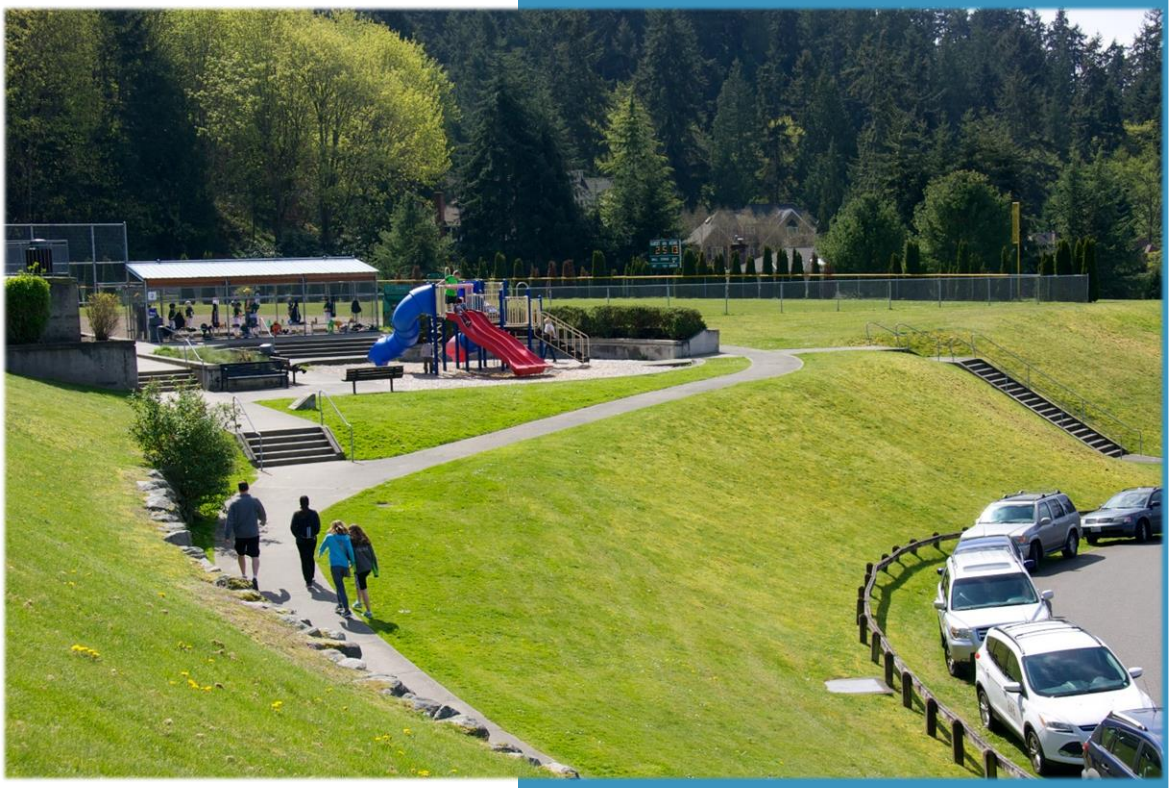
2024 EDM and relevant Tables, Figures, and Appendices: Effective 3/19/2024

2024

ENGINEERING DEVELOPMENT MANUAL



Public Works Department

City of Shoreline

17500 Midvale Avenue North

Shoreline, WA 98133

CONTENTS

Contents

CONTENTS i

DIVISION 1 - ADMINISTRATION 1

Chapter 1. Introduction 2

1.1. General Authority 2

1.2. Vesting 3

1.3. Revising the EDM 3

1.4. Contact Information 3

Chapter 2. Permits 4

2.2. Right-of-Way Permits 5

2.3. Public Utilities 9

2.4. Non-City Agencies 9

Chapter 3. Permit Process 10

3.1. Permit Process 10

3.2. Pre-application Meeting 12

3.3. Neighborhood Meeting 13

3.4. Permit Review 13

3.5. Plan Approval 13

3.6. Plan Revisions 13

3.7. Independent Review 13

3.8. Permit Issuance 14

3.9. Pre-construction Meeting 14

3.10. Permit Inspections 14

3.11. Final Project Approval 14

3.12. Permit Timing and Expiration 15

3.13. Notification (Right-of-way) 16

3.14. Franchises, Electric and Communication Facilities 16

Chapter 4. Permit Submittals 16

4.1. Design Professionals 16

4.2. Plans and Specifications 17

4.3. Survey 18

4.4. Site Assessment 18
4.5. Surface Water Report 18
4.6. Geotechnical Report 19
4.7. Transportation Impact Analysis 19
4.8. Traffic Control Plan 19
4.9. Declaration of Covenant 20
4.10. Easements 21
4.11. Tracts 21
4.12. Dewatering Plan 22
4.13. Financial Guarantee 22
4.14. Insurance 23
Chapter 5. Permit Fees 23
5.1. Fee-in-lieu of Frontage Improvements 24
5.2. Latecomer Agreements 24
5.3. Revisions to Issued Permits 24
5.4. Impact Fees 24
DIVISION 2 – RIGHT-OF-WAY 25
Chapter 6. Standards 26
6.1. Companion Documents 27
6.2. Deviation from Engineering Standards 29
Chapter 7. General Requirements 29
7.1. Americans with Disabilities Act 29
7.2. Low Impact Development 30
7.3. Maintenance 30
7.4. Street Tree Removal/Pruning 30
7.5. Connectivity 30
7.6. Underground Utilities 30
7.7. Frontage Improvements 31
7.8. Dedication of Right-of-Way 32
7.9. Curbing 32
7.10. Pavement Cut Moratorium 33
7.11. Staging Area for Solid Waste Detachable or Drop-box Containers 33
Chapter 8. Illumination 33

8.1. General Requirements....33
8.2. Roadway Lighting....36
8.3. Sidewalk Lighting....37
Chapter 9. Street Classification....38
9.1. Arterial Streets....38
9.2. Non-Arterial Streets....39
9.3. Alley....39
9.4. Private Street....39
Chapter 10. Access Management....39
10.1. General....39
Chapter 11. Access Design....42
11.1. General....42
11.2. Access Width....43
11.3. Access Clearance and Spacing....43
11.4. Access Approach....45
11.5. Driveway....45
11.6. Parking Lot Throat Lengths....46
Chapter 12. Street Design....46
12.1. Reconstruction....46
12.2. Widths....47
12.3. Vertical Alignment....47
12.4. Vertical Curve Criteria....47
12.5. Horizontal Curve Criteria....49
12.6. Street End....51
12.7. Utility Locations....52
12.8. Private Streets....54
12.9. Woonerf....55
12.10. Street Parking....56
Chapter 13. Intersection Design....57
13.1. Alignment....57
13.2. Spacing....57
13.3. Design Vehicles....58
13.4. Curb Radii....58

13.5. Drainage 58
13.6. Intersection Grades 59
13.7. Pedestrian Accommodations 59
13.8 Sight Distance 60
Chapter 14. Pedestrian and Bicycle Facilities 64
14.1. General 64
14.2. Sidewalks 64
14.3. Pedestrian Paths 65
14.4. Shared-Use Paths 65
14.5. Bicycle Facilities 66
Chapter 15. Roadside Features 68
15.1. Fixed Objects 68
15.2. Landscaping 69
15.3. Mailboxes 71
15.4. Steps 72
15.5. Railing 72
15.6. Cut-and-fill Slopes 72
15.7. Guardrail 73
Chapter 16. Surface Treatment 73
16.1. General 73
16.2. Asphalt Pavement Design 73
16.3. Pavement Widening 74
Chapter 17. Traffic Control Devices 74
17.1. Roundabouts 75
17.2. Traffic Signals 75
DIVISION 3 – SURFACE WATER 77
Chapter 18. Standards 78
Chapter 19. Stormwater Manual Additional Requirements 79
Chapter 20. General Requirements 88
20.1. Licensed Professionals 88
20.2. Grading 89
20.3. Separated Runoff 89
20.4. Backflow Prevention 90

20.5. Sump Pumps 90
20.6. Footing Drains 90
20.7. Catch Basin Grates 90
20.8. Catch Basin Medallions 90
20.9. Maintenance Access 90
20.10. Watercourses 91
20.11. Flood Control 91
20.12. Subdivisions 92
20.13. Phased Projects 92
20.14. Protect Vegetation Post-Construction 93
20.15. Infiltration Facility Prohibitions 93
20.16. Stormwater Frontage Improvements 94
20.17. Permeable Pavements 95
Chapter 21. Surface Water Project Classifications 97
Chapter 22. Construction Stormwater Pollution Prevention Plan 99
22.1. Stormwater Pollution Prevention Plan Requirements 99
22.2. Rainy Season 100
Chapter 23. Conveyance System 102
23.1. King County Surface Water Design Manual Modifications 102
23.2. Pump Systems 106
23.3. Junction 107
23.4. Drop Structures 108
23.5. Rockeries/Retaining Walls Crossing 108
23.6. Ditch Modifications 108
DIVISION 4 – WASTEWATER 110
Chapter 24. Public Sewer, Use, and Connections 111
24.1. Standards 111
24.2. Public Wastewater System 111
24.3. Connection of Non-Assessed Property 111
24.4. Connection of All Plumbing Outlets 111
24.5. Prohibited Connections and Discharges 111
24.6. Oil/Water, Sand, and Grease Interceptor-Separators 113
24.7. Fat, Oil, and Grease (FOG) 113

Chapter 25. Permits, Charges, and Fees 114
25.1. Application and Issuance 114
25.2. Unauthorized Work 115
25.3. Right-of-Way Permit 115
25.4. Other Permits/Notifications Required 115
25.5. Failure to Comply With Permit Provisions 115
25.6. Permit Fees 115
25.7. Connection Charges 115
Chapter 26. General Sewer Requirements 116
26.1. Manholes 116
26.2. Sewer Main 118
26.3. Force Mains 119
26.4. Side Sewers 119
26.5. Alternative Sewer Systems 126
26.6. Individual Lift Stations 126
26.7. Lift Stations 128
26.8. Pipeline Testing 130
26.9. Protection of Live Sewers 133
26.10. Pipe Installation 134
26.11. Repairs 135
26.12. Sewer and Water Line Separation 136
26.13. Pipe Split Casing 136
Chapter 27. Inspections and Testing 136
27.1. Call for Inspection 136
27.2. Materials and Workmanship 137
Chapter 28. Special Releases, Agreements and Documents 137
28.1. Developer Extensions 137
28.2. Wastewater Utility Easements 137
28.3. Hold Harmless and Indemnification 138
28.4. Sewer Service Agreement 138
28.5. Alternative Construction Methods and Materials – Trenchless Technology 138
Chapter 29. Flushing Permit/ Industrial Discharge Permit 139
29.1. Industrial Discharge Permit 139

DIVISION 5 – CONSTRUCTION AND INSPECTION 142
Chapter 30. Construction 143
30.1. Standards 143
30.2. General 143
30.3. Temporary Traffic Control 144
30.4. Staking 145
30.5. Trenches 146
30.6. Abandoned Utilities 147
30.7. Sidewalks 148
30.8. Landscaping 148
30.9. Curb, Gutter, and Access Approach 152
30.10. Pavement Restoration 152
30.11. Stop Work 156
Chapter 31. Inspection 156
31.1. Authority and Duties of Inspectors 156
31.2. Inspection Requirements 157
APPENDIX A – ACRONYMS AND DEFINITIONS 159
APPENDIX B – SURVEY CRITERIA 181
APPENDIX C – SURFACE WATER REPORT GUIDELINES 186
APPENDIX D – GEOTECHNICAL REPORT GUIDELINES 196
APPENDIX E – TRANSPORTATION IMPACT ANALYSIS REPORT GUIDELINES 211
APPENDIX F – STREET MATRIX 218
APPENDIX G – RIGHT-OF-WAY STREET TREE LIST 246
APPENDIX H – RECORD DRAWING CRITERIA 263
APPENDIX I – STREET LIGHTING LEVELS CRITERIA 265
APPENDIX J – TRAFFIC CONTROL PLAN SUBMITTALS 272
APPENDIX K – APPROVED STORMWATER FACILITY PLANTING LIST 275
APPENDIX L – STANDARD PLANS 282
APPENDIX M – SEWER DESIGN CRITERIA 292
APPENDIX N – DEFERRED UTILITY FACILITY AREA MAP (DUFA) 297
APPENDIX O – DEVELOPER EXTENSION MANUAL 300
APPENDIX P – BICYCLE LEVEL OF TRAFFIC STRESS (LTS) VISION MAP 323

Tables

Table 1. Contact Information 3
Table 2. Permit Process Outline (Example) 11
Table 3. Access Widths 43
Table 4. Access Spacing and Clearance 43
Table 5. Typical Lane Widths 47
Table 6. Maximum Profile Grade 47
Table 7. Vertical Curve - Minimum Stopping Sight Distance (ft) 48
Table 8. Horizontal Curve Design 50
Table 9. Underground Utility Locations- 53
Table 10. Intersection Alignment Taper Rates 57
Table 11. Typical Minimum Curb Radii Design Values 58
Table 12. Stopping Sight Distance Requirements 61
Table 13 Uncontrolled Intersection Sight Triangle Leg Lengths 62
Table 14. Bicycle LTS Vision 67
Table 15. Standard Lateral Clearances 68
Table 16. Standard Vertical Clearance 69
Table 17. Surface Water Project Classifications 97
Table 18. Surface Water Submittal Requirements 98
Table 19. Conveyance System Specifications 102
Table 20. Conveyance System Vertical Clearances 106
Table 21. Number of Compaction Tests 156
Table 22. Lighting Level Requirements 266

Figures

Figure 1 Minor Street Stop Control and Driveway Sight Distance Diagram 61
Figure 2 Uncontrolled Intersection Sight Distance Diagram 62
Figure 3 Pedestrian Sight Distance 63
Figure 4 Tree Protection Right-of-Way 150
Figure 5 Reduced Throat at a Public Intersection 221
Figure 6 Generic Cross Section 1 Diagram 245
Figure 7 Intersection Lighting Design Area 267
Figure 8 Roundabout Lighting Design Area 268
Figure 9 Street End Lighting Design Area 269
Figure 10 Significant Driveway Lighting Design Area 270
Figure 11 Midblock Crossing Lighting Design Area 270
Figure 12 Sidewalk Lighting Design Area 271
Figure 13 Bioretention Planting Zones 277

FOREWORD

This Engineering Development Manual (EDM) provides information to the development community to help with the processes, administration, engineering, and inspection that apply to private development within the City of Shoreline (City). Land Use codes related to development can be found in Title 20 of the Shoreline Municipal Code (SMC).

This manual has five divisions that provides standards and policies on the following topics:

Division 1: Administration

Division 2: Right-of-Way

Division 3: Surface Water

Division 4: Wastewater

Division 5: Construction and Inspection

The Appendices contain information that supplements Divisions 1 through 5.

DIVISION 1 - ADMINISTRATION

Chapter 1. Introduction

1.1. General Authority

SMC 12.10.015 authorizes the preparation, administration, interpretation, and amendment of the EDM.

The EDM addresses permitting and engineering requirements for site and right-of-way work related to development within the City. While the EDM is geared toward the Applicant/Permittee and the Applicant/Permittee's engineer, it is intended to provide information to a wide group of users.

The EDM sets forth minimum engineering criteria and specifications and supplements the SMC; it does not replace the SMC. 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.

The Director of Public Works (Director) reserves the right to substitute more stringent design standards and specifications where special conditions warrant.

The City's website provides access to the EDM, the SMC, information handouts, permit applications, and other guidance documents.

- City's website: http://www.shorelinewa.gov
- Shoreline Fee Schedule: https://www.codepublishing.com/WA/Shoreline/#!/ShorelineFEE/ShorelineFEE.html
- Shoreline Municipal Code: http://www.codepublishing.com/wa/shoreline
- Title 12 SMC Streets, Sidewalks and Public Places: https://www.codepublishing.com/WA/Shoreline/html/Shoreline12/Shoreline12.html
- Title 13 SMC Utilities: https://www.codepublishing.com/WA/Shoreline/html/Shoreline13/Shoreline13.html
- Title 20 SMC Unified Development Code (Development Code): http://www.codepublishing.com/wa/shoreline/html/Shoreline20/Shoreline20.html
- Engineering Development Manual: http://www.shorelinewa.gov/government/departments/public-works/engineering-standards
- Permit Checklists and Application Packets: http://www.shorelinewa.gov/government/departments/planning-community-

development/forms-application-checklists-application-handouts/permit-checklists-application-packets

- Development Handouts: http://www.shorelinewa.gov/government/departments/planning-community-development/forms-application-checklists-application-handouts/development-handouts

1.2. Vesting

A project is vested under the zoning and land use control regulations in place on the date when the permit application is determined to be complete by the City. Refer to the appropriate submittal checklist for guidance on the requirements for complete applications.

The City periodically reviews and revises the EDM. In the case that a land use regulation has been revised more recently than the update cycle for the EDM, the most current provision of the SMC supersedes the information provided in the EDM.

1.3. Revising the EDM

The City always accepts public feedback to inform future revisions to the EDM. To share your comments, please use the Online EDM Feedback Form on the City's Engineering Standards webpage: http://www.shorelinewa.gov/government/departments/public-works/engineering-standards

1.4. Contact Information

The contact information in Table 1 is provided as assistance during project planning and development and is not a comprehensive list of contacts.

Table 1. Contact Information

Planning and Community Development Department **17500 Midvale Avenue N** **Shoreline, WA 98133-4905** **https://www.shorelinewa.gov/government/departments/planning-community-development** **(206) 801-2500**	**Public Works Department** **17500 Midvale Avenue N** **Shoreline, WA 98133-4905** **https://www.shorelinewa.gov/government/departments/public-works** **(206) 801-2400**
Shoreline Fire Department **17525 Aurora Avenue N** **Shoreline, WA 98133** **https://shorelinefire.com/** **(206) 533-6500**	**Shoreline Police Department** **17500 Midvale Avenue N** **Shoreline WA, 98133** **https://www.shorelinewa.gov/government/departments/police-department**

	(206) 801-2710
Code Enforcement and Customer Response Team 17500 Midvale Avenue N Shoreline, WA 98133-4905 https://www.shorelinewa.gov/services/customer-response-team (206) 801-2700	Solid Waste Purveyor: Recology King County 801 S Fidalgo Street Suite 100 Seattle, WA 98108 https://www.recology.com/recology-king-county/shoreline/ (206) 763-4444
Water Purveyor: North City Water District 1519 NE 177th Street Shoreline, WA 98155 https://northcitywater.org/ (206) 362-8100	Water Purveyor: Seattle Public Utilities (SPU) 700 5th Avenue Suite 4900 Seattle, WA 98104 https://www.seattle.gov/utilities/your-services/water Customer Service (206) 684-3000 SPU Water Certificate (206) 684-5795
Water and Sewer Purveyor: The Highlands 181 NW Highlands Drive Shoreline, WA 98177 https://www.thehighlandsseattle.org/ (206) 362-2100 ext. 103	Natural Gas Purveyor: Puget Sound Energy 10885NE 4th Street, P.O. Box 97034 Bellevue, WA 98009-9734 https://www.pse.com/ (888) 225-5773
Electric Purveyor: Seattle City Light (SCL) 700 5th Avenue Suite 3200 Seattle, WA 98104 https://www.seattle.gov/city-light (206) 684-3000	Electrical Permits: State of Washington Department of Labor and Industries https://lni.wa.gov/licensing-permits/ (425) 996-1496

Chapter 2. Permits

The information in this chapter summarizes the requirements in the SMC. If there are any conflicts between this EDM and the SMC, 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 shall prepare and submit a complete application, including permit application, plans, and specifications to the Planning and Community Development Department for review and approval.

2.1. Site Development Permit

A. Refer to SMC 20.30.315 for activities that require a site development permit and to SMC 20.50.310 for activities that are exempt from such a permit.

B. Site development can be permitted under a Site Development Permit or as part of a Building Permit. Examples of work that can require a separate Site Development Permit include:

   i. Paving, grading, clearing, tree removal, on-site utility installation, stormwater facilities, walkways, striping, wheelstops or curbing for parking and circulation, landscaping, critical area and buffer mitigation, enhancement, remediation, or restoration (as defined in SMC 20.20.046); or

   ii. The construction of two or more detached single-family dwelling units on a single lot (SMC 20.30.315); or

   iii. Site improvements associated with short and formal subdivisions (SMC 20.30.315); or

   iv. The construction of two or more nonresidential or multi-family structures on a single lot (SMC 20.30.315); or

   v. Land disturbing activities that require Minimum Requirements (MR) 1-5 as set forth in the City's Stormwater Manual, as modified by Division 3 of the EDM (SMC 20.30.315).

2.2. Right-of-Way Permits

City right-of-way shall not be privately improved or used for access or other purposes unless a permit has been issued by the City for such improvement or use. Issued permits do not convey any vested right or ownership interest in any City right-of-way. Refer to SMC Chapter 12.15 for right-of-way use. Improvements in the right-of-way shall meet the technical requirements presented in Division 2 of this EDM.

A. Right-of-way Use Permit:

   i. Right-of-way Use Permits are issued for short-term activities in, under, or above the right-of-way and temporary alteration of the right-of-way. For specific information on Right-of-way Site Permits, refer to SMC 12.15.030(D). Refer to SMC 12.15.060 for activities that are exempt from a Right-of-way Use Permit.

   ii. SMC 12.15.030(D) lists examples of activities that require a Right-of-way Use Permit which include, but are not limited to:

a. Temporary complete or partial closures of traffic lanes or sidewalks;

b. Boring, jacking, or pushing;

c. Construction activities adjacent to the right-of-way that may physically impact the right-of-way;

d. Crane swings over the right-of-way;

e. Construction related to the installation of culverts, curb cuts, handicap ramps, sidewalks and driveway approaches;

f. Drainage facilities;

g. Installation of landscaping;

h. Paving;

i. Street trenching;

j. Temporary construction devices, such as scaffolding, barricades, walls, elevators, cranes, pedestrian walkways, etc.;

k. House moves, special usage of the street and/or public right-of-way to move houses or other oversize and overweight, materials and structures at specific times and locations;

l. Street runs, or races held on public streets and sidewalks on specific routes, parades and processions;

m. Assemblies, fairs, carnivals, shows, exhibitions, or large gatherings of people that may use or obstruct the right-of-way with people, vehicles, and signs that may produce noise;

n. Commercial filming or videotaping except that associated with news reporting;

o. Parking spaces temporarily dedicated for private use.

B. Right-of-way Site Permit:

i. A Right-of-way Site Permit allows private improvements or private long-term use of public right-of-way. A Right-of-way Site Permit is not required for use of right-of-way that is expressly allowed by the SMC. For specific information on Right-of-way Site Permits, refer to SMC 12.15.030(C).

ii. A Right-of-way Use Permit may be required in conjunction with a Right-of-way Site Permit to construct or install structures and/or amenities associated with the use.

iii. Site permits may be granted for a period of up to five (5) years. In addition to a permit fee, for some specific uses the Permittee may be assessed an annual fee for the length of the permit. The annual fee is calculated using the square feet of right-of-way proposed for leasing and multiplying it by ten (10) percent of the square foot dollar value of the abutting property.

iv. Upon termination of a Right-of-way Site Permit, if the permit is not renewed, the Permittee shall remove any improvements constructed in the right-of-way and restore the area to its original condition or better. Removal of improvements in the right-of-way could also require a Right-of-way Use Permit.

v. Right-of-way encroachments that compromise public safety shall not be allowed.

vi. SMC 12.15.030(C) provides examples of activities requiring Right-of-way Site Permit which include, but are not limited to:

a. Accessory uses permitted to the adjacent property such as parking, displays, and signage, provided the proposed use is not required to meet City development standards for any private property development;

b. Air rights;

c. Bus shelters/stops;

d. Fences, retaining walls, terracing, and similar structures;

e. Litter and recycle receptacles placed by private parties;

f. Parking of bicycles, other mobility devices, helmets, or merchandise that is made available for general public use provided by a micromobility vendor.

g. Special and unique structures such as benches, fountains, clocks, flagpoles, kiosks banners, street furniture, decorations, bicycle racks, private planters, or any other obstruction to be placed in the right-of-way by an entity other than the City;

h. Sales structures, including sidewalk cafes, telephone booths, or the usage of the right-of-way for the sales of flowers, beverages, newspaper, or other items;

i. Underground rights;

j. Utility facilities not exempt under a franchised agreement with the City.

C. The following activities are exempt from the Right-of-Way Site Permit:

i. Utility facilities placed in the right-of-way under the authority of a franchised utility;

ii. If the adjacent zoning district expressly permits use of the right-of-way, that use may be approved for an indefinite duration and is exempt from compensation. For example: Awnings on buildings projecting into the right-of-way are expressly permitted in the Development Code for certain zoning designations and do not require a Right-of-way Site Permit.

iii. Projections into the right-of-way not addressed by the Development Code may be allowed on a case-by-case basis subject to the following requirements:

a. Window projections of up to one (1) foot into the right-of-way may be permitted.

b. Canopy projections of up to five (5) feet into the right-of-way may be permitted.

c. Where balconies are proposed:

1. A canopy must be provided beneath the lowest balcony and must adhere to applicable EDM or SMC requirements

2. A minimum one (1) foot offset shall be provided between the depth of the canopy projection and the depth of the balcony projection

iv. Projections into the right-of-way that conflict with overhead utility or transportation infrastructure clearances will not be permitted

D. Temporary shoring that encroaches into the right-of-way requires a Right-of-way Site Permit and shall comply with the following requirements:

i. An encroachment of up to 24 inches into the right-of-way is permitted.

ii. At a minimum, the top four (4) feet of temporary shoring walls shall be removed at project completion.

iii. Tiebacks shall be destressed.

iv. A special inspection by the City may be required.

2.3. Public Utilities

Depending on the type of work and the standing of the utility, a permit may be required for a utility to work in the right-of-way. Refer to SMC 12.15.150 through 12.15.180 for more information.

2.4. Non-City Agencies

It is the Applicant's responsibility to obtain permits from non-City agencies that may involve work within the right-of-way.

In order to ensure coordination between utilities, the proposed locations of water, sewer, gas, and power in the right-of-way shall be approved by each provider as part of the permit review process.

The permit plans shall 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.

Prior to issuing City permit(s), verification that the Applicant has obtained other required permits may be required. Permits from non-City agencies may include:

A. Electrical permits: Washington State Department of Labor and Industries, (425) 990-1430.

B. Electrical service permit: SCL, (206) 684-3000.

C. Propane tanks: Shoreline Fire Department, (206) 533-6500.

D. Water connection services and related information: SPU (generally sites west of I-5), (206) 684-5800 or North City Water District (generally sites east of I-5), (206) 362-8100.

E. Washington State Department of Fish and Wildlife (WDFW):

   i. Any work below the Ordinary High-Water Mark (OHWM) of surface waters 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 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 WDFW website.

F. Washington State Department of Ecology (Ecology):

i. The National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit (CSWGP) Notice of Intent (NOI) is administered by Ecology. Refer to Ecology's website for information regarding applying for an NOI: https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit.

G. United States Army Corps of Engineers (USACE):

i. Coastal Zone Management Program is administered by Ecology or a federal permitting agency.

ii. Water Quality Certification (401) ensures that limits placed in a permit on the quantity and concentration of pollutants discharged are not exceeded.

iii. 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 USACE coordinates with the National Oceanic and Atmospheric Administration (NOAA) Fisheries and United States Department of Fish and Wildlife to ensure Endangered Species Act consistency.

H. United States Coast Guard and Washington State Department of Natural Resources (DNR) are involved in certain projects (such as a bridge) involving impacts over or adjacent to navigable waters (Class 1 streams).

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

Chapter 3. Permit Process

This chapter describes how the Applicant and the City work together during the permit process. Each permit application submitted to Planning and Community Development is assigned a project manager. The project manager or Planning and Community Development Permit Services can provide process information related to a specific permit. Contact Planning and Community Development for more information.

3.1. Permit Process

Refer to Table 2, Permit Process Outline for a general outline of the application review process. The outline may be adjusted to meet particular project circumstances. Not all the steps listed below are required for all permits. Contact Planning and Community Development for an explanation of the steps applicable to a certain permit application. Description of various elements of the permit process is contained in the sections following Table 2.

Table 2. Permit Process Outline (Example)

	Activity	Responsible Party
I.	Pre-Application Meeting: • Schedule a pre-application meeting when required by SMC 20.30.080 (or when desired).	Applicant
II.	Project Proposal: • Prepare studies and reports; • Prepare Project Plans; • Conduct Neighborhood Meeting when required by SMC 20.30.045, SMC 20.30.090 and SMC 20.80.224(G)(1).	Applicant
III.	Submit Application(s): • Only applications meeting the submittal requirements shall be processed. • Refer to the applicable permit submittal checklist for required submittal information and materials. https://www.shorelinewa.gov/government/departments/planning-community-development/forms-application-checklists-application-handouts/permit-checklists-application-packets	Applicant
IV.	Review: • Assign a project manager; • Determine completeness; • Coordinate reviews (for example Fire Department, Planning, Public Works, and Building and Inspection teams); • Approve permit or send a comment letter to designated contact; • Redlined plans may accompany the comment letter.	City
V.	Revision and Re-submittal: • Revise plans per the City's comments; • Submit revised plans and provide revised supporting documents; • Submit redlined plans that were provided by the City.	Applicant
VI.	Revision and Re-submittal Review • Coordinate plan review and verify that all comments have been satisfactorily addressed; • Approve permit or send a comment letter to designated contact; • Redlined plans may accompany the comment letter.	City
VII.	Notification: • Notify Applicant's designated contact regarding outstanding items needed for issuance; • Before the permit is issued, all requirements for issuance shall be met. These may include proof of insurance, posting of financial guarantee(s), draft Declaration of Covenant, • easements, permits from other agencies, payment of fees, and/or dedications;	City

	• When all conditions for issuance are met, and the permit(s) is ready to issue, a representative from Planning and Community Development shall notify the designated contact person that the permit is ready. At this time, Planning and Community Development shall notify the Applicant of fees owed.	
VIII.	Obtain Permit • Provide outstanding items; • Pay any remaining fees; • Receive the permit.	Applicant
IX.	Pre-Construction Meeting: • Schedule a pre-construction meeting: • Construction may not begin before having a pre-construction meeting.	Permittee
X.	Construction: • Complete all activities identified in the approved plans to the City's satisfaction; • Notify the City Inspector assigned to the project when elements are ready for inspection.	Permittee
XI.	Inspections: • Perform all required inspections including final inspection.	City
XII.	Release Performance Financial Guarantee (if applicable).	City
XIII.	Cancel expired permit applications when applicable. See EDM Section 3.12, Permit Timing and Expiration.	City

3.2. Pre-application Meeting

Refer to SMC 20.30.080.

Not all projects require a pre-application meeting, but many projects benefit from this service. A pre-application meeting allows the potential Applicant, City representatives, and some external agencies an opportunity to discuss a proposed project before a permit application is submitted. The pre-application meeting provides the project proponent information regarding permits, permit processes, codes, and standards that apply to the proposed project.

The meeting is scheduled at the time the Applicant submits an application for the meeting. Refer to the pre-application meeting handout available in the Permit Center or online at: http://www.shorelinewa.gov/government/departments/planning-community-development/forms-application-checklists-application-handouts/development-handouts.

3.3. Neighborhood Meeting

Certain types of permits require the Applicant to hold a neighborhood meeting. Refer to SMC 20.30.045, 20.30.090, and 20.80.224(G)(1). SMC 20.30.090 provides the requirements for neighborhood meetings, with a summary of the meeting and list of attendees submitted with the application materials. Refer to the Neighborhood Meeting handout available in the Permit Center or online at: http://www.shorelinewa.gov/government/departments/planning-community-development/forms-application-checklists-application-handouts/development-handouts.

3.4. Permit Review

The permit review process is a partnership between the Applicant and City representatives. Planning and Community Development shall review permit submittals or coordinate review with other departments and/or external agencies for compliance with applicable standards following the general outline in Table 2, Permit Process Outline.

The City reviews permits concurrently for projects having a building or site development permit and a right-of-way permit. Generally, the City issues the right-of-way permit with its associated building permit or site development permit.

3.5. Plan Approval

Plan approval does not relieve the Applicant/Permittee, the Applicant/Permittee's engineer, or the Contractor from the responsibility for ensuring that all facilities are safe and that calculations, plans, specifications, construction drawings and record drawings with as-constructed information are in compliance with accepted engineering practices, this EDM, and applicable federal, state, and local laws and codes.

3.6. Plan Revisions

To help with plan review, any revisions shall be called out on the plans using "clouds" or some other indicator. The revised plan(s) shall include the revision number and date particular to that plan set.

The engineer of record shall stamp, sign, and date revisions to the design prepared under the engineer's authority.

3.7. Independent Review

Depending on the site conditions and design complexity, the City may determine that reports, such as geotechnical, stream or wetland reports submitted to the City require independent (third party) review. Third party review is at the Applicant's cost and expense.

3.8. Permit Issuance

Before a permit is issued, all requirements for issuance shall be met. These may include proof of liability insurance, financial guarantees, draft Declaration of Covenant, easements or dedications, permits from other agencies, and/or payment of any outstanding fees. When a permit is ready to be issued, a representative from Planning and Community Development shall notify the designated contact person that the permit is ready subject to any remaining requirements, such as payment of all fees.

3.9. Pre-construction Meeting

Many 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). The Permittee is responsible for scheduling the pre-construction meeting(s). Directions for scheduling a pre-construction meeting(s) are found on the issued permit(s).

3.10. Permit Inspections

A. Inspections on-site are performed by Combination Inspectors from the Planning and Community Development. Work within the right-of-way is subject to inspection by a Construction Inspector from Public Works.

B. Inspections are usually performed Monday through Friday, from 8:00 a.m. to 3:00 p.m.

C. Some projects may require special inspections performed by pre-approved third parties.

D. For more information on inspections, refer to EDM Chapter 31, Inspection.

3.11. Final Project Approval

A. Fees:

    i. 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 the City shall be paid prior to final project approval.

B. Permanent Stabilization:

    i. All disturbed areas shall have permanent stabilization in place and functioning before final project approval.

C. Financial Guarantee:

    i. Refer to EDM Chapter 4, Permit Submittals for more information on Financial Guarantees.

D. Record Drawings:

    i. Record drawings shall be provided for private infrastructure that connects to the City's infrastructure, for public facilities, and for right-of-way work. Refer to Appendix H – Record Drawing Criteria for more information.

E. Inspections:

    i. All inspections shall 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. Refer to EDM Chapter 31, Inspection for more information on inspections.

F. Declaration of Covenant:

    i. Refer to EDM Chapter 4, Permit Submittals for more information on the Declaration of Covenant.

G. Dedications and Easements:

    i. Dedications or easements may be required for City right-of-way, stormwater, and sanitary sewer. Refer to EDM Chapter 7, General Requirements for more information regarding dedication of right-of-way. Refer to EDM Section 28.2. Wastewater Utility Easements for wastewater utility easement requirements. Regardless of the type, dedication or easement, the document shall be recorded with King County prior to permit issuance.

H. Work Completion:

    i. The permit process is complete upon final inspection approval by the City.

3.12. Permit Timing and Expiration

The following provides general guidelines regarding application and permit expiration. For specific information contact the project manager or Planning and Community Development. Refer to SMC Chapter 20.30 Subchapter 3.

A. Issuance Notification:

    i. Following plan approval, a representative of Planning and Community Development notifies the contact indicated on the permit application that the permit is ready to issue and of any fees owed. Following notification, the

Applicant has 180 calendar days to obtain the permit. If a permit is pending issuance for more than 180 calendar days without issuance and the Applicant has not requested an extension, the permit is null and void.

B. Issued Permit:

i. Permits are valid for the periods specified by ordinance. If the proposed work cannot be completed within the time covered by the permit, the City may grant an extension. The Permittee shall submit a written extension request to Planning and Community Development Permit Services prior to the expiration date of the issued permit. The City may assess additional fees for permit extension and inspection.

3.13. Notification (Right-of-way)

Notification is required for any project that has the potential to disturb encroachments into the right-of-way. Applicant/Permittee shall work with abutting property owner(s) when there are encroachments that adversely affect installation of right-of-way improvements. Notification is also required for any project whose frontage improvements will impact the driveway access, mailboxes, and/or other impacts as determined by the Director. The Applicant/Permittee shall provide proof of notification of the abutting property owner(s) to the Development Review Engineer prior to commencing work.

3.14. Franchises, Electric and Communication Facilities

In addition to a specific franchise agreement, requirements for the construction and usage of the right-of-way by utility providers are located in SMC Chapter 12.25 Right-of-Way Franchises, and SMC Chapter 13.20 Electric and Communication Facilities.

Chapter 4. Permit Submittals

Checklists with the required submittal materials are available on the City's Permit Checklists & Application Packets website: http://www.shorelinewa.gov/government/departments/planning-community-development/forms-application-checklists-application-handouts/permit-checklists-application-packets.

The checklists provide a list of the typical submittal materials. Some items are not applicable to all projects, and the City may request additional submittal materials for some projects. Contact Planning and Community Development with any questions regarding submittal materials.

4.1. Design Professionals

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

A. Activities requiring design by a licensed Professional Engineer include:

   i. Nearly all right-of-way design, except simple activities such as installation of a driveway apron;

   ii. Design of treatment facilities, flow control facilities (detention ponds or infiltration basins), structural source control Best Management Practices (BMPs), or drainage conveyance systems;

   iii. Construction Stormwater Pollution Prevention Plans (SWPPPs) that involve engineering calculations.

B. Activities requiring a licensed Land Surveyor include:

   i. Nearly all right-of-way work. The survey work includes setting right-of-way lines, locating conveyance systems and setting elevations, locating curbs and setting curb elevations, locating drainage improvements and recording elevations, and providing as-constructed information on record drawings;

   ii. Construction of treatment facilities 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. Survey marks such as property corners, right-of-way lines, subgrade elevations, and slope stakes;

   v. Placement, protection, and replacement of survey monuments;

   vi. 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;

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

   viii. Record drawings with as-constructed (surveyed) information shall be provided for private infrastructure that connects to the City's infrastructure, for public facilities, and for right-of-way work.

4.2. Plans and Specifications

The plans shall clearly indicate the location, nature, and extent of the proposed work and shall provide sufficient detail to show that all provisions of the standards and codes are met.

Specifications shall accompany the plans whenever the plans and notes do not adequately describe the proposed work and materials.

4.3. Survey

A. Surveys shall meet the following requirements:

   i. 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 North American Datum (NAD), horizontal, 1983 (2011);

   ii. 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;

   iii. 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 1988 North America Vertical Datum (NAVD);

   iv. 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; and

   v. For Flood Elevation certificates, a conversion from 1988 NAVD to 1929 NAVD may be provided.

B. All real properties, including lots, right-of-way, and easements shall be located or 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. Site Assessment

A site assessment for drainage design is required for medium impact and large impact projects. Refer to Division 3 – Surface Water and Ecology's Stormwater Management Manual for Western Washington (Stormwater Manual) for more information.

4.5. Surface Water Report

The scope of drainage review varies with the project complexity and potential surface water impacts. A drainage report may be required. Refer to Division 3 – Surface Water and Appendix C – Surface Water Report Guidelines for design and report requirements.

4.6. Geotechnical Report

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:

A. Land fill or excavation over 500 cubic yards;

B. Work on sites containing or adjacent to slopes that are 15 percent or steeper. Refer to SMC Chapter 20.80 for critical area regulations; and

C. Some storm drainage design.

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:

A. The report is less than five (5) years old and no significant changes to the site have occurred; or

B. 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.

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

4.7. Transportation Impact Analysis

A Transportation Impact Analysis (TIA) may be required to inform the City on the need for additional improvements to meet concurrency requirements pursuant to SMC 20.60.140. A TIA is required for each development or redevelopment that would generate 20 or more trips during the peak hour consistent with the most current edition of the Trip Generation Manual, published by the Institute of Traffic Engineers (ITE). A TIA may also be required if the City Traffic Engineer assesses that the project will have a significant impact to the transportation network, even if the 20-trip threshold is not met.

The TIA scope is developed with the City Traffic Engineer. Please contact the City Traffic Engineer for details including background traffic growth information, trip distribution and assigned assumptions, and intersections and/or roadways required for study.

If the proposed project is changed by type or size or the TIA is older than two (2) years, updates to the TIA shall be required.

See Appendix E for Transportation Impact Analysis guidelines.

4.8. 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 a Right-of-way Use Permit, a traffic control plan that

meets the most current Manual of Uniform Traffic Control Devices (MUTCD) standards. Refer to EDM Section 30.3, Temporary Traffic Control and Appendix J – Traffic Control Plan Submittals.

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

4.9. Declaration of Covenant

The City requires a Declaration of Covenant for all permanent surface water BMPs on all projects. The Declaration of Covenant is a legal document that grants the City permission to access the property to inspect BMPs. The covenant includes several exhibits described below, which detail the BMPs and address operation and maintenance requirements.

While the owner is responsible for maintaining all features of a private drainage system, BMPs which require the covenant are limited to stormwater features which provide mitigation under MR5, MR6 and/or MR7 per EDM chapters 18 and 19, and SWMMWW. The BMP owner is responsible for operating and maintaining all BMPs to the standards set forth in SMC Chapter 13.10.

Exhibit A shall include the stormwater plan, simplified if needed for legibility on letter-size (8.5"x11") or legal-size (8.5”x14”) paper. All BMPs shall be clearly identified.

Exhibit B shall include details for all stormwater features including all BMPs as well as any on-site piping, surface access points, and/or drain points (yard drains, CBs, French drain, etc.). Any powered devices, including pumps, shall be included. All details shall be legible on letter-size (8.5"x11") or legal-size (8.5”x14”) paper. For all Infiltration-based BMPs, infiltration test locations shall be clearly identified on the site plan and the baseline infiltration rate shall be included on the details for all infiltration facilities.

Exhibit C shall include facility-specific maintenance standards for all stormwater BMPs. Any proprietary components shall include the vendor's contact information and the vendor's recommended maintenance schedule. Exhibit C shall also include a draft log of maintenance activity. The owner is responsible for keeping a log of maintenance activity that indicates what actions were taken. The log shall be made available for inspection by the City.

A draft Declaration of Covenant is available online on the City’s Individual Forms webpage. A completed draft covenant shall be submitted with the drainage design for review and approval. Upon verification of the constructed items and prior to final approval of the project, the Permittee shall proceed with recording the covenant with the King County Recorder's office. After recording, the Permittee shall provide the City with a copy of the recorded document prior to final acceptance.

For subdivision projects, the recorded covenant shall be stated on the face of the Final Plat.

4.10. Easements

Easements shall be provided when facilities on private property are to be used by more than one (1) lot or will benefit the public (SMC 20.70.160).

A. Utilities:

    i. Each utility (water, sewer, power, surface water, etc.) determines the minimum width for an easement.

B. Pedestrian/Bicycle:

    i. For traffic safety or access to schools, playgrounds, urban trails, shopping facilities, or other community facilities, bike routes or walkways shall be a minimum of five (5) feet wide. Additional width may be required.

C. Non-motorized:

    i. Non-motorized easements facilitate pedestrian 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 (2) feet on each side.

D. Roadway:

    i. Either the street's functional classification or its particular design features may necessitate slope, sight distance, wall, or drainage easements beyond the right-of-way line. Such easements may be required in conjunction with dedication or acquisition of right-of-way pursuant to SMC Chapter 20.70.

4.11. Tracts

Tracts should be used for facilities used by a broader group of individuals than easements, may 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 (1) lot. Tracts shall be large enough to accommodate the facilities and activities located within them.

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 five (5) feet around the facility. In limited cases, an easement may be permitted. If an easement is permitted, dimensions shall be determined by the City.

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 shall have a Temporary Dewatering Plan reviewed and approved by the City before dewatering begins.

4.13. Financial Guarantee

The City determines the performance and maintenance financial guarantee amounts. The performance guarantee shall be submitted before permit issuance. The maintenance guarantee shall be provided before final approval.

A. Performance Guarantee:

   i. The City requires a performance guarantee to cover the construction costs of proposed right-of-way improvements pursuant to SMC 12.15.040.

   ii. A performance guarantee may be required for proposed on-site improvements such as landscaping, tree replacement, critical area restoration, stormwater facilities installation, and for erosion prevention and sediment control on projects which clear more than 7,000 square feet (SF) or contain or abut critical areas such as steep slopes, wetlands, or streams pursuant to SMC 12.15.040.

   iii. Performance financial guarantees remain in full force and effect until:

      a. The obligations secured are fully performed as determined by the City's inspection program;

      b. A guarantee for maintenance and operation of all improvements for a guarantee period have been submitted to the City; and

      c. The City has released the guarantee in writing.

   iv. The guarantee may be released in increments as improvements are completed and have satisfactorily met all inspection requirements of the City.

   v. The guarantee estimate is calculated by the City. The right-of-way guarantee estimate is based on the 2019 King County Site Improvement worksheet for a standard frontage section.

B. Maintenance Guarantee:

   i. A maintenance guarantee shall be required to guarantee maintenance and operation of right-of-way improvements for a period of at least two (2) years.

ii. A maintenance guarantee may be required to guarantee maintenance and operation of on-site improvements for a period of at least two (2) years.

iii. For Low Impact Development (LID) or for innovative technologies, the maintenance financial guarantee term may be up to three (3) years.

iv. For street tree replacement, a maintenance guarantee is required for three (3) years.

4.14. Insurance

As a condition of the City permitting work within the public right-of-way, a Certificate of Liability Insurance shall be provided indicating that the Permittee and/or Contractor are covered by a Commercial General Liability insurance policy pursuant to SMC 12.15.040.

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 risks involved.

The minimum Commercial General Liability insurance limits are to be no less than $2,000,000 each occurrence, $2,000,000 general aggregate and $2,000,000 products completed operation aggregate limits.

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

The City shall be named as an 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.

Chapter 5. Permit Fees

All fees are set forth in the Shoreline Fee Schedule (https://www.codepublishing.com/WA/Shoreline/#!/ShorelineFEE/ShorelineFEE.html). Planning and Community Development collects these fees.

Plan review and submittal fees are collected when the application is submitted. Additional fees may include independent review costs, additional inspection or review time, and/or transportation impact fees. Additional fees are due prior to permit issuance.

5.1. Fee-in-lieu of Frontage Improvements

The City does not accept fee-in-lieu of frontage improvements. A waiver may be approved by the Director to not require frontage improvements pursuant to SMC 20.70.320.

In the instance where streets are to be improved as a whole through a Capital Improvement Project (CIP) or local improvement district within five (5) years of permit issuance, a contribution may be made and calculated based on the improvements that would be requested on the development. (SMC 20.70.320)

5.2. Latecomer Agreements

SMC 3.90 authorizes the use of latecomer agreements for the prorated recovery of the costs of installation of private, private/public, and public construction of municipal and utility system improvements through a charge to later users of the improvements who benefit from the improvements, but who did not previously contribute to the costs of such improvements.

5.3. Revisions to Issued Permits

The cost to review revisions to an issued permit is charged at the currently adopted hourly review rates. These fees shall be paid before the permit revisions are issued.

5.4. Impact Fees

The City collects impact fees for transportation and park/recreation improvement projects. The City also collects impact fees on behalf of the Shoreline Fire Department for fire protection services. Impact fees are collected at the time of building permit issuance unless a specific exemption applies. Fees are calculated based on the type of development listed in the fee schedule in effect at the time of complete application. Fee amounts are calculated during the permit review either by the City or through an approved independent fee calculation. See SMC Chapters 3.70, 3.75, and 3.80 for more information.

DIVISION 2 – RIGHT-OF-WAY

Chapter 6. Standards

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 current American Association of State Highway and Transportation Officials (AASHTO), Federal Highway Administration (FHWA), ITE, and Washington State Department of Transportation (WSDOT) standards.

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 the State of Washington. All right-of-way drawings, designs, sections, details, standard plans, and supporting data submitted to the City for approval, unless specifically excluded, shall be stamped, signed, and dated by the engineer of record.

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

The following documents and/or regulations provide the basis for design and construction requirements for public or private development within the City:

A. Shoreline Comprehensive Plan

B. Transportation Master Plan (TMP)

C. Surface Water Master Plan (SWMP)

D. Streetlight Master Plan

E. Shoreline Municipal Code

6.1. Companion Documents

When standards or other design criteria are not specifically addressed in the EDM, then the most current editions of the following shall govern the design.

A. Transportation design standards:

i. Design Manual, WSDOT; available online at https://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm

ii. A Policy on Geometric Design of Highways and Streets, AASHTO; available online at https://www.fhwa.dot.gov/programadmin/standards.cfm

iii. Guidelines for Urban Arterial Program, WSDOT; available online at http://www.tib.wa.gov/grants/grants.cfm

iv. Urban Street Geometric Design Handbook, ITE; available online at https://www.ite.org/technical-resources/topics/geometric-design/

v. Guide for the Development of Bicycle Facilities, AASHTO; available online at https://nacto.org/wp-content/uploads/2015/04/AASHTO_Bicycle-Facilities-Guide_2012-toc.pdf

vi. Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way, United States Access Board; available online at https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/proposed-rights-of-way-guidelines

vii. Americans with Disabilities Act (ADA) Standards for Accessible Design; available online at https://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm

viii. Small Town and Rural Multimodal Networks Guide, FHWA; available online at https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/fhwahep17024_lg.pdf

ix. Urban Bikeway Design Guide, National Association of City Transportation Officials (NACTO); available online at https://nacto.org/publication/urban-bikeway-design-guide/

x. Urban Street Design Guide, NACTO; available online at https://nacto.org/publication/urban-street-design-guide/

B. Surface water design standards:

i. Stormwater Management Manual for Western Washington (Stormwater Manual), Department of Ecology as amended in EDM Chapter 19, Stormwater Manual Additional Requirements; available online at http://www.ecy.wa.gov/programs/wq/stormwater/manual.html

ii. 2021 King County Surface Water Design Manual (KCSWDM), Chapter 4 "Conveyance System Analysis and Design," as amended in EDM Chapter 23, Conveyance System; available online at https://kingcounty.gov/en/dept/dnrp/nature-recreation/environment-ecology-conservation/stormwater-surface-water-management/surface-water-design-manual/surface-water-design-manual-2021

iii. Highway Runoff Manual, (HRM) M31-16.04, WSDOT; Only publicly funded linear transportation projects may use the BMPs and minim design requirements, except LID Feasibility (HRM Section 405.2 and within individual BMP design criteria in Section 5-4) available online at http://www.wsdot.wa.gov/Publications/Manuals/M31-16.htm

C. Traffic control design standards:

i. Manual on Uniform Traffic Control Devices, FHWA; available online at http://mutcd.fhwa.dot.gov

D. State highway guidelines:

i. Local Agency Guidelines, WSDOT; available online at https://www.wsdot.wa.gov/Publications/Manuals/M36-63.htm

E. Construction specifications:

i. 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:

i. Highway Capacity Manual, Transportation Research Board

ii. Standard Rock Wall Construction Guidelines, Associated Rockery Contractors

iii. National Electrical Installation Standards (NEIS); available online at http://www.neca-neis.org/

iv. American Society for Testing and Materials (ASTM); available online at https://www.astm.org/Standard/standards-and-publications.html

v. Design criteria of federal agencies including the Federal Housing Administration, Department of Housing and Urban Development, and the FHWA, Department of Transportation

6.2. Deviation from Engineering Standards

A Deviation from Engineering Standards is a mechanism to allow the City to grant an adjustment in the application of engineering standards where there are unique circumstances relating to the proposal. (SMC 20.30.290)

An application shall be submitted to request a Deviation from Engineering Standards. The application shall include justification to the nine (9) decision criteria set forth in SMC 20.30.290.

Refer to the Deviation from Engineering Standards Checklist on the City's Permit Checklists & Application Packets website for additional submittal information (http://www.shorelinewa.gov/government/departments/planning-community-development/forms-application-checklists-application-handouts/permit-checklists-application-packets).

It is recommended that an Applicant discuss a potential Deviation with a Development Review Engineer prior to submitting the application.

Chapter 7. General Requirements

This chapter provides general requirements related to right-of-way improvements.

7.1. Americans with Disabilities Act

All designs shall meet the current ADA requirements and standards. The City standard for ADA requirements is the 2011 Public Right-of-Way Accessibility Guidelines (PROWAG).

When pedestrian access route features are impacted, the pedestrian access route and all affected traffic control devices shall be improved to current ADA standards. Pedestrian access route features and possible affected traffic control devices may include, but are not limited to sidewalks, driveways, pavement markings, traffic signal systems, illumination systems, communication systems, traffic signs, and enhanced traffic control devices.

In the event field conditions prohibit meeting the ADA requirements, the Applicant's/Permittee's engineer shall submit documentation that the designed and constructed improvements meet ADA to the maximum extent feasible (MEF). The Applicant's/Permittee's engineer shall use the City's standard forms for the MEF documentation. After construction, the as-built conditions shall be surveyed by a surveyor licensed in the State of Washington. The Applicant's/Permittee's engineer shall revise the MEF documentation to reflect the as-built conditions.

7.2. Low Impact Development

Requirements for LID apply to both onsite improvements and improvements in the right-of-way. Refer to the Stormwater Manual as adopted and amended in Division 3 – Surface Water.

Permeable sidewalks installed in the right-of-way shall follow Standard Plans 775 Permeable Sidewalk and 776 Permeable Sidewalk on Slopes. Bioretention installed in the right-of-way shall follow Standard Plans 777 Bioretention Facility and 778 Bioretention Inlet.

Proprietary emerging stormwater treatment technologies that have received Ecology General Use Level Designation may be installed in the right-of-way with approval of the Director.

7.3. Maintenance

The City maintains and repairs public streets.

See SMC Chapter 12.05 for information regarding the construction and maintenance of sidewalk, landscaping, trees, and driveway approaches.

7.4. Street Tree Removal/Pruning

Street tree removal and pruning in the right-of-way is regulated by SMC 12.30.040. All trees planned for removal from the right-of-way shall be posted with the Right-of-Way Tree Removal Notification sign at least 14 days prior to removal.

Download the sign template from the City's Right-of-Way Permitting and Inspection Services webpage: https://www.shorelinewa.gov/government/departments/public-works/right-of-way-permitting-and-inspection-services.

7.5. Connectivity

In order to provide connectivity, street layouts shall continue streets in adjoining developments(s) or their anticipated locations where adjoining property is not yet developed.

7.6. Underground Utilities

Refer to SMC 20.70.430 for new service connections on private property and refer to SMC 13.20.050 for undergrounding in the right-of-way.

7.7. Frontage Improvements

A. Certain activities require the installation of frontage improvements. Refer to SMC 20.70.320.

B. Standard frontage improvements consist of dedication of right-of-way, curb, gutter, sidewalk, amenity zone and landscaping, drainage improvements, and pavement overlay up to one-half (0.5) of each right-of-way abutting a property as defined in the Master Street Plan. Additional improvements may be required to ensure safe movement of traffic, pedestrians, bicycles, transit, and nonmotorized vehicles. The improvements can include transit bus shelters, bus pullouts, utility undergrounding, street lighting, signage, and channelization.

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

D. When frontage improvements are required, City staff shall review the required improvements for consistency with SMC Chapter 12.50 regarding Complete Streets. The Complete Streets policy strives to provide an integrated multimodal transportation system that provides for the safe accommodation of pedestrians, bicyclists, transit users, motorists and users of all ages and abilities. This review may require variations of improvements from those in Appendix F – Street Matrix.

E. Acknowledging that the City is a built environment, design and installation of new or replaced frontage improvements may be adjusted during design or installation, with approval from the Director, to meet the existing conditions. Approval may require a formal Deviation from Engineering Standards, as determined by the Director.

F. Appendix F – Street Matrix defines street widths, curb locations, sidewalk widths and other right-of-way requirements for all streets.

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

H. An amenity zone is required, except where an alternate street design has been approved, or where protection of critical areas requires special consideration.

I. Required frontage improvements shall 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.

J. The installation of required frontage improvements shall not create flooding, ponding, or other drainage issues.

K. The design of frontage improvements shall address the access needs of the adjacent land use such as mail collections, solid waste and recycling services, and deliveries.

L. Private irrigation systems installed in the amenity zone shall be maintained by the abutting property owner and shall be connected to the water line servicing that abutting property.

7.8. 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. Refer to SMC Chapter 20.70 for more information.

C. The Director may grant some reduction in the minimum right-of-way requirement where it can be demonstrated that sufficient area has been provided for all frontage improvements, including utilities, within the right-of-way.

