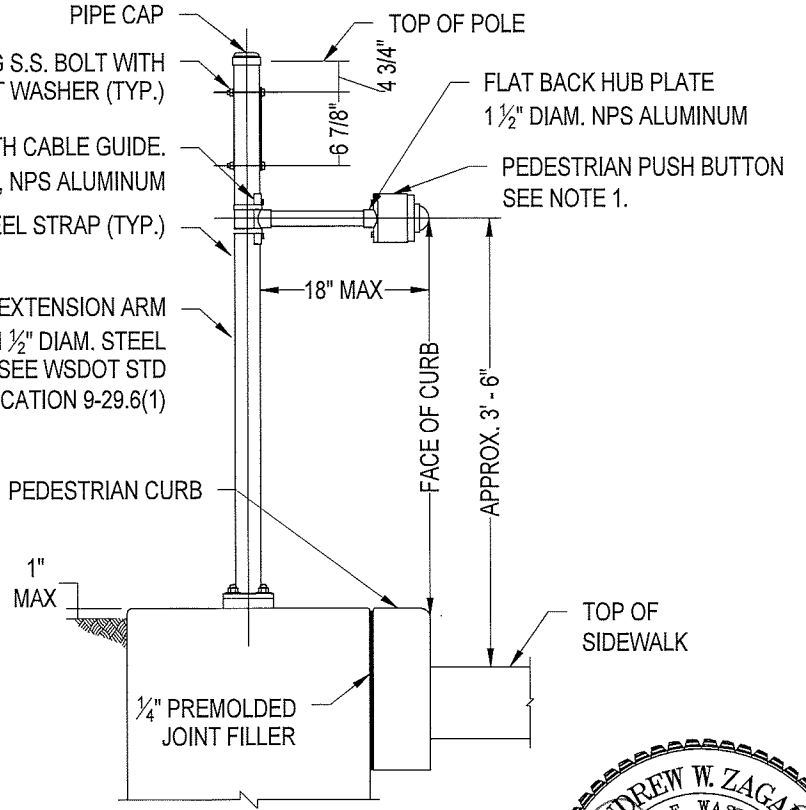
REV. NO. X



ELEVATION
WITHOUT LANDING



ISOMETRIC VIEW
PEDESTRIAN PUSH BUTTON POST



ELEVATION
WITH LANDING

NOTES:
1. SEE WSDOT STD PLAN J-20.26
FOR PEDESTRIAN PUSH BUTTON DETAILS.

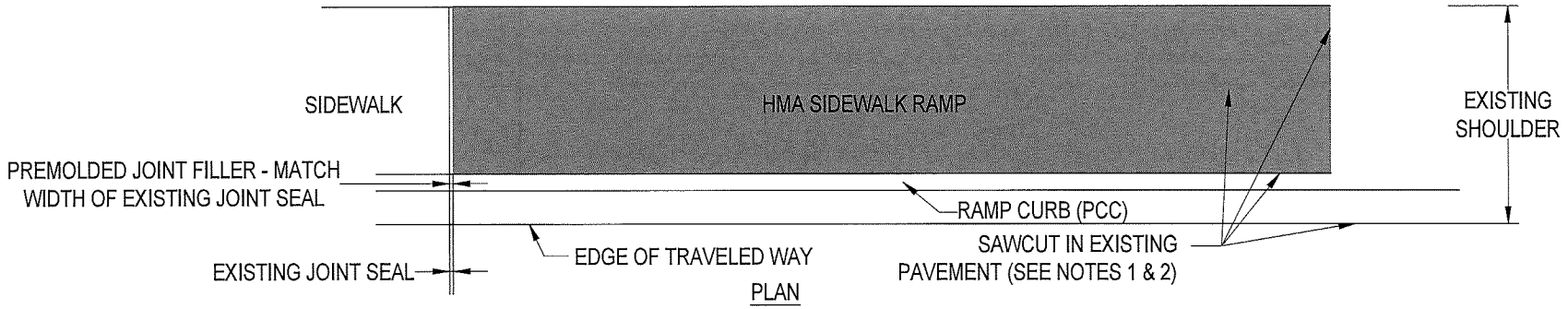
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