D. Dedications may be required in the following situations:

   i. Accommodation of motorized, pedestrian and bicycle transportation, landscaping, utility, street lighting and traffic control devices, and buffer requirements;

   ii. 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;

   iii. Right-of-way is needed for the extension of existing public street improvements necessary for public safety; and

   iv. Right-of-way is needed in order to incorporate improvements that are reasonably necessary to mitigate the direct impacts of development.

E. Trees located on private property that are to be dedicated to the City as a right-of-way dedication shall not be considered street trees for the purposes of determining required replacement trees. Only trees within the existing right-of-way are considered street trees.

7.9. Curbing

A. Curb and gutter shall be Type A per Standard Plan 312, Curb and Gutter on all street classifications; however, 24-inch wide vertical curb may be used for uniformity or replacement.

B. Rolled curb is not allowed, unless it replaces or matches existing, and/or it is approved by the Director.

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

7.10. Pavement Cut Moratorium

The following applies to a utility doing work, such as system repair or expansion, within the right-of-way. This moratorium does not apply to utility service installation required for new development or redevelopment.

A. Any street that has been constructed, reconstructed, resurfaced, overlaid or paved within the past five (5) years cannot be cut for five (5) years from the date of project completion unless:

    i. A Deviation from Engineering Standards is approved; or

    ii. It is allowed through a valid franchise agreement.

B. Emergency situations are exempt from the five (5) year moratorium. A right-of-way permit shall be applied for within 48 hours after beginning emergency work in the right-of-way pursuant to SMC 12.15.060.

7.11. Staging Area for Solid Waste Detachable or Drop-box Containers

The staging area for collection of detachable or drop-box solid waste containers shall be:

A. Located outside of public right-of-way.

B. Located so that hauling trucks do not project into public right-of-way during collection.

C. Accessed in a manner that does not require trucks to back into or out of public rights-of-way.

Chapter 8. Illumination

Lighting improvements are required as part of roadway frontage improvements and shall be designed and constructed consistent with this chapter and the target lighting levels provided in Appendix I unless otherwise approved by the City Traffic Engineer.

8.1. General Requirements

An illumination system consists of the following basic components:

    i. A SCL power connection;

ii. A SCL power metering point;

iii. A SCL termination handhole;

iv. A Shoreline owned electrical service cabinet, containing circuit breakers and photocell-controlled lighting contactors (switches);

v. Conduit, junction boxes, and wiring between the service cabinet and the individual light standards;

vi. A light standard (pole) with concrete foundation. The pole base may include breakaway features as appropriate; and

vii. A luminaire (light) on the pole above the roadway.

A. SCL maintains and establishes service connections for street lighting within the City. When street lighting is required or modified, the Applicant/Permittee shall coordinate closely with the Public Works Department and SCL on design and installation. The Applicant/Permittee pays the costs associated with the design and installation of the lighting system. These costs may include new electrical service cabinet and/or a new pole.

i. Utilize the SCL Electrical System map for potential SCL power connection points: https://seattlecitygis.maps.arcgis.com/apps/MapSeries/index.html?appid=24bdb8181b2848ec9ee2cf92723c0319

ii. Locate Shoreline metered service cabinets close to the SCL termination handhole, on minor streets if possible, and outside of sight triangles (see Chapter 13.8).

iii. Shoreline metered service cabinets shall be located on the same side of the street as the SCL termination handhole.

iv. Conduit coming from the SCL termination handhole shall route directly into the Shoreline metered service cabinet foundation without any additional Shoreline owned and maintained junction boxes.

v. When provided, Shoreline service cabinets, and SCL wiring shall be designed and installed with 100 Amp main breakers unless otherwise approved by City Traffic Engineer.

vi. SCL Customer Requirement Drawings for Shoreline metered service cabinets are required to be provided to Traffic Services and the details of the SCL Customer Requirement Drawing (SCL power connection, SCL termination handhole) shall be reflected in the final as-built illumination plans.

a. Proposed SCL power connections and proposed SCL termination handholes may be shown as preliminary until final documentation from SCL is available.

B. Contractor installed, City owned service cabinets containing circuit breakers, photocell-controlled lighting contactors (switches), and other necessary components are required for installation of roadway and sidewalk lights.

C. Projects installing metered lighting located near an existing cabinet may be allowed to connect to the existing cabinet with approval from the City Traffic Engineer. At minimum, the following conditions must be met:

i. Roadway and pedestrian scale lighting must be on separate circuits.

ii. A given circuit can have a maximum of 14 luminaires. Load calculations must be provided showing that both the cabinet and the circuit can support the additional load.

iii. If there would be a gap in lighting between the existing cabinet and the project– photometric and load calculations must be submitted showing that lighting could be provided in the missing gap and result in under 12 luminaires on the same circuit.

iv. Modifications of existing systems are more complex. Any existing system that is modified shall be updated to current system design and NEC requirements. This may require adding ground wires to conduits, replacing junction boxes and/or conduits, modifying light standard foundations and grading to support proper slip base function, or replacing wiring and splices.

D. All new and retrofitted lighting systems shall be Light Emitting Diode (LED).

E. Newly installed roadway and sidewalk lighting standards shall be approved by the City and SCL and shall be consistent with SCL's Stock Catalog including but not limited to poles, arm types and lengths, mounting heights, and luminaires. https://web8.seattle.gov/city-light-engineering-standards/BrowseAll

F. All lighting shall conform to NEIS standards. Street lighting system designs shall be stamped by a Professional Engineer licensed in the State of Washington experienced with lighting design and shall include the following: photometric calculations, illumination calculations, line losses. Plans shall include centerline/station/offset, existing signal and illumination infrastructure where applicable, illumination calculations summary table (illumination level, uniformity ratio), a wiring schedule, one-line diagram, breaker schedule, junction box schedule, sidewalk and/or roadway light standard schedule, location of SCL power connection point, location of Shoreline service cabinet, landscaping elements, the electrical and physical layout, installation details, and specifications. All designs shall be approved by the City Traffic Engineer or designee.

G. As-constructed roadway and sidewalk lighting plans for City-owned systems shall be provided to the City. Refer to Appendix H – Record Drawing Criteria for as-built guidelines.

H. Street lighting systems shall be designed to be accessible by a wheeled vehicle weighing 30,000 lbs.

I. The exact location of the power source for all roadway or sidewalk lights shall be indicated on the plans together with the remaining capacity of that circuit. System continuity and extension shall be provided.

J. Street lighting may be 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. All streetlight maintenance, installation, and power costs for private street systems shall be paid by the property owner, homeowner, or homeowners' association.

K. Ensure street trees in the public ROW have 8’ clearance (or 3’ clearance with tree barrier) from the Shoreline metered service cabinet and any poles. See EDM Chapter 15.2. Landscaping.

L. Junction boxes shall be placed either in the amenity zone, observing necessary street tree clearances, behind the sidewalk within City right of way, or in the sidewalk with ADA compliant, non-skid lids if the amenity zone and behind the sidewalk are unfeasible for placement.

    i. Junction boxes shall not be placed in the roadway.

    ii. Junction boxes shall not be placed within curb ramps or curb ramp landings.

M. Non-SCL maintained roadway crossings shall be perpendicular to the roadway being crossed with junction boxes on both sides and shall be placed at intersections or at marked midblock crossings.

8.2. Roadway Lighting

A. Lighting level requirements and design areas are provided in Appendix I – Street Lighting Levels Criteria.

B. Where a half-street improvement is required in conjunction with a development, the roadway width to be used for illumination design purposes shall be the full design width of the roadway. Plans depicting the full design width of the roadway, curb to curb, are required.

C. Roadway illumination calculations are required for the entire roadway consistent with Appendix I. If the existing design does not meet the target standards within Appendix I,

additional roadway lighting in the form of leased luminaires, higher powered leased luminaires, or metered roadway lighting will be required. Lighting calculations should be based on a 5 x 5 foot grid. Calculations for illumination and uniformity levels shall be provided in the following design areas consistent with requirements described in Appendix I.

i. Arterial Streets and high activity Local Streets – each street shall have a separate calculation provided.

ii. Intersections and Significant Driveways

iii. Midblock crossings

iv. Street ends

D. Roadway luminaire arm lengths should be designed such that luminaire is directly over the edge line plus or minus 4 feet from roadway edge line.

E. Roadway light pole placement must be a minimum of 10 feet horizontally from any overhead power line, including neutrals and aerial service connections. Even if a location may be more than 10 feet from the wire, 10 feet of horizontal clearance is required for crane operations to place the pole. In some cases, such as high voltage transmission lines, the required horizontal clearance distance may be greater than 10 feet. For overhead line voltages more than 50,000 volts (50 kV), the minimum required offset distance from the lines shall be increased by 0.4 inches for every additional 1 kV in accordance with WAC 296- 24-960. Consideration should also be given to crane clearances as described in WAC 296-155-53408 Table 4.

8.3. Sidewalk Lighting

A. Projects within Mixed Use, Mixed Business, Community Business, Neighborhood Business, Town Center, and Campus zoning designations and located along an arterial street shall provide pedestrian scale lighting per Standard Plan 440, Pedestrian Lighting and consistent with Appendix I.

i. Sidewalk lighting can be provided via 1 of 3 options. All options require an illumination calculations summary table on the plan sheet:

a. Pedestrian scale luminaires placed at 50-foot spacing. In this scenario, no pedestrian lighting calculations are required.

1. Please add a note in the illumination calculations summary table that the lighting target is met via the 50’ spacing criteria.

b. Pedestrian scale luminaires placed at different spacing that meet the minimum requirements of this chapter and the requirements shown in Appendix I, with calculations included.

c. A combination of pedestrian scale luminaires, roadway luminaires, and/or non- City owned/maintained building facade lighting that meet the requirements shown in Appendix I, with calculations included.

Chapter 9. Street Classification

Federal and State guidelines require that streets be classified based on function. The City mainly classifies streets as arterial or non-arterial (local). Other classifications include alley and private streets. The street classification map is available on the City's website: http://www.shorelinewa.gov/home/showdocument?id=45928. Street classification is approved through the TMP process.

9.1. Arterial Streets

Arterials 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 classes: Principal, Minor and Collector Arterials.

A. Principal Arterials:

i. Principal Arterials have higher levels of local land access controls, with limited driveway access, and have regional significance as major vehicular travel routes that connect metropolitan areas.

ii. Examples include: Aurora Avenue N, NE 175th Street, and 15th Avenue NE.

B. Minor Arterials:

i. Minor Arterials generally provide a high degree of intra-community connections and are less significant than Principal Arterials when considering regional mobility.

ii. Examples include: Meridian Avenue N, N/NE 185th Street, and NW Richmond Beach Road.

C. Collector Arterials:

i. Collector Arterials assemble traffic from the interior of an area/community and deliver it to the closest Minor or Principal Arterial. Collector Arterials provide mobility, and access to property.

ii. Examples include: Greenwood Avenue N, Fremont Avenue N, and NW Innis Arden Way.

9.2. Non-Arterial Streets

Streets that are not designated as arterials are non-arterial streets. The City divides non-arterial streets into Local Primary and Local Secondary classifications. Refer to the City's TMP for more detail on street classifications, located on the City's TMP webpage: https://www.shorelinewa.gov/government/departments/public-works/transportation-planning/transportation-master-plan.

9.3. Alley

Per the Revised Code of Washington (RCW) 46.04.020, an alley is a public right-of-way that is used primarily as a means of access to the rear of residences and business establishments and is not designated for general vehicular or pedestrian travel. The City does not maintain alleys.

9.4. Private Street

A private street is a privately owned and maintained street providing vehicular access within a property or properties. The City may approve a private street under certain conditions (see SMC 20.70.240). Refer to EDM Section 12.8, Private Streets for more information.

Chapter 10. Access Management

Access management recognizes the need to balance access to private properties with the maintenance of safety, capacity and Level of Service (LOS) on the streets that provide access. Property owners abutting City right-of-way generally have a right to access, but the means of access shall be reviewed and approved by the City.

Safety and the function (both current and future) of each street are the foremost factors in determining the number, location, and design of street accesses. Roadway design elements such as auxiliary lanes, medians, channelization, and safe stopping and turning sight distances are also factors in access management, as are the elements of land development, such as internal site circulation and parking layout. Access management is implemented via the Right-of-Way Use Permit, Site Development Permit, Building Permit, and Subdivision review processes.

10.1. General

A. Authority:

i. City Rights-of-Way:

a. The Director approves the design, number, and location of access points to City rights-of-way. When changes in land use result in changes to the type and operation of access, the access location and design shall be reviewed with the development plans and shall be constructed or modified to meet current standards.

ii. State Highways:

a. Access to State highways is regulated by WSDOT pursuant to RCW Chapter 47.50 and Washington Administrative Code (WAC) Chapters 468-51 and 468-52. Two classifications of State highway exist within City Limited Access and Managed Access. Interstate 5 is the only Limited Access Highway within the City. SR 99 (Aurora Avenue N), SR 522 (Bothell Way NE), SR 523 (N/NE 145th Street) and SR 104 (Ballinger Way NE) are Managed Access Highways within or adjacent to the City. For information on access permitting through WSDOT, please visit the WSDOT Access Management website: https://wsdot.wa.gov/engineering-standards/design-topics/right-way-access-control

iii. Construction or improvement of an access, approach or driveway, or construction of any classification of street that will intersect a State highway shall be designed in accordance with this EDM and WSDOT requirements. Where applicable state or federal standards exceed the requirements of the EDM, state or federal standards shall govern.

B. Consolidation of Access:

i. In the interest of safety and efficient traffic operations, access to individual and contiguous lots should be consolidated to the extent practicable. Access shall be reviewed and approved to minimize conflicts between vehicles, pedestrian and bicycle traffic, and traffic entering and exiting adjacent driveways.

ii. Each lot shall have access to a public right-of-way by:

a. Direct access to a right-of-way; or

b. By a recorded easement providing shared access; or

c. By a recorded tract providing shared access.

iii. No more than one (1) access shall be provided to an individual lot, to contiguous lots under the same ownership, or to lots that are included in the same subdivision or project, unless approved by the Director. Additional access may be granted to contiguous lots if the minimum spacing requirements are met or if a Traffic Engineering Study acceptable to the

Director demonstrates that the additional access will not adversely affect safe operation of the street.

C. Required Access:

i. All new development shall be served by adequate vehicular access as follows:

a. Every lot upon which one (1) or more building(s) is proposed to be erected, or where a traffic generating use is proposed, shall establish direct access from the street right-of-way, access easement, or fire lane, as needed to provide public services such as fire protection, emergency medical service, mail delivery, or trash collection.

b. The circulation system of the proposed development shall intersect with existing and planned streets abutting the site at approved locations.

ii. The circulation system within the proposed development shall provide direct connections to adjacent developments (inter-lot) where appropriate and/or required.

D. Maintenance:

i. Maintenance of driveway approaches shall be the responsibility of the owner whose property they serve.

E. Restriction of Turning Movements:

i. Conflict reduction measures may be required to safely manage turning traffic to and from the development site. Median design and driveway channelization are appropriate to reduce conflicts.

ii. Traffic control devices controlling traffic from private property shall be installed and by the property owner at no cost to the City.

F. Abandoned Access:

i. All abandoned accesses on the same frontage shall be removed within 30 days after abandonment and the curbing, sidewalk, and amenity zone, or shoulder and ditch section shall be restored to meet current standards.

G. Temporary Access:

i. The City Engineer may grant temporary access to accommodate phased development of a site in accordance with an approved phasing plan. Temporary access shall be removed, relocated, redesigned, or reconstructed after permanent, approved access is constructed.

H. Transition Areas:

i. Developments within a Transition Area (commercial zones NB, CB, MB and TC-1, 2 and 3, abutting or directly across street rights-of-way from R-4, R-6, or R-8 zone) shall follow requirements in the SMC 20.50.021(C).

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:

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

B. Design:

i. Access design shall comply with required grade transitions while considering building setback, terrain, and existing and designed grades.

C. Emergency Vehicles:

i. All accesses shall be located and designed to readily accommodate emergency vehicles that would ordinarily respond to the site. The International Fire Code, as adopted by SMC Chapter 15.05, shall also apply to driveways designated as fire lanes and/or fire apparatus access roads.

D. Traffic Control Devices:

i. All on-site traffic control devices, including signs and pavement markings, shall meet the MUTCD standards.

E. Sight Distance:

i. All new access points shall meet sight distance standards per Chapter 13.8. New access points shall not require modification to adjacent properties to comply with sight distance standards.

F. Consolidation:

i. Consolidation and joint use of access is strongly encouraged. Coordination with the City on the design and dedication of public alleys to facilitate future joint use may allow for increased flexibility in access standard requirements.

11.2. Access Width

The access width is measured at the right-of-way/property line. Table 3 provides maximum/minimum access widths. The City Engineer may approve a wider access when the traffic study or the turning radius of the appropriate design vehicle turning radius warrants the wider access.

Table 3. Access Widths

Access Types	Non-Arterial Streets		Arterial Streets	
	Width (ft)		Width (ft)	
	Min.	Max.	Min.	Max.
Residential	10	20	10	20
Shared	20	30	20	30
Multi-family	20	30	20	30
Commercial	20	30	20	36
Private Street	20	30	20	30

11.3. Access Clearance and Spacing

Minimum Access Spacing and Clearance distances are provided in Table 4.

Table 4. Access Spacing and Clearance

Access Spacing and Clearance		Local Streets	Minor & Collector Arterial Streets	Principal Arterial Streets
Access Spacing (ft) Residential – serving 4 or fewer homes		10	20	75
Access Spacing (ft) All other land uses		30	50	100
Clearance from Intersections (ft) Residential - serving 4 or fewer homes	Signalized, Roundabout, or All-Way-Stop-Controlled	75	100	125
	All other intersections	50	75	100
Clearance from Intersections (ft) All other land uses	Signalized, Roundabout, or All-Way-Stop-Controlled	100	125	150
	All other intersections	75	100	125

Access points resulting in reduced spacing and/or clearance to intersections may be approved under the following circumstances:

ii. The parcel frontage is not long enough to achieve spacing and/or clearance standards;

iii. The project does not generate more than twenty (20) net new PM peak trips;

iv. The parcel to be served cannot be accessed from another lower classification street; and

v. The access is located to best balance the sometimes competing minimum spacing and intersection clearance standards, with the priority focused on achieving intersection clearance to the extent feasible.

Access control may be required for driveways not meeting the minimum spacing and/or intersection clearance standards. Projects that generate more than twenty (20) net new PM peak trips and do not meet minimum spacing and/or intersection clearance requirements will be required to demonstrate the safety and operational legitimacy of the proposed location within the Transportation Impact Analysis.

A. Multiple Frontages and Corner Parcels:

i. Access for projects with multiple frontage shall be provided from the lower classified road except in transition areas per SMC 20.50.021. Additional access may be allowed provided spacing requirements are met.

B. Circular Driveways

i. Circular driveways shall meet all the following criteria:

a. Driveways shall meet the applicable requirements of this chapter;

b. Driveway sight distance as described in Chapter 13.8 is available for both access points;

c. Circular driveways shall be designated for one-way traffic circulation, unless otherwise approved by the City Traffic Engineer;

d. One-way circular driveways shall be a minimum of twelve (12) feet wide and up to fifteen (15) feet wide. Turning path diagrams may be required to demonstrate emergency vehicle access;

e. Circular driveway approaches shall be separated by a minimum of forty (40) feet between their closest point;

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. Approaches shall conform to Standard Plans 301-306 based on site conditions.

B. The maximum change in access approach profile grade, within the right-of-way, shall be six (6) percent within any ten (10) feet of distance on a crest vertical curve and 12 percent within any ten (10) feet of distance in a sag vertical curve.

C. Driveways, parking, or loading areas that require backing maneuvers in a public street shall be approved only for single-family detached or duplex residential uses abutting a Local street.

D. A drainage culvert is required for access approach that crosses an open ditch section. Minimum culvert internal diameter shall be 12 inches, or larger if required to carry anticipated stormwater flows. Refer to EDM Chapter 23, Conveyance System for additional information regarding required culvert size and materials.

E. An access shall not be placed in a curb setback.

11.5. Driveway

A. A driveway, including the landing, extends from the access at the property line/right-of-way line onto the property.

B. Driveways shall be graded to blend into possible future road section without encroachment into graded shoulder or sidewalks.

C. A shared driveway has one (1) access to the right-of-way via a shared tract or easement on the private property. Minimum tract/easement length shall be 20 feet from the right-of-way line. Refer to Standard Plan 307, Shared Driveway.

D. Driveways shall be paved to the nearest property line of the most distant lot sharing the access or 20 feet, minimum, whichever is farther.

E. All driveways shall be 90 degrees to the street at the right-of-way access unless a Deviation from Engineering Standards is approved.

F. A landing on a driveway accessing an arterial shall not exceed a 1V:30H slope for a distance of 30 feet. For an access to a local street, the landing slope shall not exceed 1V:20H slope for a distance of 20 feet. Refer to Standard Plan 215, Intersection Landing.

G. The maximum driveway profile grade is 15 percent. Shoreline Fire Department may approve steeper grades for short distances.

H. The maximum change in driveway grade shall be eight (8) percent within any ten (10) feet of distance on a crest and 12 percent within any ten (10) feet of distance in a sag vertical curve.

I. Grade breaks, including the tie to the roadway, shall be constructed as smooth vertical curves.

11.6. Parking Lot Throat Lengths

A. Traffic signage in a parking lot shall meet MUTCD requirements.

B. The required throat length at a parking lot access to public right-of-way is determined during the permit review process and through analysis provided within the Transportation 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 (2) approach lanes, subject to the traffic 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.

Chapter 12. Street Design

This chapter sets the minimum standards for the geometric street design. The most current WSDOT Design Manual shall be used where additional roadway geometric guidance is necessary.

12.1. Reconstruction

A. Reconstructed roadways shall be brought up to current standards.

B. Transitions or tapers necessary to connect with existing roadway of a different width shall meet AASHTO and MUTCD standards.

12.2. Widths

A. Minimum widths for specific streets are provided in Appendix F - Street Matrix.

B. Typical Lane widths are defined in Table 5.

Table 5. Typical Lane Widths

Lane Type	Width (ft)
Parking	6-8 *
Bus Only	11-12
Vehicle Lane	10-12
Bicycle	5-6
Bicycle/Vehicle	14
Bicycle Buffer	2-3

12.3. Vertical Alignment

A. Curve length and stopping sight distance shall be designed to ensure proper drainage, clear sight distance, and safety for vehicles and pedestrians.

B. The maximum profile grades in Table 6 may be exceeded for 300 feet or less, upon showing that no practical alternative exists. Exceptions exceeding 15 percent shall require approval by the Shoreline Fire Department's Fire Marshal.

C. Grade transitions shall be constructed as smooth vertical curves except, upon approval of the Director, in intersections where the difference in grade is one (1) percent or less.

Table 6. Maximum Profile Grade

Local Secondary	Local Primary	Arterial - Collector	Arterial - Minor	Arterial - Principal
15%	10%	10%	10%	9%

12.4. Vertical Curve Criteria

A. The minimum vertical curve length for roadways is 75 feet.

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

C. Cross Slope: The typical cross slope is two (2) percent crown to provide for adequate drainage to the pavement edge. The maximum cross slope on the tangent sections shall not exceed four (4) percent. The minimum cross slope shall be one (1) percent.

D. Stopping Sight Distance: SSD applies as shown on Table 7, Vertical Curve – Minimum Stopping Sight Distance.

E. SSD is based on an eye height of three and one-half (3.5) feet and the height of an object at one-half (0.5) foot.

F. For downgrades exceeding three (3) percent, the SSD shall be increased by the values shown in Table 7, Vertical Curve – Minimum Stopping Sight Distance.

G. The Director may approve sag vertical curves on Local Primary and Local Secondary Streets with SSD less than that in Table 8, if no practical design exists and if acceptable road lighting is provided throughout the curve.

Table 7. Vertical Curve - Minimum Stopping Sight Distance (ft)

Design Speed (mph)	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. Superelevation is not required in the design of horizontal curves of Local Primary and Local Secondary Streets, but may be needed to meet terrain and right-of-way conditions.

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

C. See Table 8 for horizontal curve standards.

Table 8. Horizontal Curve Design

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

1 Use these criteria without superelevation.

2 Radii based on crown section with two (2) percent slope on each side of crown.

3 Where superelevation is used, calculate runoff lengths according the WSDOT Design Manual.

4 Where a curved road approaches an intersection, these tangent sections shall 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 superelevation 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 superelevation 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 – See Standard Plan 209, Street Ends.

A. Turnaround facilities shall be provided at street ends where the street length from the nearest intersection is more than 200 feet measured from the face of curb to end of dead-end street pavement, and shall be constructed as follows:

   i. Minimum right-of-way diameter across bulb section: 93 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.

   ii. Right-of-way may be reduced, if utilities and necessary drainage are accommodated on permanent easements within the development.

   iii. Minimum diameter of surfacing across bulb: 80 feet of paving in curb type road.

   iv. Cul-de-sac Island (Optional). If provided, 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 adjoining property owners shall maintain the island through a maintenance agreement.

   v. Sidewalks shall be constructed on both sides of the stem and on the bulb.

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

C. A public pedestrian connection or an emergency vehicle access to connect a street at its terminus with other streets, parks, schools, bus stops, or other pedestrian trip generators shall be required. Off-street sidewalks shall be contained in the right-of-way or a sidewalk easement.

D. If a street temporarily terminated at a property boundary during development serves more than three (3) lots or is longer than 200 feet, a temporary bulb shall be constructed near the subdivision boundary. The paved bulb shall be 80 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 Applicant/Permittee who extends the road.

E. The maximum cross grade of a street at the street end shall be eight (8) percent.

F. Partial bulbs or eyebrows shall have a minimum paved radius and an island configuration. Island shall be offset two (2) feet from edge of traveled way.

G. A hammerhead per Standard Plan 208, On-Site Street Ends may be used to fulfill the requirement to provide a turnaround facility where the street serves (or will serve) four (4) or fewer single-family residential units.

H. Pedestrian access shall be required to connect a street end to adjacent streets, parks, schools, or other pedestrian facilities. The pedestrian access shall be in right-of-way or, if approved, may be 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 200 feet, measured from the face of curb to the end of the dead-end street pavement.

12.7. Utility Locations

A. Utility structures shall be located in the amenity zone, at the back of sidewalk without encroaching onto private property, in the gutter line, or within the roadway (outside of vehicular wheel paths is preferred) as specified in Table 9, Underground Utility Locations.

B. New utility structures are not allowed in sidewalks, driveways, driveway approaches, or curb ramps.

C. Underground systems shall be located at least five (5) feet away from road centerline and where the system will not otherwise disturb existing survey monuments.

Table 9. Underground Utility Locations-

Utility	Location from Centerline	Cover	Notes
Water Main[1]	5 to 10 feet north and east	Minimum 24-inch cover from finished grade, ditch bottom or natural ground.	
Water Service	N/A	Minimum 24-inch cover from finished grade, ditch bottom or natural ground.	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 the sidewalk and right-of-way line. Not to be located within a driveway.		
Sanitary Main[1, 2]	5 feet south and west	Minimum 96-inch over from finished grade, ditch bottom or natural ground.	Stub out perpendicular to water main preferred. Tracer wire is required.
Force Main Side Sewer	Within 10 degrees of perpendicular-to-road centerline and extend to the 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	5 to 10 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 ten (10) feet in accordance with the most current edition of the Criteria for Sewage Work Design, Washington Department of Ecology.

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

i. Utility poles or other appurtenances shall be located as far from the travel lane 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.

ii. 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.

iii. Utility poles or other appurtenances shall be located back of ditches, unless an alternate location is approved by the Director.

iv. Utility poles should not be placed in sidewalks, curb ramps, or landing areas. Utility poles shall not impede ADA access in any way.

v. On roadways having vertical curb, poles and obstacles shall be placed clear of sidewalks.

vi. On arterials and non-arterial streets, poles and obstructions shall be placed at least five (5) feet from edge of travel way.

vii. Deviations from the pole and obstacle clearance criteria may be requested by utilities when there are no other viable alternatives and shall identify adequate protection for motorized and nonmotorized users.

12.8. Private Streets

A. Private street design and installation shall meet ADA requirements.

B. For private streets with a dead-end, refer to EDM Section 12.6, Street End and Standard Plan 209, Street Ends.

C. The private street shall be paved.

D. Pedestrian access at least five (5) feet wide shall be provided on at least one (1) side of the private street. The pedestrian access shall be separated by a curb or other acceptable physical barrier. Parking is not permitted in the pedestrian access.

E. Street lighting systems for private streets shall be designed and constructed on a separate power source from the public street systems and shall be the responsibility of the property owner, homeowner, or homeowner's association.

F. Private streets shall be designed to provide adequate access for trash collection and merchandise deliveries.

G. See EDM Section 11.2, Access Width for access width requirements.

H. See SMC 20.70.240 for private street requirements.

12.9. Woonerf

A woonerf (also known as a home zone, living street, or shared street) is a street that facilitates pedestrian, bicycle, and vehicular traffic within a shared space. Woonerfs typically lack separate pavement zones for different travel modes (e.g., walking, bicycling, and driving) and include a variety of surface treatments, bollards, street lighting, and landscaping to define a shared space.

Woonerfs can be private or public and are intended to be designed to meet the needs of the immediate community. The following standards are generalized and provide a starting point for woonerf design. Each woonerf is a unique shared space.

Woonerfs designs should achieve the following objectives:

A. Shared pedestrian, vehicular, and bicycle traffic;

B. Safe transitions for between woonerfs and standard facilities;

C. Traffic calming measures, such as sitting areas, planters, parking spaces, and bollards; and

D. ADA-compliant access.

Woonerf design requirements include the following:

A. Entrance/Exit:

   i. The international woonerf sign is required at all entrances and exits. Informational signs may be placed under the international woonerf sign.

   ii. Traffic calming measures may be required at entrances and exits.

B. Designated Spaces:

   i. The design shall not give the impression of a curbed roadway and elevated sidewalk.

   ii. To designate pedestrian-only spaces, the use of bollards, landscaping, and other protection are encouraged.

   iii. Parking and/or loading spaces are acceptable. Parking spaces shall be distinguished by pavement markings, surface treatments, or other means.

C. Surface Treatments:

   i. The use of a variety of surface treatments is encouraged.

D. Other Amenities:

i. Pedestrian-scale lighting is required consistent with EDM Section 7.9, Illumination.

E. The Applicant shall coordinate with the Shoreline Fire Department to ensure adequate access is provided for emergency services.

12.10. Street Parking

A. Where angled street parking is provided within street rights-of-way, adequate accessible designated spaces consistent with PROWAG R310.4 and R310.5 must be provided

i. Spaces shall be designated with R7-801 sign or similar sign as appropriate

B. Load/Unload - if a development is expected to result in an increase of twenty trips or more, the following load/unload spaces should be provided:

i. Five (5) minute passenger loading zone complying with PROWAG 311.

a. For buildings with exclusively residential units, provide a full-time passenger loading zone.

b. For buildings without residential units, passenger loading zone restriction can be limited to business hours.

ii. Fifteen or thirty minute load/unload zone for short loading needs (such as deliveries etc.) located near the entrance to the building. This restriction should be limited to business hours as appropriate for both residential and commercial/retail buildings.

C. Time Restricted Parking

i. Buildings with ground floor commercial, retail or restaurant should have one (1) or two (2) hour time-limited parking for any on-street parking outside of designated load/unload areas.

ii. Some time restricted parking shall be accessible per the requirements in PROWAG R310.2. The number of accessible spaces will be determined by the City Traffic Engineer or designee.

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.

To the extent feasible, intersection design shall conform to the guidelines set forth in the most current versions of the WSDOT Design Manual, AASHTO Policy on Geometric Design, the ITE Urban Street Geometric Design Handbook, and the MUTCD, including alignment, sight distance, and geometric elements.

13.1. Alignment

A. The angle of an intersection of two (2) streets shall be 85 degrees to 95 degrees.

B. It's desirable that entering through traffic is aligned with the exit lanes at an intersection. However, the entering and exit lanes may be offset up to six (6) feet as shown in WSDOT Design Manual Exhibit 1310-1, when the following conditions are met:

   i. Illumination is provided;

   ii. The intersection is not within a horizontal curve, nor is it within a crest vertical curve; and

   iii. The taper rates provided in Table 10 are used.

Table 10. Intersection Alignment Taper Rates

Posted Speed Limit (mph)	Taper Rate
40	27:1
35	21:1
30	15:1
25	11:1

C. Dotted extension lines may be required when the travel lanes are offset.

D. Special consideration shall be made when the exit lanes have been shifted to the right to ensure vehicles can safely traverse the intersection without conflicting with on-coming traffic.

13.2. Spacing

The minimum distance between adjacent parallel private or Local Primary and Local Secondary Streets shall be 150 feet, measured from nearest curb edge to nearest curb edge. For all other intersections, the spacing shall be determined during preliminary design.

13.3. Design Vehicles

A. Where applicable, the intersection design shall accommodate the use of the roadway as a designated truck route, bus route, or school bus route.

B. The City's standard design vehicle is the AASHTO SU-30, although use of larger design vehicles may be required depending on roadway classification, transit routes, and adjacent land use.

C. 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 travel flow, unless otherwise approved by the Director.

13.4. Curb Radii

A. Curb radii design shall 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, round curb radii to the nearest five (5) foot increment.

C. Typical curb radii based on street classification are shown in Table 11. However, these values may be impacted by site conditions, including width of receiving lanes, on-street parking, and angle of intersecting roadways.

Table 11. Typical Minimum Curb Radii Design Values

Street Classification (for highest street classification at intersection)	Radius
Arterial to Arterial	25 feet
Arterial to Local Street	20 feet
Local Street to Local Street	20 feet
Where vehicular turn is prohibited	10 feet
Radii for curb setbacks and bulb-outs	15 feet

13.5. Drainage

A. An intersection shall be laid out and graded so that surface water drains and the intersection is safe and accessible for pedestrians and bicyclists.

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

C. Unless otherwise approved by the City, drainage structures shall be located outside the corner radii.

D. Drainage structures shall be placed at upstream side to reduce runoff or ponds in ADA ramp area.

E. When new curb and gutter is installed as part of frontage improvements, drainage shall be addressed to avoid ponding upstream and flooding downstream. This typically involves the installation of catch basins at the extents of the frontage improvements.

13.6. 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 (4) percent extending a minimum of 50 feet in each direction, measured from the outside edge of the travel lane of the intersecting street.

C. At signalized intersections, the maximum grade is two (2) percent within the intersection and extends 200 feet in each direction. Grades above four (4) percent shall be allowed only in areas with steep topography or other unusual circumstances that prevent a flatter grade.

D. On sloping approaches at an intersection, landings shall be provided with grade not to exceed one (1) foot difference in elevation for a distance of 30 feet approaching an arterial or 20 feet approaching a Local Primary or Local Secondary Street, measured from future right-of-way line (extended) of intersecting street. See Standard Plan 215, Intersection Landing.

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

13.7. Pedestrian Accommodations

A. To provide pedestrian safety, accommodations for pedestrians shall be designed into all intersections. Pedestrian accommodations include sidewalks, crosswalks, and pedestrian refuge islands. Pedestrian accommodations shall meet ADA guidelines. See the Standard Plans 300 Series for curb ramp, driveway, crosswalk and sidewalk.

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

C. Two (2) compliant curb ramps with tactile warning strips shall be installed at each corner, where possible, and corresponding companion ramps shall adhere to RCW 35.68.075. This may require construction or retrofit of companion ramps.

D. When street paving impacts an intersection or modification to a curb ramp occurs, the curb ramps shall be retrofitted to meet the current standard. Impact to an intersection is defined as:

i. Nine (9) SF or more of disturbance to the sidewalk within the area bounded by the curb, the right-of-way or property lines, and the extensions of right-of-way/property lines (across the sidewalk); or

ii. Three (3) linear feet (LF) of disturbance to the curb; or

iii. Development projects requiring installation of frontage improvements; or

iv. 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.

13.8 Sight Distance

A. General:

i. Sight distance is the length of roadway visible to a driver. Sight distance standards are established to ensure drivers have sufficient time and distance to make decisions such as stopping to avoid a collision, or starting a turn onto a roadway. For all conditions, the City of Shoreline applies a driver eye location that is offset ten (10) feet minimum to eighteen (18) feet maximum from the edge of conflicting roadway traveled way, and is three and a half (3.5) feet above the pavement grade. Sight lines are measured in consideration of a two (2) foot tall object height. Additional context, criteria and requirements for sight distance standards are provided in A Policy on Geometric Design, AASHTO, A Guide for the Development of Bicycle Facilities, AASHTO, and the WSDOT Design Manual.

B. Stopping Sight Distance:

i. Stopping Sight Distance is the design principle that ensures drivers traveling along a roadway have adequate time to perceive, react to and stop a vehicle in time to avoid a collision. Table 12 provides the Stopping Sight Distance required based on the roadway speed limit and grade. Stopping Sight Distance is the minimum standard applicable to travel along a roadway. Object height is assumed to be two (2.0) feet, consistent with AASHTO and WSDOT standards.

Table 12. Stopping Sight Distance Requirements

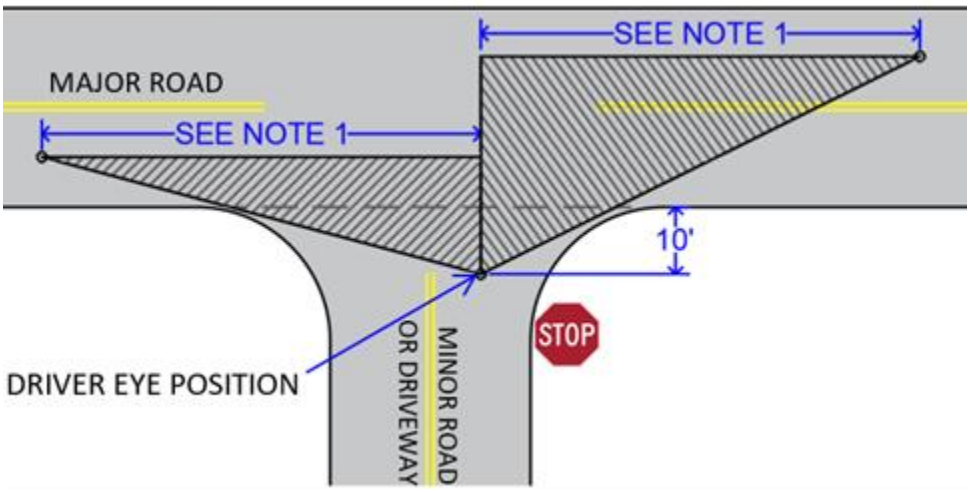
Speed Limit (MPH)	Stopping Sight Distance (ft)						
	Flat	Downgrade			Upgrade		
	Roadway	-3%	-6%	-9%	3%	6%	9%
15[1]	80	80	82	85	75	74	73
20[1]	115	116	120	126	109	107	104
25	155	158	165	173	147	143	140
30	200	205	215	227	190	184	179
35	250	257	271	287	237	229	222
40	305	315	333	354	289	278	269

[1] *In certain cases, reference speed lower than the speed limit may be applicable.*

C. Intersection Sight Distance – Minor Street Stop Control and Driveways:

i. Clear sight triangles shall be provided per Figure 1. Unless specifically approved by the Director, no new structures, improvements, vegetation or other objects between two and a half (2.5) feet and eight (8) feet above street grade may be within sight triangles. This standard also applies to yield controlled minor street approaches.

Figure 1 Minor Street Stop Control and Driveway Sight Distance Diagram

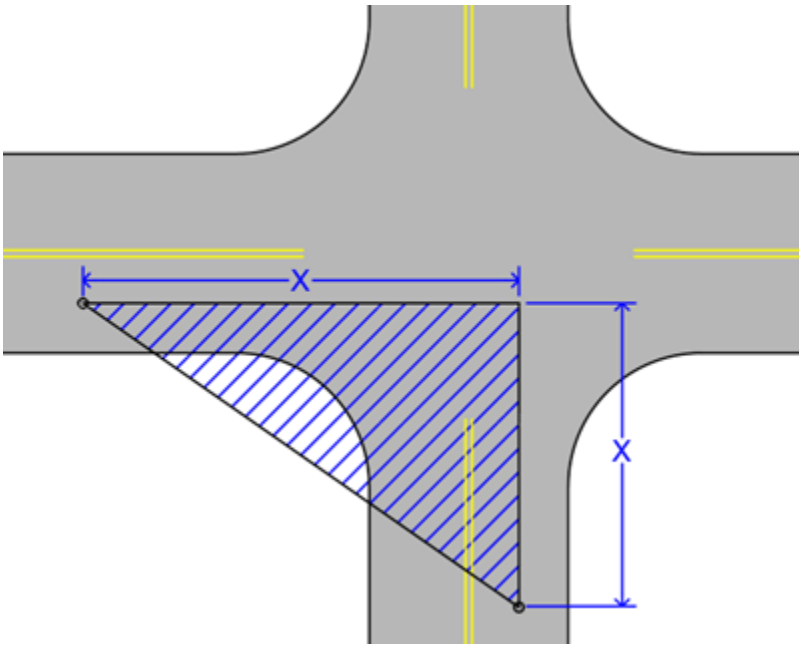


[1] *For applicable minimum Stopping Sight Distance requirement – the speed limit for the Major Road shall be applied. Intersection Sight Distance complying with WSDOT Design Manual Exhibit 1310-29 Sight Distance at Intersections is required for alterations to arterial intersections.*

D. Intersection Sight Distance - Uncontrolled Intersections:

i. For alterations of uncontrolled intersections, sight triangles as shown in Figure 2 and Table 13 shall be provided.

Figure 2 Uncontrolled Intersection Sight Distance Diagram



Value “X” shown in Figure 2 corresponds to the lengths shown in Table 13. For additional context, see AASHTO Policy on Geometric Design Case A.

Table 13 Uncontrolled Intersection Sight Triangle Leg Lengths

Speed Limit (MPH)[1]	X (ft)
15	70
20	90
25	115
30	140

[1] Speeds lower than posted speed limits may be justified in certain cases.

E. Intersection Sight Distance - All Way Stop Control:

i. The first stopped vehicle at any approach should be visible to the first stopped vehicle on all other approaches.

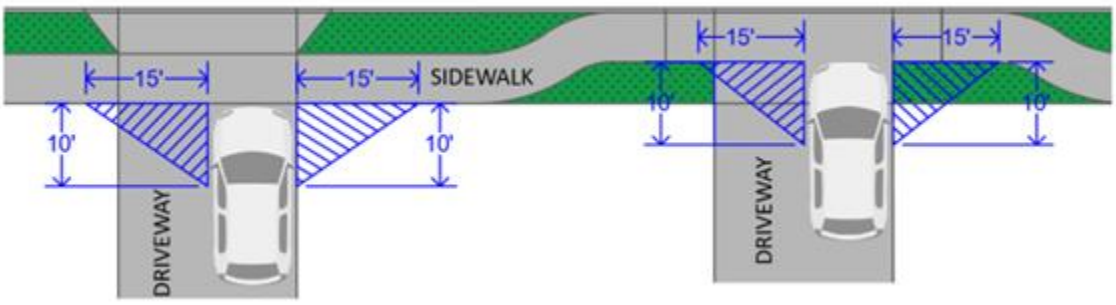
F. Intersection Sight Distance – Signalized Control:

i. At signalized intersections, the first vehicle stopped on one approach shall be visible to the driver of the first vehicle or bicycle stopped on each of the other approaches. The minimum sight distance to signal faces shall be consistent with MUTCD Table 4D-2. For sight distance standards applicable to permissive left turns, see AASHTO Policy on Geometric Design, case F. For right turn on red movements, see criteria in section C. Intersection Sight Distance – Minor Street Stop Control and Driveways.

G. Pedestrian Sight Distance:

i. The driver of an existing vehicle shall be able to view a two (2) foot high object fifteen (15) feet from either edge of the exit lane at the driveway throat when the driver's eye is ten (10) feet behind the back of the pedestrian walkway. See Figure 3. The minimum sight distance shall be provided at all driveways, buildings, and garage entrances where structures, wing walls, etc., are located adjacent to or in close proximity to a pedestrian walkway.

Figure 3 Pedestrian Sight Distance



Chapter 14. Pedestrian and Bicycle Facilities

14.1. General

A. Consideration of pedestrian and bicycle facilities shall be included in any project in accordance with SMC Chapter 12.50 Complete Streets.

B. Pedestrian and bicycle facilities may be required by the SMC, though Transportation Impact Analysis, by Appendix F - Street Matrix, or other similar means.

C. Pedestrian and bicycle facilities may use developed or unopened right-of-way, or in some circumstances may be located across private property within an easement.

14.2. Sidewalks

A. All designs shall meet the current ADA requirements and standards. Refer to EDM Chapter 13, Intersection Design for curb ramp requirements.

B. Sidewalks are required on all public streets, except alleys. Sidewalks may be required on private streets and street ends. See EDM Chapter 12, Street Design.

C. Sidewalk design should address opportunities to maximize the retention of significant trees in the City right-of-way. Alternatives could include narrower sidewalk widths and/or moving sidewalk to front or back of tree. The City may require an arborist report to assess the health and condition of street trees.

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

E. Sidewalks abutting single-family residential uses shall be at least six (6) feet wide.

F. Sidewalks abutting uses other than single-family residential shall be at least eight (8) feet wide.

G. The required width of a sidewalk is defined for many streets in Appendix F – Street Matrix. Sidewalks may be greater than eight (8) feet when the City determines that greater widths are warranted due to expected pedestrian traffic volume.

H. Sidewalks installed immediately adjacent to curb shall have a minimum width of eight (8) feet to provide adequate space for signs, fire hydrants, utilities, tree grates, and door swing.

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

J. When a sidewalk must transition to frontage that does not have a sidewalk, the transition shall meet ADA requirements. Unless the City requires a different transition, an asphalt

transition is acceptable. Refer to Standard Plan 311, Asphalt Transition Ramp to Shoulder.

K. Parking stalls shall be designed and constructed so that no part of any parked vehicle obstructs the Pedestrian Access Route as defined by ADA or the sidewalk.

L. Sidewalks shall be constructed with concrete, unless otherwise approved by the Director.

M. When amenity zone is not continuous and trees are located within the pedestrian circulation path, tree grates and/or rubberized tree well substitute may be allowed but shall not be considered a part of the pedestrian access route. See WSDOT Design Manual Exhibit 1510-2.

14.3. Pedestrian Paths

A. All designs shall meet the current ADA requirements and standards.

B. Paths designated for pedestrian use shall be at least six (6) feet wide and have one (1) foot wide shoulders on each side.

C. The maximum grade shall not exceed five (5) percent. Depending on site conditions, stairs, ramps with landings, and/or switchbacks may be required.

D. Acceptable surface materials are asphalt concrete (asphalt) and Portland cement concrete (concrete).

14.4. Shared-Use Paths

A. Shared-use paths shall be designed for pedestrian and bicycle use.

B. All designs shall meet the current ADA requirements and standards.

C. Shared-use paths shall be at least ten (10) feet; an eight (8) foot minimum is allowed at pinch points. A minimum two (2)-foot graded or paved shoulder is required on either side of a shared-use path. A wider graded shoulder may be required when heavy pedestrian use is anticipated. If the shoulder is paved and adjacent to a bank slope greater than 6H:1V, a longitudinal pavement marking or surface treatment shall be used to differentiate between the path and the shoulder.

D. The maximum grade shall not exceed five (5) percent. Depending on site conditions, stairs, ramps with landings, and/or switchbacks may be required.

E. Acceptable surface materials are asphalt concrete (asphalt) and Portland cement concrete (concrete).

14.5. Bicycle Facilities

Roadway improvement projects shall be designed and constructed consistent with the Bicycle Plan and Bicycle Level of Traffic Stress (LTS) Standards set forth in Section 14.5C.

A. Bicycle facilities shall be provided in accordance with:

- Appendix F - Street Matrix
- AASHTO Guide for the Development of New Bicycle Facilities. https://nacto.org/wp-content/uploads/2015/04/AASHTO_Bicycle-Facilities-Guide_2012-toc.pdf
- NACTO Urban Bikeway Design Guide (https://nacto.org/publication/urban-bikeway-design-guide/).

B. Bicycle facilities shall be installed to complete the Bicycle Level of Traffic Stress Vision Map in the Transportation Element provided in Appendix P.

C. Bicycle Level of Traffic Stress Vision identifies the type of bicycle facilities that are required, based on a street's posted speed and traffic volume to meet the needs of the intended users of the system. Refer to Table 14, Bicycle LTS Vision. The City strives to achieve a minimum of LTS 2 on all City streets. A map of the Bike LTS Vision with assigned streets is in Appendix P. The LTS methodology identifies four stress levels:

- LTS 0 - None
- LTS 1 - Very Low
- LTS 2 - Low
- LTS 2.5 - Moderate Low
- LTS 3 - Moderate High
- LTS 4 – High

Table 14. Bicycle LTS Vision

Speed Limit (mph)	Traffic Volume	No Marking	Sharrow Lane Marking	Striped Bike Lane	Buffered Bike Lane	Protected Bike Lane	Physically Separated Bike Path
≤25	Local streets	1	1	1	1	1	1
	Up to 7k	3	3	2	2	1	1
	≥7k	3	3	2	2	1	1
30	<15k	4	3	2	2	1	1
	15-25k	4	4	3	3	3	1
	≥25k	4	4	3	3	3	1
35	<25k	4	4	3	3	3	1
	≥25k	4	4	4	3	3	1
40	Any volume	4	4	4	4	3	1

D. The direction of travel for bicycle facilities shall be in the same direction as motor vehicle traffic, unless the bicycle facilities are protected from vehicular traffic by a physical barrier.

E. Off-street bicycle paths shall be constructed in accordance with Standard Plan 328, Off-Street Bike Path. (https://www.shorelinewa.gov/home/showpublisheddocument/58274/638132573541430000).

F. Vaned grates or solid lids shall be used on all catch basins located within bicycle facilities and/or roadways in accordance with Standard Plan B-5.20-02 in accordance with Standard Plan B-5.20-02 (https://www.shorelinewa.gov/home/showpublisheddocument/58282/638132574643170000).

- Rectangular vaned grates and rectangular solid metal covers are preferred over other storm drain grate designs to ensure that a bicycle wheel cannot be caught in the grate.

- If Rectangular Herringbone grates are utilized, the length of the openings in the grate should be oriented so that the openings are not parallel to the direction of travel for bicycles.

Chapter 15. Roadside Features

Parking facilities for bicycles, motorized foot scooters, and similar devices shall be constructed in accordance with selected applications from Association of Pedestrian and Bicycle Professionals (APBP) Essentials of Bike Parking (2010 and 2015) outlined in Figures 5-11.

15.1. Fixed Objects

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

B. Standard clearances shall be met in accordance with Table 15 and Table 16 unless approved otherwise to accommodate existing site conditions.

Table 15. Standard Lateral Clearances

From	To	Standard Clearance
Edge of motor vehicle traveled way[1]	Closest part of any fixed object	5 feet
Curb face[2]	Closest part of any fixed object	2 feet
Textured surface of wheelchair ramp	Closest part of any fixed object	1 foot
Edge of sidewalk	Stair riser	2 feet
Pole face, fire hydrant	Closest part of any fixed object (excluding traffic control signs and parking meter posts)	5 feet

[1] For lateral clearance measurements, the edge of traveled way is measured from the effective edge of motor vehicle traveled way and does not include the bike lane, shoulder, or parking area where present.

[2] Where a curb is present, fixed objects shall be at least five (5) feet from the edge of traveled way, and at least two (2) feet from face of curb.

Table 16. Standard Vertical Clearance

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 require installation of or adjustments to SCL facilities, the Applicant/Permittee shall coordinate this activity with SCL. Please visit the SCL website or SCL engineering for the most recent information on clearance requirements. SCL and City staff should work closely with the Applicant/Permittee 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.

D. The Contractor shall install the asset tags on all assets as provided by the City.

15.2. Landscaping

The landscaping design criteria in this section are based on transportation safety requirements and on minimum requirements for plants to achieve mature growth.

Any existing right-of-way landscaping disturbed by construction activity shall be replaced or restored to the same or better condition that was existing before construction started.

All landscaping shall meet the sight distance and sight requirements in EDM Chapter 13, Intersection Design.

For landscaping requirements on private property, contact Planning and Community Development.

Right-of-way landscaping plans shall meet the following design requirements:

A. Landscaping Plan:

i. 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.

ii. Coordinate landscaping with transportation and utility plans. Adjust locations of trees and to accommodate utilities, pedestrians, and sight distance.

iii. Preserve existing trees and landscaping where possible.

B. Plant Selection:

i. All plants shall conform to the standards as published in the most current edition of 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. The American Standard for Nursery Stock manual is available online at: https://www.americanhort.org/nursery-standards.

ii. Plant selection shall consider adaptability to climatic, geology, and topographic conditions of the site.

iii. Tree and shrub canopies, upon maturity, shall not reach an above ground utility such as streetlights and power lines.

C. Soil:

i. The landscaping plan shall provide soil specifications, including soil depths. Refer to BMP T5.13 Post Construction Soil Quality and Depth (Stormwater Manual) for general soils specifications. Improvements that include biofiltration require specific specifications for the soils. Refer to Standard Plan 774, Soil Amendment and Depth.

D. Street Trees:

i. New trees shall be at least two-inch caliper and selected from the City-approved street tree list in Appendix G – Right-of-way Street Tree List.

ii. Street trees shall be spaced a minimum of 25 feet on center.

iii. The standard clearance from underground stormwater and wastewater utilities often is not enough space to minimize the effects of utility maintenance and repair and ensure longevity of the tree. When right-of-way width allows, additional clearance distance shall be provided.

iv. When right-of-way width is limited and the eight (8) feet clearance cannot be met, the City shall evaluate site conditions and may permit one (1) or both of the following:

a. Tree installation less than eight (8) feet from ductile iron or Polyvinyl Chloride (PVC) pipe; or

b. Tree installation less than eight (8) feet from concrete pipe that has rubber gaskets.

c. The City may allow the separation to be reduced to three (3) feet when root barriers are installed.

E. Adjust placement to avoid conflict with driveways, utilities, and other functional needs. Trees shall be placed:

i. Centered within the amenity zone between the curb and sidewalk;

ii. Outside of the sight distance triangles per EDM Sections 13.8, Clear Sight Triangle.

iii. Eight (8) feet from underground utility lines, street light poles, or traffic cabinets or three (3) feet with root barriers;

iv. Ten (10) feet from power poles (15 feet recommended);

v. Seven and one-half (7.5) feet from driveway edges (10 feet recommended);

vi. 25 feet from streetlights or existing trees;

vii. 30 feet from curb or travel lane street intersections (when no curb);

viii. Ten (10) feet from roadway edge where no curb is present; and

ix. 20 feet from marked or unmarked crosswalks.

15.3. Mailboxes

A. United States Postal Service (USPS) shall approve all mailbox locations.

B. Clustered mailboxes are preferred.

C. The approach to mailboxes shall be clear of obstruction(s).

D. Refer to Standard Plans 514, Mailbox Stand (Non-Arterial) and 515, Mailbox Stand Without Amenity Zone.

E. Mailboxes shall not be installed adjacent to ditches unless approved by the director.

15.4. Steps

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

B. Stairways in public right-of-way shall be designed and constructed according to Standard Plans 325, Stairs and 326, Cement Concrete Stairway.

C. The first riser shall be at least two (2) feet clear of a public walk.

D. A minimum of five (5) feet by five (5) feet landing shall be provided after each 20 risers.

E. Pedestrian lighting may be required for stairways.

15.5. Railing

A. Railings on private property shall be consistent with guard requirements of the construction and building codes contained in SMC Chapter 15.05. Railings shall have a maximum spacing of four (4) inches for vertical elements of the railing.

B. Railings in the right-of-way shall be consistent with Standard Plan 324, Pedestrian Railing and the most current WSDOT Standard Specifications.

C. Railing in the right-of-way shall be installed along a nonmotorized transportation facility when there is a loss in elevation from the facility of 30 inches or more and:

   i. The vertical wall face is less than four (4) feet in horizontal distance from the facility.

   ii. The vertical wall face is greater than four (4) feet horizontally to the facility and the slope to the wall top is steeper than 1V:3H.

   iii. The slope(s) adjacent to the facility average greater than 1V:2H.

15.6. Cut-and-fill Slopes

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

B. Steeper slopes may be approved by the Director when supported by a geotechnical report and engineering recommendations.

C. 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/Permittee as directed by the Director. For purposes of warrants, design, and location, all guardrails along public and private roadways shall conform to the criteria of the most current editions of the WSDOT Standard Plans and Standard Specifications.

Chapter 16. Surface Treatment

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

16.1. General

A. Hard surfacing such as asphalt concrete or Portland concrete cement (PCC) is required within the right-of-way.

B. Gravel surfacing may be allowed in right-of-way that the City does not maintain, such as alleys.

C. When approved by the City, grades steeper than 20 percent shall be paved with PCC.

D. Use of permeable pavement for roadway construction in the right-of-way, subject to approval of the Director. Refer to EDM Section 7.2, Low Impact Development. Refer to Standard Plans 775, Permeable Sidewalk and 776, Permeable Sidewalk on Slopes.

16.2. Asphalt Pavement Design

A. Arterial Streets:

   i. 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.

   ii. 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.

   iii. Pavement design shall be prepared by a Professional Engineer licensed in the State of Washington who is proficient in pavement design. Soils tests are required to assess the California Bearing Ratio (CBR) for the subgrade.

B. Local Primary and Secondary Streets:

i. Minimum asphalt pavement sections are identified in Standard Plan 201, Typical Non-Arterial (Local) Street.

ii. Unless otherwise approved by the City, in areas of pavement restoration or adjacent to existing pavement, reconstruction shall, at a minimum, match existing roadway sections, provided it exceeds the minimum pavement section.

C. Poor Subgrade:

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

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 Director. The responsibility for any shoulder material thickness improvement shall be considered part of the requirement for roadway widening.

Chapter 17. Traffic Control Devices

All traffic control devices shall conform to the MUTCD and the standards in this EDM.

All signs, such as street name, parking, stop, dead end, speed limit, and nonmotorized indicators shall be approved as part of the project plan. The channelization plan showing paving markings, permanent signing, and crosswalk locations shall be prepared by a Professional Engineer licensed in the State of Washington.

Temporary traffic control to ensure traffic safety during construction activities shall be provided by the Permittee and installed per standards, or as directed by the City’s Inspector.

17.1. Roundabouts

Where traffic studies show that a traffic signal or all way stop is warranted, or to address high collision locations as identified in the Annual Traffic Report, a roundabout should be evaluated as a preferred intersection control method. (Annual Traffic Reports are available on the City's Annual Traffic Report webpage: https://www.shorelinewa.gov/government/departments/public-works/traffic-services/annual-traffic-report.) An engineering study and traffic analysis shall be conducted and approved by the City Traffic Engineer prior to installation.

Consistent with the WSDOT Design Manual Chapter 1300.03(5), no specific warranting conditions stipulate use of roundabouts over other intersection control types; however, if the traffic analysis shows equivalent or better performance over other control types, the cost is equal to or lower than other control types, and other geometric factors do not preclude it, a roundabout should be selected as the intersection control type.

Roundabouts shall be designed in accordance with the most current version of the following publications: Roundabouts: An Informational Guide, the MUTCD and Washington State adoptions, and the WSDOT Design Manual.

17.2. Traffic Signals

The following apply to new or modified traffic signals:

A. A signal warrant study prepared by a Professional Engineer licensed in the State of Washington shall be required for all new traffic signal installations. The City Traffic Engineer shall review and approve the study.

B. Signal design shall meet ADA, MUTCD, and WSDOT Design Manual 13.30 requirements.

C. Emergency vehicle preemptions systems are required for all new signal installations and may be required for signal modifications.

D. Signal structures consisting of poles and mast arms shall be required for all new installations.

E. Stop bar and advanced loop detection is required for all signalized approach lanes per Standard Plan 420, Traffic Signal Loop. Camera detection may be installed by request subject to review and approval by the City Traffic Engineer.

F. Transit Signal Priority capability may be required at intersections which serve transit routes. Bicycle loop detection is required for all bike lane approaches to signalized intersections. If a predominant left turning movement for bicyclists is present, bicycle push buttons or channelized bike boxes may be required.

G. All new signals require backup battery systems. New signals shall provide communication to the City's Central Transportation System when feasible.

H. Traffic signal equipment, including cabinets, controllers and other components, shall be reviewed and approved by the City Traffic Engineer.

DIVISION 3 – SURFACE WATER

Chapter 18. Standards

Division 3 – Surface Water applies to public and private development within the City.

The City has adopted the *2019 Department of Ecology Stormwater Management Manual for Western Washington* (Stormwater Manual) and, for general guidance, refers to the *2012 Low Impact Development Technical Guidance Manual for Puget Sound* (LID Manual).

A. For Surface water design:

   i. 2019 Stormwater Manual, Department of Ecology. The City's modifications to the Stormwater Manual are itemized in EDM Chapter 19, Stormwater Manual Additional Requirements. The Stormwater Manual is available on Ecology's website: http://www.ecy.wa.gov/programs/wq/stormwater/manual.html

   ii. The 2012 LID Manual may be used for guidance on LID site design. The LID Manual is available on the Puget Sound Action Team website: https://www.psp.wa.gov/downloads/LID/20121221_LIDmanual_FINAL_secure.pdf

B. For conveyance system design in the City:

   i. 2021 KCSWDM Chapter 4 "Conveyance System Analysis and Design". The City's modifications to the KCSWDM are itemized in EDM Chapter 23, Conveyance System. The manual is available online at: https://kingcounty.gov/en/dept/dnrp/nature-recreation/environment-ecology-conservation/stormwater-surface-water-management/surface-water-design-manual/surface-water-design-manual-2021

   ii. The City of Shoreline has had certain areas of the City modeled for future capacity needs of certain stretches of the City system, as summarized in Technical Memorandum: Model Development and Results for Shoreline Modeling Project from Brown and Caldwell dated January 10, 2022. Projects located within, or draining to, these modeled areas may require additional capacity upgrades in order to provide the adequate conveyance system required of frontage improvements based on the modeling results and best available sciences. The City will provide more specific information on capacity need for such locations.

Chapter 19. Stormwater Manual Additional Requirements

This chapter lists the City's amendments to the Stormwater Manual. All requirements in the Stormwater Manual are applicable in the City, including any guidelines or requirements that Ecology recommends or encourages, unless otherwise noted herein.

Per Section I-12.15, the City has adopted the following more stringent requirements:

A. Section I-3.2 Exemptions

   i. Underground utilities associated with new or redevelopment are not considered underground utility projects and are not subject to the exemption in I-3.2.

B. Section I-3.3 Supplemental Guidelines

   i. The City allows the MRs to be met for an equivalent area (flow and pollution characteristics) on-site within the same Threshold Discharge Area (TDA). For an area transfer outside the TDA, refer to the additional requirement for Section I-D.6.

C. Section I-3.3 Options for Local Governments

   i. The City has adopted an additional threshold for MR7.

   ii. The City does not exempt or institute a stop-loss provision for redevelopment projects from compliance with MR5, MR6, MR7, and/or MR8 as applied to the replaced hard surfaces.

   iii. The City has not established criteria for allowing redevelopment projects to pay a fee-in-lieu of constructing Runoff Treatment or Flow Control BMPs.

   iv. The connection of existing hard surfaces to the MS4 or a receiving water which did not have a direct and obvious connection previously, shall be viewed as new hard surfaces for the sake of applying the requirements of this chapter and SWMMWW. This includes new roof drain tightlines which previously dispersed or infiltrated runoff before reaching the public drainage system. It may also include the connection or routing of additional upland hard surface within a private drainage system if they were previously dispersed or infiltrated runoff before reaching the public drainage system.

D. Section I-3.3, Figure I-3.2 Flow Chart for Determining Requirements for Redevelopment

   i. The valuation criteria for non-road projects shall not be applied within the City of Shoreline; all projects with more than 5,000 square feet of new plus

replaced hard surfaces shall answer “Yes” for the final question pertaining to non-road projects.

ii. Frontage improvements associated with plats and/or the construction, or reconstruction, of inhabitable structures are not considered a “road-related project” as it relates to the drainage requirements of this chapter and SWMMWWW.

E. Section I-3.4.2 MR2: Construction SWPPP Supplemental Guidelines

i. The City has developed abbreviated Construction SWPPP format.

ii. Refer to EDM Chapter 22, Construction Stormwater Pollution Prevention Plan for additional information.

iii. Element 2 — Establish Construction Access:

a. Street washing is not permitted, even after shoveling or sweeping.

b. During construction, if material is being deposited on off-site streets, additional strategies may be required including:

1. Regenerative-type vacuum sweepers and repeated or continuous sweeping.

2. Special site procedures and provisions (such as transferring haul-outs to trucks that travel only on paved and maintained surfaces in the site).

3. Suspension of work until dry weather.

iv. Element 6 – Protect Slopes:

a. Clearing/grading work shall comply with the Stormwater Manual, geotechnical recommendations, State Environmental Policy Act (SEPA) conditions, and other applicable regulations and standards. These project-specific requirements are in addition to and take priority over general standards.

v. Element 7 – Protect Drain Inlets:

a. The Contractor shall remove inlet protection at the end of the project without releasing captured sediment into the storm system.

vi. Element 12 – Manage the Project:

a. For Certified Erosion and Sediment Control Lead (CESCL) requirements, and Rainy Season Requirements and Seasonal Suspension Plan, refer to EDM Chapter 22, Construction Stormwater Pollution Prevention Plan.

vii. Element 13 – Protect LID BMPs:

a. All proposed and existing LID BMPs shall be shown on the Applicant/Permittee's erosion control plan. The erosion control plan shall detail the protection and cleaning of all LID BMPs, including protecting any infiltration-based BMPs and sub-grades from over-compaction before, during and after construction activities.

viii. Additional requirements for all projects:

a. Dust is controlled and is in compliance with the Puget Sound Clean Air Agency; and

b. Work in Critical Areas conforms to requirements of the City's Critical Areas Ordinance (CAO).

c. All temporary erosion sediment control BMPs shall be fully removed and legally disposed of after permanent site stabilization but prior to permit close out.

F. Section I-3.4.6 MR6: Runoff Treatment

i. If MR6 applies to the project, an Enhanced Treatment BMP is required, unless Runoff Treatment is provided by infiltrating into the native soil per Section III-1.2.

ii. While portions of the City may be within basins that contribute to aquifers, the City does not have currently designated wellhead protection areas.

iii. The Lake Ballinger Watershed, which includes the Echo Lake sub-basin, currently has a Total Maximum Daily Load (TMDL) for phosphorus. Bioretention with underdrains is not permitted to be installed within one-quarter (0.25)-mile of Echo Lake unless the Ecology-approved high-performance bioretention soil mix, or other suitable mix which reduces potential for phosphorus export as approved by the Director is utilized. Phosphorus treatment is required in the McAleer Creek Basin, unless the site discharges downstream of Lake Ballinger.

iv. The City clarifies that all rubber surfacing shall be consider pollution generating for the application of MR6 and its thresholds, including poured in place surfacing, turf infill, or similar products.

G. Section I-3.4.7 MR7: Flow Control

i. Refer to the Stormwater Manual Vol. I: 3.4.7 for the thresholds that trigger flow control requirements. If a project exceeds any one of the three thresholds, the project triggers the requirement for flow control facilities.

H. Section I-3.4.7 TDA Thresholds

i. The City adopted a fourth threshold for MR7: All projects that propose to exceed 50 percent effective impervious surface within the site trigger the requirement for flow control facilities. Frontage improvements, while still requiring mitigation one MR7 is determined applicable, need not be considered for this extra evaluation only.

I. On projects that do not have set building footprints, such as a site development permit for a short plat, the flow control modeling shall use maximum hardscape allowed in the applicable zoning designation as the maximum impervious surface at full build out. Refer to SMC Chapter 20.50. For example, if a zoning designation allows maximum 50 percent of a lot as hardscape, then 50 percent is the maximum impervious surface to use for flow control modeling at full build-out. Section I-3.4.7 TDA Exemption.

i. Flow Control is not required for TDAs that discharge directly, or indirectly through a Municipal Separated Storm Sewer System (MS4s) to Puget Sound or to Lake Washington per the requirements in Section I-3.4.7.

ii. The analysis of the conveyance system between the TDA and the exempt receiving water shall consider full build-out conditions, based on current zoning using the direct discharge option for flow control for those lots that drain to the conveyance system. The analysis shall consider both conveyance impacts to the system down gradient of the proposed project and also the project's backwater impact to upstream and lateral flood stages in the conveyance system.

J. Section I-3.4.7 Flow Control Performance Standard

i. The criterion allowing the use of existing land cover condition in basins that have been 40 percent total impervious area since 1985 is not permitted in any basins in the City.

ii. All BMPs applied to reduce the effective impervious surfaces for the MR7 thresholds shall be recorded in a Declaration of Covenant per EDM Section

4.9, Declaration of Covenant. The impervious surfaces shall be designed, modeled, and maintained in accordance with the Stormwater Manual.

K. Section I-3.4.8 MR8: Wetlands Protection

i. While this source alone does not qualify as adequate investigation of wetland conditions on the site, many known wetlands in the City are shown online in the Property Information Interactive Map: https://www.shorelinewa.gov/our-city/maps-gis/online-ineractive-maps.

L. Section I-3.4.9 MR9: Operation and Maintenance (O&M)

i. For public facilities, including public facilities built by private development:

a. A copy of the draft O&M Manual shall be submitted with the permit submittal. The final O&M Manual shall be submitted for review and approval prior to acceptance of the completed construction project. The final approved O&M Manual shall be submitted with one (1) hard copy and one (1) electronic copy.

b. At a minimum, the O&M Manual shall include:

1. Party/parties responsible for facility maintenance, including phone numbers and addresses;

2. Maintenance cost distribution for shared stormwater BMPs and drainage facilities;

3. Site map showing BMPs, critical area(s), buildings, affected lots, and dimensions;

4. A list of BMPs and facilities installed on-site and purpose of each;

5. For each BMP or facility, the required maintenance activities and schedule meeting the minimum requirements given in the Stormwater Manual Appendix V-A;

6. List of any proprietary components along with vendor's contact information and the vendor's maintenance schedule and costs;

7. Inspection and maintenance schedules including recommended maintenance schedules per vendor specifications for proprietary components;

8. Inspection procedures and how the maintenance schedule will be modified if inspections determine the facility is not operating properly;

9. The final O&M manual shall incorporate any comments made during the development review process and shall incorporate any field changes made to the facilities during construction;

10. Surface bioretention facilities within the right-of-way must be designed and modeled with regular/non-proprietary bioretention soils and/or the Ecology approved high-performance bioretention soils mix;

11. Public flow control facilities must be maintainable with routine hand tools, vacuum truck and/or water source; no special equipment or routine (less than 10 year) proprietary replacement products may be required for public flow control facility maintenance;

12. Proprietary water quality treatment facilities must be consistent with the latest Surface Water Utility O&M plans and shall be restricted to certain product types for efficiency and economy of City maintenance operations. The following manufacturers and product types are approved for use within the public right-of-way, provided that all manufacturer recommendations for design and installation are followed and all conditions required for Washington State Technology Assessment Protocol – Ecology (TAPE) approval are met. Alternative proprietary facilities are allowable upon Director approval, provided that it can be demonstrated that such systems can be fully operated and maintained using only materials that are fully interchangeable with materials needed to operate and maintain the proprietary systems listed below;

    i. Underground bioretention/biofiltration shall be Modular Wetland products manufactured by BioClean/Contech.

    ii. Media filtration shall be StormFilter products manufactured by Contech.

    iii. Curb and gutter biofiltration shall be Filterra products manufactured by Contech.

ii. For private facilities:

a. A declaration of covenant is required. Refer to EDM Section 4.9, Declaration of Covenant.

M. Section I-3.5.2 Additional Protective Measurer (APM)1: Financial Liability

i. Division 1 - Administration provides requirements for Financial Guarantee information for work performed within the right-of-way.

N. Section I-3.5.3 APM2: Off-Site Analysis Report

i. The City has adopted APM2 for Large Impact Projects that discharge stormwater off-site. The preliminary off-site analysis shall be qualitative. The City may require qualitative analysis and mitigation based on the results of the preliminary off-site analysis.

O. Section I-4 Underground Injection Control (UIC) Program

i. The UIC Program applies to the entire City. UICs shall be registered with Ecology. Refer to WAC Chapter 173-218.

P. Section I-4.17 Classification of Vadose Zone Treatment Capacity

i. Geotechnical analysis from the project site is required to classify the vadose zone. Analysis from a nearby site is not acceptable.

ii. A two-stage drywell is not acceptable for UIC pollutant loading treatment. At a minimum, pretreatment is required for all UICs.

Q. Appendix I-D Regional Facilities

i. Currently, the City does not have any regional facilities with capacity available to be used to satisfy the drainage mitigation requirements of this chapter.

ii. Regional facilities may be added or built as opportunities allow for such projects; where the City or other entity constructs a regional facility in the future, all development projects built after the project completion and within the contributing drainage areas must comply with the plan developed during the regional facility design process for that particular facility and approved by the City, and which may or may not require connection to the facility, set unit prices for mitigation and/or require additional agreements with facility owner.

R. Appendix I-E Introduction to the Stormwater Control Transfer Program

i. The City does not have a Stormwater Control Transfer Program.

S. Section III-1.2 Step 4: Determine if a Phosphorus Treatment BMP is required

i. Phosphorus treatment is required in the Echo Lake subbasin.

T. Section III-2.2 Continuous Simulation Model Approval Status`

i. All Hydrological Simulation Program-Fortran (HSPF) modeling shall be completed using Western Washington Hydrology Model (WWHM) or MGSFlood as approved in SWMMWW Section III-2.2. King County Runoff Time Series (KCRTS) shall not be used on projects requiring drainage review in Shoreline.

U. Section III-3.2 Step 3: Perform an Off-Site Analysis

i. An offsite analysis is required for Large Impact Projects.

V. Section IV-1:S454 BMPS for Preventive Maintenance / Good Housekeeping

i. All dumpsters or outdoor trash collection receptacles within the City of Shoreline must have operable lids which can sufficiently keep rain fall from contacting trash and material gathered within the bin. The lids must remain closed and properly sealed at all times when materials are not actively being moved into or out of the container.

ii. The design of the trash enclosure area shall proceed in the following order:
   a. When feasible, dumpster or trash storage areas be placed entirely under cover and isolated from rain fall. In such cases, the covered area shall be isolated from run-on from adjacent surfaces and plumbed to sanitary sewer consistent with wastewater requirements of this EDM.
   b. If a dumpster or trash storage area cannot be reasonably covered, it shall be isolated from run-on from adjacent surfaces and dispersed or infiltrated to the extent feasible in a BMP or facility which remains separated and independent of site runoff from other areas.
   c. If a dumpster or trash storage area cannot be reasonably covered and cannot be reasonably dispersed/infiltrated, it shall be isolated from run-on from adjacent surfaces and runoff from the enclosure area must be collected in an isolated CB which includes floatable separation (i.e. vertical tee or down-turned elbow) prior to mixing with runoff from other surfaces.

W. Section V-1.2 Setbacks, Slopes, and Embankments

i. The City has adopted the setbacks in this section. Reductions in these setbacks may be approved if evaluated by a Professional Engineer licensed in the State of Washington with geotechnical expertise.

X. Section V-5.2 Step 8. Construct the Infiltration BMP & Conduct Performance Testing

i. The excavation and installation of all infiltration facilities proposed on-site and in the right-of-way shall be observed by a licensed geotechnical engineer. The geotechnical engineer shall conduct an additional infiltration test in accordance with the Ecology Manual after the Contractor has excavated to the bottom of the proposed infiltration facility (prior to the installation of the infiltration facility). The geotechnical engineer shall submit an updated report that verifies that the design infiltration rate is equal to or greater than infiltration rate in the approved design. If the infiltration rate is less than the approved design, a revision to the stormwater design shall be submitted for City review and approval. Alternatively, other measures to improve the infiltration capacity may be taken and re-testing shall be conducted.

Y. Section V-5.4 Determining the Design Infiltration Rate of the Native Soils

i. When a small- or large-scale Pilot Infiltration Test (PIT) is used to determine infiltration rates outside of the December 1 to April 1 window, three (3) PITs shall be performed in the same hole within three (3) days, with the beginning of each test spaced 24 hours apart, and the hole shall be an additional two (2) feet deeper than the bottom of the facility.

ii. Grain size analysis shall not be used for UICs with low to high pollutant loading.

Z. Section V-5 BMP T5.15 Permeable Pavements

i. Certain additional provisions for public permeable pavements and for additional assurances of product quality are included in this manual; see EDM Section 20.17 Permeable Pavements.

ii. Check dams are required for all permeable pavement types above 5% in subgrade slope, including permeable concrete and pavers.

AA. Section V-12 BMP D.3: Detention Vaults

i. Unless the structural design accounts for live loading from all feasible Shoreline Fire Department vehicles, any vault or other facility located under common or shared drivable surfaces, private driveways, private roadways, parking lots, or other locations where fire truck access could reasonably be needed, must include surface markings and signage to visually alert operators of the facility below.

a. The footprint of the vault shall be outlined in a line at least 2” wide.

b. Signage, listing the load limits of the facility below, shall be placed at any access point where a vehicle could approach the vault area from

off-site. The signs shall be of significantly contrasting color, of sufficient size, and shall be appropriately placed so as to be visible to a vehicle in the approaching lane/drive-isle which is within 10'-20' of the structure outline. Adjustments to the minimum letter sizing may be needed to maintain adequate legibility for some configurations, but in no case shall the lettering be less than two (2)" tall, with a minimum stroke width of 0.3".

c. Markings and signage shall be maintained for the life of the vault and may require routine refreshing or replacement as part of the O&M plan.

d. This requirement shall not be applied if it conflicts with required traffic striping, striping per other sections of this EDM, or striping per the direction of the Traffic Engineer.

BB. Refer to Appendix K – Approved Stormwater Facility Planting List of the approved plant list for surface water facilities in the City right-of-way.

Chapter 20. General Requirements

20.1. Licensed Professionals

A. State law requires engineering work be performed by or under the direction of a Professional Engineer licensed to practice in the State of Washington. Plans involving construction of treatment facilities or flow control facilities, structural source control BMPs or drainage conveyance systems generally involve engineering principles and should be prepared by or under the direction of a licensed engineer.

B. Construction SWPPPs that involve engineering calculations shall also be prepared by or under the direction of a Professional Engineer licensed in the State of Washington.

C. Infiltration testing shall be performed by a licensed professional. Refer to the Stormwater Manual Section V-5.4.

D. Depending on project scope and location characteristics, the Director may require a licensed professional for any project. All credentials shall be current and issued by the State of Washington.

E. A State of Washington licensed civil engineer with geotechnical expertise is required for site assessment for site work within or adjacent to slopes steeper than 15 percent and higher than ten (10) feet.

F. In addition to Department of Ecology NPDES Construction General Permit requirements, the Director may require a designated CESCL when disturbance is proposed on a site

that contains or abuts a critical area. Refer to the Stormwater Manual Section II-3.2, BMP C160: CESCL.

G. The City may require planting plans and specifications to be prepared by a licensed Landscape Architect or a qualified professional working in the field of landscape design or horticulture.

20.2. Grading

Any grading activity, whether or not it requires a permit, shall prevent soils leaving the site or entering drainage facilities, streets and roads, water resources, or adjacent properties.

20.3. Separated Runoff

A. Sanitary sewer facilities shall be separate from stormwater facilities.

   i. Open grate structures intended to drain covered surfaces which are not subject to direct rainfall shall be plumbed to sanitary sewer facilities and shall not be included in the stormwater system.

B. Project design shall keep runoff from non-project public right-of-way surfaces separate from on-site surface water runoff.

C. Where projects elect to mitigate runoff from public right-of-way hard surfaces in on-site facilities in order to meet the requirements of this chapter:

   i. The BMP shall be appropriately sized for all flows physically reaching the BMP.

   ii. Grading and drainage design may utilize treatment trades and swaps to isolate portions of unmitigated public right-of-way hard surface runoff match project mitigation requirements. Such trades or swaps shall be well defined and documented in the project drainage report.

   iii. Flows splitting within the public MS4s system for private development is discouraged and shall be permitted by Director approval only.

   iv. Conveyance requirements per EDM Section 20.16, Stormwater Frontage Improvements still apply to the project.

D. Surface water controls for private property shall not be placed in public right-of-way or on other public property.

E. The engineer may choose to over-detain in an on-site facility to allow for bypass of frontage improvements within public right-of-way when feasible. Modeled conditions

must match those proposed, including flows which bypass the facility must be modeled as bypass and accounted for at the project stormwater discharge point-of-compliance. Runoff may not be credited as treated in the on-site facility if it does not physically reach the facility.

20.4. Backflow Prevention

The City may require backflow prevention on private stormwater connections to City-owned stormwater trunk lines or to undersized stormwater mains.

20.5. Sump Pumps

Uncontaminated clean groundwater discharge from sump pumps may connect to the City's surface water system when approved by a permit. Sump pumps must discharge to an on-site gravity basin, in compliance with EDM Section 23.2, Pump Systems before connecting to the City system.

20.6. Footing Drains

For single-family residences, footing drains may connect to the downspouts, on the property, at a covered catch basin or yard drain that is located no closer than (5) feet to the foundation. Care shall be taken to ensure that slopes carry the water away from the building during high flows. When connected to the roof drain BMP, all footing drains shall be high enough above the BMP overflow elevation to ensure the BMP cannot backwater the footing drain system (minimum 6" is recommended).

20.7. Catch Basin Grates

Stormwater basin grates manufactured in the United States shall be used in the City right-of-way, unless expressly authorized by the City.

20.8. Catch Basin Medallions

Surface water education medallions shall be installed at all existing and new catch basins installed on-site or within adjacent right-of-way. The City provides the medallions and installation instructions at no cost when requested. Refer to Standard Plan 725, Storm Drain Medallion.

20.9. Maintenance Access

A. All stormwater facilities shall be accessible to maintenance vehicles, unless specifically waived by the City. If not located in or adjacent to an existing accessible access, an improved roadway surface shall be provided.

B. Access roads shall be designed with a 40 foot inside radius on curves, grades flatter than 15 percent, and shall be 12-feet wide on straight sections, and 15-feet wide on curves. The access shall be designed to carry H20 loading, operable gates shall only be located on straight sections of road, and a paved aprons shall be provided where the access road connects to the paved public roadways. The approved surfaces include asphalt concrete, cement concrete, pervious concrete, pervious asphalt, structurally stabilized vegetated surface, or crushed surfacing.

C. The City may require the maintenance access be located in a separate tract.

D. A stormwater declaration of covenant shall be required for all privately constructed storm facilities for all permanent surface water BMPs on all projects. Refer to EDM Section 4.9, Declaration of Covenant.

E. Maintenance access for privately maintained facilities may be demonstrated by providing written verification from an active service provider stating that adequate maintenance can be performed with the equipment and methods at their disposal. City staff may request supporting information or further description of certain elements of the operation if specific concerns arise.

F. A minimum vertical clearance of 14' shall be maintained along maintenance access roads. If site design precludes this minimum clearance, then alternative maintenance access must be demonstrated by a service provider as noted above.

20.10. Watercourses

A. Streams shall be preserved in their existing channels, unless expressly authorized by Ecology and WDFW.

B. Any alteration to a stream channel, piped watercourse, or associated setbacks requires approval by Ecology and the WDFW.

C. A copy of the WDFW approval shall be submitted prior to permit issuance.

D. Refer to SMC Chapter 20.80 for critical area regulations.

20.11. Flood Control

Projects in the special flood hazard areas, as defined in SMC Chapter 13.12, shall submit a Floodplain Development Permit application, including all required items on the permit application checklist available online: http://www.shorelinewa.gov/government/departments/planning-community-development/forms-application-checklists-application-handouts/permit-checklists-application-packets.

The City shall review the application for compliance with FEMA floodplain development requirements and SMC Chapter 13.12.

20.12. Subdivisions

A. The maximum hardscape in SMC Chapter 20.50 is used to determine impervious area for surface water design when the total hard surface area is not known.

B. Construction of the lot drainage connection systems shall be feasible and allow connection to the proposed formal and short subdivision improvements or to the documented infiltration areas.

C. When a subdivision surface water plan includes piped connections, provide a connection stub for each lot. A maximum of three (3) lots may be connected to a common private collection pipe, six (6) inches or more in diameter. For subdivisions, no more than three (3) roof drain stubs are allowed on a single roof drain collection pipe.

D. Roof and footing drain connection stubs shall be at least one (1) foot below the lowest existing elevation of the building envelope on all newly created lots, unless a different elevation is approved or required by the City.

E. Easements for the specific drainage systems shown on the site development documents shall be provided as part of the formal or short subdivision.

F. Where the surface water plan and flow control calculations for a subdivision include assumptions about the size, location, or performance of permeable pavement, rain gardens or bioretention facilities on individual lots, the surface water plan and site development plan shall identify the obligation of each lot. The Permittee shall record a deed restriction against each lot for the maintenance of those facilities by subsequent owners.

20.13. Phased Projects

A. For projects that are proposed to be built in phases, but are part of a Common Plan of Development or Sale per the Stormwater Manual, the Applicant/Permittee shall provide plans that show the overall project as well as the project phases. The plan shall clearly delineate phase boundaries and provide estimates for construction dates for the phases.

B. Phasing of projects shall not result in a reduction of surface water and/or erosion control requirements.

C. The Applicant/Permittee shall consider all phases when calculating thresholds for stormwater management.

20.14. Protect Vegetation Post-Construction

A. Mechanisms shall be put in place to assure long-term protection of vegetation retention areas. Mechanisms to protect conservation areas include setting aside conservation areas into separate tracts, permanent easements, homeowner covenants, maintenance agreements, and education.

B. Permanent signs shall be installed indicating the removal of trees or vegetation is prohibited within a native vegetation retention area.

C. Permanent fencing is required around the limits of any native vegetation retention area. The type, size, and location of the fencing shall be approved by the City review staff and should be made of materials that blend in with the natural surroundings. For example, wood split-rail, pinned if necessary, and located in such a manner as to not impede the movement of wildlife within the vegetation retention areas.

20.15. Infiltration Facility Prohibitions

Infiltration facilities are prohibited under the following conditions:

A. Infiltration rates lower than three-tenths (0.3) inches per hour may be allowed to meet MR5 and MR7 if the design is modeled in WWHM2012 and the geotechnical engineer has confirmed he design shall not have any adverse impacts to the subject property or adjacent properties.

B. Infiltration is not permitted within a Landslide Hazard Area as defined by SMC Chapter 20.80 Critical Areas or within a setback above a Landslide Hazard Area as described in SMC Chapter 20.80, unless otherwise recommended by a licensed geotechnical engineer in written documentation bearing the engineer's seal and signature, and subject to Director approval. Note: Other critical areas may have infiltration restrictions.

C. Infiltration is not permitted within ten (10) feet of underground storage tanks.

D. Contaminated soil or groundwater;

E. Infiltration has the potential to mobilize contaminants present in soil and groundwater. Unless a different setback is given in an approved cleanup plan, the following setbacks apply to areas with known soil or groundwater contamination (typically federal Superfund sites or state cleanup sites under the Model Toxics Control Act (MTCA)):

    i. Areas known to have deep soil contamination:

        a. Bioretention, permeable pavement, and other infiltration facilities serving less than 5,000 SF of impervious surface are not permitted within 100 feet of an area known to have deep soil contamination.

b. Other infiltration facilities serving 5,000 SF or more of impervious surface are not permitted within 500 feet of an area known to have deep soil contamination.

ii. Where groundwater modeling indicates infiltration will likely increase or change the direction of the migration of pollutants in the groundwater.

iii. Within ten (10) feet (horizontal) of contaminated surface soils.

F. Landfills:

i. Bioretention, permeable pavement, and other infiltration facilities serving less than 5,000 SF of impervious surface are not permitted within 100 feet of a closed or active landfill.

ii. Other infiltration facilities serving 5,000 SF or more of impervious surface are not permitted within 500 feet of a closed or active landfill unless a licensed hydrologist determines that stormwater can be safely infiltrated.

20.16. Stormwater Frontage Improvements

A. Frontage improvement surfaces, consistent with the definition in SWMMWW, are included in the 'project site' for private development projects and must be included in the project drainage threshold and mitigation calculations and mitigated by the project facilities.

B. Facilities required for the benefit of a private development to meet the provisions of this manual and SWMMWW shall be privately maintained, except facilities located entirely within the public right-of-way and mitigating exclusively runoff from the right-of-way.

C. Consistent with SMC 20.70.320, where frontage improvements are required of a development and/or project, the frontage improvements shall include adequate drainage conveyance systems for passing upland flows for future build-out, or fully developed, conditions.

D. Conveyance systems shall generally be subsurface piping unless otherwise approved by the City Engineer and shall extend the full length of all project frontages as determined necessary by the Director. At a minimum, a junction structure shall be provided at the upstream end of the improvements, and/or at any project connections to the main line. Additional catch basins within the project frontage, or along the extension, shall be provided per the spacing guidance provided in Table 19, Conveyance System Specifications, of this manual. Where no formal drainage system exists, a project shall provide sufficient downstream conveyance to assure the frontage and project discharge locations will not negatively impact adjacent properties or right-of-way. Generally, this is anticipated to require a sub-surface connection to the existing City piped system,

daylighting at an existing City ditch line, or discharging directly to a receiving water (additional approvals and permits may be required). No formal limit of length is placed on this requirement. Where dual, or parallel, roadway drainage systems and/or courses exist on each of the roadway, the applicant shall generally maintain the individual drainage systems and/or courses. The combining of multiple existing conveyance courses into a single main, and/or the use of existing conveyance systems on the opposite side of a roadway, is only permitted by approval of the City Engineer and may require additional details to support conveyance capacity verification.

E. Where developments or projects disrupt or remove any existing publicly maintained stormwater utility asset, the conveyance capacity and mitigation capacity of the public facility must be restored by the project in addition to the provisions of this manual and SWMMWW. Stormwater utility assets may include, but are not limited to, catch basins, manholes, flow-diversion devices, ditches, swales, berms, pipes, and/or drain tiles, as well as water quality treatment facilities, flow control facilities, control structures, and/or BMPs.

20.17. Permeable Pavements

A. Permeable pavements may be used for any private paving surfaces (including those subject to vehicular traffic) and for public pavement surfaces not subject to vehicular traffic, subject to the additional site suitability and treatment requirements in this Manual and SWMMWW.

B. All permeable pavements shall be designed and installed per SWMMWW BMP T5:15: Permeable Pavements.

C. Care should be taken to avoid overly shaded areas or areas with excessive vegetation debris (e.g. needle and/or leaf drop) which can reduce the ability of the pavements to infiltrate, and the City reserves the right to direct relocation or reject installations proposed in such area.

D. All permeable pavement types require check dams per Standard Detail 776 on subgrades slopes exceeding five (5) - percent.

E. Privately maintained permeable pavement requires a declaration of covenant to be recorded.

F. Permeable pavement shall not be permitted in the right-of-way when the long-term design infiltration rate is below the feasibility criteria for permeable pavements (0.3 inches per hour).

G. Underdrains shall not be used on public permeable pavements.

H. Construction methods and materials for installation of all permeable pavements shall follow WSDOT Local Agency GSP Divisions 2 - 9. Available online at: https://www.wsdot.wa.gov/partners/apwa/Division_5_Page.htm

I. For permeable pavements other than asphalt or concrete, the manufacturers specifications and/or design and installation guidance shall be followed unless otherwise approved by the Engineer of Record.

J. The manufacturer's maintenance guide and/or manual shall be incorporated into the required O&M manual for such facilities.

K. For pervious concrete installations in the public right-of-way, and/or private installation to be subject to vehicular traffic from more than one (1) home or unit, the contractor must have completed National Ready Mixed Concrete Association (NRMCA) Pervious Concrete Contractor Certification Program at least a "technician" level prior to undertaking the installation. The contractor shall provide evidence of such qualification prior to beginning any subgrade preparation and can be looked-up on the NRMCA website.

L. Post construction testing:

   i. For private permeable pavement less than 1,000 SF, a bucket test may be sufficient for acceptance.

   ii. For private permeable pavement exceeding 1,000 SF combined area, at least one test per ASTM C1702 or ASTM C1781 is required to be completed, documented, and provided to the City inspector. Additional tests are required for each 2,000 SF of permeable pavement.

   iii. For all public permeable pavement installations, at least one test per ASTM C1702 or ASTM C1781 is required to be completed, documented, and provided to the City inspector.

   iv. For public permeable pavement exceeding 1,000 SF combined area, at least two tests per ASTM C1702 or ASTM C1781 are required to be completed, documented, and provided to the City inspector. Additional tests are required for each 1,000 SF of permeable pavement.

M. The City reserves the right to require additional geotechnical verification of the subgrade materials prior to installation of any permeable pavement if subsurface site conditions are different than previously reported and/or contractor operations have potentially compromised the infiltration capability of the area.

N. The City reserves the right to reject any materials believed to not be meeting the Specifications above or believed to have been mishandled in a way that will negatively impact the pavement performance for either longevity or infiltration.

O. For sites proposing to use permeable pavement for a pollution-generating surface (driveway, parking area, street), the soil shall meet all three of the following criteria or a six (6) inch layer of sand that meets Table V-6.1: Sand Medium Specification shall be used:

   i. Cation exchange capacity (CEC) is >5 milliequivalents CEC/100 g dry soil (USEPA Method 9081).

   ii. Organic content is greater or equal to one (1) percent (ASTM D 2974).

   iii. One (1) foot depth of soil below base of permeable pavement has the above characteristics.

Chapter 21. Surface Water Project Classifications

The City classifies stormwater impacts into three project classifications based on the MRs: Small, Medium, and Large Impact Projects. The three types of impact projects are based on two thresholds: proposed hard surface and the amount of disturbed area. Table 17 summarizes the thresholds that trigger each classification:

Table 17. Surface Water Project Classifications

Threshold	Small Impact Project	Medium Impact Project	Large Impact Project
New + Replaced Hard Surface	Less than 2,000 SF	2,000 SF to 5,000 SF	Greater than 5,000 SF
Total Area of Disturbance	Less than 7,000 SF	Greater than 7,000 SF	Greater than 1 acre

A project is classified based on the highest impact level of either threshold. Applicability of the MRs shall be determined using the thresholds given in the Stormwater Manual Vol. I: 2.4 and the definitions given in the Stormwater Manual Appendix I-G. Table 18 summarizes the requirements for each project classification:

Table 18. Surface Water Submittal Requirements

	Small Impact Project	Medium Impact Project	Large Impact Project
MRs per the Stormwater Manual	MR2	MR1-5	MR-9
Soils Report	Not required	A soils analysis is required. Grain-size analysis (outwash soils only) or PIT are acceptable to calculate infiltration rates.	Geotechnical report is required. Grain-size analysis (outwash soils only) or PIT are acceptable to calculate infiltration rates. If grain-size analysis is performed, geotechnical engineer is required to review drainage design.
Surface Water Report	Not required	Required	Required
Is a licensed engineer required to prepare the site development plan?	Not required	Required if the site is within 100 feet of a critical area or its buffer	Required
Site Development Plan	Not Required	Required	Required
SWPPP	Handout SWPPP	SWPPP Short Form for Small and Medium Impact Projects	Department of Ecology's SWPPP template
Declaration of Covenant	Not required	Required for any stormwater facilities	Required for any stormwater facilities
Copy of NPDES CSWGP Coverage Letter	Not required	Required, if coverage is necessary	Required, if coverage is necessary

Chapter 22. Construction Stormwater Pollution Prevention Plan

22.1. Stormwater Pollution Prevention Plan Requirements

Refer to the Stormwater Manual Section II-2, Construction SWPPPs.

A. All development, regardless of size, shall comply with MR2, even when a permit is not required.

B. The SWPPP incudes plans and a narrative:

   i. For Small Impact Projects, the applicant may make use of the City's Handout SWPPP. The applicant remains responsible for all discharged from the site. The form is available on the City's website: http://www.shorelinewa.gov/home/showdocument?id=42686

   ii. For Medium Impact Projects, the Applicant is required to complete the SWPPP Short Form for Medium Impact Construction Projects. The form is available on the City's website: http://www.shorelinewa.gov/home/showdocument?id=42686

   iii. For Large Impact Projects, the Applicant is required to complete the Ecology's SWPPP template.

C. Small and Medium Impact Projects with persistent stormwater pollution issues and/or deemed by the City at high risk of stormwater pollution may be required to submit a more robust SWPPP than as minimally required in 22.1.B above.

D. The following are minimum requirements need to be shown on the plans for all projects:

   i. Site areas which do not need to be disturbed shall remain undisturbed (clearing limits are defined and maintained);

   ii. Runoff from areas not under construction does not flow over disturbed soils;

   iii. Temporary cover on disturbed soils that are not being worked;

   iv. Permanent cover installed without unnecessary delay on all areas at final grade;

   v. Off-site streets are kept free of dirt and mud originating from the construction site, using sweeping, not flushing, in the streets and, if appropriate, on-site wheel wash facilities;

vi. Dust is controlled and is in compliance with the Puget Sound Clean Air Agency;

vii. Work in Critical Areas conforms to requirements of the City's CAO; and

viii. Plans need to show construction BMP's to be used during construction.

E. If construction is being phased, the Director may require separate erosion and sediment control plans to address the specific needs for each phase of construction.

22.2. Rainy Season

A. The rainy season is defined as the months between October 1 and April 30 of any given year.

B. Slope stability and adequate protection of receiving waters are major concerns during the rainy season. For the following activities, clearing and grading is prohibited during the rainy season, unless the City has specifically given approval to continue or to initiate clearing and grading:

i. Disturbing more than 7,000 SF of soil and:

a. Having area(s) that drain, by pipe, open ditch, sheet flow, or a combination of these to a tributary water, and the tributary water is one-quarter (1/4) mile or less downstream; or

b. Having slopes steeper than 15 percent adjacent or on-site; or

c. Having highly erodible soils adjacent or on-site; or

d. Located upstream of a critical area or critical area buffer; or

e. Having high groundwater table or springs.

ii. Exemptions:

a. Routine maintenance and necessary repair of erosion and sediment control BMPs;

b. Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to soil; and

c. Activities where there is one-hundred percent infiltration of surface water runoff within the site in approved and installed erosion and sediment control facilities.

C. Seasonal Suspension Plan:

i. When rainy season construction is prohibited, the Applicant/Permittee shall provide a Seasonal Suspension Plan for review and approval. The plan shall be submitted to the City no later than September 1 and shall be implemented and inspected by September 30.

ii. The seasonal suspension plan shall include the following:

a. CESCL (with contact information) having the authority to direct implementation of additional measures or maintenance and repair of existing measures;

b. Inspections increased to weekly;

c. Erosion prevention and sediment control plan that protects all disturbed areas;

1. Areas that are to be unworked during the wet season shall be seeded and mulched by September 30;

2. Cover measures shall be installed on all areas where seeding is not well established;

3. All soil stockpiles and steep cut-and-fill slopes shall have cover measures;

4. Construction road and parking lots shall be stabilized.

iii. Stockpile on-site cover materials sufficient to cover 50 percent of disturbed areas.

iv. Stockpile on-site at least 50 LF of silt fence (and the necessary stakes) per acre of disturbance.

v. Additional requirements for projects one acre or greater:

a. Contingency plans for controlling spills and other potential pollutants which have been developed and are ready to implement at the construction site;

b. Designated point of contact that can call out and direct crews 24 hours a day and seven days a week (24/7), obtain materials, and authorize immediate expenditures for on-site temporary erosion prevention and sediment control work;

c. Compliance with all project approval conditions and permits (including HPA from WDFW and Ecology NPDES CSWGP);

d. Ensure that turbidity in runoff from the construction area does not exceed 25 Nephelometric Turbidity Units (NTU) or 5 NTU above background.

D. When clearing and grading during the rainy season is prohibited, building construction can proceed as long as clearing and grading is halted and the seasonal suspension plan is in place and being maintained.

E. Refer to EDM Section 30.11, Stop Work.

Chapter 23. Conveyance System

23.1. King County Surface Water Design Manual Modifications

A. The City has adopted the 2016 King County Surface Water Design Manual (KCSWDM), Chapter 4, for the design of conveyance systems. Modifications to these requirements are given in Table 19.

B. The Applicant is responsible for determining adequate pipe sizes. The Director may require the Applicant to verify the adequacy of the pipe size and expand the conveyance system, such as adding pipe or catch basins.

C. Storm pipe bedding shall be 5/8 inch minus crushed rock, compacted in eight (8)-inch lifts.

Table 19. Conveyance System Specifications

KCSWDM Section	Amendment
Section 4.2.1.1 Acceptable Pipe Sizes	1. For public stormwater pipe and storm pipe in the right-of-way, the minimum diameter shall be 12 inches. With Director approval, eight (8)-inch diameter pipe may be permitted on cross street laterals less than 66 feet long to avoid utility conflict or meet shallow gradient. 2. For private stormwater pipe, the minimum size shall be six (6) inches. Footing and wall drains may be four (4) inches. 3. High-density polyethylene (HDPE, also known as thermoplastic or solid wall polyethylene) pipe with maximum Standard Dimension Ratio (SDR) of

	32.5, minimum cell Class ASTM D3350-06 and meeting WSDOT Specifications for ductile iron pipe with restrained mechanical joints may be used for outfalls on steep slopes. Above ground installation of HDPE does not require pipe bedding. 4. HDPE shall be tested using the deflection test procedure described in Section 7-17.3 of the WSDOT Standard Specifications.
Section 4.2.1.1 Allowable Pipe Materials	1. Pipe material in the right-of way shall be Corrugated Polyethylene Pipe (CPEP) (Double-walled, smooth interior). Other pipe materials may be allowed in the right-of-way with Director's approval, including: a. HDPE (SDR 32.5) b. Reinforced concrete pipe (RCP) (Min. Class III) c. Ductile iron pipe (Class 50) d. PVC ASTM 3034 2. Allowable pipe materials on private property include all pipe materials permitted in the right-of-way and: a. PVC (SDR 35, Schedule 40, or Schedule 80) with solvent welded joints is permissible in private conveyance systems. b. Corrugated metal pipe (CMP) c. Spiral steel pipe 3. Single-wall CPEP may be used in private conveyance systems for downspouts, footing drains, or yard drains. 4. CMP may be used for private or public detention tanks or infiltration tanks (if perforated).
Section 4.2.1.1 Changes in Pipe Size	1. Any increases or decreases in pipe size shall occur only at drainage structures. 2. Any change in pipe type or material shall occur only at drainage structures. 3. Ductile iron mechanical couplings (e.g. Romac) may be used to connect pipes of differing materials or diameters, if approved by the Director.
Section 4.2.1.1 Structures	1. Frames shall be affixed using a cement slurry or other approved grout.
Section 4.2.1.1 Pipe Design Between Structures	1. Minimum pipe slope shall be one-half (0.5) percent. Pipes larger than 12 inches in diameter may be designed for slopes lower than one-half (0.5) percent based on a minimum velocity of

	three (3) feet per second, if approved by the Director. 2. In the right-of-way: a. Catch basins shall be spaced no greater than: • 150 feet for grades less than one (1) percent, • 200 feet for grades between one (1) percent and three (3) percent, and • 300 feet for grades three (3) percent and greater. b. Catch basins, rather than concrete inlets, shall be used to collect stormwater from road surfaces, unless approved by the Surface Water Utility Manager. c. Vaned grates rather than herringbone grates shall be used in the roadway, unless approved by the Director. d. Catch Basins in the right-of-way should be located within the gutter line or outside of the vehicular wheel path. e. For structures not intended to collect surface runoff, see Section 23.3 Junctions.
Section 4.2.1.1 Pipe Cover	1. If two (2) feet of cover cannot be achieved, pipe material shall be ductile iron. Ductile iron pipe shall have six (6) inches minimum cover.
Section 4.2.1.1 Pipe Clearances	1. The minimum vertical clearances for storm conveyance systems are given in Table 20, Conveyance System Vertical Clearances. Utility providers may have additional clearance or crossing requirements. The Applicant/Permittee shall verify with the utility provider. If achieving the minimum clearance is not possible, use of pads or pipe sleeves may be allowed with approval from the Surface Water Utility Manager and from the utility provider. 2. Where a storm pipe crosses above or below another utility, one full length of pipe shall be used with the pipe centered at the crossing for maximum joint separation. 3. The minimum horizontal spacing between closed storm drains and water mains, gas mains, other underground utility facilities and all structures shall be five (5) feet horizontally, unless the utility provider requires additional separation.

	4. The minimum horizontal distance between any open storm drainage facilities (swales, open channels, biofiltration swales, etc.) and water mains, gas mains, and other underground facilities shall be ten (10) feet. 5. For pipe crossings, the preferred horizontal angle is 90 degrees, but 20 degrees obtuse or acute of 90 degrees is acceptable.
Section 4.2.1.1 Spill Control	1. Spill control is not applicable.
Section 4.2.1.1 Debris Barriers	1. Refer to Standard Plan 702, Trash Rack for debris barriers (also known as trash racks).
Section 4.2.1.1 Other Details	1. Refer to the adopted Standard Plans in Appendix L.
Section 4.2.1.2 Conveyance Capacity	1. Small and Medium Impact Projects may use the preliminary sizing as the final sizing per the engineer's judgement.
Section 4.4 Floodplain/Floodway Analysis	1. This section is not adopted by the City. Refer to EDM Section 20.11, Flood Control.
Pipe System Installation	1. Install pipe in accordance with section 7-08 of the WSDOT Standard Specifications. 2. Unstable soil conditions, such as peat, shall be removed from under pipes unless special measures are approved by the City. 3. For pipe crossings in the right-of-way: a. A foam pad is required for some installations to provide additional protection between adjacent utilities. The size of the pad shall be based on the outside diameter (O.D.) of the larger crossing pipe. The pad shall be O.D. by O.D. square by two and one-half (2.5) inches thick minimum or as required to protect the pipes. The pad shall be a strong, resilient, medium-density, closed-cell, polyethylene foam plank (Dow Ethafoam 220, or accepted equivalent). b. A pipe sleeve is required for some installations to provide additional protection of stormwater from potential leakage from other utilities. A pipe sleeve shall be a single section of pipe (no joints) with a minimum length of three (3) feet to

	each side of pipe crossing. The pipe sleeve shall be placed around the stormwater pipe with the annular space between the pipe sleeve and the stormwater pipe filled with grout. Additional measures may be necessary to ensure system integrity and may be required on a case-by-case basis.
Pipe Testing	1. Thermoplastic pipe (e.g., Solid Wall Polyethylene (SWPE)) shall be tested using the deflection test procedure described in Section 7-17.3 of the WSDOT Standard Specifications.

Table 20. Conveyance System Vertical Clearances

Utility	Location (Above or below Storm Pipe)	Minimum Clearance	Special Requirement
Storm	Above or below	12 inches	N/A
Electrical	Above or below	12 inches	N/A
Communications	Above or below	12 inches	N/A
Water main or gas main	Above or below	12 inches	N/A
Water main or gas main	Above or below	6 inches	Ethafoam pad
Sanitary Sewer	Below	12 inches	N/A
Sanitary Sewer	Above	18 inches	N/A
Sanitary Sewer	Above or below	6 inches	Pipe sleeve and Ethafoam pad
Liquid petroleum	Above or below	18 inches	N/A

23.2. Pump Systems

Pump systems may be used for on-site conveyance if a gravity system is not feasible. Pumps shall comply with the following criteria:

A. The pump system shall not be used to circumvent any code, engineering standard, or permit condition. The construction and operation of the pump system shall not violate any other City requirements.

B. Pump systems shall be owned, operated, maintained, repaired, and replaced (as needed) by property owner(s) served by such system.

C. Pumped discharges requiring compliance with MR 7 shall meet the flow control standard at the downstream point of compliance where flows re-enter the MS4s and/or receiving water.

D. If a flow control system is not required, the pump system shall have a storage facility (such as a pond, tank, or vault) sized to hold 25 percent of the total volume of runoff for the developed tributary drainage area for the two (2)-year storm.

E. The pump system shall have dual, alternating pumps with emergency on-site, automatic back-up power supply, and an external alarm system for the high-water level indicator and system failure.

F. A safe emergency overflow route shall be provided, if possible, and shown on the plans. A safe overflow is an overflow which discharges to a public MS4s, or is completely self-contained on-site, so as to not create flooding of the adjacent properties or right-of-way. Gravity overflow pipe are preferred when feasible, but surface overflow may be permitted providing the flow path is controlled and does not create a flooding or erosion nuisance.

G. The pump system shall discharge to an elevation higher than the downstream design water surface elevation to prevent backwater or backflow conditions.

H. The pump operations and maintenance requirements shall be included within the Declaration of Covenant.

I. A note on the approved plans and in the O&M Manual shall stipulate that the private property owner(s) shall be responsible for any and all claims for injuries and damage due to the operation or failure of the pump system.

J. The pump system force main shall connect into a private catch basin and gravity flow to the public stormwater system. Direct pressure discharge to a gutter, ditch, or stream shall not be allowed.

23.3. Junction

A. A catch basin, concrete inlet, and/or manhole is required at each connection to a publicly maintained pipe. No blind taps or tees shall be proposed or re-used for new or redevelopment projects.

B. Junctions which are not intended to collect surface runoff, and only provide a connection point between any pipe and a publicly maintained pipe, shall be installed with a solid locking lid and shall be:

    i. Installed as a concrete inlet without sump if at or under five (5) feet max depth from rim to invert, or

    ii. Installed as channelized Type 1 manhole if over five (5) feet from rim to invert.

23.4. Drop Structures

Drop structures shall generally be discouraged to the extent practical. The City reserve the right to reject drop structures if the other alternatives exist.

23.5. Rockeries/Retaining Walls Crossing

Crossing of rockery/retaining wall and drain pipe should be perpendicular. Depending on conditions, the drain pipe may need a steel casing per engineer recommendation.

Rockeries and retaining walls may have foundation drains, when required by the design engineer. The foundation drain outlets shall connect to an approved outfall.

23.6. Ditch Modifications

Ditches are an integral part of the stormwater conveyance system within the right-of-way and as such, eliminating (closing) or otherwise modifying existing ditches is allowable only where sufficient cover exists, and only as reviewed and approved through the permit process.

A. Ditches having ten (10) percent or flatter longitudinal slopes shall remain open. The City may approve enhancement when either a “natural drainage system” swale design or a “bioretention swale” design is proposed.

B. Ditch closure approvals are subject to the following criteria:

    i. A Right-of-way Use Permit is required. The design shall be prepared by a Professional Engineer licensed in the State of Washington. The City shall review all applications to verify compliance with the City’s critical areas requirements.

    ii. The property owner is responsible of the cost of permit, engineering, materials, labor, and equipment required for the installation.

iii. Modifications shall be designed by a Professional Engineer licensed in the State of Washington and shall meet the material and design requirements of this chapter.

iv. Modifications may only be approved if adequate cover to support vehicle loading is provided for the pipe materials proposed. The cover requirement applies to the existing driveway culvert pipe as well as any new pipes or extensions.

v. Install catch basins:

   a. At low points that drain to the ditch,

   b. At locations where roof downspouts, footing drains or other surface water piping connects to the ditch, and

   c. For maintenance purposes, when the pipe run is 100 feet or greater.

vi. Once the pipe is installed and covered, the disturbed areas shall be graded such that any runoff from the road and private property is directed to a catch basin or open ditch. Cover the graded area using compacted 5/8-inch minus crushed rock.

vii. Reasonable use of the adjacent property is not possible. This includes culvert installations that are necessary to provide driveway access.

viii. Harm or threat of harm to public health, safety and welfare, the environment, or public and private property shall not exist or be a result of the work.

DIVISION 4 – WASTEWATER

Chapter 24. Public Sewer, Use, and Connections

24.1. Standards

Division 4- Wastewater applies to public and private development within the City.

The City has adopted the 2022 Department of Ecology Criteria for Sewage Works Design (Orange Book).

24.2. Public Wastewater System

Any person owning property with structures containing facilities for the disposal of wastewater within the City's municipal boundaries shall connect to the public wastewater system when:

A. New development or redevelopment of a structure occurs, and public wastewater service is within a horizontal distance of 300 feet from the property line for the parcel where the development or redevelopment is occurring; or

B. Property containing a structure with facilities for the disposal of wastewater by an on-site septic system shall connect to the public wastewater system when ordered to do so by the Seattle/King County Department of Health, or its successor agency.

24.3. Connection of Non-Assessed Property

The owner of a property that has not been subject to special assessments for sewers by the City may connect structures on that property to the public wastewater system or, any other wastewater system where the City has an agreement with another agency. The owner must obtain wastewater disposal service by entering into the necessary agreements and paying the necessary fees.

24.4. Connection of All Plumbing Outlets

All plumbing outlets used as either a receptacle or conductor of wastewater from the structure shall connect to the sanitary sewer.

24.5. Prohibited Connections and Discharges

The following connections to the public wastewater system are prohibited: gutter drains, downspouts, stormwater collection systems, cesspools, septic tanks, privy vaults, cisterns, footing drains or any other connection determined by the Director to be principally a storm drain, a conduit for stormwater, or a source of wastewater unsuitable for the City's municipal sewage collection system.