PEDESTRIAN PUSH BUTTON POST

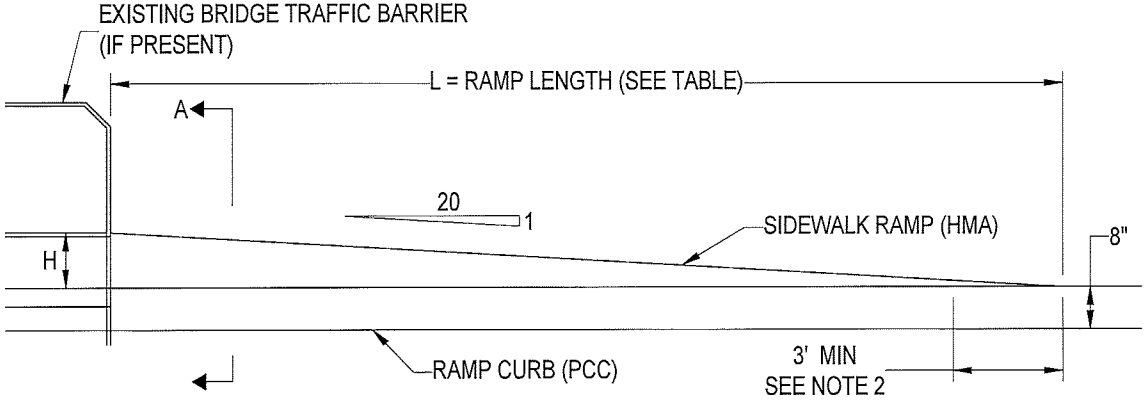
APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-17

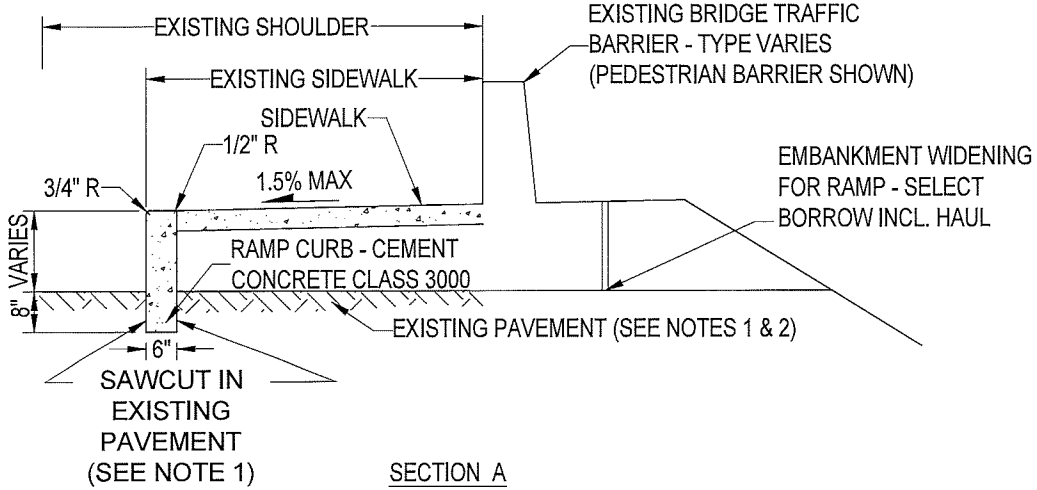
REV. NO. X



PLAN



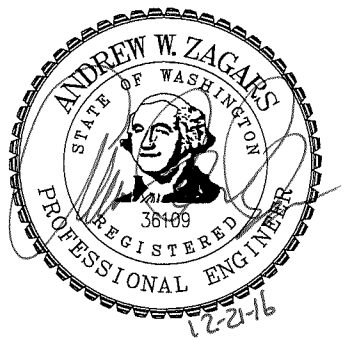
ELEVATION



SECTION A

NOTES:

1. THIS PLAN SHOWS A RETROFIT CONDITION. FOR DESIGN REFERENCE, "EXISTING" MAY BE INTERPRETED AS "TO BE CONSTRUCTED". FOR NEW CONSTRUCTION, OMIT THE EXISTING PAVEMENT AND SAWCUTS FROM THE DESIGN.
2. REMOVE A MINIMUM OF 3 FEET OF EXISTING PAVED SHOULDER AT THE BOTTOM OF THE RAMP, FOR EMBEDMENT OF NEW HMA.