In accordance with SMC 13.05.1150 and 13.05.220, the following materials shall not be discharged into the sanitary sewer:

Biochemical Oxygen Demand (BOD): Any matter containing a 5-day BOD in excess of 300 mg/L.

Fat, Oil, and Grease (FOG): Any material containing sufficient sources of fats, oils, and grease such that the total concentration of FOG exceeds 100 mg/L.

High Temperature Wastes: Any liquid or vapor having a temperature higher than 150 degrees Fahrenheit.

Inflammable or Explosive Substances: Any material containing flammable or explosive substances such has hydrocarbons (gasoline, naphtha, kerosene, BTEX chemicals, volatile oils, paints, lubricating oils, or any matter that is inflammable or explosive or may become inflammable or explosive upon introduction to the City sewage collection system).

Medical Wastes: Any medical wastes including but not limited to hypodermic syringes and needles.

Noxious Substances: Any noxious or malodorous gas or substance capable of creating a public nuisance, including the contents of septic tanks and cesspools, without the prior written consent of the City.

Obstructive Wastes: Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, manure, or any other solid or viscous substance capable of causing obstructions to the flow in sewers or causing other interference with the proper operation of the City sewage system.

Other: Any waste which, in the opinion of the Director, may harm facilities of the City or adversely affect the wastewater treatment process.

Paper and Plastic Products: Any paper or plastic products such as wet wipes, cups, dishes, napkins and milk containers.

PH Limitations: Any waters or wastes having a pH lower than 5.5 or higher than 9.0.

Corrosive Substances: Any material having corrosive properties capable of causing damage or hazard to structures, equipment, and personnel of the City and wastewater treating agencies.

Suspended Solids: Any waters or wastes containing suspended solids of such character and quantity that unusual attention or expense is required to handle such material at the sewage treatment plant or any waste discharge containing suspended solids in excess of 350 milligrams per liter (mg/L).{XE “mg/L:milligrams per liter”.}

Toxic or Poisonous Substances: Any waters or wastes containing a toxic or poisonous substance in sufficient quantity to interfere with any sewage treatment process, or to pose a hazard to humans or animals, or to create a human-health or ecological hazard in the receiving waters of the City sewage system.

24.6. Oil/Water, Sand, and Grease Interceptor-Separators

In accordance with SMC 13.05.160, property owners identified in this section shall be required to install, at owner's expense, oil/water, sand and grease interceptor-separators when, in the opinion of the City, they are necessary for the proper handling of liquid wastes containing FOG in excessive amounts or any flammable wastes, sand, and other harmful ingredients.

A. Businesses Affected:

   i. Commercial and retail food preparation operations

   ii. Self-service car washes

   iii. Automobile service stations

   iv. Steam cleaning facilities

   v. Any other businesses which release FOG, industrial chemicals, sand, or heavy metals in quantities that the City anticipates may adversely affect the sewage collection system or County treatment systems shall comply with this section before a side sewer permit will be issued.

24.7. Fat, Oil, and Grease (FOG)

In accordance with SMC 13.05.160, all food processing, sales and service establishments generating FOG shall install and maintain a grease interceptor.

A. Grease Interceptor: The requirements for grease interceptors are as follows:

   i. Grease interceptor sizing and installation shall conform to the requirements contained in the current edition of the Uniform Plumbing Code (UPC) or other criteria as determined on a case-by-case basis based on review of relevant information. Supporting sizing calculations shall be submitted to the City.

   ii. The grease interceptor shall have a minimum of two (2) compartments with fittings designed for grease retention.

   iii. Grease interceptors shall be installed at a location where they are easily accessible for sample collection, inspection, cleaning, and removal of

retained grease. The grease interceptor may not be installed within any part of the building, unless approved by the City.

iv. Grease interceptors shall be located in the food service establishment's lateral line between all fixtures which may introduce grease into the wastewater system and the connection to the wastewater system. Such fixtures shall include but not be limited to sinks, dishwashers, floor drains for food preparation and storage areas, and mop sinks.

v. Grease interceptors shall be directly vented. Grease interceptors shall not be connected to building vents.

vi. A maintenance access opening with a minimum diameter of 24 inches shall be provided over each chamber and sanitary tee. The maintenance access holes shall extend at least to finished grade and be designed to prevent water inflow or infiltration. The maintenance access hole shall also have readily removable covers or easily accessed hatches to facilitate inspection, maintenance, cleaning, and sample collection. Maximum riser height shall not exceed 24 inches without approval from the City. Access lids in paved areas or where any vehicular traffic is expected within 10 feet shall be AASHTO HS-20 traffic rated.

vii. Toilet water must not be introduced into the grease interceptor.

Chapter 25. Permits, Charges, and Fees

25.1. Application and Issuance

Prior to connection of any structure to the public wastewater system, or the making of any repairs, alterations, or additions, an application shall be submitted on official forms prescribed and provided by the City, and shall be accompanied by all required documents and appropriate fees. The application shall be signed by the owner, owner's authorized agent, or Contractor.

An approved permit authorizes the Applicant to proceed to connect to the public wastewater system in accordance with the terms and conditions of the permit. If the Applicant proceeds in any manner other than as authorized, the City may require the Applicant to correct any work that is not in accordance with the permit, or may require the owner to expose any work which has been done to allow inspection.

A property owner may install a side sewer on the property provided the owner complies with these standards.

25.2. Unauthorized Work

No repairs to nor installation of a sewer pipe shall be performed on any private property, nor shall side sewers be connected to a sewer main without a permit issued by the City.

25.3. Right-of-Way Permit

A right-of-way permit is required for all work performed on public right-of-way.

25.4. Other Permits/Notifications Required

The issuance of a side sewer permit by the City shall not relieve the permit holder from the responsibility of obtaining any other permits or licenses which may be required by the City, county, state or other agency. The permit holder shall contact the Utilities Underground Location Center (Call 811) for the location of any underground facilities 48 hours prior to starting excavation.

25.5. Failure to Comply With Permit Provisions

If any work done under a side sewer permit is not in accordance with these standards and if the permit holder doing the work fails and/or refuses to properly construct and complete such work, notice of such failure or refusal shall be given to the Permittee, Contractor, owner, or occupant in writing. The City may cause the work to be stopped if the work, in the opinion of the City, constitutes a violation of the permit or a hazard to public safety.

25.6. Permit Fees

Prior to issuance of any permit, all fees shall be paid to the City per the Fee Schedule (https://www.codepublishing.com/WA/Shoreline/#!/ShorelineFEE/ShorelineFEE.html).

25.7. Connection Charges

A. **General Facilities Charge:** Prior to making a connection, all property owners who shall have a change of use of property, connect to, or establish a new wastewater service connection shall pay a general facilities charge. The purpose of the charge is to recover costs already paid by present and past customers for building sewage collection capacity to serve newly connected customers and to ensure that all customers pay their share of the cost of capital improvements to provide service.

B. **Treatment Facilities Charge:** All property owners who shall have a change of use of property or connect or establish a new wastewater service connection shall be subject to a Treatment Facilities Charge. The purpose of this charge is to recover costs already

paid by present and past customers for building and providing the sewage treatment capacity necessary to serve newly connected customers.

i. **King County Wastewater Treatment Facility Charge:** King County collects a charge for all new or change of use connections which serve into the King County Wastewater Treatment Plant Facility. King County Wastewater Treatment Facility Charge forms are completed at the time of permit issuance and forwarded to King County by the City. King County should contact the property owner directly for payment of these charges.

ii. **City of Edmonds Wastewater Treatment Facility Charge:** The City collects a Wastewater Treatment Facility Charge that is retained to offset capital costs incurred from the Edmonds Treatment Plant.

Chapter 26. General Sewer Requirements

26.1. Manholes

A. Manholes shall be constructed according to the City Standard Details, Section 600 Wastewater.

B. Manhole numbers are obtained from the City Wastewater Utility.

C. All lines eight (8) inches and larger shall terminate in a manhole. All pipes entering/leaving a manhole shall be aligned with the center of the manhole unless otherwise authorized by City.

D. Manholes shall be precast, shall generally be 48 inches inside diameter and shall conform to ASTM C478. Ideally, manholes should be seven (7) feet or greater in depth. Avoid manhole depths between four (4) and six (6) feet wherever possible. Manholes shallower than four (4) feet are not allowed. Manholes and wet wells larger than 48-inches inner diameter may be approved on a case-by-case basis.

E. Manholes located in traffic areas must have a concrete collar to hold neck and rim assembly in place in accordance with Standard Detail 605.

F. Where drop manhole is required, use outside drop unless otherwise authorized by the City. See Standard Detail 612, Manhole Outside Drop Connection - Sanitary.

G. Manholes shall have a minimum one-tenth of a foot drop across the channel.

H. Manhole channels shall be shaped to allow placement and use of the City's Closed-Circuit Television (CCTV) inspection equipment. Approximate camera trolley dimensions are 36-inches long x six (6)-inches in width.

I. Manholes shall be placed at each grade and direction change. Distances between manholes shall not exceed 400 feet.

J. Terminal manholes where future connection/extension may occur shall not be channeled. A grouted bottom sloping to the outlet shall be constructed as shown in Standard Detail 611, Manhole Channeling Detail - Sanitary.

K. Cones with small-end diameter of 36 inches shall be at least 24 inches in height. Cones with a small-end diameter of 24 inches shall be at least 17 inches in height.

L. Unless otherwise provided, steps shall be installed in each section so that sections placed together in any combination will provide a continuous vertical ladder.

M. All pipe connections to new and existing manholes shall be accomplished by installation of a flexible pipe-to-manhole connector which shall provide a watertight joint between both the pipe and connector and the connector and manhole.

N. Every effort shall be made to locate manhole covers outside of wheel paths. Final elevation of manhole cover shall conform to final grade, unless otherwise specified by the Utility Engineer. Manhole covers in paved areas shall be tilted to match the final slope and grade of the surface.

O. The installer must make every effort to maintain continuous sewer service for the duration of work. In the event that short term shutdown is necessary, the Contractor (and Developer, as applicable) must inform the City and seek approval at least one week prior to the anticipated service outage. Sewer service shall not be interrupted for a period greater than four (4) hours as a result of utility construction activities, and all affected customers must be notified at least 72 hours in advance of the proposed service interruption. Weekend interruptions are not allowed except in the case of an emergency.

P. Interior manhole grouting must result in watertight seals at all junctions; groutwork must be warrantied against failure for a period of no less than five years from the date of acceptance by the City. After the specified sealing and repair work has been completed, the manholes will be visually inspected by the City to confirm if acceptable. All rehabilitated manholes shall be re-inspected for leaks at the end of one year warranty period. If leaks are present, they shall be resealed at the Contractor’s expense (or Developer’s expense, as applicable). Cementitious grout for joint, gap and leak sealing/repair shall be a low shrink, fiber reinforced, high bond strength, low chloride penetration, chemically durable cement material specifically formulated for stopping water and infiltration/inflow, Xypex Megamix II or approved equal.

Q. Manhole lids shall be skid-resistant in compliance with the Americans with Disabilities Act, and shall conform to City of Shoreline Standard Detail 608.

26.2. Sewer Main

A. These standards are only for gravity lines and are not intended for pressure mains. Pressure mains shall meet ASTM specifications and/or specifications established by the City Engineer or the City's consulting engineers for the project.

B. Gravity sewer mains shall conform to the City Standard Details, City Standard Specifications, and WSDOT Standard Specifications Section 7-17, in that order of precedence.

C. The pipe sizes, routing, and alignment (including build-through) shall be selected as is indicated by good practice and shall conform to the Comprehensive Sewer System Plan, as approved by the City.

D. Gravity line connection shall be made at the point designated by the City and all plumbing outlets shall be connected to the public wastewater system.

E. "Build through" requirements may apply to serve upstream property.

F. Where surface slopes exceed ten (10) percent, utilize manhole junctions and exterior drop pipes to reduce sewer main slopes below ten (10) percent. If this is not feasible, use ductile iron pipe or C900/905 PVC pipe for sewers sloped between ten (10) and 20 percent. Where pipe slopes greater than 20 percent are unavoidable, ductile iron pipe and pipe anchors shall be required. Install concrete anchors on sewers laid on slopes of 20 percent or greater in accordance with Standard Plan 620, Pipe Anchor Detail - Sanitary. Alternative pipe anchors shall be designed by a professional civil or geotechnical engineer licensed in the State of Washington and submitted to the City Engineer or designee for review and approval prior to installation.

G. No sewer mains shall be designed to produce flows exceeding ten (10) feet per second without approval by the City Engineer.

H. Sewer pipes shall have at least four (4) feet of cover.

I. All gravity sewer pipes eight (8) inches and larger shall terminate at a manhole.

J. Where a new main is to be connected to the existing collection system, there shall be the following notations on the plans, "Verify invert elevation prior to construction."

K. For sewer main extensions serving a new building, the system shall be designed so the building lowest floor elevation is at least one foot higher than the rim of the first manhole upstream from point of side sewer connection.

L. Gravity sewers shall be PVC pipe, HDPE pipe, or ductile iron pipe.

M. All joints shall contain rubber gaskets.

N. Minimum grade for 8-inch mains shall be 0.5% and the minimum grade for end sewer mains that will not be extended shall be 0.75%, unless otherwise approved by the City's Engineer. Minimum grade and design criteria, unless City criteria is more stringent, shall be in accordance with Section C1-4 of the "Criteria for Sewage Works Design, State of Washington, DOE."

26.3. Force Mains

A. Force mains shall be PVC, HDPE, or ductile iron with interior ceramic epoxy lining (Protecto 401 or approved equal). All pressure mains shall be designed to accommodate the maximum operating and testing pressures anticipated for the service life of the main. Pressure mains shall also be designed to withstand transient and sudden pressure fluctuations and "water hammer" that may be reasonably expected to occur with the proposed application. Mains shall be designed and installed according to requirements in Section C2-3 of the "Criteria for Sewage Works Design, State of Washington, DOE."

B. Sewer force mains shall be sufficiently restrained such that the hydraulic thrust and water hammer resulting from sudden changes in fluid velocity does not result in joint separation. Designers may use thrust blocking, restrained joints, or a combination, and shall provide to the Engineer thrust calculations to support their design choices.

C. Sewer force mains eight (8) inches or larger may be hot-tapped into existing force mains of equal or greater diameter.

26.4. Side Sewers

A. Stub and tee locations are available in most cases and may be provided upon request. However, some of this information has not been verified by City personnel. Therefore, neither the City, nor its personnel may be responsible for the accuracy of the information supplied. Rather, the Contractor shall be responsible for verifying stub and tee locations.

B. Prefabricated saddles approved by the City shall be used for any connection into the public sewer unless otherwise specified by the City. No connection shall take place unless an authorized City representative is present, and their presence is noted on the permit at that time. The sewer contractor responsible for coring a mainline shall be licensed and bonded with the City. All coring equipment shall be strapped onto the main during the cutting process and shall be centered on the pipe at no more than a 45-degree slope. All cores to the main shall be a minimum of six (6) inches in diameter.

C. A manhole is required for connections to the Public Sewer with pipes 8-inch diameter or greater at the direction of the Wastewater Utility Specialist or designee.

D. If, in the opinion of the Wastewater Utility Specialist or designee, the integrity of the Public Sewer main is threatened by a proposed new connection to the main, the threatened section of main shall be replaced at the time of the connection.

E. The City shall require a payment for any connection whether there is an existing wye, tee, or if a new main tap is required.

F. A four (4) inch side sewer shall be required for any detached single-family residence.

G. A maximum of four (4) detached single family residences may be connected to a common side sewer provided the side sewer is not less than six (6) inches in diameter. A side sewer easement/agreement is required. See EDM Section 28.2 Wastewater Utility Easements.

H. A maximum of eight (8) attached single family residences (townhouses) may be connected to a common side sewer provided the side sewer is not less than six (6) inches in diameter. A side sewer easement/agreement is required. See EDM Section 28.2, Wastewater Utility Easements.

I. Side sewer pipes for apartment buildings containing up to 29 apartments shall be minimum 6-inch diameter with fittings to match.

J. Side sewer requirements for office buildings and apartments with greater than 29 units, and other commercial buildings, shall be determined by the City on an individual basis based on physical conditions and system loading.

K. No six (6)-inch side sewer shall be more than 150 feet in length, except in such cases as may be approved in writing by the Director or designee.

L. The Director may require any side sewer more than 150 feet in length to be at least eight (8) inches in diameter with manholes on each end and at intervals of not more than 400 feet. Those lines shall be installed with both vertical and horizontal alignment.

M. Mobile Homes:

    i. Mobile homes situated on an individual single-family lot shall meet the same side sewer requirements as single-family structures.

N. Accessory Dwelling Unit:

    i. A four (4) inch side sewer from an accessory dwelling unit may be permitted to connect to a four (4) inch side sewer serving an existing single-family structure. Only one (1) accessory dwelling unit per lot shall be allowed to connect. The accessory dwelling unit is subject to all permits, fees, connection charges, notifications, and requirements of a single-family residence.

O. A cleanout is required for the following conditions:

i. A cleanout is required for the following conditions:

a. When a side sewer in the public right-of-way or a public easement crosses onto private property. The cleanout shall be located on private property within five (5) feet of the public right-of-way or public easement. The private property owner shall grant the City an access easement.

b. Whenever two consecutive 45-degree bends are installed, no matter their separation;

c. Immediately outside a house or structure;

d. Every 100 feet for side sewers which are in excess of 100 feet in length;

e. At the end of a line with multiple connections.

ii. Additional clean outs may be required by the City. All clean-outs within paved areas shall be brought to surface.

iii. The cleanouts in public right-of-way shall have locking metal lids. Side sewer cleanouts shall be raised to grade in paved areas and some gravel areas as determined by the City.

P. Each building or lot to be served shall have its own side sewer extending from the sewer main. Indicate the lowest finished floor elevation of each building on drawing.

Q. Side Sewer Stubs:

i. Provide side sewer stubs extending to the right of way line for all properties adjacent to main line sewer unless otherwise directed by the City. Unless authorized in writing by the City, excavation for main line sewers shall not begin more than 1,000 feet ahead of the completion of side sewer construction in the public right-of-way.

ii. Sewers are designed to serve the downstream side of properties. Exceptions shall be as directed by the City at the time of construction. Such exceptions shall be marked by a stake or other suitable marker. Contractor shall be responsible that a "tee" be located in the main line opposite each marker and shall construct a side sewer to terminate at the property lines, edge of easements, or as otherwise directed by the City.

iii. Side sewer stubs shall not be installed as vertical risers, but shall be laid on a slope not to exceed two feet vertical to one foot horizontal.

iv. Side sewer stubs shall be constructed with a maximum deflection not to exceed manufacturer's recommendations. Larger changes in direction shall be made by use of 22.5-degree or 45-degree bends.

v. Plugs shall be installed at end of line and blocked to withstand test pressures without leakage.

vi. A temporary marker stake shall be installed at the stub location as shown in the Standard Details.

vii. Where commercial or multiple dwellings are to be constructed, stubs should be taken from the manhole. Multiple dwelling complexes shall have the number of units indicated. Commercial and industrial complexes shall have anticipated peak flows noted.

viii. The Contractor shall not backfill any side sewer stub until the City has visually inspected and approved the installation. Should any such work be covered up without such approval or consent it must be uncovered for inspections.

R. Side sewer pipe shall be ASTM D3034 DR 35 PVC, 4-inch or 6-inch, depending on the anticipated wastewater demand for the building. Pipes larger than six (6) inches in diameter shall be installed per the requirements outlined in the section on sanitary sewer mains.

S. All gravity side sewer connections shall have an accessible cleanout as shown on Standard Detail 629. All pressurized laterals shall have an accessible cleanout at the gravity transition as shown on Standard Details 633 and 634.

T. Side sewers shall be connected to the nearest suitable mainline with sufficient capacity. Pipes smaller than eight (8) inches in diameter shall not connect directly to manholes without express approval by the Wastewater Utility Specialist.

U. All four (4) inch and (6) inch side sewers shall be laid on not less than a two (2) percent grade and no more than 200% grade.

V. Side sewers shall not be laid within 30 inches from any foundation wall of any building and if there is no foundation wall, side sewers shall not be laid within 30 inches from the outer lines of any footings, pilings, or building supports.

W. The side sewer connection to the main shall be orthogonal (90-degrees) and be laid at uniform grade and in straight alignment between the sewer stub and the main. Line and grade shall be uniform throughout the installation, except as allowed by the City’s inspector. Changes in direction shall be made only with curved pipe or with no greater than 45-degree bends. The connection to the structure’s plumbing outlet shall be made with 45-degree bends or a combination of bends. If a side sewer alignment must be

deflected at an angle greater than 45-degrees, then two angled joints shall be used, and angled joints shall be spaced no less than 12 inches apart.

X. All pipe shall be laid on a four (4) inch granular base of gravel backfill for pipe zone bedding described in WSDOT 9-03.12(3) unless otherwise approved by the City's inspector. Initial backfill around the pipe and to a point four (4) inches above the crown shall be the same material.

Y. Minimum cover:

   i. Not less than 60 inches at the curb line;

   ii. Not less than 36 inches at the property line;

   iii. Not less than 18 inches on private property;

   iv. If minimum cover on private property cannot be attained, Polyvinyl Chloride (PVC) C900 or ductile iron pipe shall be installed;

   v. If minimum cover in the right-of-way cannot be attained, ductile iron shall be installed or PVC C900 providing a required minimum cover of 24 inches.

   vi. Install temporary marker stake as shown in the Standard Details.

Z. When an existing side sewer is to be reused after being disconnected or abandoned, the side sewer, the stub in the right of way, and the connection to the main shall be telespected (CCTV inspected) to determine the integrity and condition of the lines. If the City determines the side sewer, stub, or tee connection is deteriorated, structurally unsound, cracked, leaking, or shows other indications that the useful life of the side sewer, stub, or tee connection is short, the side sewer, stub, and/or tee shall be replaced.

AA. Side Sewer Leak Testing

   i. Side sewers shall be tested by the Contractor for visible leakage before backfilling by inserting a removable test plug at the lower end of the line and filling the line with water to its highest point. The Contractor shall have the test ready when the inspector arrives so that the inspector can observe the test and results. A tee shall be provided in the sewer for insertion of the plug and shall be capped tightly and securely against back pressure upon completion of the test.

BB. Air testing may be substituted for the above procedure. Air testing shall be performed as follows:

   i. Perform air testing in the presence of a City inspector.

ii. Plug the lower and upper ends of the lateral. Introduce air pressure slowly to approximately four (4) psig.

a. Determine ground water elevation above spring line of piping.

b. For every foot of ground water above spring line of piping, increase starting air test pressure by approximately 0.4 psi.

c. Do not increase pressure above Ten (10) psig.

iii. Allow pressure to stabilize for at least five minutes before starting the timer.

iv. Adjust pressure to three and one half (3.5) psig or to increased test pressure as determined above when ground water is present.

v. Start a timer and test the lateral for at least 45 seconds for each 100 feet of linear lateral length.

vi. Record drop in pressure during testing period.

vii. If air pressure drops more than 1.0 psi during testing period, piping has failed.

viii. If 1.0 psi air pressure drop has not occurred during testing period, piping is acceptable; discontinue testing.

ix. If piping fails, test reach of piping in incremental stages until leaks are isolated, repair leaks, and retest entire reach.

CC. Connection of Another Structure to an Existing Side Sewer:

i. All new development shall require a new sewer stub within the right-of-way.

ii. When an existing side sewer is used to connect another structure to the sewer system, the side sewer and the main line it is connected to shall be video inspected to ensure the integrity and condition of the existing side sewer and the mainline connection. If the City determines that the side sewer or mainline tee is deteriorated, structurally unsound, cracked, leaking, or shows other indications that the useful life of the side sewer, stub, or tee connection is/are short, the side sewer, stub, and/or tee shall be replaced at the property owner's expense.

iii. When structures on a property are demolished and the property redeveloped, the existing sewer stub in the right-of-way shall be replaced, except in the following case:

When an existing side sewer is to be reused after being disconnected or abandoned, the side sewer, the stub in the right-of-way, and the connection to the main shall be visually inspected by CCTV to determine the integrity and condition of the lines. If the City determines the side sewer, stub, or tee connection is/are deteriorated, structurally unsound, cracked, leaking, or show other indications that any components are nearing the end of their useful lives, such components shall be replaced at the property owner's expense.

DD. RV Disposal for Single-Family Residences

i. Installation of an RV wastewater disposal system for intermittent use requires a side sewer permit and inspection. The installation shall include a cleanout at grade with a locking lid.

EE. Side Sewer Cleaning

i. All side sewer cleaning contractors shall, prior to engaging in cleaning side sewers within the service area of the City, notify the City Wastewater Manager prior to start of that operation.

FF. Rodding of Side Sewers

i. In order to ensure that the City's mains are not jeopardized by the procedure of rodding of any side sewer and to determine the cause of the blockage, if any, it shall be the responsibility of the owner or his/her representative to contact the City Wastewater Manager prior to rodding a side sewer.

GG. Repairs

i. Any repairs to a side sewer required by the City shall be made within 30 days after the date of notice to the owner of the property served, notifying the owner to make the repair. In the event of an emergency, the City may establish a shorter period of time for the repair to be made or if the owner cannot be located or does not promptly make the repair.

HH. Cap-Off

i. When any property owner desires to have side sewer service terminated for any property because the building or structure on it shall be removed, destroyed, or condemned the side sewer shall be capped off. A cap-off permit is to be issued by the City prior to the cap-off. No structure shall be removed from billing until the side sewer has been capped off in full compliance with this section and until all sewer service charges have been paid in full.

II. Abandonment of Existing Side Sewers

i. When an existing side sewer is abandoned, the pipe shall be securely capped with a mechanical plug, encased in concrete or filled with flowable fill, and inspected by the City prior to backfilling.

26.5. Alternative Sewer Systems

If gravity sewer service to homes or businesses is not feasible, pressurized sewer systems may be considered for approval by the City. The Applicant is responsible to provide a report showing why gravity service is not feasible, with supporting hydraulic and/or other calculations for evidential support. Individual lift stations may be considered, depending on the development proposal characteristics. No other technology/system shall be allowed within the City's sewer service area.

26.6. Individual Lift Stations

This section applies to lift stations with demands equal to or less than 1,000 gallons per day.

A. If a property cannot be served by gravity to a City sewer main, the owner may apply for an individual sewage lift station permit.

B. The City shall not be responsible nor liable for the operation, maintenance, replacement, or malfunction of the pump station.

C. A design shall be submitted to the City for review and shall include:

i. A site plan of the property with the building proposed.

a. Include contours as described in the drawing requirements of Appendix M, Sewer Design Criteria Engineering Drawing Requirements

b. Show swing ties to verifiable landmarks such as property corners, survey markers, and building corners.

c. The number of bedrooms of the building shall be given on the drawing.

d. All trees with diameters greater than four (4) inches that are within 40 feet of the proposed lift station components.

ii. Section view drawings of the proposed sewage holding tank showing bedding material and thickness, tank material, wall thickness, height, soil cover, access risers and lids, pump, control switches (e.g., floats or transducer), electrical junctions, plumbing, and pump extraction hardware.

a. Static lift height and total dynamic head.

b. Controls programming parameters, including anticipated run time per cycle, number of estimated cycles per day, pump actuation elevations, emergency pump shut off, and high- and low-level alarms.

c. Pump literature (curve, model, horsepower, etc.).

d. Control panel literature.

e. A Hold Harmless Agreement to the City shall be executed before permits are issued.

D. Required individual lift station design parameters include:

i. A single-compartment sewage storage tank or septic tank. The tank may be precast concrete supplied by a precast tank supplier. Fiberglass, polyethylene, or polypropylene tanks must be designed with an anti-flotation anchoring method.

ii. The total storage volume above the high-water alarm elevation shall be equal to or greater than the 24-hour wastewater demand for the building being served.

iii. Wastewater demand for the house shall be calculated using 150 gallons per day per bedroom.

iv. The pump shall be sized to cycle between 48 and 100 times per day at the required duty point.

v. The minimum and maximum force main design velocities are two (2) feet per second and ten (10) feet per second, respectively.

vi. The sewage pump shall be of the grinder type, capable of shredding common inadvertent wastewater solids such as “flushable” and non-flushable wipes, small rags, and small malleable plastics smaller than three (3) inches in any given dimension.

vii. Wastewater force main shall be SCH 80 PVC, C900 PVC, or DR 11 HDPE and shall discharge to a watertight six (6) inch tee that connects to a six (6) inch PVC gravity lateral via tee connection with a locking-lid cleanout (see City Standard Details 633, 634 and 641 for reference). The residual pressure at the discharge shall be less than two (2) feet of water (0.86 psi).

26.7. Lift Stations

This section applies to lift stations with demands greater than 1,000 gallons per day. If required, lift stations and appurtenances shall be designed and constructed in accordance with the policy outlined herein.

Design Criteria:

A. Wet wells

i. Precast reinforced concrete cylindrical structures.

ii. Sufficient volume to allow pump run times greater than one (1) minute for between two (2) and six (6) starts per hour at the firm capacity design flow.

iii. Aluminum hatch with stainless steel hardware. Use double leaf hatches for duplex submersible systems and triple leaf hatches for triplex submersible pumping systems.

iv. Provide anti-flotation measures and calculations.

a. Show buoyancy and flotation calculations for installations wherein the structure is expected to be located below the seasonal water table.

b. Any designs for underground structures installed in liquefaction zones must be accompanied by buoyancy calculations accounting for soil saturation and liquefaction.

c. Anti-flotation measures may include drainable aggregate backfills, collars, or flanged base slabs.

v. Contour the wet well floor to provide a 45–60-degree slope around the edges and direct flow toward the pump inlets.

vi. Interior coating shall be Tnemec Series 142 Epoxoline or approved equivalent.

vii. Surface shall be graded away from the wet well top slab at a slope no greater than 3:1 H:V. Wherever it is not feasible to maintain this maximum grade, install permanent erosion control devices such as rip rap or retaining walls.

B. Dry wells

i. Dry wells shall be constructed of reinforced precast concrete.

ii. Provide continuous ventilation at a rate of six (6) air changes per hour.

iii. Provide a sump and sump pump. Slope drywell floor toward sump.

iv. Ensure that there are no pathways for liquid to pass between the wet well and dry well. This means that all conduits between the wet well and dry well must be watertight, and ventilation pipes on both the wet well and dry well must extend at least two (2) feet above the surface grade.

v. Surface shall be graded away from the dry well top slab at a slope no greater than 3:1 H:V. Wherever it is not feasible to maintain this maximum grade, install permanent erosion control devices such as rip rap or retaining walls.

vi. Provide overhead lighting and switch.

vii. Provide I-beam and automatic monorail winch with pendant control for lifting and moving pumps.

viii. Provide an aluminum manway hatch with stainless steel hardware and slow lowering hinges.

ix. Provide a vertical ladder and an “Easy Up” or similar assistance device.

x. Install flush mount sleeves for a davit crane, which shall be positioned near the manway hatch such that the proposed davit pulley can be pivoted to a position centered on the hatch opening. The flush mount sleeve shall be installed into a precast opening in the dry well top slab.

C. Pumps

i. Capacity

a. The design flow shall be equal to the expected rate of flow (in gallons per minute) equal to the peak hourly flow rate. Wherever possible, existing wastewater flows into the proposed pump station shall be used to determine the peak hourly flow rate during the seasonal period with the greatest demand. If sufficient flow data are unavailable, the designer shall utilize the appropriate peaking factor derived from the City’s latest hydraulic model update.

b. The pump station shall be capable of providing the full firm capacity flow rate with one pump out of service.

c. Velocity: the flow rate in the force main shall be no less than two (2) feet per second and no greater than ten (10) feet per second.

D. Solids handling: The pumps shall be capable of passing at least three (3) inch round solids.

E. Pump Controls

i. Soft starters or variable frequency drives shall be used. Whenever a pumping station's demand is expected to vary significantly over time, variable frequency drives shall be installed.

ii. Provide a Human-Machine Interface with the following programmable parameters:

a. Pump speed

b. Pump on/off elevations

c. Alarm settings (elevations and power)

iii. Pump and system controls shall be integrated with the City's SCADA system, allowing for remote data viewing and station control.

26.8. Pipeline Testing

A. Quality Assurance

i. Testing Before Acceptance:

a. The City Engineer may require that the first section of pipe, not less than 300 feet in length, installed by each of the Contractor's crews be tested to qualify the crew and/or the materials.

b. Pipe laying shall not be continued more than an additional 300 feet until the first section has been tested successfully.

B. Final Acceptance:

i. Prior to final inspection, all pipelines shall be flushed and cleaned, and all debris removed.

ii. Deflection test shall be performed on all pipes, where in the City's opinion, video inspection warrants it. Before sewer lines are accepted, all pipes shall be tested as specified herein and inspected for line and grade by checking each section between manholes for alignment using one of the following methods.

a. Lamp testing: The installer shall visually inspect all gravity sewer pipe (plastic composite and ductile iron) installed to verify alignment and ensure the pipe is free from obstructions and debris. A light is shown from one manhole towards the other manhole. A mirror is held at the

invert of pipe and adjusted so the light and barrel of pipe can be seen. The barrel of the pipe shall have no vertical deflection and at least 75% of the barrel shall be visible in the horizontal direction. In the event that alignment shows the pipe not laid true and to grade it shall be repaired and be aligned as necessary until the alignment complies with these requirements. If the segment of pipe fails the visual inspections, the pipe shall be cleaned and/or replaced and re-tested. The lamp inspection must be done in the presence of a City Representative, unless the City Engineer states otherwise in writing.

b. Mandrel testing in conformance with WSDOT Standard Specifications Section 7-17.3(2)G.

C. CCTV Inspection

i. All lines shall be video inspected. Recordings shall be submitted to the City as separate video files for each segment of pipe (manhole to manhole). Provide either a flash drive or link to a secure file transfer protocol.

a. A device will be attached in front of the camera to measure the depth of any ponding water.

b. Any observed defects or ponded water with a depth of over three-quarters (3/4) of an inch shall be cause for the rejection of the pipe.

c. Video equipment shall consist of a self-contained camera and a monitoring unit connected by three wire coaxial cable.

d. Camera shall be small enough to pass through 6-inch diameter sewer pipe for mainline inspections, or 3-inch pipe for side sewer inspections. Camera assembly shall be waterproof and shall have a self-continuous 650-line resolution picture showing the entire interior pipe periphery.

e. Furnish video recordings of the sewer lines on flash drive in MP4 format or File Transfer Protocol (FTP).

f. Video inspection shall be performed on one manhole section at a time by propelling the television camera through the line along the axis of the pipe. The inspection shall be performed in a forward (upstream) direction.

g. Video inspection shall result in a continuous recording, beginning with the camera above grade with a pan view of the immediate vicinity of the originating manhole, then continuing while camera is placed in sewer and advanced to end manhole or segment being inspected.

h. The video inspection shall be done at a speed (maximum one half (0.5) feet per second) and quality that allows the City to identify all pipe defects and sewer branches.

i. Any corrections required shall be made at the expense of the Contractor and the line retested.

D. All gravity sanitary sewer pipe and appurtenances shall be cleaned and tested after backfilling by the low-pressure air test method. Pipes over 36 inches in diameter may be tested one joint at a time with the water exfiltration method or by low pressure air test.

i. Low Pressure Air Testing and basis of acceptance shall conform to the methods and requirements described in WSDOT Standard Specifications Section 7-17.3(2)E and 7-17.3(2)F for air permeable and non-air permeable pipe materials, respectively.

ii. If the Contractor elects to test large diameter pipe one joint at a time, leakage allowances for water exfiltration per 100 feet shall be converted to allowances per joint by dividing by the number of joints occurring in 100 feet.

iii. If the pipe installation fails to meet these requirements, the Contractor shall determine at his own expense the source or sources of leakage, and he shall replace all defective materials or workmanship. The completed pipe installation shall then be retested as required to meet the requirements of this test.

iv. Safety Precautions: Plugs used to close the sewer pipe for the air test must be securely braced to prevent the unintentional release of a plug which can become a high velocity projectile. Gauges, air piping manifold and valves shall be located at the top of the ground. No one shall be permitted to enter a manhole where a plugged pipe is under pressure. Air testing apparatus shall be equipped with a pressure release device designed to relieve pressure in the pipe under test at six (6) psi.

v. Limit of Test Section: Pipes less than 36 inches in diameter shall be tested from manhole to manhole, or, shorter lengths as the Contractor may choose. Pipes over 30 inches in diameter shall be tested one joint at a time. The length of pipe tested shall not exceed 700 feet or the distance between manholes when greater than 700 feet.

E. The City may require an infiltration test if it appears that there is excessive infiltration after air tests are completed. The Wastewater Specialist or designee shall also be the sole judge of whether this test is required. Excessive infiltration shall be cause for rejection. Infiltration testing and basis of acceptance shall conform to WSDOT Standard Specifications Section 7-17.3(2)C.

F. Exfiltration test shall be used only if specifically authorized by the Engineer, and shall conform to WSDOT Standard Specifications Section 7-17.3(2)B.

26.9. Protection of Live Sewers

A. All existing live sewers and vaults, including septic tanks and drain fields, shall remain in service at all times except in the case of pre-planned, City-approved outages lasting not more than four (4) hours where affected customers are given at least 72 hours notice. Adequate provision shall be made for disposal of existing sewage flow if any existing sewers are damaged.

B. Contractors shall submit a spill response plan describing protocols to address inadvertent sewage spills. The plan shall include the following features:

   i. Response personnel (primary responders) and their responsibilities.

   ii. Response time for business hours, off hours, and weekend mitigation.

   iii. Description of potential system failures resulting from construction activities.

   iv. Health hazards that personnel must be made aware of prior to working on any sewage works components.

   v. Hygiene protocols: prevention and response to exposure to sewage.

   vi. List of personal protective and cleanup equipment required to perform cleanup activities.

   vii. Step-by-step cleanup procedure.

   viii. First aid protocol in response to sewage exposure to personnel.

C. Contractors shall ensure that existing functional or abandoned sewer lines and laterals are not damaged or compromised during any construction project. Contractors are solely responsible for locating such lines, regardless of whether the City can provide location records of their locations. Contractors shall locate existing and abandoned laterals that may be connected to the public sewer and take preventative measures to ensure that (1) functional laterals are not impacted, and (2) abandoned laterals are plugged at the sewer main so as to prevent the inadvertent introduction of debris or construction materials into the main. The Contractor is responsible for any damage to the sewer system, as well as impacts to homeowners as a result of failure to protect functional sewer lines. Where abandoned laterals are discovered, they shall be capped off at the connection to the sewer main using one of the following methods:

i. Installing a cured-in-place pipe into the lateral stub, leaving the downstream end uncut, resulting in a barrier to the sewer main;

ii. Installing a cured-in-place pipe in the sewer main to block debris entering damaged pipes that connect to the sewer main. This cured-in-place pipe shall not block any functional lateral connections but must block abandoned laterals; or

iii. Excavating to a depth sufficient to cap the lateral at the connection to the sewer main, followed by cutting the lateral pipe off at the main and installing a City-approved mechanical plug over the cut lateral stub.

D. Any damage to the City's existing system must be repaired to a condition equal to or better than that existing prior to the damage.

E. The existing system is discharged through some sewers with flat grades and in some cases through lift stations. All water accumulating during construction must be removed from the new sewers and shall not be permitted to enter the existing system. The Contractor will be required to flush out the existing lines and/or repair lift stations or other facilities if gravel, rocks, or other debris are permitted to enter the existing lines.

F. The physical connection to an existing manhole or sewer line must not be made until so authorized by the City. This authorization will not be given until all upstream lines have been completely cleaned, all debris removed, and where applicable, a pipe temporarily placed in the existing channel and sealed.

G. Use of Sewers Prior to Completion

i. The City hereby reserves the right to make use of any portion of the work prior to completion of the entire Contract without invalidating the Contract and without constituting acceptance of any of the work.

H. Survey Line and Grade

i. The Contractor must constantly check line and grade of the pipe and in the event that they do not meet specified limits, the work must be immediately stopped, the Engineer notified, and the cause remedied before proceeding with the work. Newly installed sewer pipe must not be backfilled prior to inspection and verification of line and grade and bedding compaction.

26.10. Pipe Installation

A. Bedding must be installed according to the City Standard Details and WSDOT Standard Specifications Section 7-08.3(1)C, with this added requirement:

If no bedding class is specified for rigid pipe, compacted gravel bedding per Section 9-03.12(3), “Gravel backfill for pipe zone bedding” must be provided to the spring line, imported material compacted to 95% of the material’s dry compacted proctor value.

B. Laying of sewer pipe shall be accomplished to line and grade in the trench only after it has been dewatered and the foundation and/or bedding has been prepared. Pipe must be laid according to WSDOT Standard Specifications Section 7-08.3(2) and the associated City Special Provisions and Standard Details.

C. After inspection and acceptance, pipes must be backfilled according to the requirements in WSDOT Standard Specifications Section 7-08.3(3) and the City Special Provisions and Standard Details.

D. Before acceptance testing is performed, the pipe installation should be reasonably clean. The pipe must be cleaned either before or after testing the pipe in the following or equivalent manner.

E. The Contractor must furnish an inflatable rubber ball of a size that will inflate to fit snugly into the pipe to be tested. The ball may, at the option of the Contractor, be used without a tag line; or a rope or cord may be fastened to the ball to enable the Contractor to know and control its position at all times. The ball must be placed in the last cleanout or manhole on the pipe to be cleaned, and water must be introduced behind it. The ball must pass through the pipe with only the pressure of the water impelling it. All debris flushed out ahead of the ball must be removed at the first manhole where its presence is noted. In the event cemented or wedged debris or a damaged pipe must stop the ball, the Contractor must remove the obstruction and/or repair any damaged pipe. All visible leaks showing flowing water in pipelines or manholes must be stopped even if the test results fall within the allowable leakage.

26.11. Repairs

A. Any pipe or appurtenance which has been laid or jointed that is not in conformance with these standards shall be repaired or be removed and replaced.

B. Any concrete pipe or manhole with any continuous crack having a surface width of 0.01 inch or more extending for a length of 12 inches or more regardless of position in the wall of the pipe or main shall be removed and replaced.

C. Repair bands or clamps or concrete collars shall not be used to repair defective pipe. Acceptable means of repair include the use of mechanical coupling devices such as ROMAC couplers or similar.

26.12. Sewer and Water Line Separation

Construction must comply with the local water provider's regulations. In general, parallel construction requires a minimum horizontal separation of ten (10) feet with the sewer line constructed a minimum vertical distance of 18 inches below the water line on a separate shelf, except under special conditions described in Washington State Department of Ecology Pipeline Separation Design and Installation Reference Guide. Perpendicular crossing requires a vertical separation of 18 inches between the sewer and the water line when the sewer main is below the water. Any exceptions shall comply with most current edition of the Washington State Department of Ecology Criteria for Sewage Works Design and any conditions imposed by the City or local water provider.

26.13. Pipe Split Casing

Pipe casing may be necessary where soil conditions are unfavorable for standard pipe installation, or where large loads would compromise the integrity of the carrier pipe. Split Casing construction must conform to the City Standard Detail 619 unless alternative designs are approved by the City Engineer.

Chapter 27. Inspections and Testing

27.1. Call for Inspection

The permit fee covers one inspection visit. Any additional inspections resulting from any cause shall be charged at the current hourly rate.

No person shall cover or backfill any side sewer or public sewer without having first called for an inspection and having received permission and approval to backfill from the City.

If any person covers or backfills any side sewer or public sewer without inspection and without having obtained approval, the City shall require the person to uncover the work so that a proper inspection can be made.

The Contractor and/or owner are responsible for locating and connecting all plumbing outlets to the side sewer.

The City shall have access at reasonable times for the purpose of inspecting sewers and ascertaining whether provisions of these standard have been complied with.

Inspections after regular office hours or on weekends are at the option of the City inspector by appointment. No inspections shall be performed on legal holidays.

27.2. Materials and Workmanship

The City shall inspect and perform such tests as it deems necessary in order to ensure that all sewer construction meets all requirements of these standards.

Chapter 28. Special Releases, Agreements and Documents

28.1. Developer Extensions

The City may enter into contracts with owners of real estate as provided in the Municipal Water and Sewer Facility Act (35.91 RCW) to provide for the extension of mainlines, prior to the property owner(s) initiating plans for the improvement, where the owner(s) of property desire to construct additional sewer facilities not previously provided by the City and where such facilities may upon completion and acceptance become a part of the City's sewer system.

The City Developer Extension Manual is included in the EDM as Appendix O. The Developer Extension Manual provides the necessary steps to determine whether a developer extension is needed, the steps required to obtain service from the City by an extension of the existing sanitary sewer system including design and construction standards.

The Developer Extension process includes submitting application, signing a contract for service, paying connection charges, determining classification of service, preparing and reviewing of plans, submittals to agencies, certification of construction costs and inspection, revising plans to construction, recording of easements, bill of sale and conveyance of sewer facility, one year warranty, and final acceptance.

28.2. Wastewater Utility Easements

Public wastewater easement widths shall be 15 feet for a single utility and 25 feet for dual utilities owned and maintained by the City. Construction easements shall be 30 feet minimum in total width, including the permanent easement. When trench depths dictate or where pipe diameter or vault widths exceed four feet, a wider easement may be required by the Director.

In certain instances where easement widths cannot be reasonably achieved, the Director may allow a lesser easement width.

Legal descriptions for easements for all portions of the sewer which lie outside of public street right-of-way must be signed and stamped by a Professional Land Surveyor, currently registered in the State of Washington, and transmitted to the City. The easement shall be a minimum of 15 feet in width, with the sewer in the center. There shall be a separate easement provided for each lot that a sewer crosses. These easements are required by the City regardless of easements recorded with property deeds or plats. Easements must be approved by the City prior to construction.

28.3. Hold Harmless and Indemnification

Where physical conditions render compliance with the provisions of these standards impracticable, the City may issue a special permit for installation of a side sewer requiring compliance with special provisions insofar as is reasonably possible. Such a permit shall be issued only upon the condition that the property owner execute and deliver to the City an instrument, in the form furnished by the City, agreeing to save harmless and indemnify the City for any damage or injury resulting from such sub-standard installation.

28.4. Sewer Service Agreement

A. Eligibility

Properties which are not entitled to sewer service by reason of not having been subjected to a sewer assessment in favor of the City, but otherwise qualifying for sewer service, may be connected to the public sewer of the City and served by it when the owner of the property executes a sewer service agreement in the form approved by the Director and has executed the agreement signed by the owner.

B. Conditions

The sewer service agreement shall provide the conditions of the contract, including but not limited to ownership, property to be served, use of the public sewers, sewer service charges classified and fixed, penalties and interest and recording of the document. The property owner shall agree to the formation of any Utility Local Improvement District (ULID), or to any annexation into the City in the area which includes the subject property. The contract shall constitute a charge against the property and be a covenant running with the land and shall bind the property and all future owners of it.

28.5. Alternative Construction Methods and Materials – Trenchless Technology

The City recognizes that there are certain advantages to using trenchless technology applications for sewer pipe and casing installation and sewer pipe rehabilitation. It is solely the City's decision to approve any alternative construction methods and materials proposed for development or capital project applications shall solely by the City's.

Trenchless technologies for construction of new pipelines include pipe jacking, microtunneling, Horizontal Directional Drilling auguring or boring, and pipe ramming. Costs, topography, soils conditions or other issues that may preclude traditional trench excavation and backfill construction often will dictate the use of these technologies. A preliminary engineering report evaluating these factors, including a geotechnical investigation and report shall be submitted to

the City for approval. The engineering report must evaluate alternative construction techniques, including open-cut-and excavation.

Trenchless technologies used for existing pipe rehabilitation/replacement applications are summarized below. A preliminary engineering report is also required for recommending one of these technologies, but a geotechnical evaluation would not be required.

A. Sliplining Existing Pipe – is the insertion of a new pipe of smaller diameter into an existing host pipe

B. Cured in Place Pipe (CIPP) – is a lining process consisting of inverting a resin-impregnated flexible tube into the existing line using hydraulic or air pressure. The resin is cured using steam heat or ultraviolet light. The fold and form lining process is similar.

C. Pipe Bursting – consists of fragmenting and bursting the existing pipe into the surrounding soil by pulling a bursting head through the line. A new pipe is pulled behind the bursting head.

Chapter 29. Flushing Permit/ Industrial Discharge Permit

This policy is adopted by the City to allow the discharge of flushing water from domestic water service lines by municipal agencies into the City's collection system.

29.1. Industrial Discharge Permit

Municipal Water Purveyor Flushing Guidelines

A. The agency requesting permission to discharge into the sanitary sewer should provide a minimum of 72 hours (3 working days) advance notice of their intentions to discharge.

B. When requesting permission, the requesting agency shall provide the following:

    i. Location of the proposed discharge.

    ii. Amount of water to be discharged.

    iii. Information on the concentration of chlorine or other disinfecting agents in the water to be discharged.

    iv. Date and time of proposed discharge.

    v. Name of responsible contact person and an emergency telephone number of agency conducting discharge.

C. Prior to issuance of an Industrial Discharge permit, the receiving Treatment Plant (King County Metro or Edmonds) shall first approve the discharge.

D. Prior to issuance of an Industrial Discharge permit, discharging agency shall submit a written assurance to the City which shall guarantee payment of the appropriate fees as determined above. In lieu of this guarantee, a cash deposit may be accepted.

E. A representative of the City shall be on site during the actual discharge operation.

Discharge of Industrial Waste

A. An Applicant who intends to discharge industrial waste into the City's sewage collection system must make application requests to the City of Shoreline and King County Wastewater Treatment Division Industrial Waste Program (KCIW) for discharges treated in King County and to the City of Edmonds Wastewater Treatment Plant (EWWTP) for discharges treated in Edmonds.

B. In general, discharges of industrial waste that is damaging to the collection system or at a rate of volume that would overwhelm the collection system will not be accepted. An Industrial Discharge Permit is only issued on a contingent basis subject to approval of the same discharge by the KCIW or EWWTP program(s).

C. Discharging industrial waste into the sewage collection system without obtaining an Industrial Discharge Permit will subject the violator to a fine. Refer to SMC Fee Schedule table (https://www.codepublishing.com/WA/Shoreline/#!/ShorelineFEE/ShorelineFEE.html).

D. The City charges a permit issuance fee and monthly inspection, monitoring and treatment fee for discharge into the wastewater collection system. King County and City of Edmonds discharge fees are administered and levied by the respective jurisdiction.

E. After obtaining approval from the KCIW or EWWTP and a discharge permit from the City, the discharger is required to notify the City of Shoreline Wastewater Utility Manager or designee at least 72 hours (3 Business Days) prior to the first discharge and schedule an inspection of the discharge connection set up. No modifications may be made to the discharge connection set up. without approval, once the Wastewater Utility Specialist or designee has approved the connection point for discharge.

F. Monthly discharge billings begin when the wastewater discharge connection set up has been inspected and approved. The discharger is required to report the rate of flow and volume discharged into the wastewater collection system by supplying a copy of the Discharge Log no later than the 15th of every month. Discharge Logs can be emailed to: ww@shorelinewa.gov.

G. Discharge Logs must be updated upon each discharge. Zero Discharge Logs must be reported during months with no water discharge. Failure to report your Discharge Log monthly will result in automatic billing for that month. The City must be notified of the project end in order to inspect the disconnection of the discharge connection set up and close out the monthly billing and reporting requirements. Disconnecting without notifying the City for inspection will result in a No Notification Penalty Fee. Violation of the terms and conditions of the discharge permit may result in the cancellation of the permit and subject the Applicant to fines. Refer to the SMC Fee Schedule table (https://www.codepublishing.com/WA/Shoreline/#!/ShorelineFEE/ShorelineFEE.html).

DIVISION 5 – CONSTRUCTION AND INSPECTION

Chapter 30. Construction

30.1. Standards

Construction, workmanship, and materials shall be in accordance with the approved plans, permit conditions, and the standards referenced in this EDM. Any change to these standards during construction in the right-of-way shall be approved by the Director.

A. WSDOT Standard Specifications for Road, Bridge, and Municipal Construction M 41-10.

B. 2016 King County Surface Water Design Manual, Chapter 4 “Conveyance System Analysis and Design”, as amended in Division 3 – Surface Water.

C. FHWA Manual on Uniform Traffic Control Devices: http://mutcd.fhwa.dot.gov/

D. Department of Ecology Surface Water Management Manual for Western Washington, as modified in Division 3 – Surface Water.

30.2. General

A. Work Hour Restrictions:

i. Work in arterials is restricted to the hours between 9:00 a.m. and 3:00 p.m., unless approved in the permit or by the City Traffic Engineer.

ii. Sounds originating from construction sites, including but not limited to sounds from construction equipment, power tools and hammering between the hours of 10:00 p.m. and 7:00 a.m. on weekdays and 10:00 p.m. and 9:00 a.m. on weekends are considered public disturbance (SMC Chapter 9.05), except construction noise or other noise generated in response to emergency situations, in times when unexpected and uncontrollable events result in an imminent risk of physical harm or property damage.

iii. Weekend or City-recognized holiday work may be allowed with five (5) working days prior approval.

iv. For night and/or weekend work, a noise variance permit is required pursuant to SMC 9.05.080.

v. In school zones, work may be restricted to alternative hours as approved in the permit and coordinated with the school district.

B. Survey Monuments:

i. Anyone performing construction, maintenance, or other work in the City shall protect all survey monuments within the area of work.

ii. The Permittee is responsible for all contractors working on the project. If it is necessary to disturb a survey monument, the Inspector shall be notified and a permit from the DNR shall be obtained before the disturbance occurs.

iii. 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.

C. Vegetation:

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

D. During construction, the SWPPP shall be revised as necessary by the CESCL or SWPPP supervisor to address changing site conditions, unexpected storm events, or non-compliance with the SWPPP performance criteria.

i. The City may stop site work if the SWPPP is not being monitored and maintained, or if the runoff leaving the site exceeds state standards.

E. Cleanup, incidental and collateral damage:

i. 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 as necessary to pre-existing or better condition.

ii. Costs associated with site cleanup and restorations are integral to the project. If the City incurs additional cleanup costs, these costs may be billed to the Permittee 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 Permittee’s or Contractor's expense. This includes restoration of all traffic devices and pavement markings. The Director shall determine the extent of damage and order the extent and type of restoration, except as provided in RCW 19.122.030.

30.3. Temporary Traffic Control

A. Refer to Appendix J – Traffic Control Plan Submittals.

B. Pursuant to SMC Chapter 12.15, a traffic control plan shall be prepared to address disruptions to traffic, pedestrians, and bicyclists.

C. A temporary traffic control (work zone) plan shall be submitted and approved before beginning any work requiring traffic control.

D. The Inspector may approve field adjustments to traffic control to meet actual conditions.

E. The traffic control plan shall be consistent with the standards defined in the MUTCD and Standard Plans 900 Series. The following basic principles and standards shall be observed by all those who perform work within a street right-of-way.

    i. Work areas are safe, and congestion is minimized;

    ii. Motorized and nonmotorized traffic is warned, controlled, and protected;

    iii. Emergency access is maintained; and

    iv. All traffic is expedited through the work zone to the extent possible.

F. The traffic control plan shall allow for continued emergency services. For business disruption, the plan shall contain adequate connections and clear signage.

G. If steel plates are approved for use, the plates shall be pinned, and cold mix asphalt shall be added to provide suitable transition from the roadway to the top of the steel plates.

H. “MOTORCYCLES USE EXTREME CAUTION” signs and appropriate plaques shall be installed for each traffic direction when conditions stated in RCW 47.36.200 require them.

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

30.4. Staking

A. At a minimum, items that require staking include property corners, subgrade elevations, slope (grade) stakes, right-of-way location, drainage structures and other permanent structures.

B. Staking of property corners shall be maintained until final acceptance of the project.

C. In the right-of-way, all surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The Professional Engineer or Land Surveyor directing such work shall be licensed by the State of Washington.

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

   i. Stake centerline alignment every 25 feet (50 feet in tangent sections) with cuts and/or fills to subgrade;

   ii. Stake top of ballast and top of crushed surfacing at centerline and edge of pavement every 25 feet;

   iii. Stake top back of curb at a consistent offset for vertical and horizontal alignment;

   iv. Staking shall be maintained throughout construction.

30.5. Trenches

A. General:

   i. The Director may allow trenchless methods such as boring or jacking when it is demonstrated that trenching methods are not possible due to surface and subsurface conflicts or soil conditions or when the utility is installed after reconstruction or overlay of the road.

   ii. Open trench sides shall be kept as nearly vertical as possible and follow Washington Industrial Safety and Health Administration (WISHA) safety requirements.

   iii. When groundwater is anticipated or is encountered during trenching, a dewatering plan shall be provided for approval.

B. Excavation Protection: No person shall leave unprotected any excavation made in connection with construction or repair of any side sewer or private drain within four (4) feet of any public place.

C. Non-Conforming Installations

   i. Non-conforming installation or deviation from City standards shall not be permitted without the advance written express approval of the Director. Any deviation permitted shall be subject to the person requesting the deviation executing and recording the necessary releases or documents required under EDM Chapter 28, Special Releases, Agreements and Documents.

D. Backfill:

i. All subgrade shall be compacted to 95 percent maximum density as described in Section 2-03 of the latest version of the WSDOT Standard Specifications;

ii. Crushed surfacing materials used for backfill shall conform to Section 4-04 of the latest version of the WSDOT Standard Specifications;

iii. Granular material shall conform to Section 9-03.19 of the latest version of WSDOT Standard Specifications;

iv. Native material may be used if deemed acceptable by the City. Soils tests are required to determine if the material is acceptable and to test for adequate compaction. When existing material is used, the top six (6) inches shall be Crushed Surfacing Top Course;

v. Controlled density fill (CDF) shall meet the requirements of 2-09.3 of the latest version of the WSDOT Standard Specifications.

E. Temporary Trench Closure:

i. Trenches that will receive traffic or that will be left 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 or cold mix placed directly into the trench, bladed out, and compacted. The trench shall be filled flush to the surrounding surfaces to provide a smooth riding surface.

ii. Use of steel plates requires approval from the Inspector. If approved, the Applicant/Contractor shall follow EDM Section 30.3, Temporary Traffic Control.

iii. Steel plate(s) shall cover CDF for at least 48 hours prior to pavement placement.

iv. Prior to predicted or possible snow events, the Inspector shall be notified of all the locations of steel plates.

30.6. Abandoned Utilities

All abandoned utilities shall be removed to the fullest extent possible. However, when it is not possible to remove abandoned pipe, the pipe shall be filled with CDF when abandoned in place unless approved by the applicable utility.

30.7. Sidewalks

A. See Standard Plan 309, Sidewalk Detail.

B. During removal, panels should be removed to the nearest complete and competent panel.

C. Installation:

i. Install an 18-inch root barrier placed between trees and sidewalks/curbs/driveways;

ii. Surfacing shall be Portland cement concrete. The concrete shall be placed and finished per WSDOT Standard Specifications 8-14.3 (3);

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

iv. Concrete sidewalks shall be cured for at least 72 hours. During curing time, sidewalk shall be protected from pedestrian and vehicle traffic;

v. Expansion joints shall consist of 3/8 inch wide full depth pre-molded material. Expansion joints shall be placed around fire hydrants, poles, posts, and utility castings;

vi. Expansion joints in sidewalks shall be located so as to match the joints in the curb whether the sidewalk is adjacent to curb or separated by an amenity zone.

30.8. Landscaping

A. Soil:

i. 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

ii. Soils for improvements, such as biofiltration and raingardens, shall meet specified material and installation requirements.

B. New Street Tree Installation:

i. Refer to Standard Plan 308, Amenity Zone.

ii. Refer to EDM Section 15.2, Landscaping for street tree clearance requirements.

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

iv. Trees shall be staked using five (5) foot staking and root barriers between the tree and the sidewalk and curb.

v. All new street trees are required to have a ten (10) foot long root barrier, centered on both sides of the tree.

C. Existing street trees and tree root systems shall be protected during construction 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 should be at least equal to the diameter of the tree canopy plus five (5) feet;

iv. Restricting trenching and excavation in critical tree root zone areas; (See Figure 5, Tree Protection - Right-of-Way)

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 or other mitigation is needed.

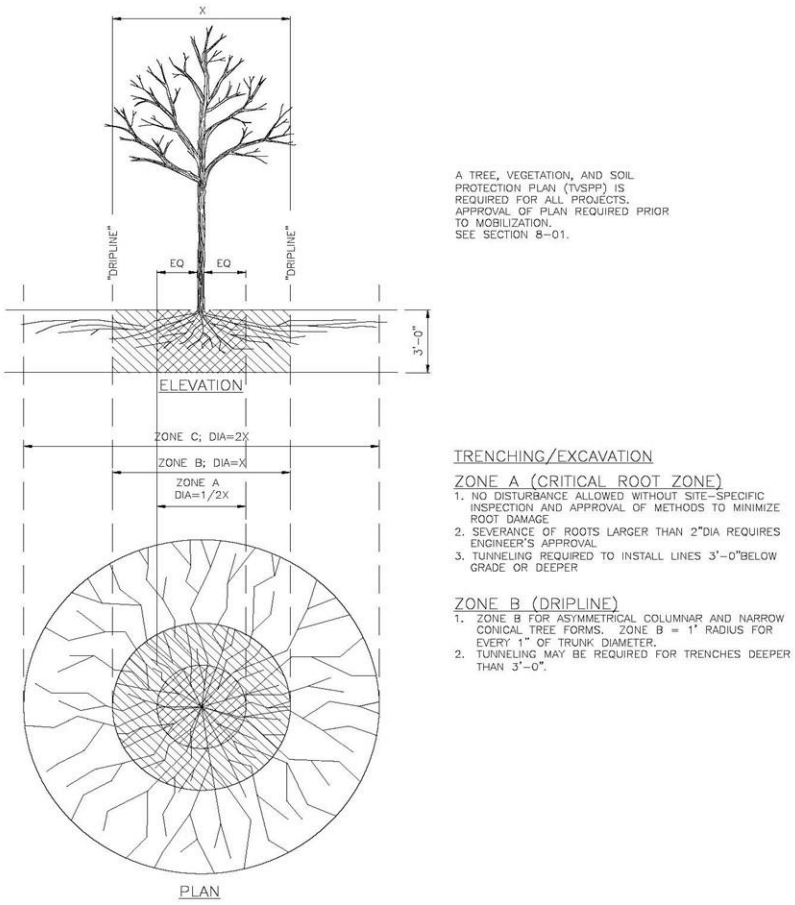
vi. The following guidelines are provided as acceptable measures to help protect trees from construction impacts:

a. Place tree protection fences around each tree or group of trees to be retained. Place four (4) to six (6) foot high temporary chain link or polyethylene laminar fencing five (5) feet (if possible) outside the drip line(s) or a plywood box around the tree or group of trees. Install fence posts using pier block only. Avoid driving posts or stakes into major roots.

b. Tree protection fences need to be clearly marked as “Tree Protection Areas” with four (4) inch or larger letters.

c. Where there is not enough space to erect tree protection fencing, alternative methods may be approved.

Figure 4 Tree Protection Right-of-Way



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

E. Tree pits shall be graded to provide a soil surface four (4) inches below the adjacent sidewalk and curb elevation and shall then be top-dressed with four (4) inches of bark or wood chips to surrounding grade.

F. Protect Vegetation During Construction: The following steps shall be taken to protect vegetation during construction:

i. Map natural resource protection areas on all plans and delineate these areas on the site with silt, construction, or other appropriate fencing to protect soils and vegetation from construction damage.

ii. Before any groundwork begins, meet and walk property with equipment operators to clarify construction boundaries and limits of disturbance.

iii. Protect drainage areas during construction. If an area has any type of channel/drainage swale that provides a hydrologic connection to vegetation protection area(s), then the channel shall also be protected throughout the construction phase by fencing and use of erosion control measures to prevent untreated runoff from the construction site flowing into the channel.

iv. Install signs and fences to identify and protect natural resource protection areas.

v. Protect trees and tree root systems utilizing the following methods:

a. Reduce soil compaction during the construction phase by protecting critical tree root zones that usually extend beyond the tree's canopy or drip line;

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

c. Avoid 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 should be at least equal to the diameter of the tree canopy pursuant to SMC 20.50.370;

d. Restrict trenching in critical tree root zone areas or require use of air spade excavation and/or root pruning;

e. Prevent wounds to tree trunks and limbs during the construction phase;

f. Prohibit the installation of any impervious surfaces in critical root zone areas. Where road or sidewalk surfaces are needed under a tree canopy, unmortared porous pavers or flagstone (rather than concrete or asphalt) or bridging techniques should be used;

g. Prepare tree conservation areas to better withstand the stresses of the construction phase by fertilizing, pruning, and mulching around them well in advance of construction activities.

G. City owned irrigation systems shall be protected during construction.

i. Prior to construction, the Permittee shall request a pre-construction irrigation test conducted by City staff to confirm system functionality.

ii. Prior to final acceptance of right-of-away permit, the irrigation shall be tested by City staff to confirm system functionality.

iii. If irrigation systems are damaged or modified, the Permittee shall restore systems to City standards. City irrigation standards will be provided upon request.

30.9. Curb, Gutter, and Access Approach

A. Type A vertical curb and gutter shall be used on all street classifications. Refer to Standard Plan 312, Curb and Gutter.

B. Subgrade compaction for curbs, gutters, access approaches, and sidewalks shall meet a minimum 95 percent of maximum density per ASTM D1557. Compaction shall be tested by an independent testing laboratory.

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

i. When used, 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.

ii. When used, extruded asphalt concrete curb shall be anchored by means of a tack coat of asphalt in accordance with WSDOT Standard Specification Section 8-04.

D. A concrete access approach shall have a construction joint at the right-of-way line.

30.10. Pavement Restoration

A. General:

i. Anyone creating an opening in the right-of-way is responsible for permanent restoration.

ii. Temporary cold mix patches shall be maintained at all times by the Permittee.

iii. Pavement restoration shall be completed within 30 days unless approved by the permit or by the Inspector.

iv. Damaged traffic signal detection shall be restored per City of Shoreline Standard Plan 420 Traffic Signal Loop. Temporary signal detection may be required by the City Traffic Engineer depending on project impacts. If on-

street bike lanes are present, bike detection shall be restored or designed and implemented as part of detection restoration.

B. Cement Concrete Pavement:

i. Refer to Standard Plan 801, Rigid Pavement Restoration Detail.

ii. Cement concrete roadway shall be restored to the nearest half panel.

iii. Cement concrete shall be replaced or patched with concrete.

iv. Any cement concrete pavement traffic lane affected by the trenching shall have all affected panels replaced.

v. Cement concrete pavement shall be connected to existing concrete pavement with dowels and epoxy and restored with mix per WSDOT Standard Specification 9-01.2(1).

vi. Concrete pavement shall be restored consistent with WSDOT Standard Plan A-60.10-03.

C. Asphalt Concrete Pavement:

i. Refer to Standard Plan 802, Flexible Pavement Patching.

ii. Asphalt concrete pavement removal may be by full depth saw cut or drum grinder.

iii. Asphalt concrete pavement cut widths, based on the final trench width, for pavement restoration/patching shall be according to Standard Plan 802, Flexible Pavement Patching; however, the Inspector may extend cut limits to competent roadway pavement.

iv. The Inspector shall approve the restoration limits before restoration begins.

v. Cuts in asphalt shall be wide enough to accommodate compaction equipment.

vi. Cuts shall be expanded to include joints, panel edges, existing patches or cracks within four (4) feet of the opening.

vii. Cuts shall be expanded to ensure that new longitudinal joints are not located in a wheel path.

viii. Cuts shall be expanded to ensure that new longitudinal joints are not located in a bicycle lane

ix. The cut face shall be neat, straight and vertical. The corners shall be square.

x. 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.

D. Overlay:

i. A public street shall be overlaid when any one of the following conditions applies:

a. 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 installation.

b. If the utility trenching encroaches on both sides of the centerline, a full street overlay along the entire length of the utility installation shall be required;

c. 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 of the utility installation. If a trench extends beyond the centerline, the Director may require a full street overlay;

d. Utility installed at an angle to the pavement centerline requires an overlay from the centerline to the curb line for the entire length of the utility installation. If the utility trenching encroaches on both sides of the centerline, the Director may require a full street overlay;

e. When the permit conditions require street improvements and the existing pavement has alligator cracking, the existing pavement shall be removed and paved from the centerline to the new curb line.

f. A minimum half street overlay from property line to property line is required if the project requires frontage improvements.

g. Additional pavement restoration may be required to include any pavement damaged during construction and/or to include pavement patches per the Right-of-Way Inspectors.

ii. Cold-plane both ends of the overlay perpendicular to the roadway for at least 15 feet to provide a flush transition. For half-street or full-street overlays, cold-planing (grinding) of the entire paving area is required (centerline to gutter or gutter to gutter). When curb and gutter does not exist, the new overlay

surface may, at the Director's discretion, be tapered to meet the elevation of adjacent paved surfaces. All asphalt joints and tapered transitions shall be sealed with AR4000 or equivalent.

iii. Where curb and gutter does not exist, the shoulder shall be restored with crushed rock.

E. Monitoring Wells and Potholing:

i. Decommissioned monitoring wells or resource protection wells shall be decommissioned adhering to the requirements of WAC 173-160-460. Once the well has been decommissioned, the pavement restoration shall adhere to the appropriate Standard Plan.

ii. Vertical potholing from vacuum excavations shall be backfilled. All subgrade shall be compacted to 95 percent maximum density as described in Section 2-03 of the latest version of the WSDOT Standard Specifications. Refer to EDM Section 30.5.C, Backfill. Once backfilled, the pavement restoration shall adhere to the appropriate Standard Plan.

F. Channelization:

i. 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 Inspector, prior to permanent installation by the Contractor. Approval may require a three (3)-working day notice for layout approval.

G. Testing:

i. 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 surface base course and the crushed surface top course.

ii. 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 is not intended to relieve the Contractor from any liability for the trench restoration.

iii. Material testing may be required for trench backfill (native or imported), asphalt, and concrete.

iv. All densities shall be determined by testing specified in WSDOT Standard Specifications.

v. Compaction of all lifts of asphalt shall be at an average of 91 percent of maximum density as determined by WSDOT Standard Specifications.

vi. The compaction tests shall be performed in maximum increments of two (2) feet. The number of tests required per SF of material are defined in Table 21 or as directed by the Inspector.

Table 21. Number of Compaction Tests

Total Amount of Material (SF)	Number of Tests
Less than 50	1
50-100	2
100-300	3
Greater than 300	3, plus 1 for every additional 200 SF

30.11. Stop Work

If a permit is issued and the City subsequently issues three (3) stop-work orders for that permit or if three (3) illicit discharges are reported due to insufficient erosion prevention and sedimentation control, the permit shall be suspended until the dry season, or, if violations occurred in the dry season, until weather conditions are favorable and effective erosion and sedimentation control is in place. The suspension shall be removed at the end of the rainy season or upon the City's determination that appropriate BMP's have been installed and are working and that the Permittee has adequate resources and abilities to manage BMPs effectively without further discharges that do not meet requirements.

Chapter 31. Inspection

The City's inspectors inspect work performed under an approved permit. The Combination Inspectors in Planning and Community Development provide inspection services for the permitted on-site work; Public Works Construction Inspectors provide inspection services for permitted right-of-way development and for franchise permits for the right-of-way.

31.1. Authority and Duties of Inspectors

A. The Inspector functions as a resource for the Permittee and Contractor. The duties of the Inspector include, but are not limited to:

i. Conducts field investigations;

ii. Interprets and applies standards;

iii. Monitors compliance with permit conditions;

iv. Monitors utilities protection;

v. Monitors traffic control and pedestrian access;

vi. Monitors excavation, shoring, backfill and restoration, and public safety;

vii. Enforces the Stormwater Pollution Prevention Plan during construction;

viii. 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 Permittee or Contractor of any faulty work or materials; however, failure of the Inspector to advise the Permittee 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. The Permittee/Contractor is required to comply with all applicable codes and standards.

C. The Inspector is not authorized to revise, alter, or relax the provisions of these standards or the SMC.

31.2. Inspection Requirements

A. At all times during construction, the Permittee/Contractor shall have the issued permits and approved plans and specifications on the job site.

B. Tree protection and erosion control measures shall be installed and inspected prior to any clearing or grading activities.

C. 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.

D. It shall be the duty of the Permittee 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 may 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 for inspection.

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

i. Survey monuments;

ii. Survey stakes: Construction staking prior to construction. Could include contour lines of boundaries and depth of all existing floodplains, wetlands, channels, swales, streams, storm drainage systems, roads (low spots), bogs, depressions, springs, seeps, 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; or forms elevations (before concrete is poured);

iii. Stormwater Pollution Prevention Plan implementation, including installation and maintenance of BMPs;

iv. Staging and stockpile areas;

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

vi. Drainage facilities – materials and installation;

vii. Retaining walls and rockeries;

viii. Utility installation, depth and location;

ix. Pavement cuts;

x. Trench backfill/compaction;

xi. Roadway centerline elevations;

xii. Elevations at curb radii PVC's, Points of Vertical Intersection (PVI), and Points of Vertical Tangency (PVT);

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.

APPENDIX A – ACRONYMS AND DEFINITIONS

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

Acronyms

AASHTO: American Association of State Highway and Transportation Officials,

ADA: Americans with Disabilities Act,

ADT: Average Daily Traffic,

APM: Additional Protective Measure,

ASTM: American Society for Testing and Materials,

BMP: Best Management Practice,

BOD: Biochemical Oxygen Demand,

CAO: Critical Areas Ordinance,

CBR: California Bearing Ratio,

CCTV: Closed-Circuit Television,

CDF: Controlled Density Fill,

CESCL: Certified Erosion and Sediment Control Lead,

CFR: Code of Federal Regulations,

CIP: Capital Improvement Project,

CIPP: Cured in Place Pipe,

CMP: Corrugated metal pipe,

CPEP: Corrugated Polyethylene Pipe,

CSWGP: Construction Stormwater General Permit,

DNR: Department of Natural Resources,

EDM: Engineering Development Manual,

EWWTP: City of Edmonds Wastewater Treatment Plant,

FEMA: Federal Emergency Management Agency,

FHWA: Federal Highway Administration,

FOG: Fat, Oil, and Grease,

HDPE: High-density polyethylene,

HPA: Hydraulic Project Approval,

HRM: Highway Runoff Manual,

HSPF: Hydrological Simulation Program-Fortran,

ITE: Institute of Traffic Engineers,

JARPA: Joint Aquatic Resource Permit Application,

KCIW: King County Wastewater Treatment Division Industrial Waste Program,

KCSWDM: King County Surface Water Design Manual,

LED: Light Emitting Diode,

LID: Low Impact Development,

LOS: Level of Service,

LTS: Bicycle Level of Traffic Stress,

MEF: Maximum extent feasible,

MPH: Miles per hour,

MR: Minimum Requirement,

MS4s: Municipal Separated Storm Sewer System,

MTCA: Model Toxics Control Act,

MUTCD: Manual of Uniform Traffic Control Devices,

NACTO: National Association of City Transportation Officials,

NAD: North American Datum, horizontal, of 1983/1991,

NAVD: North America Vertical Datum,

NEIS: National Electrical Installation Standards,

NOAA: National Oceanic and Atmospheric Administration,

NOI: Notice of Intent,

NPDES: National Pollutant Discharge Elimination System,

NTU: Nephelometric Turbidity Unit,

O&M: Operation and Maintenance,

O.D.: Outside Diameter,

OHWM: Ordinary High-Water Mark,

PCC: Portland concrete cement,

PIT: Pilot Infiltration Test,

PROWAG: Public Right-of-Way Accessibility Guidelines,

PVC: Polyvinyl Chloride,

PVI: Point of Vertical Intersection,

PVT: Points of Vertical Tangency,

RCP: Reinforced concrete pipe,

RCW: Revised Code of Washington,

RTA: Regional Transportation Analysis,

SCL: Seattle City Light,

SDR: Standard Dimension Ratio,

SEPA: State Environmental Policy Act,

SF: Square Foot / Feet,

SMC: Shoreline Municipal Code,

SPU: Seattle Public Utilities,

SSD: Stopping Sight Distance,

SWMP: Surface Water Master Plan,

SWPE: Solid Wall Polyethylene,

SWPPP: Stormwater Pollution Prevention Plan,

TAPE: Washington State Technology Assessment Protocol – Ecology,

TDA: Threshold Discharge Area,

TDM: Travel Demand Management

TIA: Transportation Impact Analysis,

TMDL: Total Maximum Daily Load,

TMP: Transportation Master Plan,

UIC: Underground Injection Control,

ULID: Utility Local Improvement District,

UPC: Uniform Plumbing Code,

USACE: United States Army Corps of Engineers,

USPS: United States Postal Service,

WDFW: Washington State Department of Fish and Wildlife,

WISHA: Washington Industrial Safety and Health Administration,

WSDOT: Washington State Department of Transportation,

WWHM: Western Washington Hydrology Model.

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.

Actual elevation. The elevation in relationship to mean sea level.

Adverse effect or Adverse impact. 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.

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

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

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, bioretention facilities and mailboxes.

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.

Application for Developer Extension Contract. A completed application for a Developer Extension Contract.

As-built. Actual surveyed locations of constructed elements. As-constructed 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.

Availability; Certificate of Sewer. A City issued document stating what types of sewer service are available to a property such as: main, stub, tee, saddle to main, or approved Developer Extension Contract, what conditions shall be met before a permit will be issued in compliance with City rules and regulations, and it may also state if sewer service is not available.

Backup. A sanitary sewer overflow resulting from an obstruction in a sewer line, a failure of a pump system, or other cause.

Best Management Practices (BMPs). 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.

Bike 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)

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)

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)

Bike route. A roadway or bike route designated by the jurisdiction having authority, either with a unique route designation or with BIKE ROUTE signs, along which bicycle guide signs may provide directional and distance information. Signs that provide directional, distance, and destination information for cyclists do not necessarily establish a bicycle route.

Bike network. A system of bike routes designated by the jurisdiction having authority. This system may include bike lanes, bicycle routes, shared-use paths, and other identifiable bicycle facilities. (AASHTO)

Bioretention. Engineered facilities that store and treat stormwater by passing it through a specified soil profile. Refer to the Stormwater Manual Vol. V, Chapter 7 for bioretention practices and design specifications.

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

Bus and Turn (BAT) lane. Traffic lane dedicated for bus travel with a provisional use for general-purpose vehicle right turns.

Chlorinated. Water that contains more than ten (10) mg/Liter chlorine.

Circular Driveway. A driveway or access approach with two points of access across the right-of-way line to a public street which may serve a single/multi-family residence, business, or other approved parking surface.

City. The City of Shoreline.

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. 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.

Comprehensive Plan. The plan and amendments as described in SMC Chapter 20.20.

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.

Corner clearance. The distance between a driveway and the nearest intersecting street.

Cover. The depth of material lying between the top of the sewer and the finish grade immediately above it.

Critical areas. Critical areas as defined in SMC 20.20.014.

Cross section. Vertical section of a roadway showing the position and number of vehicle and bike lanes, curb and gutter, amenity zones, and sidewalks, along with their cross slope or banking. Cross sections also show drainage features, 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 ten (10) feet there from, except as modified by a marked crosswalk. (RCW 46.04.160)

Daily Traffic – Annual Average (AADT). Daily traffic that is averaged over one (1) calendar year.

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

Dangerous Waste. Those solid wastes designated in WAC 173-303-070 through 173-303-100 as dangerous or extremely hazardous or mixed waste, as further defined under WAC 173-303-040.

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 title holder to perform required maintenance and repairs on drainage facilities necessary to meet the City's specified standards within a reasonable time limit. The covenant also grants the City permission to access the property to inspect drainage features.

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

Detachable container. A watertight metal or plastic container, not less than one (1) cubic yard in capacity nor greater than eight (8) cubic yards in capacity, equipped with a tight-fitting metal, plastic, or other City approved cover, and capable of being mechanically unloaded into a collection vehicle. The term shall also apply to containers of other material of similar size when approved by the City manager.

Detention facility. A permanent facility designed to store runoff and discharge storage at controlled rates.

Developer Extension Agreement. A contract between the City and a property owner, person, and/or developer that sets forth the terms and conditions for a developer extension, including plan review, inspection, construction, costs, conveyance of title, and warranty.

Developer Extension Manual. A document containing procedures, standards and specifications for Developer Extensions.

Development. The division of a lot of land into two or more lots; the construction, reconstruction, conversion, structural alteration, relocation, or enlargement of any structure; any mining, clearing, or grading; changes to surface or ground waters; or any use, change of use, or extension of the use of land. (SMC 20.20.016)

Deviation from Engineering Standards. Written permission from the City to depart from the requirements of the Engineering Development Manual.

Director. The Public Works Director or designee.

Discharge. Runoff leaving a new development or redevelopment via overland flow, built conveyance systems, or infiltration facilities. (Stormwater Manual)

Downspout. A pipe which conducts water from the roof of a structure.

Drainage. Collection, conveyance, containment, and/or discharge of surface water and stormwater runoff. (Stormwater Manual)

Drainage facility. A constructed or engineered feature that collects, conveys, stores, or treats stormwater runoff. “Drainage facility” includes, but is not limited to, a constructed or engineered stream, pipeline, channel, ditch, gutter, lake, wetland, closed depression, flow control or water quality treatment facility, erosion and sediment control facility and other structure and appurtenance that provides for drainage.

Driveway. The on-site portion of an access to a property. Driveway is privately owned and maintained.

Driveway/Access – Approach. That area between the pavement edge of the intersecting street and the right-of-way/property line.

Driveway – Apron. See Driveway/Access – Approach.

Driveway – Shared. A jointly owned and maintained tract or easement serving two to four single-family detached units.

Drop-box container. An all-metal container with ten (10) cubic yards or more capacity that is loaded onto a specialized collection vehicle, transported to a disposal or recycling site, emptied and transported back to the customer’s site.

Dwelling, Accessory. As defined in SMC 20.40.210.

Dwelling, Multiple-Family. As defined in SMC 20.20.016.

Dwelling, Single-Family. As defined in SMC 20.20.016.

Easement. A grant by the property owner of the use of a strip of land by the public, corporation or persons for specific purposes.

Emergency Generator. An alternate source of electrical power used to operate City equipment and pump stations during electrical failures.

Engineer – Geotechnical. A practicing, professional civil engineer licensed by the State of Washington, who has knowledge and practice of geotechnical engineering.

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

Engineer – Soils. Geotechnical Engineer.

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.

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.

Extension, Mainline. An addition to the City's system of sewers constructed by an owner or developer according to the terms and conditions of a Developer Extension Contract and is to be conveyed to the City upon the City's inspection and acceptance of the sewers as built by the property owner.

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, assignment of funds, 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. (SMC Chapter 12.15 and SMC Chapter 20.50)

Fire apparatus access road. As defined in the International Fire Code.

Fire lane. As defined in the International Fire Code.

Fixed object. An object, when struck, can result in impact forces on a vehicle's occupants that may result in injury or place the occupants in a situation that has a high likelihood of injury. Examples of fixed objects include, as defined in the WSDOT Design Manual:

A. Wooden poles or posts with cross-sectional areas greater than 16 square inches that do not have breakaway features.

B. Signs, illumination, cameras, weather stations, and other items mounted on non-breakaway poles, cantilevers, or bridges.

C. Trees with a diameter of four (4) inches or more, measured at six (6) inches above the ground surface.

D. Fixed objects extending above the ground surface by more than four (4) inches; for example, boulders, concrete bridge rails, signal/electrical/ITS cabinets, piers, and retaining walls.

E. Drainage elements, such as culvert and pipe ends.

Flow attenuation. Detaining or retaining runoff to reduce the peak discharge.

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

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

General Facility Charge. A one-time charge at the time of development for new or expanded connections that recovers a proportionate share of the past and planned capital costs of the public wastewater system other than costs paid by grants, developer donations, or property assessments.

Grading. See Land Disturbing Activity.

Gravity Service. Sewer service which may be obtained between a property and the City's existing system of sewers in accordance with the City's Rules and Regulations without use of a pump.

Grease Interceptor. An appurtenance or appliance that is installed in a sanitary drainage system to intercept nonpetroleum fats, oil, and grease (FOG) from wastewater.

Grinder Pump. The pump, wet well, alarm, panel, valve vault, and appurtenances located on private property for the purpose of grinding and transporting wastewater into the wastewater system used by its owner, public or private.

Ground disturbance. See Land Disturbing Activity.

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. (Stormwater Manual)

Illicit Connection. Any artificially constructed conveyance that is connected to the public wastewater system without a permit, or that is not intended for collecting and conveying only wastewater discharge. Examples of illicit connections include storm sewer connections, exterior floor drains, channels, pipelines, conduits, footing drains, downspouts, inlets, or outlets that should be connected directly to the municipal separate storm sewer system.

Illicit Discharge. Any direct or indirect discharge into the public wastewater system that is not composed entirely of wastewater, except discharges pursuant to a NPDES permit, or any discharge prohibited by the Code of Federal Regulations, such as 40 CFR 403.5, King County Code Chapter 28.84, and Edmonds Municipal Code Chapter 7.91, and any regulation adopted to implement those laws, all as amended from time to time.

Impervious surface. A non-vegetated 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 those 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 MRs are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling. (Stormwater Manual)

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.

Industrial Waste. Any liquid, solid, or gaseous substances or combination thereof, resulting from any process of industry, manufacturing, commercial food processing, business, agriculture, trade, or research, including, but not limited to, development, recovery, or processing of natural resources, leachate from landfills or disposal sites, decant water, contaminated non-process water, and contaminated stormwater or ground water.

Infiltration. The downward movement of water from the surface to the subsoil. (Stormwater Manual)

Inspector. Designee of the Director.

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

Interceptor. A sewer that receives flow from other large sewers or outlets and conveys the wastewater to a point for treatment or disposal.

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. For the purposes of this Engineering Development Manual and SMC Chapter 13.10. 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, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land disturbing activity. Vegetation maintenance practices are not considered land disturbing activity. Stormwater facility maintenance is not considered 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.

Latecomer Agreement. A written agreement between the City and one or more developers providing for partial reimbursement of the cost of construction of wastewater system improvements as authorized by SMC Chapter 3.90.

Lateral. A sewer which will receive the flow from one or more side sewers and discharge into a trunk or interceptor.

Local Facilities Charge. A charge that applies to a property owner connecting to previously installed public wastewater facilities that provide services available to the property and is due at the time a property is connected to the public wastewater system to recover a proportionate share of the City’s investment in the wastewater infrastructure fronting the property.

Local Improvement District. A type of district established by ordinance pursuant to Chapter 3.40 SMC for the purpose of assisting property owners within a defined geographical area in financing capital improvements by the levying of a special assessment.

Lift Station. A facility used to pump sewage to a higher elevation when it cannot flow by gravity through the City's sewer system. The design requirements are to be determined by the City's Engineer and shall include an emergency generator and overflow storage facilities.

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.

Lot. A designated parcel, tract, or area of land established by plat, subdivision, or as otherwise permitted by law, to be separately owned, used, developed, or built upon. (SMC 20.20.032)

Low Impact Development (LID). A stormwater and land use management strategy that strives to mimic predisturbance 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. (Stormwater Manual)

Low Impact Development (LID) Best Management Practices (BMPs). 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, bioretention/rain gardens, permeable pavements, roof downspout controls, dispersion, soil quality and depth, minimal excavation foundations, vegetated roofs, and water re-use. (Stormwater Manual)

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. (Stormwater Manual)

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. In regard to stormwater facilities, maintenance includes assessment to ensure ongoing proper operation, removal of built up pollutants (e.g., sediments), replacement of failed or failing treatment media, and other actions taken to correct defects as identified in the maintenance standards of Chapter 4, Volume V of the Stormwater Manual. See also Pavement Maintenance exemptions in Section 2.2, Volume I of the Stormwater Manual.

Micromobility. A range of small, lightweight vehicles operating at speeds typically below 15 miles per hour and driven by users personally.

Mobile Home. A moveable single-family dwelling.

Multimodal. Pertains to diverse transportation options, typically including walking, cycling, public transit, and automobile, and accounts for land use factors that affect accessibility.

Municipal Separate Stormwater System (MS4s). 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 Clean Water Act 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 as defined at 40 Code of Federal Regulations (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 the State of Washington, 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. (Stormwater Manual)

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. See also the definition for “turbidity” included below.

Occupant. Any person or owner in physical possession of a structure to which wastewater service is available.

Off-Street Bike Path. A bike path physically separated from motorized vehicular traffic by an amenity zone or barrier and either within the roadway right-of-way or within an independent right-of-way. Off-street Bike Paths may be used by people bicycling, skateboarding, scootering, operating wheelchairs, or other micromobility devices.

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 (O&M) Plan. A set of instructions and schedules to keep drainage facilities working to meet the design performance criteria.

Outfall. Point source as defined by 40 CFR 122.2 at the point where a discharge leaves the MS4s and discharges to waters of the State. Outfall does not include pipes, tunnels, or other

conveyances which connect segments of the same stream or other surface waters and are used to convey primarily surface waters (e.g., culverts). (Stormwater Manual)

Overflow Storage. A facility built to store sewage flow during a high flow event or failure of any part of a sewer system.

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

Performance guarantee. A financial guarantee in a form acceptable to the City, ensuring that all improvements, facilities, or work shall be completed in compliance with regulations, and approved plans and specifications.

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.

Permittee. Any person, governmental agency, or other entity that is performing, or plans to perform, permitted work within the City.

Person. Any individual, a homeowner or a representative of any of the following: company, partnership, corporation, association, society or group and the singular term shall include the plural and reference to any gender shall mean all genders.

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

Plumbing Outlet. The part of the lowest horizontal piping of a sewer system that receives the discharge waste pipes from inside the walls of the structure and connects to the side sewer.

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. (Stormwater Manual)

Pretreatment Device. Any approved device, structure, system, or method used and maintained for the purpose of bringing a waste stream within acceptable limits and standards of quality prior to its discharge to the public wastewater system.

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

Prohibited Discharge. Any liquid, solid, or material other than discharge intended from domestic plumbing fixtures, or as permitted by an Industrial Waste Discharge Permit, prohibited by the Code of Federal Regulations, such as 40 CFR 403.5, King County Code Chapter 28.84, and Edmonds Municipal Code Chapter 7.91, and any regulation adopted to implement those laws, all as amended from time to time.

Project. Activity encompassing all phases of the work to be performed and is synonymous to the term “improvement” or “work.”

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

Project site. That portion of a property, properties, or right-of-way subject to land disturbing activities, new hard surfaces, or replaced hard surfaces. (Stormwater Manual)

Public Wastewater System. The City of Shoreline’s public system providing wastewater services for areas within its municipal boundaries or in other areas under contract.

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

Receiving waters. Naturally and/or reconstructed naturally occurring surface water bodies, such as creeks, streams, rivers, lakes, wetlands, estuaries, and marine waters, or groundwater, to which a municipal separate storm sewer discharges.

Record drawings. Drawings that document as-constructed conditions of a permitted development or redevelopment project.

Recreational Vehicle (RV). A vehicle designed and intended for use on public roadways (not designed nor intended as a permanent residence).

Redevelopment. For surface water purposes: on a site that is already substantially developed (e.g., 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. (Stormwater Manual)

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. (Stormwater Manual)

Replaced impervious surface. See “replaced hard surface.”

Revised Code of Washington (RCW). The Revised Code of Washington, as it currently exists and as amended from time to time.

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, bike routes, and parking whether improved or unimproved, including the air rights, sub-surface rights and easements thereto.

Road. Interchangeable with “Street”.

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.”

Saddle. A mechanical device acceptable to the City to install a tee onto a sewer main.

Sanitary Sewage. Water carrying waste discharged from sanitary facilities.

Sanitary Wastewater System. Has the same meaning as “wastewater system.”

Sediment. Soils or other materials transported or deposited by the action of wind, water, ice, or gravity.

Service, Residential. Any sanitary sewerage system serving a single dwelling or multiple dwelling containing four units or less.

Service, Commercial. All sanitary sewerage systems other than residential.

Sewer, Private. Wastewater conveyance facilities which are owned, operated, maintained, and controlled by the property owner served by those facilities.

Sewer, Public. Any sanitary sewerage system, including but not limited to interceptors, mains, laterals, stubs, pump stations and force mains constructed by the City or by any person and conveyed to the City lying within the right-of-way or a perpetual easement obtained by or granted to the City.

Shared lane. A lane of a traveled way that is open to both bicycle and motor vehicle travel. (AASHTO)

Shared roadway. A roadway that is open to both bicycle and motor vehicle travel. This may be an existing roadway, a street with wide curb lanes, or a road with paved shoulders. (AASHTO)

Shared-Use Path. A path physically separated from motorized vehicular traffic by an open space or barrier and either within the roadway right-of-way or within an independent right-of-way. Shared-use paths may be used by people walking, jogging, bicycling, skateboarding, operating wheelchairs, or other micromobility devices.

Sharrow. A pavement marking symbol that indicates an appropriate bicycle positioning in a shared lane. (AASHTO)

Shoreline Municipal Code (SMC). The City of Shoreline Municipal Code, as it currently exists and as amended from time to time.

Shoulder. The paved or unpaved portion of the roadway outside the traveled way that is available for parking or nonmotorized use.

Side Sewer, Private. A privately owned and maintained pipe system designed to convey wastewater to the public wastewater system and includes, the pipe system up to, but not including, the tee, wye, or connection to the side sewer stub.

Side Sewer Stub. The portion of the side sewer between the City's sewer main and the property line or the edge of a perpetual easement on the property being served. Side sewer stubs are considered part of the public wastewater system.

Side Sewer Tee. The tee fitting at the point at which the side sewer stub joins the sewer main.

Sidewalk. All hard-surface walkways within public right-of-way or a public easement in the area between the street margin and the roadway, including driveways. (SMC 20.20.046)

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. (AASHTO A Policy on Geometric Design)

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)

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 – Stopping. The distance needed for 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)

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 Citywide 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.

Station Surcharge. A monthly charge which the City may impose on properties served by a pump station in order to compensate the City for additional expense that is incurred in the maintenance and operation of such facility.

Storm Drain. A public or private drain which carries storm and surface waters or drainage effluent from storm plumbing outlets and other water unpolluted by sanitary or industrial waste.

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 on-site and offsite.

Stormwater. See “surface water.”

Stormwater Manual. The 2019 Department of Ecology Stormwater Management Manual for Western Washington.

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

Street – Arterial. Provides a high degree of vehicular mobility by limiting property access. The vehicles on arterials are predominantly for through traffic. Arterials are generally connected with interstate freeways or limited access expressways.

Street – Arterial – Collector. Connect traffic from the interior of an area/community to the closest Minor or Principal Arterials.

Street – Arterial – Minor. Provide intra-community connections and are less significant from a perspective of a regional mobility.

Street – Arterial – Principal. Provide major vehicular travel routes between cities within a metropolitan area.

Street – Local Primary. Connect local streets to Collector Arterials.

Street – Local Secondary. Provides local access connections to higher classification streets.

Street – Non-Arterial. Provide local access to residential areas. The City classifies local streets as Neighborhood Collectors or Local Streets.

Street – Private. A privately-owned and maintained access provided by a tract, easement or other legal means.

Structure. Anything constructed or erected on property within the City, designed, intended, or in any manner capable of being used for human occupation, recreation, employment, or other similar purposes and shall include but not be limited to trailers, mobile homes, house trailers, carports, and garages but shall not include fences and walls.

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. (Stormwater Manual)

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

Threshold Discharge Area (TDA). An on-site area draining to a single natural discharge location or multiple natural discharge locations that combine within one-quarter (1/4) mile downstream (as determined by the shortest flowpath.) The purpose of this definition is to clarify how the thresholds of the Stormwater Manual are applied to project sites with multiple discharge points. (Stormwater Manual)

Transportation Impact Analysis. A Transportation Impact Analysis (TIA) is an assessment of the transportation impacts of a development on the surrounding transportation system that documents increased traffic growth, trip distribution and assignment assumptions, and intersection levels of service. A TIA is used to highlight on-site and off-site mitigation needs for those impacts and inform the transportation impact fee program. A Transportation Impact Analysis (TIA) may be required to inform the City on the need for additional improvements to meet concurrency requirements pursuant to SMC 20.60.140 (Chapter 8).

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

Trunk. A sanitary sewer that receives flow from multiple tributary branches.

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

Turbidity meter. A portable, electric, hand-held measuring device designed to give a numerical value of the turbidity (cloudiness) of a sample of water. The numerical values are expressed in units known as Nephelometric Turbidity Units (NTUs).

Utility. Private or municipal corporations owning, operating or proposing to own or operate facilities that comprise a system or systems for public service. Private utilities include gas, electric, telecommunications, 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. (SMC 20.20.050)

Wastewater. The water carried waste that is contained in and conveyed by any part of a wastewater system from residential, commercial, or industrial facilities. This term is used interchangeably with the term “sewage.”

Wastewater Conveyance Facilities. Facilities such as side sewers, sewer pipes, manholes, grinder pumps, and other facilities.

Wastewater Facility. Any facility for the conveyance or storage of wastewater, whether part of the public wastewater system or a private wastewater system, which is connected to or intended to be connected to the public wastewater system. Also referred to as a sewer facility.

Wastewater Master Plan. Plan adopted pursuant to SMC 13.05.040 of this chapter.

Wastewater Pretreatment. The treatment of industrial waste before discharge to the public wastewater system.

Wastewater Service. Providing for the conveyance of wastewater from a structure into the public wastewater system.

Wastewater System, Public. The wastewater facilities which are operated, maintained, and controlled by the City of Shoreline’s Wastewater Utility. Such facilities typically include sewer mains, pump or lift stations, and side sewer stubs.

Wastewater Treatment Provider. The public entity that provides treatment and disposal services for the wastewater collected by the City.

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 the State of Washington and "waters of the state" as defined in RCW Chapter 90.48 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.

APPENDIX B – SURVEY CRITERIA

Survey Format and Content

The following requirements apply to surveys performed for development projects. Review of the survey shall be conducted as part of the plan review process. Contact Planning and Community Development for land use survey requirements. A survey acceptable to the City shall contain the elements listed below:

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. NAVD 88 and NAD 83/91 are required (See Note 3)
5. Monuments within the project area (See Note 4)
6. Site benchmarks (See Note 5)
7. Right-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, if required, 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 shall be filed with the State of Washington DNR, pursuant to RCW 58.24.040(8). Under such conditions add Note 21 to General Notes on plan (See Note 20).

See below for the notes referenced above:

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) State of Washington 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, etc. Include the plat name or short plat number, block number if any, and lot number or lot letter, or the meet's and bounds description of the lot.

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

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 shall 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 may be shown on the design drawings, the vicinity map, or on its own sheet.

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 shall not be disturbed by the proposed construction.

Note 6. **Right-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, 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, etc.

Note 12. **Contours** – Show existing and proposed contours at two (2)-foot intervals for portions of the site with slopes greater less than 40 percent, and for those areas exceeding 40 percent that will be graded. Show five (5)-foot intervals for portions of the site with slopes that exceed 40 percent but will not be disturbed.

Note 13. **Steep Slopes** – Identify slopes 15 percent and steeper. Show the top 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 (8) inches or more in diameter and deciduous trees that are twelve inches or more in diameter. Diameter is measured four (4) 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 the City's Critical Areas Ordinance (SMC Chapter 20.80). If the survey shows protected areas on or adjacent to the site, contact the Department of Planning and 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.

Note 20. **Survey Monuments** – Survey Monuments shall not be removed, disturbed, covered, or destroyed before a permit is obtained from the State of Washington DNR. At least four (4) working days before a monument is removed, disturbed, covered, or destroyed, provide a copy of the DNR permit to the City representative assigned to the project.

APPENDIX C – SURFACE WATER REPORT GUIDELINES

Surface Water Report Guidelines

The surface water report is a comprehensive report that documents the technical information and analysis related to the storm drainage/surface water design of a project. All medium and large impact projects require a surface water report that meets the criteria of this appendix.

The standard report format below is an outline of the required documentation to be included in the surface water report. The specific content in each section depends on the complexity of the project and site conditions.

The report shall address each section in the outline. If a section does not apply, the engineer may simply state that the section does not apply with a brief explanation. This standardized report format allows a quicker, more efficient review of the surface water design.

General report requirements are listed below:

- The report shall be prepared, stamped, signed and dated by a Professional Engineer licensed in the State of Washington.
- All revisions shall be submitted in a complete revised report.
- The report shall be bound.
- The report shall be 8.5" x 11". Figures may be on 11" x 17" sheets.
- Each page shall be numbered.

Cover Sheet

The cover sheet has the:

- Project name and address;
- Applicant/Permittee's name, address, and telephone number;
- Engineering firm’s name, address, and contact information;
- Engineer's name and license number;
- Report date and revision dates.

Table of Contents

Show the page number for each section of the report, including appendices.

1.0 Project Overview

Introduce the formal project name, address and lot numbers.

The project overview shall provide a general description of the project, redeveloped and developed conditions of the site, site area and size of the improvements, and the pre- and post-developed stormwater runoff conditions.

The overview should summarize difficult site parameters, the natural drainage system, and drainage to and from adjacent properties, including bypass flows. Include drainage requirements and restrictions from other agencies.

Provide a table of existing and proposed land cover, including improvement areas. The table shall identify pervious land cover, impervious land cover, and pollution generating areas all noted in square footage. The values in this table shall match those identified in Section 8.0, Figure 3 of this appendix.

2.0 Minimum Requirements

Discuss MRs that apply to the project, as well as additional requirements from basin plans, critical areas, plat/short plat approvals, conditional use permits, and SEPA mitigations. Discuss any engineering deviations and any specific site conditions that affect design requirements. Discuss any assumptions used in design.

Provide the following (highlighting or otherwise denoting the flow path on each figure):

- Flow Chart for Determining Requirements for New Development (Figure I-3.1) or the Flow Chart for Determining Requirements for Redevelopment (Figure I-3.2) from the Stormwater Manual;
- Flow Chart for Determining LID MR5 Requirements (Figure I-3.3);
- Runoff Treatment BMP Selection Flow Chart (Figure III-1.1) if the threshold for MR6 is triggered;
- Flow Chart for Determining Wetland Protection Level Requirements (Figure I-3.5) if the threshold for MR8 is triggered.

3.0 Site and Basin Assessment

The site assessment provides the baseline information necessary to preserve natural resources, preserve areas most appropriate to evaporate, transpire, and infiltrate stormwater, and help to achieve the goal of maintaining or restoring predevelopment natural hydrologic conditions on the site.

Describe existing conditions including relevant hydrologic conditions. The discussion should include hydrology, topography, soils, vegetation, water features, and drainage patterns. Include site visit dates, observations, and weather.

Describe the following:

A. Topography

B. Existing ground cover, including pervious, impervious, and pollution generating areas

C. Describe the natural features of the lot (e.g., woods, pasture, and brush) and give the approximate area covered by those features

D. Offsite drainage to the property

E. Creeks, lakes, ponds, wetlands, ravines, gullies, steep slopes, springs, and other environmentally sensitive areas on or down gradient of the property

F. Drains, channels, and swales, within the project site and immediately adjacent

G. Points of exit for existing drainage from the property

H. Any known historical drainage problems such as flooding, erosion, etc.

I. Any known contaminated soils

J. Existing Structures/Improvements: List any existing buildings, driveways (dirt, gravel, etc.), sidewalks, etc. and their area size in square feet or acres

K. New structures or improvements: List new buildings and their sizes along with any size changes in existing driveways, parking areas, landscaped areas, etc.

L. Remaining Undisturbed Land: List and provide the size of the land (woods, pasture) not covered by buildings or improvements.

3.1 Off-site Analysis Report

Provide an off-site analysis performed according to the Stormwater Manual I-3.5.3 AMP2. A qualitative off-site analysis for each downstream system leaving the project site is required with initial permit submittal. The qualitative analysis shall include a site visit on a rainy day with pictures of the upstream and downstream conveyance systems within the study limits. A quantitative analysis may be required upon review.

3.2 Soils/Infiltration Rates

Discuss soils. Provide results of infiltration test(s), including observations made during the test(s). Note the date or dates of testing. Provide measured infiltration rates. Provide design infiltration rates and justification for the correction factors used. For any project proposing infiltration from pollution generating surfaces provide cation exchange capacity and organic matter content for each soil type and strata where distinct changes in soil properties occur, to a depth below the base of the BMP of at least two and one-half (2.5) times the maximum design water depth, but not less than six (6) feet.

Sites in the Medium Impact project classification may use a licensed on-site sewage designer for preparation of the soil analysis.

Subdivision projects may need to evaluate the soils on each lot for infiltration BMP applicability.

3.3 Critical Areas and Floodplain

Discuss all critical areas and buffers within and adjacent to the site. If the project is within the 100-year floodplain, show the 100-year flood hazard area on the plans.

3.4 Assessment Summary

This section should define the study area, describe the drainage system (including conveyance), identify problems, and define mitigation. Figure 2, Site Assessment and Summary, should represent the information contained in the site assessment and summary.

Summarize evaluation of impacts to fish habitat, groundwater levels, groundwater quality, or other environmental features expected to be significantly impacted by the proposed project due to its size or proximity to such features. Describe proposed mitigation for the impacts.

Provide all assumptions used.

Identify and discuss difficult site parameters and how the plan incorporates the following criteria:

Conserve existing habitat and vegetation.

Protect areas conducive to infiltration and preserve these areas during site design and construction.

Limit ground disturbance areas to road, utility, building pad, landscape areas, and the minimum additional area needed to maneuver equipment. (A ten (10) foot perimeter around the building site can provide adequate workspace for most activities.)

Reduce impervious surfaces.

Place structures as close to the public access point as possible to minimize road/driveway length.

Limit vehicular and pedestrian infrastructure, such as roads, driveways, parking areas and sidewalks, to the minimum functional needs.

Utilize porous paving options wherever possible.

Slope paved areas to facilitate drainage to stormwater management areas.

Reduce building footprints whenever possible. Utilize basements or taller structures with lofts or second stories to achieve square footage goals.

Orient buildings on slopes with long-axis along topographic contours to reduce grading requirements.

Amending disturbed soils according to BMP T5.13 in the Stormwater Manual: Volume V.

4.0 CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

An adequate construction SWPPP includes both a narrative and drawings. Describe how each of the 13 Elements in a SWPPP are being met, where and when the various BMPs should be installed, expected performance of each BMP, and actions to be taken if the performance goals are not achieved.

State the name and contact information of the SWPPP Supervisor or CESCL. (See EDM Chapter 22, Construction Stormwater Pollution Prevention Plan.)

The SWPPP should be a stand-alone document.

4.1 Rainy Season Requirements

Describe how the rainy season requirements for land disturbing work from October 1 to April 30 will be met.

4.2 Seasonal Suspension Plan

When rainy season construction is prohibited, describe the Seasonal Suspension Plan.

5.0 PERMANENT STORMWATER CONTROL

Describe how natural drainage systems and outfalls will be preserved.

Describe design measures taken to create facilities that are aesthetically pleasing, how facilities will provide useable open space, and how the facilities will fit into the landscaping plan for the property, and how the facilities are in keeping with any approved community plan.

Describe how utilities will be installed to ensure no conflicts with proposed stormwater quantity and quality control measures.

5.1 Low Impact Development and Flow Control

Describe the flow control system, including LID techniques and BMPs, outlet works and spillways, flow path lengths, and the safety factors used.

List the method used to comply with MR5 (List Approach or the LID Performance Standard).

If flow control BMP credits are used, explain how the credits will be used and how the criteria for use of credits will be met. If the flow control system is an infiltration facility, provide the soils data, groundwater mounding analysis, or other calculations used to determine the design infiltration rate.

5.2 Water Quality

This section should list receiving waters and pollutants of concern, discuss oil control facilities, describe the selection process for treatment options, and discuss how the water quality plan meets required enhanced treatment.

5.3 Source Control

Pollution source control is the application of pollution prevention practices on a developed site to reduce contamination of stormwater runoff at its source. List the possible sources of pollution after construction. Provide supporting information (site conditions, calculations, etc.) for the selection and sizing of pollution prevention BMPs.

5.4 Conveyance System Analysis and Design

Describe capacities, design flows, and velocities. Specify materials for the design (e.g., rock lining for channels when velocity is exceeded; high density polyethylene pipe needed for steep slope). Present analysis in a clear, concise manner that can be easily followed, checked, and verified.

6.0 SPECIAL REPORTS AND STUDIES

Cite special reports and studies used as reference when preparing the Stormwater Site Plan(s), such as the following:

Critical areas analysis and delineation

Geotechnical/soils

Structural design

Structural fill

7.0 OTHER PERMITS

Include a list of other necessary permits and approvals as required by other regulatory agencies, if those permits or approvals include conditions that affect the surface water plan, or contain more restrictive drainage-related requirements.

8.0 FIGURES

The following figures are required. Additional figures may be provided.

Figure 1. Vicinity Map

A vicinity map should clearly locate the property and any pertinent locations near the site.

Figure 2. Site Assessment and Summary

Figure 2, Site Assessment and Summary, should represent the information contained in the site assessment and summary. Provide a map at a scale that clearly shows the contour intervals and other information. At a minimum the map shall show the following:

- Topography
- The direction of flow, for all drainage
- Boundaries of basins, sub basins, the site and the project site
- Acreage of sub basins and areas contributing runoff to the site
- Existing discharge points to and from the site
- Downstream drainage system for the distance of the downstream analysis
- Locations of existing utilities, existing improvements, and access

- Critical areas, natural streams and drainage features on and adjacent to the site
- Areas that cannot be developed due to conditions such as slopes or critical area buffers
- Areas to be preserved (infiltration, vegetation, soils).

Figure 3. Site Development

The drainage design on the construction drawings can substitute for this figure. Designate on the plans the areas of proposed pervious, impervious, and pollution generating surfaces in square footages. These areas should match the areas provided in Section 1 of the report and include any frontage improvements.

Figure 4. Planting Plan

Provide a planting plan and specifications for each vegetated stormwater facility. Refer to Appendix K - Approved Stormwater Facility Planting List.

APPENDICES

Appendix A – Infiltration Testing

Provide the results of the infiltration test(s). Include on-site observations of soils and groundwater. All test reports shall be signed and dated, with credentials and license number or certification number for person or persons responsible for performing the testing. Include a site plan showing locations of PIT(s).

Appendix B – Geotechnical Report

Include a copy of the geotechnical report prepared for the project site.

Appendix C – Documentation

Provide the methods used for analysis, and information showing that facilities meet the performance standards. Include all supporting documentation such as assumptions, computer printouts, calculations, equations, references, storage/volume tables, duration analyses, graphs, and any other aides necessary to clearly show results used to design flow control and water quality facilities.

Appendix D – Covenants, Dedications, Easements

Include copies of legal instruments needed to guarantee construction of on-site stormwater management BMPs on individual lots, preservation of drainage systems, ongoing maintenance, and access for inspection and maintenance purposes (attach copies). The draft Declaration of Covenant for the stormwater maintenance shall be included in the surface water report. This document is not required to be recorded with King County until after the final as-built inspection.

Appendix E – Property Owners' Association Articles of Incorporation

Attach a copy of the Articles of Incorporation, when applicable and if available.

APPENDIX D – GEOTECHNICAL REPORT GUIDELINES

Geotechnical Report Guidelines

The City may require a geotechnical investigation and report based on the nature of the proposal. For site development for one (1) single-family residence on a site with no steep slopes, erosion hazards, or critical areas, a report previously prepared for that site, may be accepted if:

The report is less than five (5) years old and no significant changes have occurred;

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 shall be stamped, signed and dated by a Professional Engineer licensed in the State of Washington, 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 address each element in the outline.

The content under each element shall 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; while a high-rise structure with a deep excavation on an alluvial site warrants a longer, more detailed report. The report should 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.

GEOTECHNICAL ENGINEER means a practicing geotechnical/civil engineer licensed as a professional civil engineer by the State of Washington who has at least four (4) years of professional employment as a geotechnical engineer.

GEOTECHNICAL ENGINEERING means 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.

Please use double-sided printing for the report.

Number each page.

COVER SHEET

The cover sheet has the:

- Project name and address;
- Applicant/Permittee's name, address, and telephone number;
- Engineering firm’s name, address, and contact information;
- Engineer's name and license number;
- Report date and revision dates.

1.0 SUMMARY

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

2.0 INTRODUCTION

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

2.1 Overview

- Introduce the formal project name, address and lot numbers.
- Describe slope classification(s) according to SMC Chapter 20.80 Subchapter 2 Geologic Hazards.
- Describe briefly the current or previous work used to form the basis for the conclusions and recommendations contained in the report.

2.2 Background

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

2.3 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 service typically provided on similar projects.

2.4 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.

2.5 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.

3.0 SITE CONDITIONS

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

3.1 Location And Surface Conditions

- Provide the cross streets, addresses and lot 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.

3.2 Geological Setting

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

3.3 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 unit group 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 Stormwater Manual.
- 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.