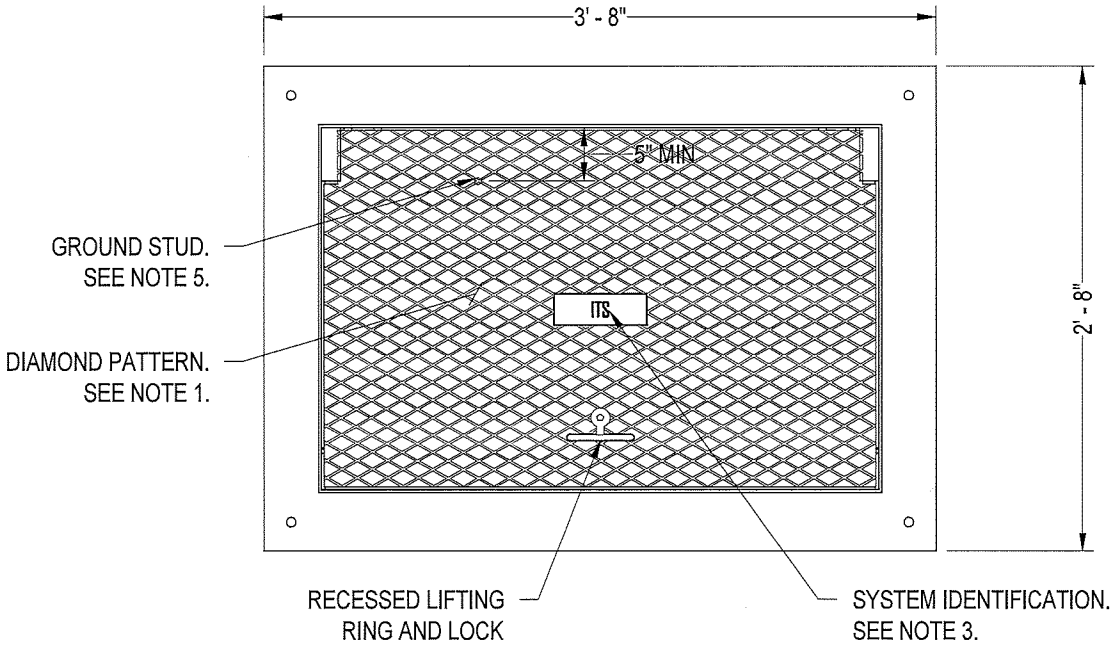
CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SIDEWALK RAMP RETROFIT

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-18

REV. NO. X



NOTES:

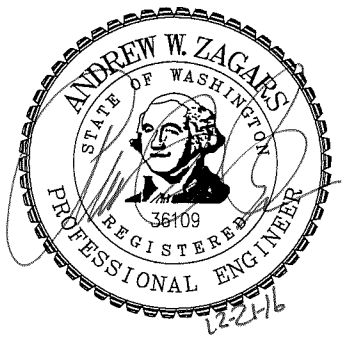
1. THE DIAMOND PATTERN SHALL BE A MINIMUM OF $\frac{3}{32}$" THICK AND SHALL NOT BE USED IN PEDESTRIAN AND BICYCLE ZONES.

2. STANDARD DUTY PULL BOXES INSTALL IN SIDEWALKS, WALKWAYS, AND SHARED-USE PATHS SHALL HAVE A SLIP-RESISTANT COATING ON LID AND SHALL BE INSTALLED WITH THE SURFACE FLUSH WITH AND MATCHED TO THE GRADE OF THE SIDEWALK, WALKWAY, AND SHARED-USE PATHS. THE NON-SLIP SHALL BE IDENTIFIED WITH PERMANENT MARKING ON THE UNDERSIDE INDICATING THE TYPE OF SURFACE TREATMENT (SEE CONTRACT DOCUMENTS FOR DETAILS) AND THE YEAR OF MANUFACTURE. THE PERMANENT MARKING SHALL BE $\frac{1}{8}$" INCH LINE THICKNESS FORMED WITH A STAINLESS STEEL WELD BEAD AND SHALL BE PLACED PRIOR TO HOT-DIP GALVANIZING.

3. THE SYSTEM IDENTIFICATION LETTERS SHALL BE $\frac{1}{8}$" LINE THICKNESS FORMED BY ENGRAVING, CASTING, STAMPING, OR WITH A S.S WELD BEAD. DUCTILE IRON LID LETTERING SHALL BE RECESSED.

4. CEMENT CONCRETE SHALL BE CLASS 4000.

5. A 1/4-20 NCx3/4" STAINLESS STEEL GROUND STUD SHALL BE WELDED TO THE BOTTOM OF THE LID; INCLUDE (2) STAINLESS STEEL NUTS AND (2) STAINLESS STEEL FLAT WASHERS.



CITY OF SAMMAMISH
DEPARTMENT OF PUBLIC WORKS

SKID RESISTANT LID

APPROVED BY
CITY ENGINEER _____ DATE _____

REV	DWN	CKD	DATE	FILE
	XXX	XXX	AUG-XX-2015	FIG09-19

REV. NO. X