3.4 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.

3.5 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.

4.0 DISCUSSION AND CONCLUSIONS

The Discussion and Conclusions should 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 should be presented in the Recommendations section.

Discussions and Conclusions should:

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

4.1 Slope Stability

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

4.2 Seismic Considerations

- Provide an opinion on the expected level of ground motion during a major earthquake.
- Describe any seismic risks associated with an earthquake such as liquefaction, lateral spreading, landslides, or flooding.
- Describe how design and construction recommendations will reduce or eliminate the impact of seismic risks.

4.3 Site Work

- Describe proposed site grading and earthwork and provide an opinion on the proper sequence and approach to accomplish the site work.
- 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.
- Describe how these key issues should be addressed during construction, including dewatering, temporary retaining structures and erosion control.
- Include specific recommendations for on-site erosion control based on soil erodibility and the presence of groundwater, surface water and slopes.
- Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

4.4 Retaining Structures

- Recommend appropriate temporary retaining systems.

- Recommend the most appropriate permanent retaining system or systems and describe their expected performance with respect to stability and deflection.
- Summarize the data and analysis used to evaluate permanent retaining systems.
- Clearly define all limitations on backfill materials, reinforcement, and drainage for reinforced soil slopes and reinforced soil backfill.
- Describe the limitations on such systems.
- 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.
- Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

4.5 Rockeries

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

4.6 Foundation Support

- Summarize the data and analysis used to evaluate foundation systems.
- 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.
- Emphasize any aspects of site work that could impact the performance of foundations.
- Include statements regarding the importance of construction monitoring by a geotechnical engineering firm.

5.0 RECOMMENDATIONS

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

For each item covered in the recommendation sections, present the following:

- Specific design recommendations along with their limitations, factors of safety, minimum dimensions and effect of expected variations in actual conditions.
- Specific construction recommendations including definitions, materials, execution, monitoring testing, or other quality control measures and any other construction requirements to support the design recommendations.
- Responsibility for seeing that each recommendation is met, such as owner, geotechnical engineer or other design consultant or Contractor.

5.1 Site Grading and Earthwork

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

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, and
8. Permanent erosion controls.

Provide specific construction recommendations for:

1. Clearing,
2. 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), and
8. Temporary slope protection and erosion control measures.

5.2 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, and
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, and
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, and
5. Seepage and drainage control.

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

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

5.3 Rockeries

Provide recommendations as outlined in the Associated Rockery Contractors 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, frequency of testing, slopes, keyways, surcharges, drainage, rock sizes, face inclination and surface drainage.

5.4 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 shall be required for each specific site.

5.5 Structure And Foundations

Provide seismic design recommendations for:

1. Building Code soil type and site coefficients, and
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, and
6. Frost protection.

Mat foundations – provide design recommendations for:

1. Bearing soils,
2. Bearing capacity,
3. Modulus of subgrade reaction,
4. Minimum dimensions, and
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, and
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, and
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, and
4. Monitoring and testing during pile installation.

5.6 Floors

Slab-on-Grade Floors – provide design recommendations for:

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

Supported Wood Floors – provide design recommendations for:

1. Vapor barrier and
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, and
4. Floor drainage system installation (when appropriate).

5.7 Pavements

Provide design recommendations for:

1. Pavement design section, and
2. Pavement drainage.

Provide construction recommendations for:

1. Pavement subgrade preparation and verification, and
2. Pavement base and subbase materials, placement and compaction.

5.8 Utilities

Provide construction recommendations for:

1. Utility excavation,
2. Bedding material placement, and
3. Backfill material, placement and compaction.

5.9 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 structures, walls, and critical areas and their buffers.

Provide all characteristics of the vadose zone layer for UICs per Table I-4.2: Vadose Zone Treatment Capacity of the Stormwater Manual.

5.10 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 should be general, and further studies may be required.

6.0 FIGURES AND ILLUSTRATIONS

6.1 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.

6.2 Site Plan

Show the project boundaries, property lines, existing features and the proposed development and structures. A north arrow and scale should be included along with all subsurface exploration

locations. The accuracy of exploration locations should be indicated on the Site Plan or in the report.

6.3 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.

For soil logs, saturated hydraulic conductivity, hydraulic restriction layer, and monitoring wells, refer to the soils report requirements in Section III-3.2 Preparing a Stormwater Site Plan of the Stormwater Manual.

6.4 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.

6.5 Cross Sections

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

6.6 Standard Plans

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

7.0 PROJECT ENGINEER'S CERTIFICATION

The report shall contain a page with the project 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 Shoreline does not and will not assume liability for the sufficiency, suitability, or performance of facilities prepared based on this report."

APPENDIX E – TRANSPORTATION IMPACT ANALYSIS REPORT GUIDELINES

Transportation Impact Analysis Guidelines

GENERAL REQUIREMENTS

- **Provide one (1) electronic copy in PDF format.** The name of the document shall reference the associated building permit number and revision number. The cover page shall also reference the building permit number.

- The estimate of vehicle trips shall be conducted in accordance with the most recent version of the Trip Generation Manual, published by the Institute of Transportation Engineers.

- **Traffic LOS analysis shall be conducted using methodology consistent with the most recent version of the Highway Capacity Manual.** Roundabout analysis shall be performed using Sidra software per WSDOT policy.

    - See Vehicle LOS Policy T59 and figure 20 of the most recent Transportation Element (Shoreline Ordinance No. 975) for LOS requirements.

- v/c ratio analysis shall be conducted for any principal or minor arterial segments within the study area. Coordinate with the City Traffic Engineer for requirements and process.

    - See Vehicle LOS Policy T59 of the most recent Transportation Element (Shoreline Ordinance No. 975) for v/c requirements.

- The year of completion of the project's final phase shall be used as the horizon year.

The study shall be prepared by a Professional Engineer licensed in the State of Washington with a background in traffic analysis.

Transportation Impact Analysis Outline

i. Cover Page

    - Applicant/Permittee's name
    - Project Title
    - Project address
    - Preparer's contact information, signature, and Professional Engineer stamp.

ii. Introduction

    - Complete project description

- Current and proposed zoning, Comprehensive Plan Designation
- Proposed land use(s)
- Size of development such as number and type of housing units and/or gross floor area
- Phasing plan for complex projects
- Project location and study area boundary
    - At minimum, the nearest intersections with arterial streets, as well as site access points should be included in analysis
    - Additionally, any intersection with an expected increase of 20 PM trips shall be included in the analysis
        - Coordinate with the City Traffic Engineer or designee for trip distribution.
    - The City Traffic Engineer or designee can may require additional intersections for study
- Executive summary of findings and mitigations, if applicable

iii. Site Evaluation

- Vehicle access and queuing

iv. Traffic Impacts

Existing Conditions

- Describe critical intersections and roadways.
- Identify peak usage period(s).
- Identify City capital projects and planned transportation improvements located in the study area.
- Identify transportation improvements in the study area planned by other private developers or by governments or agencies other than the City.
- Identify existing roadway volumes as well as entering and exiting volumes from the site during the p.m. and peak usage period(s). Existing trips shall be measured assuming full occupancy of the existing use on site. If site is still active, existing volumes shall be based on actual trips generated by site rather than ITE-based estimations.

- Existing LOS and queuing at intersections and applicable roadway segments in the study area.
- Existing v/c ratio at applicable roadway segments in the study area.
- Description of other travel modes and facilities serving the project location within the study area.
- If applicable, a gap analysis, transportation network model analysis may be required at the discretion of the City Traffic Engineer.

Future Conditions

i. Trip generation – using most recent ITE Trip Generation Manual

ii. Reduction into assumed ITE Trip Generation values – When specific Travel Demand Management (TDM) strategies are included in the project, trip generation reductions may be approved by the City Traffic Engineer. Some TDM strategies and their relative value include:

- Free or reduced cost ORCA cards – **High**
- Bike Share – **Low** – **Medium**
- Vehicle Share – either by membership in a vehicle share program, or providing a dedicated ride share hosting parking spot. – **Low** - **High**
- On site amenities – such as coworking space, gym, bicycle service center, etc. – **Low** – **High**
- Providing non-motorized facilities through the site to increase bike/pedestrian connectivity - **Medium**
- Unbundled parking costs and reduced onsite parking - **Medium**
- Shuttle service to Transit Hubs – **Medium** – **High**
- Locker rooms with showers – **Low**
- Telework and/or compressed work week/flexible work schedules - **Medium**
- Parking pricing, with reduced cost carpool parking - **Low**
- On-site Childcare - **Medium**

- Vanpools – **Medium**

iii. Background traffic growth

iv. Pipeline project growth

v. Trip distribution

vi. Future LOS and queuing at intersections and applicable roadway segments in the study area.

vii. Future v/c ratio at applicable roadway segments in the study area

v. Pedestrian, Bicycle, and Transit Facilities

- Identify key pedestrian and bicycle trip generators within the study area
- Note any school crossings in the study area. See school walking routes at https://www.shorelinewa.gov/government/departments/public-works/traffic-services/school-walking-routes

vi. Safety

- Document collisions within the study area boundary for the most recent three (3) years of collision data available. Collect collision data from WSDOT
- Reference the City's Annual Traffic Report. For any locations within the study area that have collision reduction strategies identified, the project must assist in mitigation by either implementing the collision reduction strategy or by paying a proportional amount of the cost of mitigation to be determined by the City Traffic Engineer or designee.
- For any intersections within the study area with permissive left turns, provide a cross-product analysis

vii. Parking Impacts

- Compare project's proposed parking provisions with Shoreline Code.
  - If implementing a parking management plan, include within the TIA.

viii. Neighborhood Impacts

- Depending on the project's impact to nearby local streets, implementation of traffic calming may be required, and will be coordinated with the City Traffic Engineer or designee.

ix. Traffic Impact Fee

- If an independent Traffic Impact Fee is calculated, provide calculation table within the TIA.

x. Conclusion

- Summarize project impacts and/or mitigations, including any impact fees

xi. Appendices

- Appendices should contain at minimum the following:
    - Site Plan
    - Collected Turning Movement Counts
    - Synchro/Sidra/Modeling Outputs – should contain at minimum the following:
        - Control Type
        - Signal Timing / phase information (if applicable)
        - LOS for each approach and intersection as a whole
        - Storage Lengths
        - Speed Limits
        - Queue Lengths
        - Vehicle Volumes
        - Ped/Bicycle Volumes (conflicting peds)
    - v/c Ratio for each roadway segment within the analysis area
    - Trip Generation Calculations, including:
        - ITE Trip Generation Outputs from the most recent ITE Trip Generation Manual
        - Internal Trips (if applicable) from NCHRP Report 684 and associated files.
        - Pass-by trips (if applicable) from ITE Pass-By tables

APPENDIX F – STREET MATRIX

Master Street Plan

The 2011 Master Street Plan identifies specific roadway cross sections for all Arterial Streets and Local Primary Streets in the City. It is intended to guide the development of streets throughout the City. The planned cross sections for these streets establish the location of future curbs so that streets can be constructed in the proper location. In addition, refer to EDM Section 14.5 for guidance on planned bicycle facilities for design solutions to align with AASHTO Guide for the Development of New Bicycle Facilities, Bike Level of Traffic Stress (LTS) Table from the Transportation Element, directional guidance, Standard Plan 328 for Off-Street Bike Paths, guidance on gratings, and appropriate design solutions for parking facilities that accommodate bicycles, motorized foot scooters, and similar devices based on Association of Pedestrian and Bicycle Professionals Essential of Bike Parking (2010 and 2015).

The Master Street Plan also identifies a general cross section for Local Secondary Streets which provide for travel in each direction, on-street parking and sidewalks on each side of the street. Due to the large number of Local Secondary Streets in the City, a determination of the appropriate cross section for a given Local Secondary Street shall be made at the time modifications to the street are funded or redevelopment occurs. Additionally, because the needs and conditions of the Local Secondary Streets vary greatly throughout the City, the design criteria shall be flexible.

In accordance with the adopted policies and implementation strategies associated with the Master Street Plan, the following principles accompany its implementation:

A. Frontage improvements shall support the adjacent land uses and fit the character of the areas in which they are located. Six (6) feet is the standard sidewalk width adjacent to single-family residential land uses, and eight (8) feet is the standard sidewalk width adjacent to all land uses other than single-family residential. Increased width may be required if determined by a traffic study.

B. The amenity zone should be developed in a manner that is appropriate and complimentary to the adjacent land uses and use of the street. The minimum width for amenity zones is five (5) feet. Amenity zones should generally be landscaped and, where possible, utilized for stormwater management purposes. Amenity zones adjacent to roadways that do not have off-street parking shall be landscaped as much as possible. In areas where a wide pedestrian walking surface is desired, such as commercial areas, the amenity zone may be a hard surface treatment with trees in pits. Amenity zones that are adjacent to on-street parking areas should be

landscaped as much as possible but may include limited hard surface areas for drivers or passengers exiting vehicles.

C. The identified cross sections may vary from the Street Matrix based on site specific context and our Complete Streets policy. The TMP is in the process of being updated and may alter the dimension or designation in the Street Matrix once information is available. The Street Matrix provides a guideline.

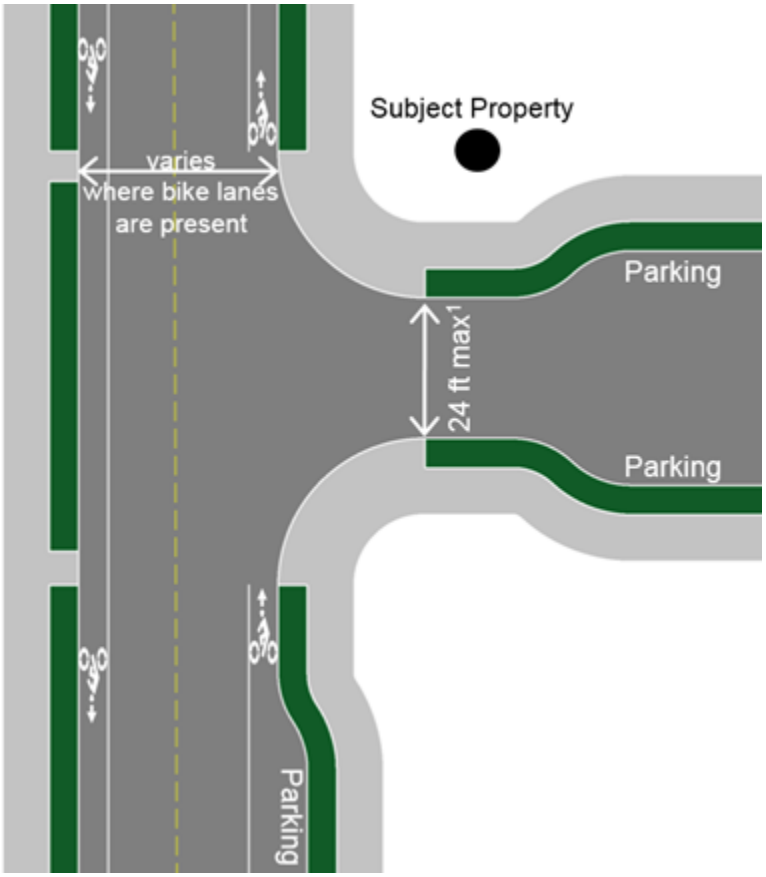
D. The maximum right-of-way needs for street classifications are as follows:

- Principal Arterial – 120 feet
- Minor Arterial – 95 feet
- Collector Arterial – 80 feet
- Local Primary Street – 66 feet
- Local Secondary Street – 90 feet

Frontage Improvements at a Public Street Intersection

If required frontage improvements abut a public street intersection, the intersection radii shall be extended to reduce the throat of the intersection to the maximum extent feasible as shown in the diagram below. This treatment should also be applied at driveways and private streets where feasible. Near intersections, additional right-of-way width may be required to accommodate the need for turn lanes or other features. See Figure 5 below for frontage improvements with a reduced throat at a public street intersection. Refer to Standard Plan 314, Curb Extension for additional details.

Figure 5 Reduced Throat at a Public Intersection



[1]*Except where:*

- *Bike lanes are present.*
- *Additional lanes of traffic are present.*
- *Large vehicle turning movements occur frequently.*

In these cases, the width may be increased to accommodate the intended movements through the intersection. See Standard Plan, 314 Curb Extension for additional details.

Bus Stops within Frontage Improvements

Any frontage improvements where an existing bus stop is located shall improve the bus stop per Standard Plan 520, Bus Stop Improvements. Some variations to the plan are acceptable depending on site constraints, however a minimum requirement of a ten (10) foot by ten (10) foot landing pad shall be required for all front improvements where bus stops are located.

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Collector Arterial	1st Avenue NE	N 145th Street	N 149th Street	60	26-37	W-E	1	8	5	0.5	0	8	10	0	10	8	0	0.5	5	8	1	65	36	East side properties shall dedicate 3 feet in conjunction with redevelopment. Protected bike lanes.
Collector Arterial	1st Avenue NE	N 149th Street	NE 153rd Street	60	30	W-E	0	14	5	0.5	0	0*	10	0	10	8	0	0.5	5	8	1	62	28	*Southbound bicycle facility is a 14-foot shared-use path. Protected bike lane northbound.
Collector Arterial	1st Avenue NE	NE 153rd Street	NE 155th Street	82-123	30-36	W-E	0	14	5	0.5	0	0*	10	0	10	8	0	0.5	5	8	1	62	28	*Southbound bicycle facility is a 14-foot shared-use path. Protected bike lane northbound. Wider amenity zones where there is extra right-of-way.
Local Secondary	1st Avenue NE	NE 157th Street	NE 159th Street	40-50	22	W-E	1	14	5	0.5	0	0	11	0	11	0	0	0.5	0	6	1	50	22	
Local Secondary	1st Avenue NE	NE 170th Street	Approx. 180 feet south of NE 174th Street	60	30	W-E	1	14	5	0.5	0	0	9	0	9	0	7	0.5	7	6	0	59	25	
Local Secondary	1st Avenue NE	Approx. 180 feet south of NE 174th Street	NE 174th Street	40-60	30	W-E	1	14	5	0.5	0	0	9	0	9	0	7	0.5	5	6	0	57	25	
Local Secondary	1st Avenue NE	NE 180th Street	NE 185th Street	60	60	W-E	2	8	7	0.5	0	0	12.5	0	12.5	0	0	0.5	7	8	2	60	25	
Collector Arterial	1st Avenue NE	NE 185th Street	NE 195th Street	60	35	W-E	0.5	8	5	0.5	0	8	10	0	10	8	0	0.5	5	8	0.5	64	36	
Collector Arterial	1st Avenue NE	NE 195th Street	N 205th Street	60	29	W-E	1	8	5	0.5	8	0	10.5	0	10.5	0	0	16.5				60	29	Utilize the eastern 16.5 feet for stormwater BMP.

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURB6	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Local Secondary	3rd Avenue NE	NE 149th Street	NE 151st Street	N/A	N/A	W-E	1	14	TBD	0.5	7	0*	9	0	9	0*	7	0.5	5	8	0	60	32	Parking lane on west side to be load/unload only. Parking lane on east side may have bulbed out landscape areas. Amenity zone TBD through woonerf design. *Bicycle facility is a 14-foot shared-use path under the light rail guideway in an easement. Amenity zone/plaza shall be in City right-of-way and easement as needed.
Local Secondary	3rd Avenue NE	NE 151st Street	Approx. 150 feet south of NE 152nd Street	48.5	28	W-E	1	14	5	0.5	7	0*	9	0	9	0*	0	0.5	5	8	1	60	25	*Bicycle facility is a 14-foot shared-use path.
Local Secondary	3rd Avenue NE	Approx. 150 feet south of NE 152nd Street	NE 152nd Street	60	N/A	W-E	0	0	0	0.5	20							0.5	0	0	0	21	N/A	Fire lane with pedestrian and bicycle access only.
Local Secondary	3rd Avenue NE	NE 152nd Street	NE 153rd Street	60	N/A	W-E	1	14	5	0.5	7	0*	9	0	9	0*	0	0.5	5	8	1	60	25	*Bicycle facility is a 14-foot shared-use path.
Local Secondary	3rd Avenue NE	NE 165th Street	NE 170th Street	60	25	W-E	1	14	5	0.5	0	0*	9	0	9	0*	7	0.5	5	8	1	60	25	*Bicycle facility is a 14-foot shared-use path.
Collector Arterial	3rd Avenue NW	NW 171st Street	NW 175th Street	60-90	22-34	W-E	1	8	5	0.5	8	0	10	0	10	0	8	0.5	5	5	1	62	36	On-street parking to be provided where feasible.
Local Primary Street	3rd Avenue NW	NW 180th Street	NW Richmond Beach Road	60	24-30	W-E	1	5	8.5	0.5	0	0	15	0	15	0	0	0.5	8.5	5	1	60	30	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Collector Arterial	3rd Avenue NW	NW Richmond Beach Road	NW 205th Street	60	28-36	W-E	1	5	5.5	0.5	0	0	14	0	14	0	8	0.5	5.5	5	1	60	36	
Minor Arterial	5th Avenue NE	NE 145th Street	I-5 on-ramp	30	68-72	W-E	1	14	5	0.5	0	0	33	0	22	0	0	0.5	5	14	1	96	55	Cross section dependent on 145th Interchange Design. Western portion of right-of-way is WSDOT Limited Access.
Minor Arterial	5th Avenue NE	I-5 on-ramp	NE 148th Street	60	43	W-E	1	14	5	0.5	0	0	22	0	22	0	0	0.5	5	14	1	96	44	Cross section dependent on 145th Interchange Design.
Minor Arterial	5th Avenue NE	NE 148th Street	NE 155th Street	60	43	W-E	1	8	5	0.5	0	8	11	0	11	8	0	0.5	5	8	1	67	38	
Minor Arterial	5th Avenue NE	NE 155th Street	NE 167th Street	60-90	43-50	W-E	1	8	5	0.5	7	7	11	0	11	7	0	0.5	5	8	1	72	43	
Minor Arterial	5th Avenue NE	NE 167th Street	NE 174th Street	60	43	W-E	0	6	5	0.5	7	5	11	0	11	5	0	0.5	5	6	0	62	39	Protected bike lanes are not required due to parallel shared-use path along Transit Way.
Minor Arterial	5th Avenue NE	NE 174th Street	NE Serpentine Place	60	43	W-E	1	8	5	0.5	0	7	11	11	11	7	0	0.5	5	8	1	76	47	Protected bike lanes.
Minor Arterial	5th Avenue NE	NE Serpentine Place	NE 180th Street	60	30-36	W-E	1	8	5	0.5	0	7	11	0	11	7	0	0.5	5	8	1	65	36	Protected bike lanes.
Minor Arterial	5th Avenue NE	NE 180th Street	700 feet south of NE 185th Street	60	28	W-E	1	8	5	0.5	0	5	11	0	11	5	0	0.5	5	8	1	61	32	Protected bike lanes not required due to parallel shared-use path along Transit Way.
Minor Arterial	5th Avenue NE	700 feet south of NE 185th Street	NE 185th Street	52-124	27-38	W-E	1	14	6.5+	0.5	0	0	12	12	12	0	0	0.5	0	0	1	63+	36	
Collector Arterial	5th Avenue NE	NE 185th Street	NE 195th Street	30-116	16-28	W-E	0.5	8	5	0.5	0	7	10	0	10	7	8	0.5	5	8	0.5	70	38	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Collector Arterial	5th Avenue NE	NE 195th Street	NE 205th Street	60	25	W-E	17				0	0	11	0	11	0	21					60	43	Utilize the western 17 feet for natural stormwater treatment; use the eastern 21 feet for a combination of parking, amenity zone, natural stormwater treatment and sidewalk, based upon topography and soils.
Collector Arterial	6th Avenue NW	NW 175th Street	NW 180th Street	60	24	W-E	1	5	5.5	0.5	8	0	11.5	0	11.5	5	0	0.5	5.5	5	1	60	36	This cross section allows for an uphill climbing lane and downhill shared/signed lane.
Local Secondary	8th Avenue NE	NE 180th Street	NE 185th Street	75	Varies	W-E	0	14	5	0.5	8	0*	10	0	10	0*	8	0.5	5	14	0	75	36	45-foot SCL right-of-way on both sides of roadway segment. Eliminate on-street parking and place bike path and sidewalk behind the transmission structures where needed. *Bicycle facility for this segment shall be a pair of directional 6-foot off-street bike path adjacent to 8-foot sidewalk.
Local Secondary	8th Avenue NE	NE 185th Street	NE 190th Street	60	27	W-E	1	14	5	0.5	0	0	11	0	11	0	8	0.5	5	8	1	65	30	
Collector Arterial	8th Avenue NW	NW 180th Street	NW 185th Street	60	20	W-E	0.5	5	5	0.5	0	5	10	0	10	5	8	0.5	5	5	0.5	60	38	
Collector Arterial	8th Avenue NW	NW 185th Street	NW Richmond Beach Road	60	29-35	W-E	1	5	5	0.5	0	5	10	0	10	5	8	0.5	5	8	1	64	38	Property on the east side shall dedicate 8 feet at the time of redevelopment.

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Minor Arterial	8th Avenue NW	NW Richmond Beach Road	Approx. 80 feet north of NW 190th Street	60	22	W-E	0.5	5	5	0.5	12	10	12	0	11	5	0	0.5	5	8	0.5	75	50	For this cross section, no parking on either side of the street and no bike lane on the west side. Figures include a right turn lane, southbound thru lane, left turn lane and northbound thru lane.
Minor Arterial	8th Avenue NW	Approx. 80 feet north of NW 190th Street	NW 205th Street	60-75	20-32	W-E	0.5	5	5	0.5	0	5	10	0	10	5	8	0.5	5	5	0.5	60	38	On-street parking allowed where right-of-way is wider.
Local Primary Street	10th Avenue NE	NE 155th Street	NE 175th Street	70-80	25-36	W-E	0	8	9	0.5	0	0	12.5	0	12.5	0	0	0.5	9	8	0	60	25	Increased amenity zone width accommodates stormwater facilities.
Collector Arterial	10th Avenue NE	NE 175th Street	NE 180th Street	70	32	W-E	0	6	5	0.5	7	7	11	0	11	7	0	0.5	9	6	0	70	43	Increased amenity zone width on east side accommodates stormwater facilities. Where existing bioretention facilities exist on the west side, bulb out into parking lane to provide a wider amenity zone.
Collector Arterial	10th Avenue NE	NE 180th Street	NE 185th Street	80	32	W-E	0	16	5	0.5	7	7	11	0	11	7	0	0.5	7	8	0	80	43	8-foot sidewalk and 8-foot flex zone on west side. Increased amenity zone width on east side accommodates stormwater facilities.
Collector Arterial	10th Avenue NE	NE 185th Street	NE 190th Street	60-160	32	W-E	0	8	5	0.5	8	7	10	0	10	7	0	0.5	5	8	0.5	60	38	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Local Secondary	10th Avenue NE	NE 190th Street	NE 195th Street	50-60	22	W-E	3	14	0	0.5	0	0	9	0	9	0	7	0.5	0	5	2	50	25	
Collector Arterial	10th Avenue NW	NW Innis Arden Way	NW 175th Street	60	20	S-N	0	0	0	0	8	0	12	0	12	0	0	0.5	5	5	17.5	60	32	No sidewalk on the south side. On-street parking on the south side accommodated where possible. Cross section across the bridge is two 12-foot travel lanes and an 8-foot sidewalk on the north side with no amenity zone.
Local Primary Street	10th Avenue NW	NW 175th Street	NW 180th Street	50-60	20	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Collector Arterial	14th Avenue NW	Springdale Court NW	NW 175th Street	60	20	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Principal Arterial	15th Avenue NE	NE 145th Street	NE 150th Street	60-77	52-55	W-E	1	8	5.5	0.5	0	0	22	12	22	0	0	0.5	5.5	8	1	86	56	Two travel lanes in each direction.
Principal Arterial	15th Avenue NE	NE 150th Street	NE 152nd Street	60-73	44-54	W-E	1	8	5.5	0.5	0	0	24	12	24	0	0	0.5	5.5	8	1	90	60	Two travel lanes in each direction.
Principal Arterial	15th Avenue NE	NE 152nd Street	NE 155th Street	60-65	44-50	W-E	1	8	5.5	0.5	0	5	11	12	11	5	0	0.5	5.5	8	1	74	44	
Principal Arterial	15th Avenue NE	NE 155th Street	NE 165th Street	60-65	42-50	W-E	0	6	5	0.5	0	5	11	12	11	5	0	0.5	5	8	1	70	44	
Principal Arterial	15th Avenue NE	NE 165th Street	NE 169th Street	60	44	W-E	1	5	5.5	0.5	0	5	11	12	11	5	0	0.5	5.5	5	1	68	44	
Principal Arterial	15th Avenue NE	NE 169th Street	NE 172nd Street	60	44	W-E	1	5	5	0.5	0	5	11	12	11	5	0	0.5	5	8	1	70	44	
Principal Arterial	15th Avenue NE	NE 172nd Street	NE 175th Street	60-70	52-44	W-E	0	5	2	0.5	0	5	11	12	11	5	0	0.5	2	5	0	59	44	
Principal Arterial	15th Avenue NE	NE 175th Street	NE 180th Street	70-80	40-54	W-E	0	6	4	0.5	7	0	22	0	22	0	7	0.5	4	6	0	79	58	Sidewalk located on private property in some locations. Two travel lanes in each direction.
Principal Arterial	15th Avenue NE	NE 180th Street	24th Avenue NE	42-95	40-44	W-E	1	8	5.5	0.5	0	5	11	12	11	5	0	0.5	5.5	8	1	74	44	Narrower sidewalks and less dedication required in front of single-family properties.
Principal Arterial	15th Avenue NE	24th Avenue NE	NE 190th Street	57-80	42-44	W-E	1	5	5.5	0.5	0	5	11	12	11	5	0	0.5	5.5	5	1	68	44	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Principal Arterial	15th Avenue NE	NE 190th Street	Ballinger Way NE	60-90	40-60	W-E	1	8	5.5	0.5	0	5	11	12	11	5	0	0.5	5.5	8	1	74	44	Narrower sidewalks and less dedication required in front of single-family properties.
Collector Arterial	15th Avenue NW	NW 167th Street	NW 175th Street	60	20	W-E	1	5	5.5	0.5	0	0	13	0	13	0	0	0.5	5.5	5	1	50	26	
Collector Arterial	15th Avenue NW	NW 188th Street	Approx. 50 feet north of NW 191st Street	60	20	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	All dedication would come from the west side, as the right-of-way is offset 10 feet.
Collector Arterial	15th Avenue NW	Approx. 50 feet north of NW 191st Street	NW Richmond Beach Road	50-60	20-37	W-E	1	8	5	0.5	8	0	10	0	10	0	8	0.5	5	8	1	65	36	Multi-family properties shall dedicate 7.5 feet on each side.
Collector Arterial	15th Avenue NW	NW Richmond Beach Rd	NW 205th Street	40-60	24-100	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Minor Arterial	19th Avenue NE	Forest Park Drive NE	NE 199th Street	60	36	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Minor Arterial	19th Avenue NE	NE 199th Street	NE 205th Street	60-70	36-40	W-E	0.5	8	5	0.5	8	0	10	0	10	0	8	0.5	5	8	0.5	64	36	
Local Primary Street	20th Avenue NW	Saltwater Park Entrance	NW 195th Street	60	18	W-E	0.5	8	0	0.5	8	0	11	0	11	0	0	0.5	5	5	0.5	50	30	
Collector Arterial	20th Avenue NW	NW 195th Street	NW 205th Street	40-50	22-30	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Collector Arterial	22nd Avenue NE	NE 171st Street	NE 172nd Street	60	24-34	W-E	0.5	5	5	0.5	8	0	11	0	11	0	8	0.5	5	5	0.5	60	38	
Minor Arterial	24th Avenue NE	24th Place NE	15th Avenue NE	60-110	26-37	S-N	0.5	5	5	0.5	8	5	10	0	10	5	0	0.5	5	5	0.5	60	38	
Collector Arterial	25th Avenue NE	NE 145th Street	NE 150th Street	30-60	28-38	W-E	0.5	5	5	0.5	0	5	10	0	10	5	8	0.5	5	5	0.5	60	38	
Collector Arterial	25th Avenue NE	NE 150th Street	NE 153rd Street	60	31	W-E	3	5	3	0.5	0	5	10	0	10	5	7.5	0.5	5	5	0.5	60	37.5	
Collector Arterial	25th Avenue NE	NE 153rd Street	NE 165th Street	30	30 -31	W-E	0	8	5	0.5	0	5	10	0	10	5	7.5	0.5	5	5	0.5	60	37.5	
Collector Arterial	25th Avenue NE	NE 165th Street	NE 168th Street	60	35-43	W-E	0.5	5	5	0.5	0	5	10	0	10	5	8	0.5	5	5	0.5	60	38	
Collector Arterial	25th Avenue NE	NE 168th Street	NE 175th Street	60	24-30	W-E	0.5	5	5	0.5	0	5	10	0	10	5	8	0.5	5	5	0.5	60	38	
Collector Arterial	25th Avenue NE	NE 175th Street	NE 177th Street	60	23-26	W-E								38								60	38	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Collector Arterial	25th Avenue NE	NE 177th Street	NE 178th Street	60-110	27	W-E	0	5	8	0	0	0	12	0	12	0	0	0	8	5	0	45	24	Amenity zone will be the shoulder. Preferred width on the east. No sidewalk is planned for the west side of the street due to topography and surface water management needs.
Collector Arterial	25th Avenue NE	NE 178th Street	NE 185th Street	55-67	26	SW-NE	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Local Primary Street	25th Avenue NE	NE 195th Street	NE 200th Street	60	23-25	W-E	0.5	8	5	0.5	0	0*	13	0	11	0*	8	0.5	5	8	0.5	60	32	*Sharrows in travel lanes.
Local Primary Street	25th Avenue NE	NE 200th Street	NE 205th Street	60	23	W-E	0.5	5	5	0.5	8	0*	11	0	11	0*	8	0.5	5	5	0.5	60	38	*Sharrows in travel lanes.
Collector Arterial	Ashworth Avenue N	N 155th Street	N 175th Street	60	24-28	W-E	1	5	7.5	0.5	0	0	16	0	16	0	0	0.5	7.5	5	1	60	32	
Collector Arterial	Ashworth Avenue N	N 175th Street	300 feet south of N 185th Street	60	23-28	W-E	1	5	5.5	0.5	0	8	10	0	10	8	0	0.5	5.5	5	1	60	36	
Collector Arterial	Ashworth Avenue N	300 feet south of N 185th Street	N 185th Street	60		W-E	0	6	5	0.5	0	7	10	0	10	5	9			6	1	60	33	
Collector Arterial	Ashworth Avenue N	N 185th Street	N 192nd Street	60	24-30	W-E	0	6	5	0.5	0	7	10	0	10	5	9			6	1	60	33	Shoulder is 4 feet wide.
Collector Arterial	Ashworth Avenue N	N 192nd Street	N 195th Street	60	20-29	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5	8	1	62.5	36	Development on the east shall dedicate 2.5 feet.
Collector Arterial	Ashworth Avenue N	N 195th Street	N 199th Street	60	23	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Collector Arterial	Ashworth Avenue N	N 199th Street	N 200th Street	60	27	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5	8	1	62.5	36	Development on the east shall dedicate 2.5 feet if developed as something other than single-family; the cross section on the west shall match the park if the City acquires additional property and extends the existing improvements.
Principal Arterial	Ballinger Way NE	15th Avenue NE	Approx. 600 feet southeast of 19th Avenue NE	90-120	62-86	W-E	1	8	21.5	0.5	0	0	24	12	24	0	0	0.5	19.5	8	1	120	60	Two travel lanes in each direction. The amenity zone width to be adjusted for Bus and Turn (BAT) lanes.
Principal Arterial	Ballinger Way NE	Approx. 600 feet southeast of 19th Avenue NE	22nd Avenue NE	100	48-56	W-E	1	8	15.5	0.5	0	0	14	12	14	0	0	0.5	15.5	8	1	90	40	The amenity zone width to be adjusted for BAT lanes.
Principal Arterial	Ballinger Way NE	22nd Avenue NE	25th Avenue NE	80-90	42-58	W-E	1	8	5.5	0.5	0	0	14	0	14	0	0	0.5	15.5	8	1	68	28	All widening to occur on the east/northeast, the amenity zone width to be adjusted for topography or for BAT lanes.
Collector Arterial	Carlyle Hall Road N	NW 171st Street	Dayton Avenue N	60-90	22-34	W-E	1	8	5	0.5	8	0	10	0	10	0	8	0.5	5	5	1	62	36	On-street parking to be provided where feasible.
Collector Arterial	Carlyle Hall Road N	Evanston Place N	Dayton Avenue N	60+	30+	N-S	0.5	5	5	0.5	0	5	10	0	10	5	8	0.5	5	5	0.5	60	38	
Minor Arterial	Dayton Avenue N	Westminster Way N	N 160th Street	90-111	38-54	W-E	0.5	5	5	0.5	12		10	0	10	12		0.5	5	5	0.5	66	44	
Minor Arterial	Dayton Avenue N	N 160th Street	Carlyle Hall Road N	95-108	30-38	W-E	0.5	5	5	0.5	8	5	10	0	10	5	0	0.5	5	5	0.5	60	38	
Minor Arterial	Dayton Avenue N	Carlyle Hall Road N	N 172nd Street	60	22-30	W-E	0.5	5	5	0.5	8	0	11	0	11	0	8	0.5	5	5	0.5	60	38	
Minor Arterial	Dayton Avenue N	N 172nd Street	St. Luke Place N	60	22-30	W-E	1	6	4	0.5	0	0	12	0	12	0	8	0.5	0	8	1	52	32	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Minor Arterial	Dayton Avenue N	St. Luke Place N	N Richmond Beach Road	60-75	22-28	W-E	0.5	5	5	0.5	8	0	11	0	11	0	8	0.5	5	5	0.5	60	38	
Local Secondary	Firlands Way N	N 185th Street	N 188th Street	92	25	SW-NE	0.5	10	5	0.5	17	0	12	0	12	0	17	0.5	5	10	0.5	90	58	
Collector Arterial	Forest Park Drive	15th Avenue NE	NE 196th Street	60	21-23	SW-NE	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Collector Arterial	Fremont Avenue N	N 165th Street	N 205th Street	60-72	28-39	W-E	0.5	5	5	0.5	8	5	10	0	10	5	8	0.5	5	5	0.5	68	46	
Collector Arterial	Greenwood Avenue N	Westminster Way N	N 155th Street	60	22-39	W-E	5	3	2.5	0	0	5	10	0	10	5	8	0.5	5	5	1	60	38	West side pedestrian improvements are trail-like due to topographic separation.
Collector Arterial	Greenwood Avenue N	N 155th Street	N 160th Street	60	22-32	W-E	0.5	5	5	0.5	0	5	10	0	10	5	8	0.5	5	5	0.5	60	38	
Collector Arterial	Greenwood Avenue N	N 160th Street	N Innis Arden Way	60		W-E	0	14	0	0.5	0	0*	10	11	10	0*	0	0.5	0	14	0	60	31	*Bicycle facility is a 6-foot off-street bicycle path.
Collector Arterial	Greenwood Avenue N	N Innis Arden Way	Carlyle Hall Road N	60	22	W-E	0	8	5	0.5	0	7	11	0	11	7	0	0.5	5	5	0	60	36	
Local Primary Street	Innis Arden Drive	Ridgefield Road NW	NW Richmond Beach Road	60-120	20	SE-NW	1	5	5.5	0.5	0	0	13	0	13	0	8	0.5	5.5	5	1	58	34	Sidewalk with no amenity zone across culvert/bridge.
Collector Arterial	Linden Avenue N	N 175th Street	N 185th Street	60	20-26	W-E	1	5	5	0.5	8	0	11	0	11	0	8	0.5	5	8	1	64	38	
Collector Arterial	Midvale Avenue N	N 175th Street	N 185th Street	20-60	22-37	W-E	0	0	0	0.5	0	0	12	0	10	0	8	0.5	5	10	0.5	46.5	30	17 feet on SCL property for back-in angle parking.
Minor Arterial	Meridian Avenue N	N 145th Street	N 205th Street	60-105	38-55	W-E	1	5	5.5	0.5	0	5	11	12	11	5	0	0.5	5.5	5	1	68	44	
Collector Arterial	Perkins Place NE	NE 185th Street	Perkins Way NE	60	20	SW-NE	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Local Primary Street	Richmond Beach Drive NW	NW 195th Street	NW 196th Street	60	20	W-E	0.5	5	5	0.5	8	0	12	0	10	0	8	0.5	5	5	0.5	60	38	
Collector Arterial	Richmond Beach Drive NW	NW 196th Street	NW 199th Street	60	20	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Local Primary Street	Ridgefield Road NW	NW Innis Arden Drive	Springdale Court NW	60	20	S-N	0.5	8	0	0.5	0	0	13	0	13	0	8	0.5	5	5	0.5	54	34	Add amenity zone to sidewalk on the south side where possible.

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Collector Arterial	Springdale Court NW	14th Avenue NW	NW 188th Street	60	20	W-E	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Collector Arterial	St. Luke Place N	N 175th Street	Dayton Avenue N	60	37	W-E	0	5	2	0.5	8	0	10	0	10	0	8	0.5	5	5	0	54	36	
Local Secondary Street	Stone Avenue N	Town Center Boundaries				W-E	2	8	7	0.5	0	0	12.5	0	12.5	0	0	0.5	7	8	2	60	25	
Principal Arterial	Westminster Way N	Greenwood Avenue N	Fremont Avenue N	90	60-68	W-E	1.5	8	5	0.5	0	0	24	12	24	0	0	0.5	5	8	1.5	90	60	Two travel lanes in each direction.
Principal Arterial	Westminster Way N	Fremont Avenue N	400 feet south of N 155th Street	90-125	60-78	W-E	0+	14	5	0.5	0	0*	22	11	22	0*	0	0.5	5	8	14+	96	55	Center Turn Lane could be paved median with openings at turn locations. *Bicycle facility for this segment shall be 14-foot shared-use path.
Principal Arterial	Westminster Way N	400 feet south of N 155th Street	N 155th Street	110-125	78	W-E	0+	14	5	0.5	0	0*	22	0	46	0*	0	0.5	0	8	14+	96	68	Additional right turn pocket at intersection (dual northbound to eastbound right turns, one thru lane, one left turn lane). *Bicycle facility for this segment shall be 14-foot shared-use path.

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Principal Arterial	Westminster Way N	N 155th Street	N 157th Street	100	56	W-E	0-8	14	5	0.5	8	0*	11	0	11	0*	8	0.5	5	14	0	85	38	Roadway segment to have mid-block crossing with raised crosswalk, curb bulb-outs at midblock crosswalk and along the roadway where on-street parking is not provided. Cross section at the intersection of N 155th Street to include a 100-foot long left turn pocket in addition to the travel lane in each direction. *Bicycle facility for this segment shall be 14-foot shared-use path.
Minor Arterial	Westminster Way N	N 157th Street	Aurora Avenue N	100-110	24	W-E	1+	14	5	0.5	8	0*	13	0	0	0	0	0.5	0	0	0	42	13	Roadway segment to provide asphalt speed hump just north of N 157th Street Intersection. Striping at connection to Aurora Avenue N shall meet current WSDOT Design Manual requirements and is subject to WSDOT Channelization Plan Approval. *Bicycle facility for this segment shall be 14-foot shared-use path.

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Local Primary Street	N 152nd Street	Aurora Avenue N	Approx. 375 feet west of Ashworth Avenue N	50-60	20-34	N-S	1	8	5.5	0.5	0	0	12	12	12	0	0	0.5	5.5	8	1	66	36	Each side of the street shall dedicate 3 feet; begin on-street parking at Scottish Rite Masonic Center.
Local Secondary	N 152nd Street	Approx. 375 feet west of Ashworth Avenue N	Ashworth Avenue N	60	30	N-S	1	5	11.5	0.5	0	0	12	0	12	0	0	0.5	11.5	5	1	60	24	Amenity zone width needs to be flexible to accommodate topography.
Principal Arterial	N 155th Street	Westminster Way N	Linden Avenue N	150-220	70-80	N-S	19+	10	5	0.5	0	0	36	0	24	0	0	0.5	5	8	58+	166		
Principal Arterial	N 155th Street	Linden Avenue N	Aurora Avenue N	115-150	70-80	N-S	18+	10	5	0.5	0	0	22	0	44	0	0	0.5	5	8	20+	133+		Striping at connection to Aurora Avenue N shall meet current WSDOT Design Manual requirements and is subject to WSDOT Channelization Plan Approval. For sidewalk segment previously constructed with the Aurora Project, existing 4-foot amenity zone may be maintained if tree pits are increased in size to 5 feet by 5 feet.
Minor Arterial	N 155th Street	Aurora Avenue N	Midvale Avenue N	74-88	47-70	N-S	0	7	4	0.5	0	0	12-34	10	20-23	0	0	0.5	0	6	0-3	75-88	48-69	
Minor Arterial	N 155th Street	Midvale Avenue N	Stone Avenue N	74	42	N-S	1	8	5.5	0.5	0	5	11	10	11	5	0	0.5	5.5	8	1	72	42	
Minor Arterial	N 155th Street	Stone Avenue N	I-5	72	42	N-S	1	5	5	0.5	0	5	11	10	11	5	0	0.5	5	8	1	68	42	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Minor Arterial	N 157th Street	Westminster Way N	Aurora Avenue N	52.5		N-S	0	10	7.5-69	0.5	0	0*	0	0	15	0*	0	0.5	5	14	0+	52.5	15	Roadway segment to provide raised crossing for the Interurban Trail. Striping at connection to Aurora Avenue N shall meet current WSDOT Design Manual requirements and is subject to WSDOT Channelization Plan Approval. *Bicycle facility for this segment shall be 14-foot shared-use path.
Collector Arterial	N 160th Street	Greenwood Avenue N	Dayton Avenue N	50	37	N-S	0	6	0	0.5	0	5	10	10	10	5	0	0.5	0	6	0	53	40	
Minor Arterial	N 160th Street	Dayton Avenue N	Aurora Avenue N	60	40-43	N-S	1	8	5	0.5	0	6	10.5	10	10.5	6	0	0.5	5	14	1	78	43	Curb line at intersection with Aurora Avenue N may need to be adjusted to account for receiving lanes.
Local Secondary Street	N 160th Street	Aurora Avenue N	Interurban Trail	30	23-34	N-S	0	8	5	0.5	0	6	10	10	10	6	0	0.5	5	14	0	63 Local	42	
Local Primary Street	N 165th Street	Aurora Avenue N	Interurban Trail	60	27-36	N-S	1	8	4	0.5	0	0	12	0	12	12	0	0.5	4	8	1	63	36	The cross section does not have bike lanes; it has a 12-foot left turn pocket. Redevelopment shall dedicate 1.5 feet on both sides and expand the sidewalk width to 8 feet.
Local Primary Street	N 165th Street	Interurban Trail	Ashworth Avenue N	60	27-36	N-S	1	5	8.5	0.5	0	0	15	0	15	0	0	0.5	8.5	5	1	60	30	
Collector Arterial	N 165th Street	Evanston Place N	Aurora Avenue N	60	26	N-S	0.5	5	5	0.5	0	5	10	0	10	5	8	0.5	5	5	0.5	60	38	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Local Primary Street	N 167th Street	Ashworth Avenue N	Meridian Avenue N	60	22	N-S	1	5	8.5	0.5	0	0	15	0	15	0	0	0.5	8.5	5	1	60	30	
Collector Arterial	N 172nd Street	Fremont Avenue N	Dayton Avenue N	60	36	N-S	0	5	4	0.5	8	0	10	0	10	0	8	0.5	8	5	1	60	36	
Collector Arterial	N 175th Street	Fremont Avenue N	Fire Department	73	42	S-N	1	8	5	0.5	0	5	11	12	11	5	0	0.5	5	5-8	1	70-73	44	
Collector Arterial	N 175th Street	Fire Department	Aurora Avenue N	66-71	43-52	N-S	0.5	7	4	0.5	0	0	22-28	0-10	28	0	0	0.5	4	7	0.5	82-90	50-66	
Principal Arterial	N 175th Street	Aurora Avenue N	Midvale Avenue N	62	54-55	N-S	1	7	4	0.5	0	0	7-38	12-22	25-29	0	0	0.5	4	7	1	112	78-88	
Principal Arterial	N 175th Street	Midvale Avenue N	Meridian Avenue N	70-100	44-60	N-S	1	13	5	0.5	0	0	22	11	22	0	0	0.5	5	13	1	94	55	Two travel lanes in each direction. Wider sidewalks to accommodate bicycles.
Principal Arterial	N 175th Street	Meridian Avenue N	1st Avenue NE	90-159	50-75	N-S	1	13	5	0.5	0	0	33	11	22	0	0	0.5	5	13	1	105	66	Includes a right turn lane at on ramps. Wider sidewalks to accommodate bicycles.
Local Street	N 178th Street, N 180th Street, N 183rd Street	Town Center Boundaries				N-S	0.5	8	5	0.5	8	0	10	0	10	0	8	0.5	5	8	0.5	64	36	
Minor Arterial	N 185th Street	Fremont Avenue N	Approx. 140 feet west of Aurora Avenue N	70-80	56	N-S	0	12	5	0.5	0	0*	22	11	22	0*	0	0.5	5	12	1	100	55	*Bicycle facility is a 6-foot off-street bike path adjacent to a 6-foot sidewalk.
Minor Arterial	N 185th Street	Approx. 140 feet west of Aurora Avenue N	Aurora Avenue N	60	44	N-S	0	12	5	0.5	0	0*	22-30	12	32	0*	0	0.5	5	12	0	100	66-74	*Bicycle facility is a 6-foot off-street bike path adjacent to a 6-foot sidewalk.
Minor Arterial	N 185th Street	Aurora Avenue N	Midvale Avenue N	60	44	N-S	0	12	5	0.5	0	0*	22	12	32	0*	0	0.5	5	12	0	100	65	*Bicycle facility is a 6-foot off-street bike path adjacent to a 6-foot sidewalk.

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Minor Arterial	N 185th Street	Midvale Avenue N	1st Avenue NE	60-72	42	N-S	0	12	9	0.5	0	0*	22	2	22	0*	0	0.5	5	12	0	85	46	12-foot BAT lane and 10-foot travel lane in each direction separated by a 2-foot wide center curb. *Bicycle facility is a 6-foot off-street bike path adjacent to 6-foot sidewalk.
Collector Arterial	N 192nd Street	Aurora Avenue N	Interurban Trail	60	22-34	N-S	2	13	5	0.5	0	0	11	12	11	0	0	0.5	0	5	0	60	22-34	
Collector Arterial	N 192nd Street	Interurban Trail	Ashworth Avenue N	60	22-26	N-S	11.5	6	3.5	0.5	0	0	12	0	18	0	0	0.5	0	8	0	60	30	
Collector Arterial	N 195th Street	Greenwood Avenue N	Fremont Avenue N	60-88	22-28	N-S	1	8	5.5	0.5	0	0	13	10	13	0	0	0.5	5.5	8	1	66	36	
Collector Arterial	N 195th Street	Fremont Avenue N	Linden Avenue N	60	30	N-S	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Local Secondary	N 195th Street	Ashworth Avenue N	Wallingford Avenue N	60	40	N-S	1	5	5	0.5	8	0	10	0	10	0	17	0.5	5	8	1	71	45	The south side shall dedicate 11 feet. Less right-of-way is needed if parallel parking is installed on-street instead of angle-in parking.
Local Secondary	N 195th Street	Wallingford Avenue N	Meridian Avenue N	60	30	N-S	1	5	7	0.5	0	0	15	0	15	0	0	0.5	7	8	1	60	30	
Collector Arterial	N 200th Street	1st Avenue NW	Whitman Avenue N	58-60	32-36	N-S	0.5	5	5	0.5	12		10	0	10	12		0.5	5	5	0.5	66	44	
Collector Arterial	N 200th Street	Whitman Avenue N	Aurora Avenue N	60	37-40	N-S	1-2	7-8	4.5	0.5	0	0	11	12	11	0	0	0.5	4.5	7-8	1-2	62-64	34	
Collector Arterial	N 200th Street	Aurora Avenue N	Approx. 720 feet east of Aurora Avenue N	60	40	N-S	0	10	0	0.5	0	0	12	12-16	12	0	0	0.5	4	7-8	0-1	60-64	36-40	
Collector Arterial	N 200th Street	Approx. 720 feet east of Aurora Avenue N	Ashworth Avenue N	60	50	N-S	0.5	8	5	0.5	0	5	11	10	11	5	0	0.5	5	8	0.5	70	42	All widening to the north.
Collector Arterial	N 200th Street	Ashworth Avenue N	Meridian Avenue N	60	40		0	5	5	0.5	7	5	11	0	11	5	0	0.5	5	5	0	60	39	
Local Secondary	NE 149th Street	3rd Avenue NE	5th Avenue NE	60	22	N-S	1	8	5	0.5	7	0	9	0	9	0	0	0.5	5	14	1	60	25	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Collector Arterial	NE 150th Street	15th Avenue NE	20th Avenue NE	60	30-36	N-S	1	8	5	0.5	0	5	10	0	10	5	8	0.5	5	5	1	64	38	
Collector Arterial	NE 150th Street	20th Avenue NE	25th Avenue NE	60	39	N-S	5	2-10	0	0	0	5	10	0	10	5	8	0.5	5	5	1	62	38	City has constructed meandering path on the north side, resulting in a varying sidewalk/amenity zone width.
Local Secondary	NE 151st Street	3rd Avenue NE	5th Avenue NE	60-77	32-77	N-S	1	14	5	0.5	0	0	9	0	9	0	7	0.5	5	8	1	60	25	
Minor Arterial	NE 155th Street	I-5	15th Avenue NE	60-72	41	N-S	1	5	5	0.5	0	5	11	10	11	5	0	0.5	5	8	1	68	42	
Local Secondary	NE 159th Street	1st Avenue NE	5th Avenue NE	60	27-30	N-S	0	6	5	0.5	0	0	9	0	9	0	7	0.5	5	8	1	60	25	
Local Secondary	NE 161st Street	3rd Avenue NE	5th Avenue NE	60	32	N-S	1	8	5	0.5	0	0	9	0	9	0	7	0.5	5	6	0	51	25	
Local Secondary	NE 165th Street	1st Avenue NE	3rd Avenue NE	60	27	N-S	1	14	0	0.5	7	0	9	0	9	0	7	0.5	5	6	0	59	32	Future project to work with nearby residents to determine whether on-street parking space should be provided.
Local Secondary	NE 165th Street	3rd Avenue NE	5th Avenue NE	60	27	N-S	1	8	5	0.5	7	0*	9	0	9	0*	7	0.5	5	8	1	61	32	*Bike lane provided by sharrows.
Collector Arterial	NE 165th Street	5th Avenue NE	10th Avenue NE	60	30-45	N-S	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60-65	36	
Collector Arterial	NE 165th Street	10th Avenue NE	15th Avenue NE	60	44	N-S	1	8	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	63	36	
Collector Arterial	NE 168th Street	15th Avenue NE	25th Avenue NE	60-64	22-29	N-S	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Collector Arterial	NE 168th Street	25th Avenue NE	25th Avenue NE	64	27	W-E/ S-N	0.5	5	5	0.5	0	5	10	0	10	5	8	0.5	5	5	0.5	60	38	
Local Secondary	NE 170th Street	1st Avenue NE	3rd Avenue NE	60	28	N-S	1	5	7	0.5	7	0	9	0	9	0	7	0.5	0	14	1	61	32	
Collector Arterial	NE 171st Street	22nd Avenue NE	25th Avenue NE	60	20	W-E/ S-N	0.5	5	5	0.5	8	0	11	0	11	0	8	0.5	5	5	0.5	60	38	
Local Secondary	NE 174th Street	1st Avenue NE	5th Avenue NE	60	30	N-S	1	8	5	0.5	7	0*	9	0	9	0*	7	0.5	5	8	1	61	32	Wider sidewalk due to trail connection. *Bikes lane provided by sharrows.

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Principal Arterial	NE 175th Street	1st Avenue NE	Approx. 120 feet west of 3rd Avenue NE	90-159	50-75	N-S	1	13	5	0.5	0	0	33	11	22	0	0	0.5	5	13	1	105	66	Includes a right turn lane at on ramps. Wider sidewalks to accommodate bicycles.
Principal Arterial	NE 175th Street	Approx. 120 feet west of 3rd Avenue NE	15th Avenue NE	60-100	26-56	N-S	1	13	5	0.5	0	0	22	11	22	0	0	0.5	5	13	1	94	55	Two travel lanes in each direction. Wider sidewalks to accommodate bicycles.
Collector Arterial	NE 175th Street	15th Avenue NE	Approx. 300 feet east of 15th Avenue NE	60-81	40	S-N	0	10			0	0	22	0	22	0	0	10			0	60	44	Two travel lanes in each direction, 8 feet of north sidewalk in right-of-way, 2 feet on private property.
Collector Arterial	NE 175th Street	Approx. 300 feet east of 15th Avenue NE	NE 172nd Street	60	24-33	W-E/ S-N	0.5	5	5	0.5	8	0	11	0	11	0	8	0.5	5	5	0.5	60	38	
Minor Arterial	NE 178th Street	24th Place NE	25th Avenue NE	60	30	W-E	0.5	5	5	0.5	8	5	10	0	10	5	0	0.5	5	5	0.5	60	38	
Local Secondary	NE 180th Street	4th Avenue NE	5th Avenue NE	60	27	N-S	1	8	5	0.5	7	0*	9	0	9	0*	0	0.5	5	8	1	54	25	Wider sidewalk due to trail connection. *Bikes lane provided by sharrows.
Local Secondary	NE 180th Street	5th Avenue NE	10th Avenue NE	60	32	N-S	0	6	0	0.5	8	7	10	0	10	7	0	0.5	5	6	0	60	42	Where existing bioretention facilities exist on the west side, bulb out into parking lane to provide a wider amenity zone.
Collector Arterial	NE 180th Street	10th Avenue NE	15th Avenue NE	60	32	N-S	0	7	5	0.5	0	6	11	0	11	7	0	0.5	4	8	0	60	35	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Minor Arterial	NE 185th Street	1st Avenue NE	5th Avenue NE	60-115	42	N-S	3.5	12	9	0.5	0	0*	22	1.5	22	0*	0	0.5	5	12	3	90	45.5	12-foot BAT lane and 10-foot travel lane in each direction separated by a 1.5-foot wide center curb. *Bicycle facility is a 6-foot off-street bike path adjacent to 6-foot sidewalk.
Minor Arterial	NE 185th Street	5th Avenue NE	10th Avenue NE	87+	46	N-S	0	8	5	0.5	0	7	11	11	11	7	0	0.5	5	8	0	74	47	
Local Secondary	NE 189th Street	7th Avenue NE	8th Avenue NE	60	32	N-S	1	8	5	0.5	7	0	9	0	9	0	0	0.5	5	8	1	54	25	
Local Secondary	NE 190th Street	8th Avenue NE	10th Avenue NE	60	43	N-S	1	14	5	0.5	7	0	10	0	10	0	7	0.5	5	8	1	69	34	
Local Secondary	NE 195th Street	5th Avenue NE	8th Avenue NE	60	20	N-S	1	5	5	0.5	0	0	9	0	9	0	7	0.5	5	14	1	57	25	Cross section could be flipped based on Trail Along the Rail Phase 1 Design Project.
Local Secondary	NE 195th Street	8th Avenue NE	10th Avenue NE	60	20-30	N-S	1	5	5	0.5	0	0	9	0	9	0	7	0.5	5	14	1	57	25	
Minor Arterial	NE 196th Street	15th Avenue NE	Forest Park Drive NE	60-80	36-39	N/W-S/E	1	5	5	0.5	0	0	12	0	12	0	10-15	0	0	0	0	45.5-49.5	24	Parking to be accommodated on southeast side where possible.
Minor Arterial	NE 196th Street	Bridge		60-80	36-39	N-S	11 (curb, walkway and railing)				0	0	12	0	12	0	0	0.5	2.5 (guardrail)			38	24	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Collector Arterial	NE Perkins Way	10th Avenue NE	15th Avenue NE	60	26-36						27											40	27	Cross section shall be no less than 40 feet. It shall consist of 27 feet of asphalt to accommodate two 12-foot travel lanes and one 5-foot bike lane in each uphill direction, a pedestrian walkway on the north side of the roadway and widened shoulder and parking where possible.
Collector Arterial	NE Perkins Way	15th Avenue NE	18th Avenue NE	60	25-41	W-E/ S-N	0.5	5	5	0.5	8	5	10	0	10	5	0	0.5	5	5	0.5	60	38	
Minor Arterial	NE 205th Street	19th Avenue NE	30th Avenue NE	N/A	N/A	CL-S	In Mountlake Terrace							0	10	12		0.5	0	7.5	0	30	22	
Collector Arterial	NW 167th Street	10th Avenue NW	15th Avenue NW	60	20	N-S	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	
Collector Arterial	N 175th Street	St. Luke Place N	3rd Avenue NW	60	28	S-N	1	5	5.5	0.5	8	0	10	0	10	0	8	0.5	5.5	5	1	60	36	Provide amenity zone on the south where feasible and allow the sidewalk to meander due to topography.
Collector Arterial	NW 175th Street	3rd Avenue NW	6th Avenue NW	60	28-34	S-N	0	8	0	0.5	8	7	10	0	10	7	0	0.5	0	8	0	54.5	36	
Collector Arterial	NW 175th Street	6th Avenue NW	10th Avenue NW (south leg)	60	28	S-N	9	8	0	0.5	0	7	10	0	10	7	0	0.5	0	8	0	60	33	Parking on the north side to consist of parking pullouts where feasible.
Local Primary Street	NW 180th Street	3rd Avenue NW	6th Avenue NW	60	32	N-S	1	5	8.5	0.5	0	0	15	0	15	0	0	0.5	8.5	5	1	60	30	
Collector Arterial	NW 180th Street	6th Avenue NW	8th Avenue NW	50-60	20-35	S-N	1	5	5.5	0.5	0	0	14	0	14	0	8	0.5	5.5	5	1	60	36	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Local Primary Street	NW 180th Street	8th Avenue NW	10th Avenue NW	60	20	N-S	0.5	6	5	0.5	8	0	10	0	10	0	8	0.5	5	6	0.5	60	36	
Collector Arterial	NW 188th Street	15th Avenue NW	Springdale Court NW	60	20	N-S	1	5	5.5	0.5	8	0	10	0	14	0	0	0.5	9.5	5	1	60	32	
Collector Arterial	NW 195th Street	8th Avenue NW	Greenwood Avenue N	50-60	28-32	N-S	1	8	5	0.5	0	0	13	10	13	0	0	0.5	5	8	1	65	36	
Minor Arterial	NW 195th Street	15th Avenue NW	20th Avenue NW	60-85	44	N-S		6	5	0.5	Curb to curb cross section to remain.							0.5	5	6				
Local Primary Street	NW 195th Place	Richmond Beach Drive NW	NW 196th St	60	27	NW-SE	0	6	5	0.5	8	0	10	0	11	0	8	0.5	5	6	0	60	38	
Collector Arterial	NW 196th Street	20th Avenue NW	24th Avenue NW	64-74	42-44	N-S		6	5	0.5	Curb to curb cross section to remain.							0.5	5	6				
Collector Arterial	NW 196th Street	Richmond Beach Drive NW	24th Avenue NW	60	26-32	N-S	0	6	5	0.5	7	5	10	0	10	5	7	0.5	5	6	0	67	44	
Collector Arterial	NW 200th Street	1st Avenue NW	3rd Avenue NW	60	30	N-S		6	5	0.5	7	5	10	0	10	5	7	0.5	5	6	0	67	44	
Local Secondary	NW 200th Avenue	3rd Avenue NW	8th Avenue NW			N-S	2.5	6	5	0.5	0	0	16	0	16	0	0	0.5	5	6	2.5	56	32	Combined travel lanes/on-street parking.
Collector Arterial	NW 205th Street	3rd Avenue NW	8th Avenue NW	40-50	19-20	N-S	0.5	8	0	0.5	0	0	11	0	11	0	8	0.5	5	5	0.5	50	30	
Collector Arterial	NW Innis Arden Way	Greenwood Avenue N	Approx. 450 feet east of 6th Avenue NW	80	22	N-S	1.5	14	5	0.5	8	0*	11	0	11	0*	8	0.5	5	14	1.5	80	38	*Bicycle facility is a 6-foot off-street bicycle path.
Collector Arterial	NW Innis Arden Way	Approx. 450 feet east of 6th Avenue NW	6th Avenue NW	80	22	W-E	0.5	8	5	0.5	8	0	10	0	14	0	0	0.5	5	8	0.5	60	32	8-foot width on south/west side is the shoulder.
Collector Arterial	NW Innis Arden Way	6th Avenue NW	10th Avenue NW	60-81	21-24	W-E	0	0	0	0	8	0	10	0	14	0	0	0.5	5	8	0.5	46	32	

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURB5	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Minor Arterial	NW Richmond Beach Road	Fremont Avenue N	2nd Avenue NW	80-110	44	N-S		6	5	0.5	Curb to curb cross section to remain.							0.5	5	6				
Minor Arterial	NW Richmond Beach Road	2nd Avenue NW	8th Avenue NW	60-80	44-54	N-S	0	6 to 8	5	0.5	0	5	22	12	22	5	0	0.5	5	6 to 8	0	89-95	66	
Minor Arterial	NW Richmond Beach Road	8th Avenue NW	15th Avenue NW	60-83	44	SW-NE		6	5	0.5	Curb to curb cross section to remain.							0.5	5	6				

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURB	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
GENERIC CROSS SECTION																								
Local Secondary or Primary Street May be applied to Arterial streets per City direction	Generic Cross Section 1			Varies	Varies		0-2.5	10-12	7-8*	0.5	7-8*	0	10-11	0	10-11	0	7-8*	0.5	7-8*	10-12	0-2.5	55-60	20-38	With this section, the parking and amenity zone are staggered to create curb bulb ins for parking areas, and curb bulb outs for landscaped areas, driveways, and intersections. All driveways, intersections, and crossings shall be bulbed out to prohibit parking related sight obstructions. See Figure 6.

FUNCTIONAL CLASSIFICATION	STREET NAME	FROM	TO	TOTAL EXISTING RIGHT-OF-WAY	EXISTING CURB TO CURB WIDTH	CROSS SECTION DIRECTION	BEHIND SIDEWALK	SIDEWALK	AMENITY ZONE	CURB	PARKING	BIKE LANE	TRAVEL LANE	CENTER TURN LANE	TRAVEL LANE	BIKE LANE	PARKING	CURBS	AMENITY ZONE	SIDEWALK	BEHIND SIDEWALK	REQUIRED RIGHT-OF-WAY	PLANNED CURB TO CURB WIDTH	NOTES
Local Secondary or Primary Street	Generic Cross Section 2			Varies	Varies		3.5	6	7	0.5	0	0	13	0	13	0	0	0.5	7	6	3.5	60	26	6-foot sidewalk adjacent to single family residential land uses; 8-foot sidewalk adjacent to all other land uses, or when adjacent to any MUR zone. Increased sidewalk width may be required if determined by a traffic study. This cross section supports alternating parking on both sides of the street.

Figure 6 Generic Cross Section 1 Diagram

APPENDIX G – RIGHT-OF-WAY STREET TREE LIST

Street Tree List last updated in 2019

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.
Ginko biloba 'Princeton Sentry' Princeton Sentry Ginkgo	40	15	No	6	N/A		Very narrow growth.
Nyssa sylvatica Tupelo	60	20	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.
Taxodium distichum 'Mickelson' Shawnee Brave Bald Cypress	55	20	No	6	N/A		Deciduous conifer. Tolerates city conditions.

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	6	N/A		Fastest growing sugar maple.
Acer saccharum 'Commemoration' Commemoration Sugar Maple	50	35	No	6	N/A		Resistant to leaf tatter. **Great Plant Pick**
Acer saccharum 'Green Mountain' Green Mountain Sugar Maple	45	35	No	6	N/A		Reliable fall color. **Great Plant Pick**
Acer saccharum 'Legacy' Legacy Sugar Maple	50	35	No	5	N/A		Limited use - where sugar maple is desired in limited planting strip area. **Great Plant Pick**
Aesculus flava Yellow Buckeye	60	40	No	6			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	50	40	No	6	N/A		Silvery-grey bark.
Fagus sylvatica 'Asplenifolia' Fernleaf Beech	60	50	No	6	N/A		Beautiful cut leaf. **Great Plant Pick**
Ginkgo biloba 'Magyar' Magyar Ginkgo	50	25	No	6	N/A		More upright and narrow than 'Autumn Gold.'
Gymnocladus dioicus 'Espresso' Espresso Kentucky Coffee	50	35	No	6	N/A		Very coarse branches. Extremely large bi-pinnately compound leaves.
Liriodendron tulipifera	60	30	No	8	N/A		Fast-growing tree. Can get very large in open conditions.

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Tulip Tree							
Metasequoia glyptostroboides Dawn Redwood	50	25	No	6	N/A		Fast growing deciduous conifer. **Great Plant Pick**
Quercus bicolor Swamp White Oak	60	45	No	8	N/A		Interesting shaggy peeling bark.
Quercus coccinea Scarlet Oak	60	40	No	6	N/A		Best oak for fall color
Quercus garryana Oregon Oak	50	40	No	8	N/A		Native to Pacific Northwest. **Great Plant Pick**
Quercus imbricaria Shingle Oak	60	50	No	6	N/A		Nice summer foliage. Leaves can persist throughout the winter.
Quercus muhlenbergii Chestnut Oak	60	50	No	6	N/A		Coarsely toothed leaf.
Quercus robur English Oak	60	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	60	50	No	8	N/A		More drought tolerant than Red Oak.
Taxodium distichum Bald Cypress	55	35	No	8	N/A		A deciduous conifer. Broadly spreading when mature; columnar when young. **Great Plant Pick**

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
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**

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	50	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	6	N/A		Similar to Hedge Maple, but faster growing and larger.
Acer pseudoplatanus 'Atropurpureum' Spaethii Maple	40	30	No	5	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.
Betula jacquemontii Jacquemontii Birch	40	30	No	5	N/A		White bark makes for good winter interest. Best for aphid resistance, but has issues with Bronze Birch Borer.
Ginko biloba 'Autumn Gold' Autumn Gold Ginkgo	45	35	No	6	N/A		Narrow when young.
Nothofagus antarctica Antarctic Beech	50	35	No	5	N/A		Rugged twisted branching and petite foliage. Difficult to find in the nursery trade.
Tilia americana 'Redmond' Redmond Linden	50	30	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 attachments.
Ulmus parvifolia 'Emer II' Allee Elm	45	35	No	5	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	40	15	No	5	N/A		Broadens when older. **Great Plant Pick**
Fagus sylvatica 'Dawyck Purple' Dawyck Purple Beech	40	12	No	6	N/A		Purple foliage.
Liriodendron tulipifera 'Fastigiatum' Columnar Tulip Tree	40	10	No	6			Good next to buildings. Can have problems with tight branch angles. **Great Plant Pick**
Malus 'Tschonoskii' Tschonoskii Crabapple	30	15	Yes	5			Sparse green fruit, pyramidal.
Oxydendron arboreum Sourwood	35	12	No	5			Consistent and brilliant fall color. **Great Plant Pick**
Pyrus calleryana 'Cambridge'' Cambridge Pear	40	15	No	5			Narrow tree with better branch angles and form than the species. Brittle limbs may be a problem with ice or wet snow.

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	5	N/A		Reliable fall color; nice reddish orange.
Acer truncatum x A. platanoides 'Warrensred' Pacific Sunset Maple	30	25	Yes	5	N/A		Limited use under higher wires.
Betula albosinenesis var septentrionalis Chinese Red Birch	40	35	No	5	N/A		White and pink peeling bark. **Great Plant Pick**
Carpinus caroliniana American Hornbeam	25	20	Yes	5	N/A		Outstanding fall color (variable – yellow, orange, red). Nice little tree. **Great Plant Pick**
Cladrastis kentukea Yellowwood	40	40	No	5			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	5			Frothy 6-inch clusters of white flowers in June. **Great Plant Pick**
Crataegus crus-galli 'Inermis' Thornless Cockspur Hawthorne	25	30	Yes	5			Red persistent fruit.
Cornus 'Eddie's White Wonder' Eddie's White Wonder Dogwood	30	20	Yes	5			A hybrid of *C. florida* and *C. nuttalii*.
Crataegus x lavalii	25	20	Yes	5			Thorns on younger trees. **Great Plant Pick**

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Lavalle Hawthorne							
Davidia involucrata Dove Tree	40	30	No	5		N/A	Large, unique flowers in May. **Great Plant Pick**
Eucommia ulmoides Hardy Rubber Tree	50	40	No	6	N/A	N/A	Dark green, very shiny leaves. Insignificant fall color.
Fagus sylvatica 'Rohanii' Purple Oak Leaf Beech	50	30	No	6	N/A	N/A	Attractive purple leaves with wavy margins. **Great Plant Pick**
Halesia monticola Mountain Silverbell	45	25	No	5			Attractive small white flower.
Halesia tetraptera Carolina Silverbell	35	30	No	5			Attractive bark for seasonal interest.
Koelreuteria paniculata Goldenrain Tree	30	30	Yes	5			Midsummer blooming. Slow growing. **Great Plant Pick**
Magnolia denudata Yulan Magnolia	40	40	No	5		N/A	6-inch fragrant white flowers in spring. **Great Plant Pick**
Magnolia grandiflora 'Victoria' Victoria Evergreen Magnolia	25	20	Yes	5		N/A	Evergreen magnolia. Can be damaged in years with wet, heavy snow. **Great Plant Pick**
Magnolia kobus 'Wada's Memory' Wada's Memory Magnolia'	30	20	Yes	5			Does not flower well when young. **Great Plant Pick**
Ostrya virginiana Ironwood	40	25	No	5	N/A		Hop like fruit. Slow growing.
Phellodendron amurense 'Macho' Macho Cork Tree	40	40	No	5	N/A		This variety is fruitless. Fall color can be varied. High drought tolerance.

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Prunus cerasifera 'Krauter Vesuvius' Vesuvius Flowering Plum	30	20	Yes	5		N/A	Burgundy colored leaves. Tree best used as an accent rather than in mass plantings.
Pterostyrax hispida Fragrant Epaulette Tree	40	30	No	5			Pendulous creamy white flowers. Fragrant. Difficult to find in the nursery trade.
Quercus Ilex Holly Oak	40	30	No	5	N/A	N/A	Evergreen oak. Underside of leaf is silvery-white. Often has a prominent umbrella form.
Rhamnus purshiana Cascara	30	20	Yes	5	N/A		Native tree. Fall color depends on exposure. Purplish fruit feeds many native birds.
Robinia x ambigua Pink Idaho Locust	35	25	No	5			Fragrant flowers. Sterile variety. Drought tolerant. Some varieties will sucker profusely.
Sorbus x hybridia Oakleaf Royal Mt. Ash	30	20	Yes	5			Leaves are similar to English Oak. Interesting bark for seasonal features.
Styrax japonica Japanese Snowbell	25	25	Yes	5			Reliable and easy to grow. Has plentiful, green ½" seeds. Flowers similar to Lily in the Valley. **Great Plant Pick**
Tilia cordata 'De Groot' De Groot Littleleaf Linden	30	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	5	N/A		High resistance to Dutch Elm Disease. Drought resistant. Cinnamon colored exfoliating bark for seasonal interest.

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	5		N/A	Interesting exfoliating bark. Flowering in June or July. Varies in intensity from year to year.
Malus 'Adirondack' Adirondack Crabapple	20	10	Yes	5			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	5			Deep pink blossom and persistent red berries for seasonal interest.
Prunus serrulata 'Amanogawa' Amanogawa Flowering Cherry	20	8	Yes	6			Pinkish flower bud, changing to white flower.
Sorbus americana 'Dwarfcrown' Red Cascade Mountain Ash	20	10	Yes	5			Nice winter form. Red berries persistent in clusters.

Small Trees

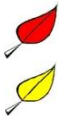
Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Acer buegerianum Trident Maple	30	30	Yes	5	N/A		Somewhat shrub-like. Must train to a single stem. Interesting bark. **Great Plant Pick**
Acer circinatum Vine Maple	25	25	Yes	5	N/A		Native tree. Avoid using on harsh sites. **Great Plant Pick**
Acer ginnala 'Flame' Flame Amur Maple	25	20	Yes	5			Clusters of small cream colored flowers in spring. Very fragrant. Nice fall color. Informal branch structure.
Acer griseum Paperbark Maple	30	20	Yes	5	N/A		Peeling cinnamon colored bark for seasonal interest. **Great Plant Pick**
Acer palmatum Japanese Maple	20	25	Yes	5	N/A		Many varieties available. Select larger varieties for street planting.
Acer triflorum Three-Flower Maple	25	20	Yes	5	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.
Arbutus unedo 'Marina' Strawberry Tree	25	20	Yes	5		N/A	Substitute for Pacific Madrone. Can suffer severe damage or death due to cold weather. Evergreen.

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Carpinus japonica Japanese Hornbeam	20	25	Yes	5	N/A		Wide spreading, slow growing. Fall color is not outstanding. **Great Plant Pick**
Cercis canadensis Eastern Redbud	25	30	Yes	5			Deep pink flowers on bare twigs in spring.
Cercis siliquastrum Judas Tree	25	30	Yes	5			Deep pink flowers on bare twigs in spring. Drought resistant.
Cornus alternifolia Pagoda Dogwood	25	25	Yes	5			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. **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**
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	5		N/A	Yellowish to cream colored flower in spring. **Great Plant Pick**
Magnolia 'Galaxy' Galaxy Magnolia	25	25	Yes	5			Showy pink flowers. **Great Plant Pick**
Magnolia x loebneri Loebner Magnolia	20	20	Yes	5			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	5			Disease resistant. Persistent yellow fruit in fall and winter. **Great Plant Pick**
Malus 'Donald Wyman'	25	25	Yes	5			Large white blossom. Nice green foliage in summer.

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Donald Wyman Crabapple							
Malus 'Lancelot' ('Lanzam') Lancelot Crabapple	15	15	Yes	4			Red flower buds, blooming white. Red persistent fruit.
Parrotia persica Persian Parrotia	30	20	No	5			Blooms before it leafs out. Drought tolerant. Varied fall color (reds, oranges and yellows). **Great Plant Pick**
Prunus 'Frankthrees' Mt. St. Helens Plum	20	20	Yes	5		N/A	Burgundy colored leaves. Tree best used as an accent rather than in mass plantings.
Prunus 'Newport' Newport Plum	20	20	Yes	5		N/A	Burgundy colored leaves. Tree best used as an accent rather than in mass plantings.
Prunus 'Snowgoose' Snow Goose Cherry	20	20	Yes	5			This selection sports abundant white flowers and healthy green, disease-resistant foliage.
Prunus x yedoensis 'Akebono' Akebono Flowering Cherry	25	25	Yes	6			Has masses of large, semi-double, pink flowers. Most widely planted cherry in Pacific Northwest.
Sorbus alnifolia Korean Mountain Ash	35	30	No	5			Simple leaves and beautiful pink/red fruit. **Great Plant Pick**
Stewartia monodelpha Orange Bark Stewartia	30	20	Yes	5			Extraordinary cinnamon colored bark. Avoid hot, dry sites. **Great Plant Pick**
Stewartia psuedocamellia Japanese Stewartia	25	15	Yes	5			Patchwork bark, white flower in spring. **Great Plant Pick**
Styrax obassia Fragrant Styrax	25	20	Yes	5			Smooth gray bark and fragrant white flowers. **Great Plant Pick**

Unimproved Right-of-Way Trees

Scientific & Common Name	Mature Height (ft)	Spread (ft)	Under Wires/View Covenants	Min Strip Width (ft)	Flower Color	Fall Color	Comments
Pseudotsuga menziesii Douglas Fir	80	30	No	20	N/A	N/A	Unimproved right-of-way only
Abies procera Noble Fir	60	25	No	20	N/A	N/A	Unimproved right-of-way only
Pinus contorta Shore Pine	80	30	No	20	N/A	N/A	Unimproved right-of-way only
Thuja plicata Western Red Cedar	70	25	No	15	N/A	N/A	Unimproved right-of-way only
Pinus strobus White Pine	80	35	No	20	N/A	N/A	Unimproved right-of-way only
Arbutus menziesii Pacific Madrone	80	40	No	15		N/A	Unimproved right-of-way only
Fraxinus latifolia Oregon Ash	80	60	No	20			Unimproved right-of-way only
Acer macrophyllum Big Leaf Maple	75	60	No	20	N/A		Unimproved right-of-way only
Picea sitchensis Sitka Spruce	80	30	No	20	N/A	N/A	Unimproved right-of-way only
Tsuga heterphylla/mertensiana Mountain/Western Hemlock	70	30	No	20	N/A	N/A	Unimproved right-of-way only

Amelanchier alnifola Serviceberry	25	20	Yes	5			Unimproved right-of-way only

APPENDIX H – RECORD DRAWING CRITERIA

Record Drawing Requirements (As-Builts)

A. Record drawings are required prior to request for final inspection or issuance of Certificate of Occupancy for all right-of-way construction projects and for surface water drainage systems that connect to City infrastructure.

B. Record drawings should accurately reflect revisions made to approved plans during construction. The record drawings should locate all newly installed, existing, and abandoned utilities encountered during construction, but not shown on the approved plans.

C. Record drawings shall be stamped, signed, and dated by a Professional Engineer licensed in the State of Washington.

D. As-constructed survey information provided on a record drawing shall be provided by a licensed land surveyor. Information from sources such as the Contractor's red-lined drawings, for which the surveyor is not responsible, shall be clearly noted/identified on the face of the record drawings.

E. The Permittee shall provide the City Inspector preliminary record drawings on paper or an electronic PDF. Once the City approves the preliminary submittal, the Permittee shall provide a flattened digital 11"x17" PDF drawing of the approved as-builts.

F. Each sheet of the record drawings shall include the following statement, preferably located in the bottom right-hand corner of each sheet.

"These plans are record drawings and the information shown accurately reflects existing field conditions as of this date _____."

APPENDIX I – STREET LIGHTING LEVELS CRITERIA

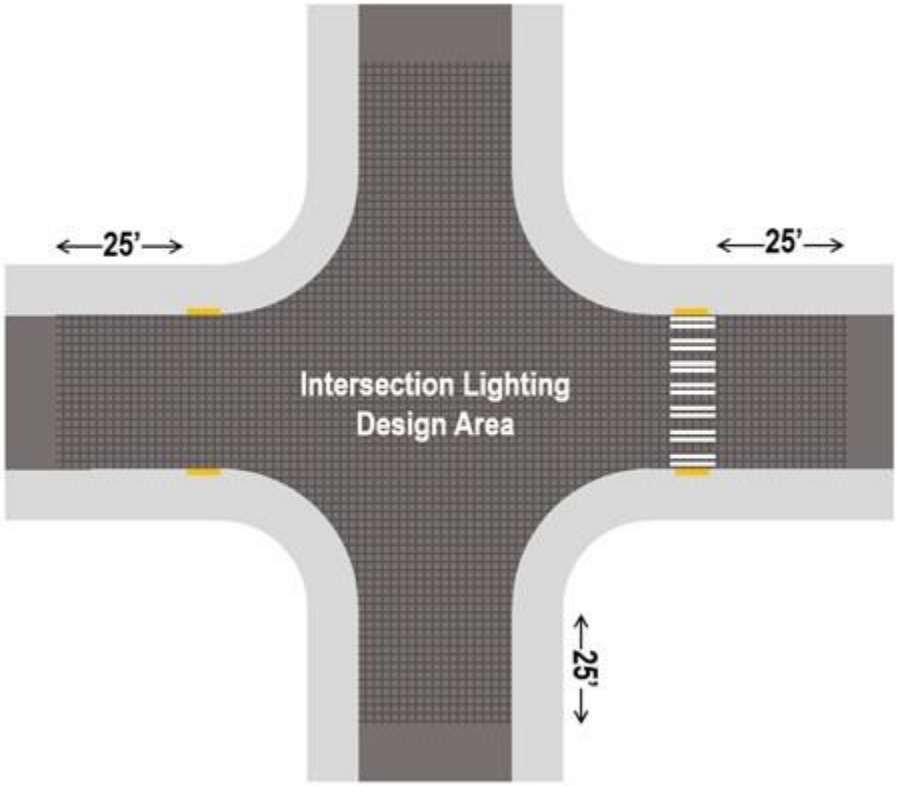
Table 22. Lighting Level Requirements

Lighting Level Requirements[1]		Principal Arterial		Minor & Collector Arterial		Local Street	
		High Activity[2]	Low Activity[3]	High Activity[2]	Low Activity[3]	High Activity[2]	Low Activity[3]
Continuous Lighting	Minimum Maintained Average (fc)	1.6	0.8	1.1	0.6	0.8	*See Note 6*
	Uniformity Ratio (Avg/Min)	3:1	3:1	3:1	4:1	4:1	
Intersections & Significant Driveways[4,5]	Minimum Maintained Average (fc)	2.4	1.2	1.7	0.9	1.2	0.6
	Uniformity Ratio (Avg/Min)	3:1	3:1	3:1	4:1	6:1	6:1
Midblock Crossing	Minimum Maintained Average (fc)	2.0	2.0	2.0	2.0	2.0	2.0
	Uniformity Ratio (Avg/Min)	3:1	3:1	3:1	4:1	4:1	4:1
Street Ends	Minimum Maintained Average (fc)	2.0	1.0	1.4	0.8	0.8	0.4
	Uniformity Ratio (Avg/Min)	3:1	3:1	3:1	4:1	4:1	4:1
Sidewalk Lighting	Minimum Maintained Average (fc)	1.0	See Note 7	1.0	See Note 7	*See Note 7*	
	Uniformity Ratio (Avg/Min)	4:1		4:1			

[1]These target lighting standards are not applicable to existing roadway lighting conditions until such roadways are redesigned and improved.
[2]Projects adjacent to Mixed Use, Mixed Business, Community Business, Neighborhood Business, Town Center, and Campus zoning designations. See: https://www.shorelinewa.gov/home/showpublisheddocument/52116/638200865637470000
[3]Projects adjacent to Residential zoning designations. See: https://www.shorelinewa.gov/home/showpublisheddocument/52116/638200865637470000
[4]At intersections, the standard for the highest intersecting street classification shall be applied.
[5]Significant driveways are defined as those serving 1,500 vehicles per day or more.
[6]Continuous lighting may be required by the City Traffic Engineer. Project improvements shall not decrease lighting conditions compared to pre-project conditions.
[7]Sidewalk lighting may be required on a case-by-case basis where high pedestrian activity is expected such as trails, bridges, near parks, or near schools.

Lighting Design Area Diagrams

Figure 7 Intersection Lighting Design Area



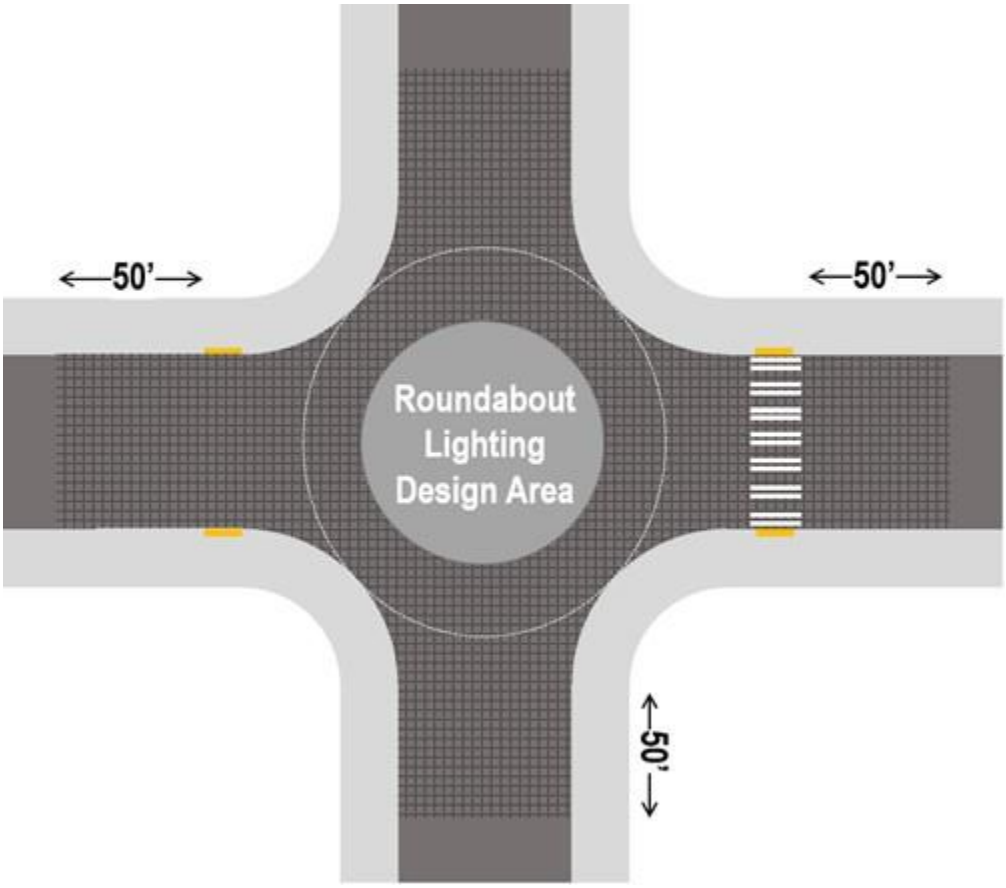
At Intersections, the Intersection lighting design area should be:

A. At least 25 feet from the furthest edge of marked crosswalk; or

B. In the absence of a marked crosswalk, 25 feet from the furthest edge of the curb ramp landing; or

C. In the absence of a marked crosswalk and curb ramp landing, 25 feet from the end of the intersection radius.

Figure 8 Roundabout Lighting Design Area



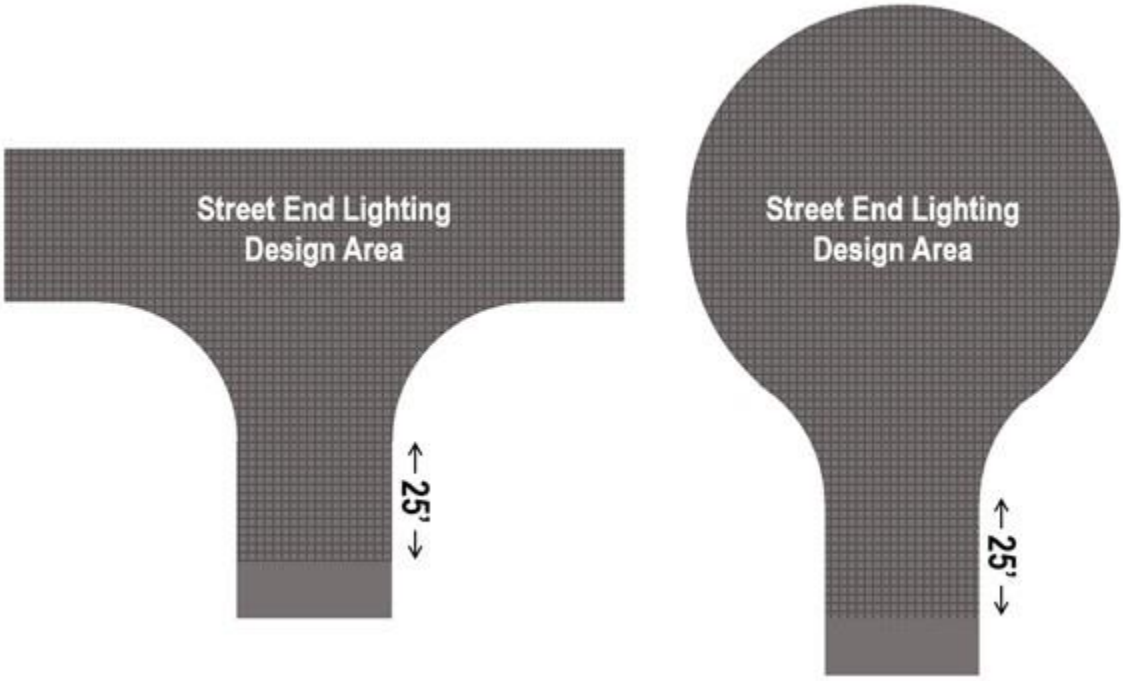
At Roundabouts, the lighting design area should be:

D. At least 50 feet from the furthest edge of marked crosswalk; or

E. In the absence of a marked crosswalk, 50 feet from the furthest edge of the curb ramp landing; or

F. In the absence of a marked crosswalk and curb ramp landing, 50 feet from the edge of circulating roadway.

Figure 9 Street End Lighting Design Area



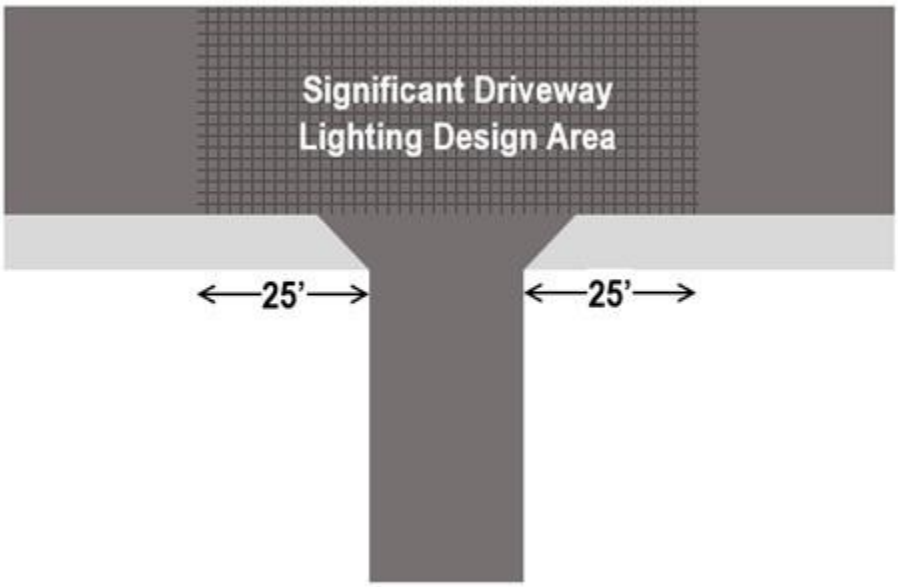
At street ends, the lighting design area includes the entire hammerhead or cul-de-sac and extends:

G. At least 25 feet from furthest edge of marked crosswalk; or

H. In the absence of a marked crosswalk, 25 feet from the furthest edge of the curb ramp landing; or

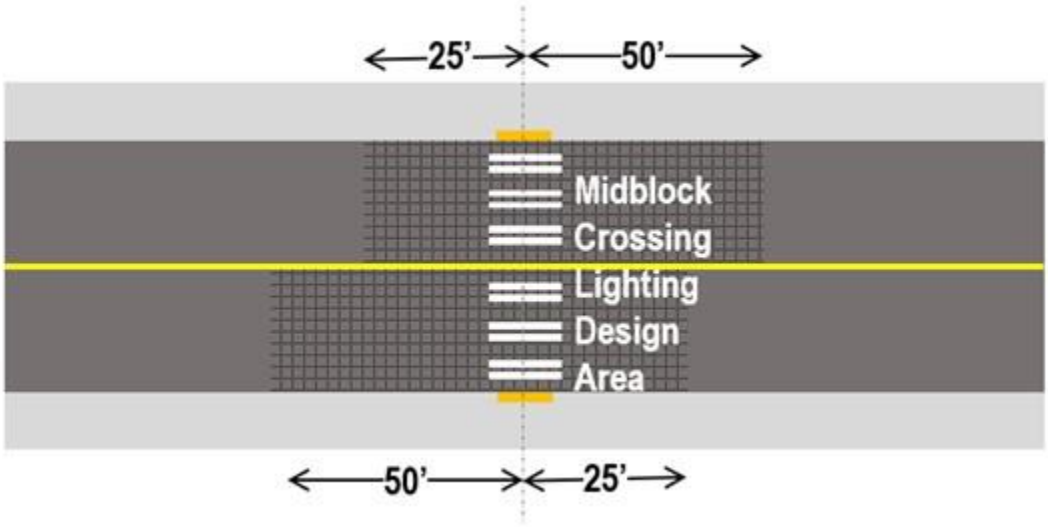
I. In the absence of a marked crosswalk and curb ramp landing, 25 feet from the end of the intersection radius.

Figure 10 Significant Driveway Lighting Design Area



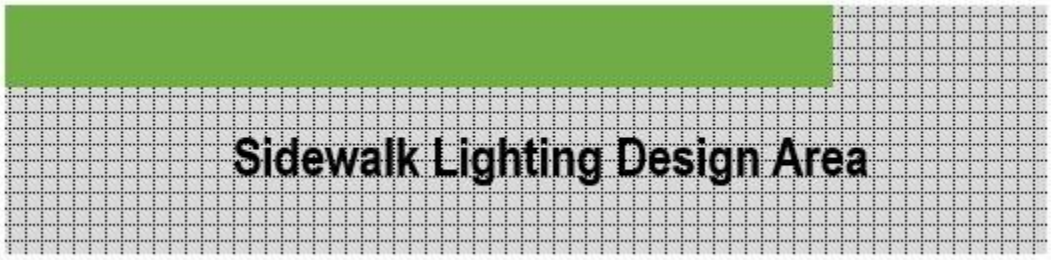
For driveways anticipated to serve 1,500 vehicles per day or more, the lighting design area extends at least 25 feet from both edges of the driveway.

Figure 11 Midblock Crossing Lighting Design Area



The lighting design area extends 50 feet from the center of the crosswalk on the approach side and 25 feet from the center of the crosswalk on the departure side.

Figure 12 Sidewalk Lighting Design Area



When sidewalk lighting is required, the lighting design area should include all accessible portions of the sidewalk.

APPENDIX J – TRAFFIC CONTROL PLAN SUBMITTALS

Typical Elements for Traffic Control Plan Submittals

This section provides information about elements that should be included in all traffic control plans submitted for review. Incorporating these elements into the plan may reduce delay in the review process and reduce the need for possible re-submittal of the plans.

All plans shall be consistent with the MUTCD. To the extent possible, the Applicant/Permittee should reference Standard Plan 900 Series when developing a traffic control plan to eliminate delays and ensure a consistent review process.

Basic Elements of a Traffic Control Plan

- A clear and accurate plan view representation of the streets and the intersection where the temporary traffic control plan will be implemented. Should include the following:
  - Street names
  - Lane configurations
  - Existing channelization devices (include pavement markings such as crosswalks)
  - Traffic signals
- Clearly indicate the active work area and the proposed temporary channelization device set up.
- Include a legend indicating symbols used to represent various traffic control device elements.
- Clearly indicate the temporary signing to be used. Label sign by appropriate signs code as per MUTCD and include size and color of signs. (Size and color can be referenced in the general notes shown on the plan.) Using both a sign image and sign code will help clarify the appropriate sign intended.
- Include all applicable tables as shown on Standard Plan 900 series, including channelizing device spacing, sign spacing, buffer data, and minimum lane closure taper length.
- Label sign spacing on plan and clearly indicate the applicable length in the table.
- Label all transition and/or taper length and clearly indicate the applicable length in table.
- Label buffer lengths on plan and clearly indicate the applicable length in table.
- Per RCW 47.36.200, include special warning signs for motorcycles (W21-1701 – “Motorcycles Use Extreme Caution”) in addition to a sign warning of the hazard if any of the following conditions exist at the work zone:
  - Grooved Pavement
  - Abrupt land edge
  - Steel Plates
  - Loosed material (such as gravel or dirt) on roadway
- End Roadwork sign at each limit of construction
- Each sheet should include general notes, including but not limited to:
- “Typical work hours are 9:00 a.m. to 3:00 p.m. unless otherwise approved”
- “Minimum 11-foot lanes shall be maintained at all times unless otherwise approved”
- “All cones shall be orange in color, at least 28 inches tall and have two (2) retroreflective bands”

- “Adjacent driveways shall remain open unless otherwise coordinated with residents”
- If bus stops are impacted, add a general note about when to notify King County Metro. See Bus Stop and Bus Route Impacts section.
- Where bike lanes are present, temporary traffic control addressing bike traffic is required.
- All traffic control plans shall address pedestrian access. Pedestrian routes should be convenient and accessible as near as practical to the existing condition, or better. This may require temporary ADA compliant ramps where applicable. In some cases, pedestrian access can be addressed by using a flagger to assist pedestrians through the work zone. This should be noted on plans.

Signalized Intersection Impacts

- A minimum of two uniformed police offers are required.
- The traffic engineer shall be contacted a minimum of three (3) business days at (206) 801-2432 in advance of work impacting traffic signals.
- The signal technician shall be contacted a minimum of three (3) business days in advance at (206) 477-1571.
- The contractor shall be responsible for repairing any signal detection impacted by construction activities.

Bus Stop and Bus Route Impacts

For bus stop or bus route impacts, King County Metro is to be notified via the following contacts:

- By phone: (206) 477-1140
- By Email: construction.coord@kingcounty.gov

For King County Metro notification details and requirements, see: https://kingcounty.gov/en/legacy/depts/transportation/metro/about/construction-contractors/transit-system-impacts.aspx

Include in the general notes: “King County Metro Shall be notified 5 business days in advance for bus stop closures and 10 business days in advance for road closures that facilitate bus reroutes. Contact KCM Construction Coordinators at (206) 477-1140 email construction.coord@kingcounty.gov

APPENDIX K – APPROVED STORMWATER FACILITY PLANTING LIST

Stormwater Facility Plantings

The following tables were compiled to specify the approved plants for bioretention and rain garden facilities in the right-of-way. Height, spread, shade tolerance, time of bloom, descriptions, and special considerations for these plants can be found in the tables. Other species and cultivars may be appropriate for larger bioretention areas if approved by the Director.

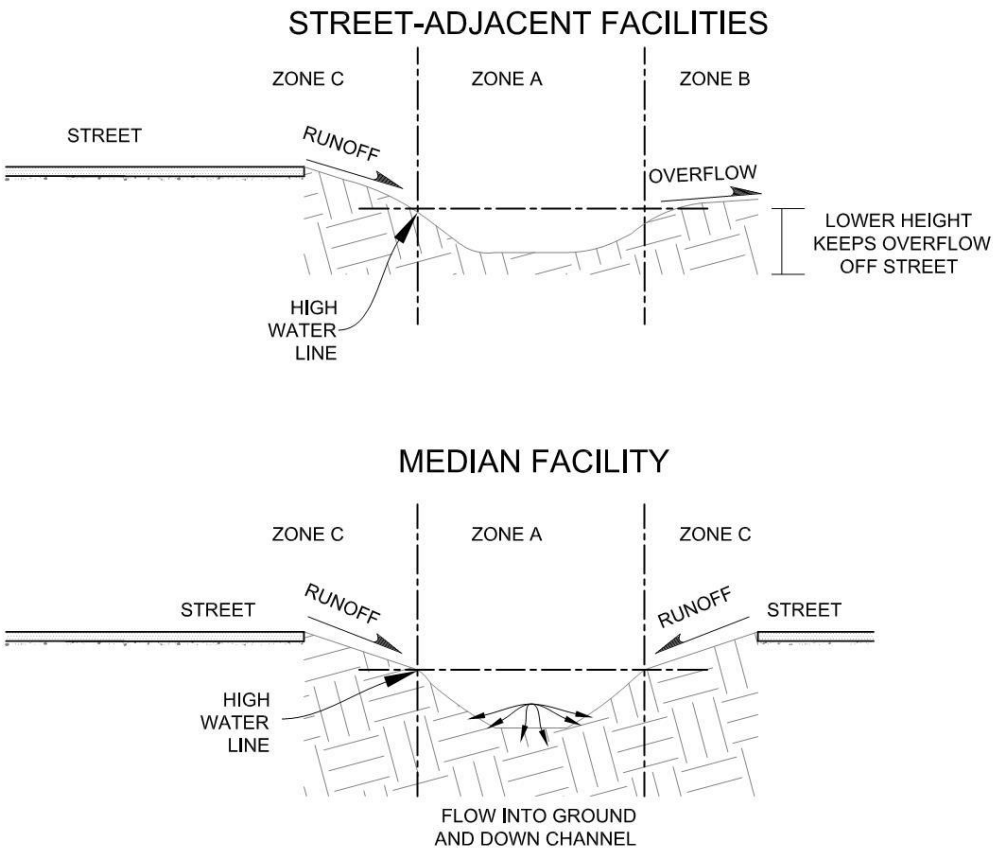
Stormwater facilities in the right-of-way shall only use plants from the approved plant list. Trees have been completely excluded from bioretention and rain gardens due to sight distance issues and because tree roots can push up pavement as they mature. Native species are preferred and have therefore been placed higher on the tables. Natives are labeled with an “N”, and low-growing, spreading groundcover plants are labeled “G”. An additional label has been included for the appropriate planting zone as referenced in Figure 13 and in Standard Plan, 777 Bioretention Facility:

- Zone A: Area of periodic or frequent standing or flowing water. Many Zone A plants will also tolerate the seasonally dry periods of summer without extra watering and may also be applicable in Zones B or C.

- Zone B: Periodically moist or saturated during larger storms. Plants under Zone B will also be applicable in Zone C.

- Zone C: Dry soils, infrequently subject to inundation or saturation. This area should blend with the existing landscape.

Figure 13 Bioretention Planting Zones



The approved plant list is separated into four tables:

- Emergents: This table contains plants that can thrive in saturated soil.
- Herbaceous Perennials/Grasses/Ferns: This table contains any plants without woody stems that are not emergent.
- Compact shrubs: This table contains woody perennials with a maximum height below six (6) feet.
- Groundcovers: This table contains herbaceous and woody perennials with recumbent form.

Emergents

Species	Common Name	Planting Zone	Native
Acorus calamus 'Variegatus'	Sweet flag	B, C	No
Acorus gramineus 'Ogon'	Golden variegated sweet flag	A, B	No
Aquilegia Formosa	Western Columbine	B, C	Yes
Carex comans	New Zealand hair sedge	A, B, C	No
Carex oshimensis 'Evergold'	Variegated Japanese sedge	B, C	No
Carex stipata	Sawbeak sedge	A	Yes
Carex Testacea	Orange New Zealand sedge	A, B, C	No
Eleocharis palustris	Creeping spike-rush	A	Yes
Juncus acuminatus	Taper-tipped rush	A	Yes
Juncus effusus 'Quartz Creek'	Common rush	A	No
Juncus ensifolius	Dagger-leaf rush	A	Yes
Lysichiton americanus	Western Skunk Cabbage	A	Yes
Petasites frigidus	Plamate Coltsfoot	A	Yes
Sidalcea hendersonii	Henderson's checker-mallow	A	Yes
Viola palustris	Marsh Violet	A	Yes

Herbaceous Perennials/Ornamentals/Ferns

Species	Common Name	Planting Zone	Native
Achillea millefolium	Western Yarrow	C	Yes
Adiantum aleuticum	Western maidenhair fern	B	Yes
Anaphalis margaritacea	Pearly everlasting	C	Yes
Aster chilensis	Common California aster	B, C	Yes
Aster subspicatus	Douglas' aster	B, C	Yes
Athyrium filix-femina	Lady fern	B, C	Yes
Blechnum spicant	Deer fern	B, C	Yes
Camassia leichtlinii	Large or giant camas	B, C	Yes
Camassia quamash	Common camas	B, C	Yes

Dicentra Formosa	Western or Pacific bleeding-heart	B, C	Yes
Echinacea purpurea	Purple coneflower	C	No
Echinops	Globe thistle	C	No
Erigeron speciosus	Showy fleabane	B, C	Yes
Erythranthe ssp	Monkey-flower	A, B, C	Varies
Gaura lindheimeri	Gaura or wand flower	B, C	No
Geranium macrorrhizum	Hardy geranium, crane's bill	C	No
Geum macrophyllum	Large-leaved avens	C	Yes
Gymnocarpium disjunctim	Common Oak Fern	**B, C**	Yes
Hakonechloa macra	Japanese forest grass	B, C	No
Helictrotrichon sempervirens	Blue oat grass	C	No
Helleborus argutifulius	Corsican Hellebore	B, C	No
Hosta	Plantain lily	B, C	No
Hyssopus officinalis 'Rosea' or 'Nana'	Hyssop (pink or blue)	B, C	No
Iris douglasiana	Douglas Iris	A, B, C	No
Iris foetidissima	Gladwin iris; stinking iris	B, C	No
Iris tenax	Oregon or tough-leaf iris	A, B, C	Yes
Lupinus bicolor	Two-color lupine	B, C	Yes
Lupinus latifolius	Broadleaf lupine	B, C	Yes
Lupinus polyphyllus	Large-leafed lupine	C	Yes
Nepeta x faassenii	Catmint	C	No
Ophiopogon planiscapus	Black mondo grass	C	No
Pennisetum orientale	Oriental fountain grass	C	No
Penstemon cardwellii	Cardwell's penstemon, beard Tongue	C	yes
Penstemon davidsonii	Davidson's penstemon	C	Yes
Smilacina racemosa	False Solomon's seal	C	Yes
Solidago canadensis	Canadian goldenrod	C	Yes
Symphyotrichum chilense	Pacific aster	B, C	Yes

Tellima grandiflora	Fringecup	B, C	Yes
Trientalis arctica	Northern starflower	B	Yes
Heuchera	Coral bells or alumroot	B, C	Varies
Tolmiea menziesii	Youth-on-age/Piggyback plant	B	Yes
Polystichum munitum	Western sword fern	B, C	Yes

Compact Shrubs

Species	Common Name	Planting Zone	Native
Andromeda polifolia	Bog rosemary	A	Yes
Cornus sericea 'Kelseyi'	Dwarf red-twig dogwood	A, B, C	Yes
Escallonia x exoniensis 'fradesii'	Pink princess	C	No
Gaultheria shallon	Salal	B, C	Yes
Hamamelis intermedia	Dian witchhazel	B, C	No
Helichrysum italicum	Curry plant	C	No
Lavandula angustifolia	English Lavender	C	No
Lavandula stoechas	Spanish Lavender	C	No
Ledum groenlandicum	Labrador tea	A	Yes
Lonicera pileata	Boxwood honeysuckle	B, C	No
Mahonia aquifolium 'Compacta'	Compact or dwarf tall Oregon grape	**B, C**	Yes
Myrica gale	Sweet gale	A, B, C	Yes
Oplopanax horridus	Devil's club	A, B	Yes
Osmanthus dalavayi	Dalavay Osmanthus	C	No
Osmanthus x burkwoodii	Devil wood	C	No
Perovskia atriplicifolia	Russian sage	C	No
Philadelphus x lemoinei	Belle Etoile' Mock-orange	B, C	No
Pinus mugo	Dwarf mugho pine	C	No
Potentilla gracilis	Graceful cinquefoil	C	No
Potentilla palustris	Marsh cinquefoil	A	Yes

Ribes sanguineum 'King Edward VII'	Red-flowering currant	**B, C**	Yes
Rosa pisocarpa	Clustered wild rose	A, B, C	Yes
Rubus parviflorus	Thimbleberry	B, C	Yes
Spiraea splendens	Rose meadowsweet	B, C	Yes
Symphoricarpos albus	Snowberry	B, C	Yes
Vaccinium ovatum 'Thunderbird'	Evergreen huckleberry	B, C	Yes
Viburnum opulus 'Nana'	Dwarf cranberry bush	B, C	No

Groundcovers

Species	Common Nam		
Arctostaphylos uvaursi	Kinnikinnick	B, C	Yes
Asarum caudatum	Wild ginger	B, C	Yes
Asarum caudatum	Bunch berry	B, C	Yes
Eriophyllum lanatum	Oregon Sunshine	C	Yes
Gaultheria ovatifoli	Oregon wintergreen/Western teaberry	**B, C**	Yes
Helianthemum nummularium	Sunrose	C	No
Kalmia microphylla ssp occidentalis	Swamp-laurel	A	Yes
Linnaea borealis	Twinflower	B	Yes
Mahonia nervosa	Cascade/Dull/Low Oregon grape	B, C	Yes
Mahonia repens	Creeping mahonia	B, C	No
Maianthemum dilatatum	False lily-of-the-valley	C	Yes
Tiarella trifoliata	Foamflower	B, C	Yes
Vancouveria hexandra	Inside-out flower or duck's foot	B, C	Yes

APPENDIX L – STANDARD PLANS

Standard Plans

Sheet #	Sheet Title	WSDOT Standard Detail #	Rev/Approve Date
200 - ROAD TYPES AND GEOMETRICS			
201	TYPICAL NON-ARTERIAL (LOCAL) STREET	N/A	9/15/2022
202	TYPICAL ARTERIAL STREET CROSS SECTION	N/A	7/17/2023
203	TYPICAL ALLEY	N/A	9/15/2022
204	HALF STREET	N/A	9/15/2022
205	SHOULDER TREATMENT	N/A	2/10/2021
207	MEDIAN	N/A	2/10/2021
208	ON-SITE STREET ENDS	N/A	2/10/2021
209	STREET ENDS	N/A	2/10/2021
210	TRAFFIC CIRCLE	N/A	2/11/2020
211	CONCRETE TRAFFIC CIRCLE DETAILS	N/A	10/6/2021
212	ASPHALT TRAFFIC CIRCLE DETAILS	N/A	10/6/2021
213	SPEED HUMP DESIGN	N/A	2/11/2020
214	SPEED CUSHION DESIGN	N/A	2/11/2020
215	INTERSECTION LANDING	N/A	2/11/2020
300- DRIVEWAYS, WALKS AND TRAILS			
301	DRIVEWAY APPROACH	N/A	9/15/2022

302	DRIVEWAY APPROACH - NO AMENITY ZONE	N/A	9/15/2022
303	DRIVEWAY APPROACH - DROP DOWN	N/A	9/15/2022
306	DRIVEWAY APPROACH - SHOULDER & DITCH SECTION	N/A	2/10/2021
307	SHARED DRIVEWAY	N/A	2/10/2021
308	AMENITY ZONE	N/A	9/15/2022
309	SIDEWALK DETAIL	N/A	9/15/2022
310	ASPHALT THICKENED EDGE	N/A	2/11/2020
311	ASPHALT TRANSITION RAMP TO SHOULDER	N/A	7/17/2023
312	CURB AND GUTTER	N/A	9/15/2022
313	PEDESTRIAN CURB	N/A	2/11/2020
314	CURB EXTENSION	N/A	2/11/2020
315	CROSSWALK WITH SINGLE APPROACH LANE	N/A	10/6/2021
316	CROSSWALK WITH MULTIPLE APPROACH LANES	N/A	10/6/2021
317	CURB RAMP - SINGLE DIRECTION	N/A	9/15/2022
318	CURB RAMP - PERPENDICULAR	N/A	9/15/2022
320	CURB RAMP - PARALLEL	N/A	9/15/2022
321	CURB RAMP LOCATIONS	N/A	2/11/2020
322	BIKE RAMP 1 OF 2	N/A	8/23/2023
322	BIKE RAMP 2 OF 2	N/A	8/23/2023
324	PEDESTRIAN RAILING	N/A	9/15/2022
325	STAIRS	N/A	2/11/2020

326	CEMENT CONCRETE STAIRWAY	N/A	2/11/2020
327	CHAIN LINK FENCING	N/A	2/11/2020
328	OFF-STREET BIKE PATH	N/A	10/6/2021
329	TYPICAL TRAIL SECTION	N/A	2/10/2021
335	GREENBELT FENCE	N/A	2/11/2020
400 - SURFACING			
401	PAVEMENT MARKINGS	N/A	9/6/2023
403	PAVEMENT MARKING DETAILS	N/A	7/17/2023
410	BIKE LANE MARKINGS, SHEET 1 OF 2	N/A	2/11/2020
410	BIKE LANE MARKINGS, SHEET 2 OF 2	N/A	8/22/2023
420	TRAFFIC SIGNAL LOOP	N/A	2/11/2020
430	PEDESTRIAN PUSHBUTTON LOCATION	N/A	10/6/2021
440	PEDESTRIAN LIGHTING	N/A	8/22/2023
450	RECTANGULAR RAPID-FLASHING BEACON 1 OF 3	N/A	8/23/2023
450	RECTANGULAR RAPID-FLASHING BEACON 2 OF 3	N/A	8/23/2023
450	RECTANGULAR RAPID-FLASHING BEACON 3 OF 3	N/A	8/23/2023
460	4 INCH ALUMINUM POLE FOUNDATION 1 OF 2	N/A	9/7/2023
460	4 INCH ALUMINUM POLE FOUNDATION 2 OF 2	N/A	9/7/2023
470	STANDARD SERVICE CABINET 1 OF 3	N/A	8/23/2023
470	STANDARD SERVICE CABINET 2 OF 3	N/A	8/23/2023
470	STANDARD SERVICE CABINET 3 OF 3	N/A	8/23/2023

471	SMALL SERVICE CABINET 1 OF 2	N/A	8/23/2023
471	SMALL SERVICE CABINET 2 OF 2	N/A	8/23/2023
500 - ROADSIDE FEATURES			
501	ROCK FACING - CUT SECTION	N/A	8/30/2023
502	ROCK FACING - FILL SECTION	N/A	8/30/2023
503	ROCK FACING UNDER SIDEWALK	N/A	8/30/2023
505	BOLLARDS	N/A	2/11/2020
507	GENERAL TRAFFIC SIGN POST INSTALLATION	N/A	7/17/2023
508	TRAFFIC SIGN & METAL POST INSTALLATION	N/A	2/10/2021
509	POST CAP	N/A	7/17/2023
510	2 INCH SQUARE METAL POST INSTALLATION	N/A	9/15/2022
512	OBJECT MARKER INSTALLATION	N/A	2/11/2020
514	MAILBOX STAND (NON-ARTERIAL)	N/A	2/10/2021
515	MAILBOX STAND WITHOUT AMENITY ZONE	N/A	2/10/2021
516	NEIGHBORHOOD DELIVERY & COLLECTION BOX UNIT INSTALLATION	N/A	2/11/2020
517	STREET NAME SIGN	N/A	2/11/2020
520	BUS STOP IMPROVEMENTS	N/A	2/11/2020
600 - WASTEWATER			
601	MANHOLE TYPE I - SANITARY	N/A	9/6/2023
602	MANHOLE TYPE II- SANITARY	N/A	9/6/2023
603	MANHOLE TYPE III- SANITARY	N/A	9/6/2023

604	MANHOLE TYPE IIIA 48 IN- SANITARY	N/A	9/6/2023
605	MANHOLE CONCRETE COLLAR - SANITARY	N/A	9/6/2023
606	MANHOLE TOP SLAB & RISER DETAIL - SANITARY	N/A	9/6/2023
607	MANHOLE LADDER & HANDHOLD DETAIL - SANITARY	N/A	9/6/2023
608	MANHOLE FRAME & COVER - SANITARY	N/A	9/6/2023
609	MANHOLE ADJUST DETAIL- SANITARY	N/A	9/6/2023
610	MANHOLE BUTT JOINT	N/A	9/6/2023
611	MANHOLE CHANNELING DETAIL- SANITARY	N/A	9/6/2023
612	MANHOLE OUTSIDE DROP CONNECTION- SANITARY	N/A	9/6/2023
613	MANHOLE INSIDE DROP CONNECTION - SANITARY	N/A	9/6/2023
614	SADDLE TYPE 48 IN DROP IN MANHOLE - SANITARY	N/A	9/6/2023
615	MANHOLE CUT IN MAIN SECTION - SANITARY	N/A	9/6/2023
616	TYPICAL TRENCH DETAIL - SANITARY	N/A	9/6/2023
617	PIPE ZONE BEDDING DETAIL - SANITARY	N/A	9/6/2023
618	FOUNDATION GRAVEL TO REPLACE UNSUITABLE MATERIAL	N/A	9/6/2023
619	SPLIT CASING DETAIL - SANITARY	N/A	9/6/2023
620	PIPE ANCHOR DETAIL - SANITARY	N/A	9/6/2023
621	VALVE BOX DETAIL - SANITARY	N/A	9/6/2023
622	LOCATE WIRE DETAIL - SANITARY	N/A	9/6/2023
623	LOW POINT DRAIN DETAIL - SANITARY	N/A	9/6/2023
624	AIR VALVE VAULT DETAIL - SANITARY	N/A	9/6/2023

625	CONNECTION TO EXISTING PRESSURE MAIN DETAIL - SANITARY	N/A	9/6/2023
626	VALVE MARKER DETAIL - SANITARY	N/A	9/6/2023
627	THRUST BLOCK-VARIOUS DETAIL - SANITARY	N/A	9/6/2023
628	THRUST LOAD CALCULATION - SANITARY	N/A	9/6/2023
629	SIDE SEWER CONNECTION DETAIL - SANITARY	N/A	9/6/2023
630	SANITARY SEWER SERVICE - NEW CONSTRUCTION	N/A	9/6/2023
631	SADDLE CONNECTION TO SEWER MAIN DETAIL - SANITARY	N/A	9/6/2023
632	SANITARY SEWER LATERAL DETAIL	N/A	9/6/2023
633	GRINDER PUMP TO GRAVITY MAIN DETAIL - SANITARY	N/A	9/6/2023
634	GRINDER PUMP TO LOW PRESSURE FORCE MAIN	N/A	9/6/2023
635	GRINDER PUMP CONNECTION TO FORCEMAIN - SANITARY	N/A	9/6/2023
636	GRINDER PUMP SYSTEM SCHEMATIC	N/A	9/6/2023
637	HOUSE LATERAL CONNECTION TO GRAVITY MAIN - SANITARY	N/A	9/6/2023
638	HOUSE CONNECTION TO GRINDER PUMP - SANITARY	N/A	9/6/2023
639	HOUSE CONNECTION W-GRINDER PUMP TO GRAVITY MAIN - SANITARY	N/A	9/6/2023
640	HOUSE CONNECTION REQUIREMENTS - SANITARY	N/A	9/6/2023
641	SANITARY SEWER CLEANOUT DETAIL	N/A	9/6/2023
642	TWO WAY SEWER CLEANOUT AT PROPERTY LINE	N/A	9/6/2023
643	BACKFLOW PREVENTER DETAIL - SANITARY	N/A	9/6/2023
644	BACKFLOW PREVENTER CLEANSWEEP DETAIL - SANITARY	N/A	9/6/2023
645	SMALL OIL WATER SEPARATOR- SANITARY	N/A	9/6/2023

646	MEDIUM OIL WATER SEPARATOR- SANITARY	N/A	9/6/2023
647	LARGE OIL WATER SEPARATOR -SANITARY	N/A	9/6/2023
648	GREASE INTERCEPTOR DETAIL- SANITARY	N/A	9/6/2023
649	RIGID PAVEMENT PATCHING	N/A	9/6/2023
700 - DRAINAGE			
B-70.20-00	BEVELED END SECTIONS	B-70.20-00	6/1/2006
702	TRASH RACK	N/A	2/10/2021
703	DEBRIS CAGE	N/A	2/10/2021
B-5.20-02	CATCH BASIN TYPE 1	B-5.20-02	1/26/2017
B-5.40-02	CATCH BASIN TYPE 1L	B-5.40-02	1/26/2017
707	CATCH BASIN INSTALLATION	N/A	9/15/2022
B-10.20-02	CATCH BASIN TYPE 2	B-10.20-02	3/2/2018
B-30.90-02	MISCELLANEOUS DETAILS FOR DRAINAGE STRUCTURES	B-30.90-02	1/26/2017
B-15.20-01	MANHOLE TYPE 1	B-15.20-01	2/7/2012
B-15.40-01	MANHOLE TYPE 2	B-15.40-01	2/7/2012
B-15.60-02	MANHOLE TYPE 3	B-15.60-02	1/26/2017
720	MANHOLE RING AND COVER	N/A	10/6/2021
721	LOCKING MANHOLE RING	N/A	10/6/2021
724	COMBINATION INLET	N/A	9/15/2022
725	STORM DRAIN MEDALLION	N/A	9/15/2022
726	RECTANGULAR VANED GRATE	N/A	9/6/2023

729	RECTANGULAR HERRINGBONE GRATE	N/A	10/6/2021
730	RECTANGULAR FRAME	N/A	9/15/2022
731	RECTANGULAR SOLID METAL COVER	N/A	9/6/2023
733	COMBINATION CATCH BASIN INSTALLATION	N/A	9/15/2022
I-40.20-00	STORM DRAIN INLET PROTECTION		9/20/2007
761	FLOW RESTRICTOR	N/A	9/6/2023
762	SHEAR GATE	N/A	9/15/2022
763	FLOW RESTRICTOR (BAFFLE)	N/A	2/11/2020
771	CONTROL STRUCTURE	N/A	2/11/2020
B-55.20-02	PIPE ZONE BEDDING AND BACKFILL	B-55.20-02	2/27/2018
774	SOIL AMENDMENT AND DEPTH	N/A	10/6/2021
775	PERMEABLE SIDEWALK	N/A	9/15/2022
776	PERMEABLE SIDEWALK ON SLOPES	N/A	2/11/2020
777	BIORETENTION FACILITY	N/A	9/15/2022
778	BIORETENTION INLET	N/A	2/11/2020
800 - UTILITIES AND RESTORATION			
801	RIGID PAVEMENT RESTORATION DETAIL	N/A	2/11/2020
802	FLEXIBLE PAVEMENT PATCHING	N/A	9/6/2023
803	PAVEMENT RESTORATION FOR WINDOWS CUTS	N/A	9/15/2022
900 - TRAFFIC CONTROL			
901	ONE-LANE, TWO-WAY TRAFFIC CONTROL WITH FLAGGERS	N/A	2/11/2020

902	PILOT CAR OPERATION	N/A	2/11/2020
903	SINGLE-LANE CLOSURE FOR MULTI - LANE ROADWAYS	N/A	2/11/2020
904	DOUBLE -LANE CLOSURE FOR MULI - LANE ROADWAY	N/A	2/11/2020
905	SHOULDER CLOSURE - LOW SPEED (40 MPH OR LESS)	N/A	2/11/2020
906	RIGHT LANE CLOSURE WITH SHIFT - 5 LANE ROADWAY	N/A	2/11/2020
907	LEFT LANE AND CENTER TURN LANE CLOSURE - 5 LANE ROADWAY	N/A	2/11/2020
908	LANE SHIFT - THREE LANE ROADWAY	N/A	2/11/2020
909	SHORT TERM RAMP CLOSURES	N/A	2/11/2020
910	INTERSECTION LANE CLOSURE - 3 LANE ROADWAY	N/A	9/6/2023
911	INTERSECTION LANE CLOSURE - 5 LANE ROADWAY	N/A	2/11/2020
912	INTERSECTION PEDESTRIAN TRAFFIC CONTROL	N/A	8/30/2023
913	SINGLE LANE CLOSURE WITH SHIFT	N/A	2/11/2020
914	TYPICAL ROUNDABOUT FLAGGING OPERATION	N/A	2/11/2020
915	LANE SHIFT - THREE LANE ROADWAY WITH TWLTL	N/A	8/24/2023
916	ONE-LANE TWO-WAY TRAFFIC CONTROL - YIELD CONDITION	N/A	8/24/2023
917	BIKE LANE TRAFFIC CONTROL	N/A	8/24/2023
918	TEMPORARY PEDESTRIAN RAMP 1 OF 2	N/A	8/24/2023
918	TEMPORARY PEDESTRIAN RAMP 2 OF 2	N/A	8/24/2023
919	TEMPORARY PEDESTRIAN PLATFORM 1 OF 2	N/A	8/24/2023
919	TEMPORARY PEDESTRIAN PLATFORM 2 OF 2	N/A	8/24/2023

APPENDIX M – SEWER DESIGN CRITERIA

Design Criteria Engineering Drawing Requirements

- Construction and record drawings shall be supplied to the City in electronic format as Civil 3D/AutoCAD .dwg files. Drafting of plans for the City shall conform to this example. Construction and as-built drawings shall be supplied to the City by electronic CAD file.
- Sheet dimensions: ANSI D (22”x34”) or ARCH D (24”x36”).
- Sheet numbering: National CAD standard, found at https://www.nationalcadstandard.org/ncs5/pdfs/ncs5_uds1.pdf
- Required sheets:
    - Cover/sheet index
    - Plan and profile sheets (profile view beneath plan view on the same sheet)
    - Detail sheets (including relevant City standard details)
- Horizontal scale: Use standard civil engineering scales or architectural scales as appropriate. Unconventional scales are not allowed.
- Vertical scale: For architectural section views, standard architectural and structural engineering scales are required. For utility profiles, use one (1) inch equals five (5) feet or one (1) inch equals one (1) foot.
- Contour intervals: Major contours of five (5) feet or less, minor contours of two (2) feet or less.
- Designers shall also provide the description, location and elevation of all benchmark data available on the project site and this information, wherever possible, shall be indicated on the maps. The datum used shall be the City's and not an assumed datum.
- Profile grid shall have one (1) horizontal line per inch separated into ten (10) tick marks and one (1) vertical line per inch equally spaced. See Sample Plan located in Appendix O.
- Horizontal scale shall be one (1) inch equals 20 feet or one (1) inch equals ten (10) feet. Vertical scale shall be one (1) inch equals five (5) feet or one (1) inch equals one (1) foot.
- Note Datum on plan. Datum shall be North American Vertical Datum or NAVD 88. Plans with other datums or lacking datum identification will be rejected.
- Note Benchmarks on plans. Include General Notes on plan as shown in Sample Plan.

- Include General Notes on plan as shown in Sample Plan.

- Plans shall be stamped by a Washington State licensed Professional Engineer. Preliminary plans for review shall bear an unsigned seal and a superimposed note reading “Not for Construction.” Each sheet of the final Plan Set shall bear a legal, signed seal of the Engineer(s) of Record. Digital Plan submittals shall be signed using digital signatures.

- Vicinity map shall show project’s location relative to the nearest intersection.

- Plans shall have a North arrow pointing either toward the top or the left of the page.

- Names of streets shall be indicated on the plans.

- Plans shall be presented in a professional, easy-to-read format, with appropriate use of text background masks, placement of text, and minimization of overlapping linework. Isolate domains of work (e.g., utilities, paving & grading, landscaping) into separate sheets as necessary to maximize readability.

- Plans shall meet design requirements of the Washington State Department of Transportation and the Washington State Department of Ecology except where more stringent City requirements are noted.

- Developers: In conjunction with prudent comprehensive planning and to ensure the availability of sewer service to adjacent parcels, it is the City policy to have Developers extend the system to certain points on a project site that will facilitate future extension of the system. This will in many cases cause the system to be extended to the opposite side(s) of the project site from the nearest point of available service.

- Right-of-Way and Monuments: All rights-of-way in which the sewer extension is to be made shall be improved prior to preparation of construction plans and installation of the sewers. Permanent private easements shall be not less than 15 feet in width. Public right-of-way shall be cleared, grubbed, and graded in accordance with the requirements of appropriate road agency. For private development projects, disturbed or destroyed monuments shall be replaced at the Developer’s expense. For public works projects, disturbed or destroyed monuments shall be replaced at the Contractor’s expense.

- As-builts and Record Drawings

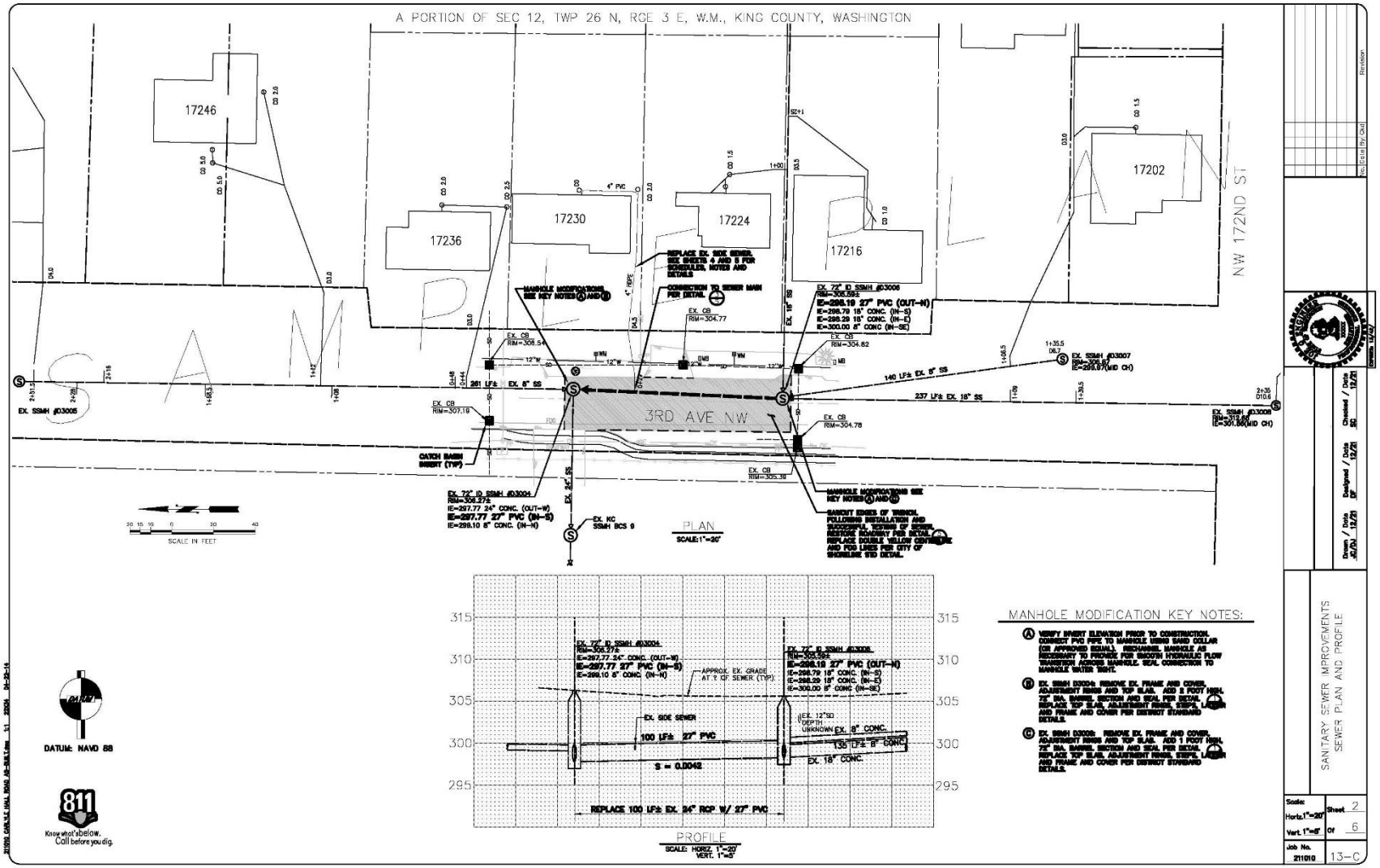
- For utility projects:

    - When the Contractor completes the main pipeline work and the manholes and vaults have been adjusted to the finished grade, the CAD files of the plans shall be revised to conform with construction records, and then sent to the City.

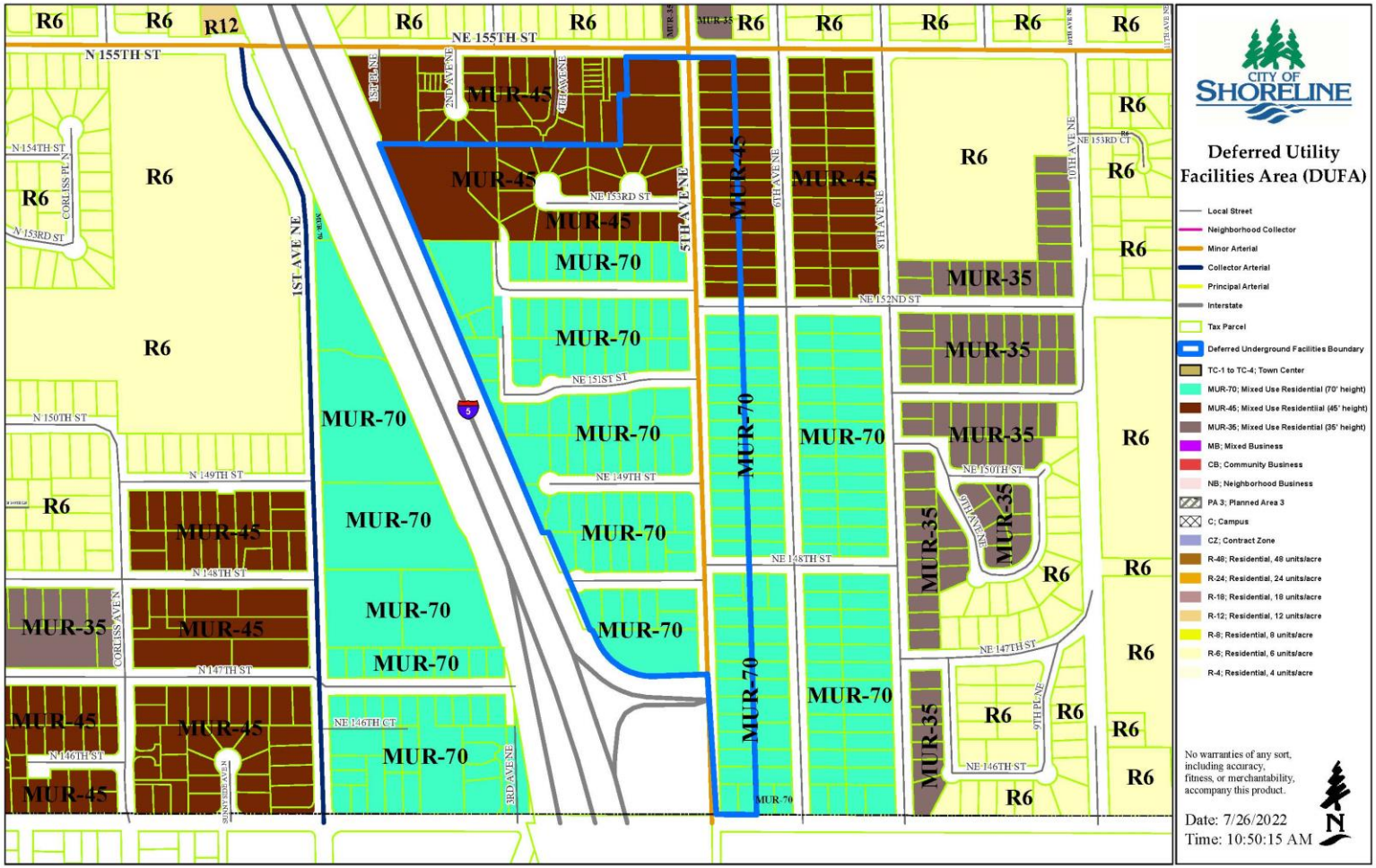
    - All manhole, vault, and catch basin inverts and horizontal pipeline alignments shall be verified by a Washington State-licensed Professional Land Surveyor prior to submitting revised drawings.

- Developers and designers shall submit all final record drawings to the City prior to acceptance.

Sample Plan


A PORTION OF SEC 12, TWP 26 N, RGE 3 E, W.M., KING COUNTY, WASHINGTON
17246
17236
17230
17224
17216
17202
NW 172ND ST
3RD AVE NW
EX. SSMH #03005
EX. SSMH #03006
EX. SSMH #03007
EX. SSMH #03008
EX. CB RIM=308.54
EX. CB RIM=307.16
EX. CB RIM=304.77
EX. CB RIM=304.82
EX. CB RIM=304.78
EX. CB RIM=305.39
261 LF± EX. 8" SS
140 LF± EX. 8" SS
237 LF± EX. 18" SS
CATCH BASIN INSERT (TYP)
EX. KC SSMH BCS 9
SCALE IN FEET
PLAN
SCALE:1"=20'
PROFILE
SCALE: HORIZ. 1"=20' VERT. 1"=5'
EX. SIDE SEWER
100 LF± 27" PVC
S = 0.0042
REPLACE 100 LF± EX. 24" RCP W/ 27" PVC
MANHOLE MODIFICATION KEY NOTES:
DATUM: NAVD 88
Know what's below. Call before you dig.
SANITARY SEWER IMPROVEMENTS
SEWER PLAN AND PROFILE

APPENDIX N – DEFERRED UTILITY FACILITY AREA MAP (DUFA)


CITY OF SHORELINE
Deferred Utility Facilities Area (DUFA)
Local Street
Neighborhood Collector
Minor Arterial
Collector Arterial
Principal Arterial
Interstate
Tax Parcel
Deferred Underground Facilities Boundary
TC-1 to TC-4; Town Center
MUR-70; Mixed Use Residential (70' height)
MUR-45; Mixed Use Residentiial (45' height)
MUR-35; Mixed Use Residential (35' height)
MB; Mixed Business
CB; Community Business
NB; Neighborhood Business
PA 3; Planned Area 3
C; Campus
CZ; Contract Zone
R-48; Residential, 48 units/acre
R-24; Residential, 24 units/acre
R-18; Residential, 18 units/acre
R-12; Residential, 12 units/acre
R-8; Residential, 8 units/acre
R-6; Residential, 6 units/acre
R-4; Residential, 4 units/acre
No warranties of any sort, including accuracy, fitness, or merchantability, accompany this product.
Date: 7/26/2022
Time: 10:50:15 AM
N
NE 155TH ST
N 154TH ST
N 153RD ST
NE 153RD ST
NE 153RD CT
N 150TH ST
N 149TH ST
NE 151ST ST
NE 149TH ST
N 148TH ST
NE 148TH ST
N 147TH ST
NE 147TH ST
N 146TH ST
NE 146TH CT
NE 152ND ST
NE 150TH ST
1ST AVE NE
3RD AVE NE
5TH AVE NE
6TH AVE NE
7TH AVE NE
8TH AVE NE
9TH PL NE
10TH AVE NE
CORLISS PL N
CORLISS AVE N
R6
R12
MUR-45
MUR-70
MUR-35

APPENDIX O – DEVELOPER EXTENSION MANUAL

INDEX

INDEX

SECTION A DEVELOPER EXTENSION PROCESS

- INTRODUCTION
- REVIEWING REQUEST FOR DEVELOPER EXTENSION
- FEES
- OUTLINE OF DEVELOPER EXTENSION PROCESS
- INFORMATION FOR DEVELOPER'S ENGINEER & CONTRACTOR
- ENGINEERING SUBMITTALS

SECTION B: APPLICATION

ADDITIONAL INFORMATION TO BE PROVIDED AT APPLICATION

- DEVELOPER EXTENSION CHECKLIST

SECTION C: ENGINEERING AND CONSTRUCTION

- DESIGN CRITERIA
- GRAVITY SERVICE
- SERVICE PROVIDED BY LIFT STATION
- EASEMENTS
- CONSTRUCTION RECORD MODIFICATION OF PLANS
- AS BUILTS
- GENERAL NOTES
- NOTICE
- CERTIFICATE OF LIABILITY INSURANCE

SECTION D: DEVELOPER EXTENSION AGREEMENT

- 11 MONTH INSPECTION

SECTION A: DEVELOPER EXTENSION PROCESS

INTRODUCTION

This manual is a guide through the necessary steps to determine whether a developer extension is needed and the steps required to obtain service from the City of Shoreline (City) by an extension of the existing sanitary sewer system.

The process includes submitting application, signing a contract for service, paying connection charges, determining classification of service, preparing and reviewing of plans, submittals to agencies, certification of construction costs and inspection, revising plans to construction, recording of easements, bill of sale and conveyance of sewer facility, one year warranty, and final acceptance.

REVIEWING REQUEST FOR DEVELOPER EXTENSION

Prior to entering into an agreement with the City, the applicant will complete the Wastewater Permit Application with attachments and submit the Developer Extension application fee. The Wastewater Permit Application can be found on the City Permit Checklists & Application Packets website: https://www.shorelinewa.gov/government/departments/planning-community-development/forms-application-checklists-application-handouts/permit-checklists-application-packets.

The City will determine if they will proceed with an agreement and any special requirements.

FEES

Engineering Review and Inspection: All engineering review and inspection will be done by the City or its consultants on a time-and-expense basis and shall be paid for by the Developer.

Fees to be paid to the City shall include but are not limited to:

1. Project Deposit: The Developer shall deposit a fee, which shall be determined by the City after review of application and preliminary plan. The fee shall be payment for the costs to be incurred by the City for design review, inspection, engineering, legal, financial or other services performed by or for the City relating to this project. The deposit shall be paid at the time of application approval by the City.

2. Application Fee: A flat fee shall be paid by the applicant. The application fee covers the cost of administrative functions related to receiving and routing the application, and performing a feasibility review.

3. Connection Charge: The Developer's contribution to the existing sanitary sewer system and the City's facilities (General Facilities Charge). The connection charge will include amounts for each Residential Customer Equivalent (RCE) and local treatment facilities charges where applicable.

4. Administrative Fee: A fee of 15 percent of all costs described under Project Deposit covering City administration costs, including recording fees, will be charged at the end of the project with the final reconciliation letter.

5. System Isolation Deposit: A $1,000.00 system isolation deposit shall be paid to the City at the time of application approval. The isolation device shall be in place and inspected by the City prior to the start of construction, it shall remain in place and be functional during construction and shall not be removed without the authorization of the City. The $1,000.00 deposit shall be forfeited if the above stipulations are not adhered to.

6. Guarantee Deposit/Warranty Bond: A deposit or bond to be paid to the City of $2,000.00 or 10 percent of the construction cost, whichever is greater. The method of payment will be determined by the City and due with the project deposit (see 1). The guarantee deposit to be held for one (1) year after conveyance. A potential refund may be issued following the 11-month warranty inspection. (NOTE: If the Developer is a government entity then the bonding requirement may be satisfied by the government entity Developer's contractor).

7. Performance and Payment Bond: A Performance and Payment Bond in an amount equal to the estimated cost of construction and site restoration as calculated by the Utility Engineer for the faithful performance of that work if work will be occurring in public right-of-way. The Performance and Payment Bond will be a requirement of the Right-of-Way Permit.

Developers requiring special provisions in their contract or their facilities can expect that the total charges to be billed by the City and/or its consultants will be increased beyond that of a similar development without the special provisions. Additional charges will be incurred by the Developer when additional research, documentation or review is required.

Some special provisions that cause additional charges to be incurred by the Developer are listed below; this is not an all inclusive list, other charges may apply.

1. Latecomer agreements

2. Use of pumping systems

3. Designs that require modification to the City's standard design practice

4. Alternate assessment practice

5. Early service connection

6. Design or construction changes

7. Installations not in accordance with plans requiring additional inspections

8. Capacity flow studies

OUTLINE OF DEVELOPER EXTENSION PROCESS

1. To initiate the Developer extension process, the Developer shall complete a Wastewater Permit Application and submit it with the application fee and required attachments to the City of Shoreline Permit Services Department. After the application has been submitted, the City will review the information for serviceability, calculate the connection charge and prepare a formal Developer Extension Agreement.

2. A Developer Extension Agreement shall be prepared by the City for signature by the Developer and the City. This contract must be signed and appropriate fees paid prior to the review of plans.

3. The Developer shall then submit plans to the City to be reviewed.

4. The City approves construction plans, transmits approved plans to all necessary agencies and receives approvals from those agencies.

5. The City holds a preconstruction conference with Developer.

6. During construction the City will have an inspector present to insure that the system is installed to City standards. When all pipe and related facilities are in place, easements covering those portions of the system outside public right-of-way shall be completed, recorded and returned to the City.

7. The plans shall be revised to conform with construction records and they shall be given to the City for use as a permanent record.

8. When easements, revised plans, and construction of the system is approved, a Conveyance of the Sewer Facility form shall be prepared and executed by the Developer whereby the completed system shall be turned over to the City.

9. The Developer is responsible for completing a Certificate of Cost of Construction and submitting it to the City.

10. At the end of the one (1)-year period, the project shall be inspected (11-month warranty inspection) and any items needing repair shall be rectified by the Developer before the Guarantee Deposit/Warranty Bond is released.

INFORMATION FOR DEVELOPER’S ENGINEER & CONTRACTOR

The Developer is responsible to inform its consultants, its contractor, and all subcontractors of the City's requirements.

Plans prepared by the Developer's engineer shall be reviewed by the City to see that they conform to the City's standards. The costs of the City engineer’s review of the plans shall be paid by the Developer.

ENGINEERING SUBMITTALS

The Developer shall furnish wastewater utility design drawings as plan-and-profile (P&P) sheets. Submit a digital PDF of the proposed plans, as well as an AutoCAD file (.dwg).

SECTION B: APPLICATION

The Wastewater Permit Application can be found on the City Permit Checklists & Application Packets webpage: https://www.shorelinewa.gov/government/departments/planning-community-development/forms-application-checklists-application-handouts/permit-checklists-application-packets.

ADDITIONAL INFORMATION TO BE PROVIDED AT APPLICATION

1. Permit Number _____ (To be completed by City)

   The proposed extension will be installed in roads and/or easements and/or on other approved public right-of-way and shall be for the use and benefit of the District and of the property legally described as follows:

   The common street address of the property is _____,

   The legal description of the property is: _____

   _____

2. (a) Describe the type of improvements planned for the above-described property, i.e., single family residences, other individual residential units or commercial usage, and the proposed number of units.

   _____

   _____

   _____

   _____

   _____

   (b) Attached to the application shall be two copies of each of the following:

- A preliminary plan setting forth the proposed development.

  The plan shall include property boundary lines, indication of type of development, if any, location of roads, building and/or other important features, type of building construction, and the number of units shall be stated.

- A contour map of the area with a five-foot contour interval or less. Datum shall be based on the most recent King County Aerial Survey with benchmark locations shown.

- Existing and proposed roadway profiles.

3. Set forth the proposed date for construction of the project and the anticipated completion date for the project:

Start of Construction: _____

Completion Construction: _____

4. Set forth common street address and telephone number of Developer:

   _____

   _____

5. Have you prepared a EIS, SEPA checklist or negative declaration?

   Yes _____ No _____

   If yes, list name of lead agency:

   _____

   Date of application: _____

   If an EIS, negative declaration or checklist has been completed, attach a copy.

6. Attached to this application is a Developer Extension Checklist. Please advise if there are any items on the checklist with which you have a question or you cannot comply.

   _____

   _____

   _____

   _____

7. Contact Information

   Prepared by: _____

   Date: _____

   Developer: _____

   Address: _____

   Telephone No.:_____

   Engineer: _____

   Address: _____

Telephone No.: _____

Architect: _____

Address: _____

Telephone No.: _____

Contact Person: _____

Address: _____

Telephone No.: _____

DEVELOPER EXTENSION CHECKLIST

Project: _____	Phone: _____
Developer: _____	Phone: _____
Engineer: _____	Phone: _____
Contractor: _____	Phone: _____

A. Application	**DATE**	**AMOUNT**
1. Submit application to City of Shoreline Permit Services	_____	
2. $750.00 Application Fee paid	_____	$_____
3. City Review and approval of application	_____	
4. City estimates fees/construction budget	_____	
5. Developers Extension Agreement prepared for review and signature	_____	

B. Contract AND PLAN REVIEW	**DATE**	**AMOUNT**
1. Developers Extension Agreement signed by Developer and returned to City.		
2. Fees Paid:	_____	
• Developer Extension deposit	_____	$_____
• Connection Charge (GFC, TFC, LFC)	_____	$_____
• Guarantee Deposit/Warranty Bond	_____	$_____
• System Isolation Deposit	_____	$_____
3. City prepares construction cost estimate for Performance Bond and Guarantee Deposit/Warranty Bond.	_____	$_____
4. Developers Extension Agreement executed and recorded with King County.	_____	

5. Submit three (3) copies of Engineered Plans to the City for Review _____

6. Plans returned to Developers engineer for revision, if necessary _____

7. Submit for agency approvals
   a. King County Wastewater Treatment Division _____
   b. Seattle Public Utilities _____
   c. North City Water District _____
8. All Agency Approvals received _____
9. Plans approved and letter to Developer _____
10. Contractor to obtain other applicable permits from City _____

C. REQUIREMENTS BEFORE CONSTRUCTION	**DATE**	**AMOUNT**
1. Contractor's references submitted to City	_____	
2. Contractor licensed and bonded by City	_____	
3. Reference checked; Contractor approved	_____	
4. Insurance certificate submitted to City	_____	_____
5. Performance bond, if required, submitted to City	_____	$_____
6. All off-site and on-site easement(s) secured, recorded and submitted to City	_____	
7. City emails pre-construction notice (see Pre-Construction List)	_____	
8. Pre-construction conference held prior to any construction (minimum 7-day notice)	_____	

9. Survey submitted to City

10. (minimum 2 days prior to construction) _____

11. Contractor gives City notice of intent to start construction _____

12. Contractor gives Notice to City for road cut start _____

13. Plug or tightline bypass inspected and approved _____

D. CONSTRUCTION **DATE** **AMOUNT**

1. City approves construction start. _____
2. City inspects project. _____
3. Channels shall accommodate TV camera, approximate _____
   dimensions 32-inch long x 6-inch diameter. _____
4. Air test, TV, jet cleaning; inspected and passed. _____
5. Contractor has new system telespected with City
   present. Telespection media to City _____
6. City sends a copy of completed air test to KCDNR _____
   WTD.
7. Punch list submitted to Contractor, Developer and City. _____

8. Punch list items inspected and revised punch list submitted
   to Contractor, Developer and City, if necessary. _____
9. Acceptance inspection and approval. _____
10. City issues Certificate of Provisional Acceptance _____

E. AFTER CONSTRUCTION **DATE** **AMOUNT**

1. Letter to Developer requesting as-builts, conveyance _____
   of sewer facility, certification of costs, approved plat.
2. Latecomer agreement executed and recorded, if

applicable. _____

3. Easement restoration release to property owners by Developer. _____

4. Contractor performs additional work on easement restoration, if necessary. _____

5. Easement restoration releases signed and submitted to City. _____

F. REQUIREMENTS BEFORE ACCEPTANCE	**DATE**	**AMOUNT**
1. As-builts submitted to City for review.	_____	
2. Certification of costs and conveyance (On-From-To) submitted to City for review.	_____	
3. As-builts, etc. returned to Developer's Engineer for revisions, if necessary.	_____	
4. As-builts, certification of costs and conveyance approved.	_____	
5. Conveyance of sewer facility and certification of costs sent to County for recording by Developer.	_____	
6. City records number and files with City Clerks office.	_____	
7. Developer submits final plat to City.	_____	
8. 1/4 Section(s) and general sewer map revised by City.	_____	
9. Developer extension deposits reconciled and brought current (including the 15-percent Administration Fee).	_____	_____
10. City pays latecomer amounts to proper parties, if necessary.	_____	_____

11. Copy of Recorded conveyance of sewer facility and certification of costs received by the City. _____

12. Project cost submitted to City accountant for inclusion in plant-in-service. _____

13. City receives recorded Conveyance, Certification of Cost, Easement and Project. _____

14. Letter sent to Developer stating project has been accepted and one year warranty has started. _____

G. FOLLOWING ACCEPTANCE	**DATE**	**AMOUNT**
1. City authorizes removal of plug	_____	
2. City refunds system isolation deposit	_____	$_____
3. City releases performance bond	_____	$_____
4. City issues side sewer permit	_____	$_____
5. City inspects side sewer	_____	
6. New accounts to accounts receivable	_____	

H. FINAL ONE YEAR CLOSEOUT	**DATE**	**AMOUNT**
1. 11-Month Inspection/TV by City	_____	
2. Developer makes warranty corrections, if necessary.	_____	
3. City sends Developer letter stating project is warranty inspection complete.	_____	
4. City makes Final acceptance.	_____	
5. City releases Guarantee Deposit/Warranty Bond and any remaining funds on deposit.	_____	
6. Director execute Release of Encumbrance.	_____	

PROJECT COMPLETE

ENGINEER _____

CITY ENGINEER _____

DIRECTOR _____

SECTION C: ENGINEERING AND CONSTRUCTION

DESIGN CRITERIA

Gravity Service

A developer extension shall provide service by gravity if such service is feasible as provided in this Section.

Any person applying for a Developer Extension Agreement with the City shall comply with the City's Developer Extension Manual.

The City shall, upon receipt of the Application for Developer Extension Agreement and the documents specified in the City's Developer Extension Manual, together with appropriate service fees, review the Application to determine whether gravity service is available.

The City shall, in determining whether gravity service is available, consider all alternative means of providing gravity sewer service to the property.

The City shall identify any means of providing gravity service, even if the capital cost of such service would be unusual or extraordinary. The City shall also provide a preliminary estimate of the cost of obtaining such service.

In the event the City has been able to identify a means of providing gravity sewer service, the applicant for the developer extension shall be so informed and instructed to determine the feasibility of proceeding with the developer extension employing gravity service.

In the event the applicant determines that proceeding with the developer extension employing gravity service is not feasible, applicant may request the City to determine whether the application meets the criteria provided below for approval of a developer extension employing a lift station.

Service Provided By Lift Station

A developer extension may provide service by means of a lift station or lift stations if gravity service is determined not to be available by the City, or if service by means of a lift station is requested by the applicant for a developer extension, provided, however, that the application must meet the criteria provided for in this section and be approved by the City.

If the City determines that gravity service is not available, or if the person requesting a developer extension determines that the developer extension employing the means of gravity service identified by the City is not feasible.

The City shall:

A. determine whether a lift station could serve the property; and

B. further identify any adjacent property to which gravity service would be unavailable, which could also obtain service by such a lift station.

If the City determines a lift station can efficiently serve the subject property, together with adjacent property to which gravity service is unavailable, the City shall provide a preliminary estimate of the cost of constructing the developer extension employing a lift station, and shall also determine the amount of the cost attributable to providing service to the other properties. The applicant shall be advised that the Developer Extension Agreement will be granted only for construction of a developer extension employing a lift station with an emergency generator and potential overflow storage. If it is determined that gravity service is not available to a property, then service may be provided by means of a lift station with an emergency generator and in certain instances overflow storage capacity may be required.

EASEMENTS

Legal descriptions for easements for all portions of the sewer which lie outside of public street right-of-ways shall be signed and stamped by a Professional Land Surveyor, currently registered in the State of Washington, and transmitted to the City. The easement shall be a minimum of 15 feet in width, with the sewer in the center. There shall be a separate easement provided for each lot that a sewer crosses. These easements are required by the City regardless of easements recorded with property deeds or plats. Easements must be approved by the City prior to construction.

CONSTRUCTION RECORD MODIFICATION OF PLANS

"AS BUILTS"

When the Contractor completes the mainline sewer work and the manholes have been adjusted to the finish grade, the CAD files of the sewer plans shall be revised to conform with construction records, and then sent to the City. Prior to submitting revised plans, manhole inverts and horizontal alignment shall be verified by a Professional Land Surveyor, currently licensed in the State of Washington.

Developer shall submit all final as-builts to the City prior to acceptance.

GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF SHORELINE WHICH ARE CONTAINED IN THE ENGINEERING DEVELOPMENT MANUAL APPENDIX O.

2. THE CITY SHALL BE NOTIFIED 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL TESTING AND CONSTRUCTION SHALL BE INSPECTED BY THE CITY OF SHORELINE.

3. ALL SIDE SEWERS SHALL BE 6 INCH DIAMETER PIPE CONSTRUCTED AT A MINIMUM SLOPE OF 2.00 PERCENT, UNLESS OTHERWISE NOTED.

4. ALL SIDE SEWER STUBS SHALL EXTEND TO THE PROPERTY LINE AND THE ENDS MARKED.

5. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE. IDENTIFICATION, LOCATION, MARKING AND RESPONSIBILITY FOR UNDERGROUND FACILITIES OR UTILITIES IS GOVERNED BY THE PROVISIONS OF CHAPTER 19.122, REVISED CODE OF WASHINGTON.

6. 15 FOOT EASEMENTS: 7.5 FEET EACH SIDE OF SANITARY SEWER LINE AND/OR APPURTENANCES TO BE FURNISHED BY THE DEVELOPER WHEN THE SEWERS ARE LOCATED ON OUTSIDE OF PUBLIC RIGHT-OF-WAYS.

7. PLAN AND PROFILE INFORMATION AS FURNISHED BY THE DEVELOPER OR HIS ENGINEER.

8. MINIMUM SEPARATION OF POTABLE WATER MAINS AND SANITARY SEWER LINES SHALL BE IN ACCORDANCE WITH THE MOST RECENTLY ADOPTED VERSION OF THE "CRITERIA FOR SEWAGE WORKS DESIGN" PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY.

9. A PLUG SHALL BE PLACED IN THE OUTLET PIPE OF THE EXISTING MANHOLE WHICH IS TO BE CONNECTED TO OR THE OUTLET PIPE OF THE FIRST NEW

MANHOLE CONSTRUCTED. A TIGHTLINE BYPASS MAY BE REQUIRED IN PLACE OF THE PLUG. THIS PLUG OR BYPASS SHALL REMAIN IN PLACE AND MAY NOT BE REMOVED WITHOUT THE PERMISSION OF THE CITY OF SHORELINE. REMOVAL WILL RESULT IN FORFEITURE OF SYSTEM ISOLATION DEPOSIT.

10. ALL PIPES ENTERING/LEAVING MANHOLES SHALL BE ALIGNED WITH THE CENTER OF THE MANHOLE. MANHOLE CHANNELS SHALL BE SHAPED TO ALLOW PLACEMENT AND USE OF THE CITY'S TELEVISION INSPECTION EQUIPMENT.

11. THE DEVELOPER SHALL BE RESPONSIBLE FOR ACQUIRING ALL NECESSARY EASEMENTS AND AGREEMENTS PRIOR TO CONSTRUCTION.

NOTICE

CAUTION -- EXTREME HAZARD -- OVERHEAD ELECTRICAL SERVICE LINES ARE GENERALLY NOT SHOWN ON THE DRAWINGS. ELECTRICAL LINES SHOWN ON THE DRAWINGS ARE LOCATED BY POINT-TO-POINT, POWER-POLE-TO-POWER-POLE CONNECTION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXTENT OF ANY HAZARD CREATED BY OVERHEAD ELECTRICAL POWER IN ALL AREAS AND SHALL FOLLOW PROCEDURES DURING CONSTRUCTION AS REQUIRED BY LAW AND REGULATION. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL MEET WITH UTILITY OWNERS AND DETERMINE THE EXTENT OF HAZARD AND REMEDIAL MEASURES AND SHALL TAKE WHATEVER PRECAUTIONS MAY BE REQUIRED.

CERTIFICATE OF LIABILITY INSURANCE

See the Public Liability Insurance Development Handout on the City's Wastewater Permitting and Inspections webpage for Certificate of Liability Insurance information:

https://www.shorelinewa.gov/government/departments/public-works/wastewater-utility/wastewater-permitting-and-inspections

SECTION D: DEVELOPER EXTENSION AGREEMENT

AGREEMENT

PERFORMANCE AND PAYMENT BOND

CONVEYANCE OF SEWER FACILITY

CERTIFICATION OF COST OF CONSTRUCTION

RELEASE OF ENCUMBRANCE

11 MONTH INSPECTION FORM

11 - MONTH INSPECTION

Final inspection report for:

1. Name of Development _____
2. Contractor _____
3. Developer _____
4. Date of Inspection _____
5. Inspector _____

INSPECTION CHECKLIST:

a. Condition of Roadway: _____

_____

_____

b. Condition of Sewer Main: _____

_____

_____

c. Condition of Manholes: _____

_____

_____

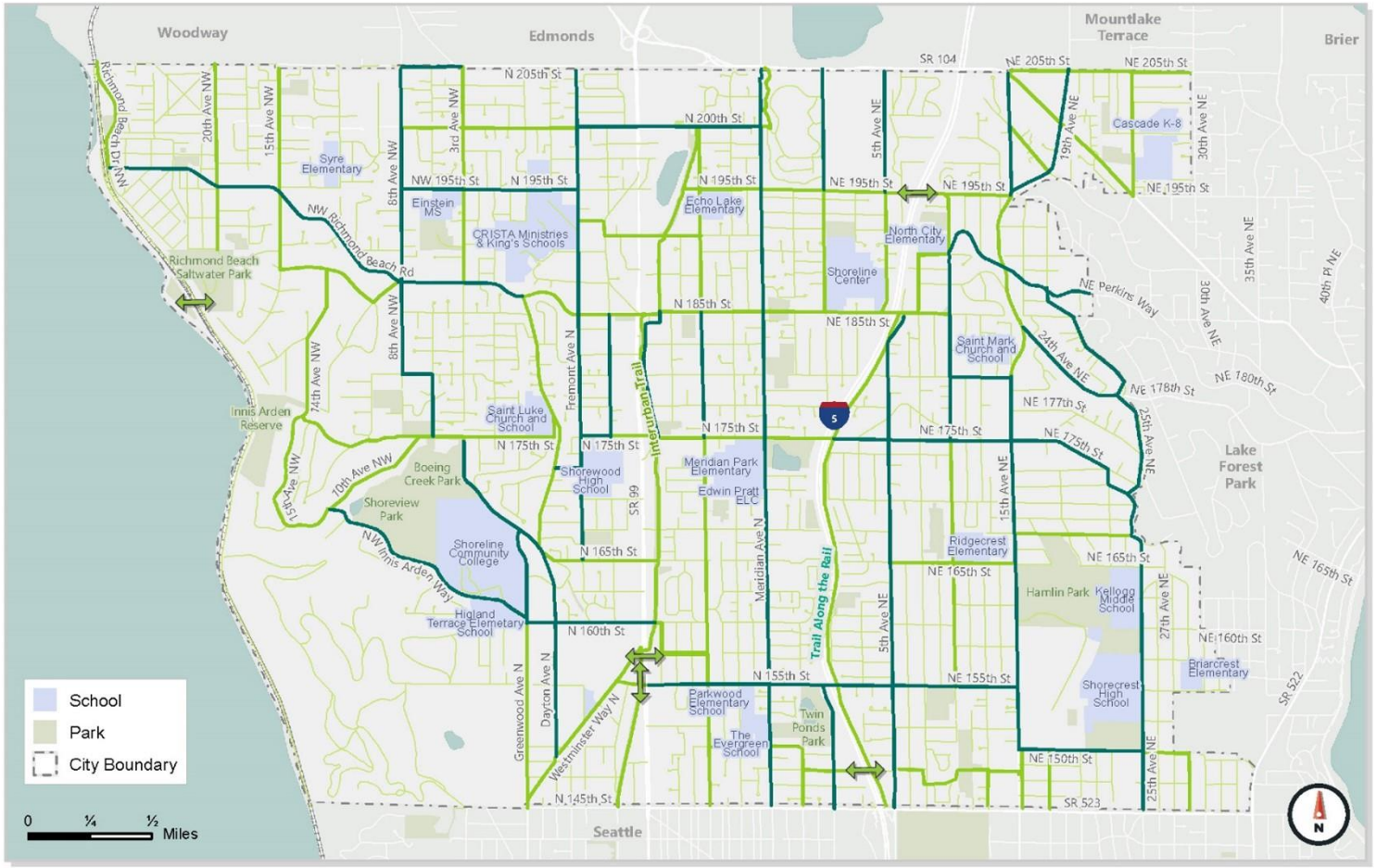
d. Any other utilities problems visible; water boxes, valve box, light poles, storm drains, etc.

_____

_____

e. What conditions need to be corrected in order to approve project. Use additional page(s), if necessary:

APPENDIX P – BICYCLE LEVEL OF TRAFFIC STRESS (LTS) VISION MAP


Woodway
Edmonds
Mountlake Terrace
Brier
Seattle
Lake Forest Park
Richmond Beach Saltwater Park
Innis Arden Reserve
Boeing Creek Park
Shoreview Park
Shoreline Community College
Syre Elementary
Einstein MS
CRISTA Ministries & King's Schools
Saint Luke Church and School
Shorewood High School
Higland Terrace Elemetary School
Echo Lake Elementary
Meridian Park Elementary
Edwin Pratt ELC
Parkwood Elementary School
The Evergreen School
Twin Ponds Park
Shoreline Center
North City Elementary
Saint Mark Church and School
Ridgecrest Elementary
Hamlin Park
Kellogg Middle School
Shorecrest High School
Briarcrest Elementary
Cascade K-8
Interurban Trail
Trail Along the Rail
SR 104
SR 99
SR 522
SR 523
N 205th St
N 200th St
N 195th St
NW 195th St
NE 195th St
N 185th St
NE 185th St
N 175th St
NE 175th St
NE 178th St
NE 177th St
NE 180th St
N 165th St
NE 165th St
N 160th St
NE 160th St
N 155th St
NE 155th St
NE 150th St
N 145th St
NE 205th St
NE Perkins Way
Richmond Beach Dr NW
NW Richmond Beach Rd
NW Innis Arden Way
20th Ave NW
15th Ave NW
8th Ave NW
3rd Ave NW
14th Ave NW
10th Ave NW
15th Ave NW
Fremont Ave N
Meridian Ave N
Greenwood Ave N
Dayton Ave N
Westminster Way N
5th Ave NE
15th Ave NE
19th Ave NE
30th Ave NE
35th Ave NE
40th Pl NE
24th Ave NE
25th Ave NE
27th Ave NE
School
Park
City Boundary
0 ¼ ½ Miles
N
Desired Minimum Level of Traffic Stress (LTS)
1
2
Local Road (LTS 1)
Pedestrian/Bicycle Bridge (LTS 1)
City of Shoreline
Bicycle Level of Traffic Stress (LTS) Vision