Transportation Design Manual and Complete Streets Guide

Volume 1

Transportation Design Manual

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Volume 1

Part 1

Transportation Design Standards

City of Bellevue

Transportation Design Standards

Prepared by the City of Bellevue, Washington February, 2025

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ABBREVIATIONS/ACRONYMS

» AASHTO – American Association of State Highway and Transportation Officials

» ADA – Americans with Disabilities Act

» ADT – Average Daily Traffic

» APS – Accessible Pedestrian Signal

» APWA – American Public Works Association

» ASTM – American Society for Testing and Materials

» BBL – Buffered Bike Lane

» CBL – Conventional Bike Lane

» CO – Certificate of Occupancy

» DC – Predevelopment Review

» FHWA – Federal Highway Administration

» HMA – Hot Mix Asphalt

» ISD – Intersection Sight Distance

» LRFD – Load and Resistance Factor Design

» LTS – Level of Traffic Stress

» MEF – Maximum Extent Possible

» MIP – Mobility Implementation Plan

» MUTCD – Manual on Uniform Traffic Control Devices

» NACTO – National Association of City Transportation Officials

» PAR – Pedestrian-Accessible Route

» PC – Point of Curvature

» PROWAG – Public Right of Way Accessibility Guidelines

» PSD – Pedestrian Sight Distance

» PT – Point of Tangency

» SBL – Separated Bike Lane

» SCATS – Sydney Coordinated Adaptive Traffic System

» SMP – Speed Management Plan

» SSD – Stopping Sight Distance

» SWF – Small Wireless Facility

» TCO – Temporary Certificate of Occupancy

» TIA – Transportation Impact Analysis

» TOD – Transit Oriented Development

» TRB – Transportation Research Board

» WSDOT – Washington State Department of Transportation

1 Introduction and General Consideration (Requirements)

The City of Bellevue has adopted this Transportation Engineering Design Standards Manual to require the standardization of design elements for consistency and to assure that public safety needs are met. This manual contains engineering standards for use by professional civil engineers with experience in street and roadway design when designing facilities within the City of Bellevue. The information contained in this manual cannot provide for all situations and conditions that may be encountered. Specific provisions contained within this manual may not be appropriate for all locations and existing conditions. These standards are intended to assist, but not substitute for, competent work by professional civil engineers. The design requirements contained within this manual do not set legal standards of care but provide guidance for possible engineering treatment under some circumstances. Compliance with these standards does not alleviate the design engineer from using sound professional engineering practices and meeting the requirements of the specific utility in question. The design criteria contained herein are the minimum acceptable under standard conditions. Special conditions may require more stringent requirements that will be addressed during the plan review process.

References and Authority

The Transportation Department Director is authorized by the Transportation Development Code, BCC 14.60.40, to prepare, adopt and update design standards to establish minimum requirements for the design and construction of transportation facilities and requirements for protecting existing facilities during construction. The standards contained in this design manual constitute the design standards authorized by BCC 14.60.021. These standards are intended to be consistent with the most currently adopted provisions and editions of the Bellevue City Code, the Comprehensive Plan and the publications cited in the appendices of this manual.

Meaning of Terms

The definitions of words and phrases as contained in BCC 14.60 are hereby incorporated by reference.

Professional Qualifications

Professionals in the technical fields of civil engineering with transportation experience, structural engineering, electrical engineering, geotechnical engineering, landscape architecture, soils engineering and surveying who prepare or are responsible for the preparation of drawings, plans, specifications or technical reports for obtaining permits and approvals shall be currently licensed or registered in the state of Washington. These professionals shall be qualified with both experience and educational background in the technical areas as warranted by the specifics of the proposed project.

City of Bellevue Planning Documents

1. Comprehensive Plan | City of Bellevue
2. Mobility Implementation Plan
3. 2009 Bicycle Pedestrian Transportation Plan
4. Downtown Transportation Plan
5. Transit Master Plan
6. Transportation Improvement Plan
7. Transportation Capital Improvement Program Plan
8. Transportation Facilities Plan
9. Vision Zero Strategic Plan

1.1 Engineering Plans

Engineering plans for transportation improvements shall be prepared and submitted for review and approval. All plans must be prepared, signed and stamped by a professional civil engineer with experience in transportation and roadway design and licensed in the state of Washington. The plans shall clearly identify all existing and proposed improvements and meet the submittal requirements for the type of plan. Refer to the City of Bellevue Preliminary Civil and Traffic Plans Requirements for details. For more information, see Appendix E and visit the following link: https://bellevuewa.gov/sites/default/files/media/file/2020/Preliminary%20Civil%20Plans%20Requirements.pdf.

The civil engineering plans shall be the controlling document on the design of all frontage improvements features. Sidewalk grading details, utilities vaults, landscape elements, street furniture, public art and any other architectural and landscape elements within the public sidewalk area must be shown on the civil engineering plans and must be signed and sealed by the professional civil engineer who prepared the plans.

After receiving comments from the City, the Design Engineer, whose signature and seal will appear on the civil engineering drawings, should provide with each review submittal a comment response letter with responses to all of the reviewers’ comments in addition to a statement that confirms the following:

- The standards, codes and criteria applicable to the design have been observed.
- The design team has implemented a QA/QC Plan in which the designs, computations, drawings and other elements have been checked thoroughly and back-checked before submitting the documents to the City.

Electronic copies of the Record Drawings shall be provided after construction is approved. These plans shall include field-verified elevations, slopes and dimensions for curblines, sidewalks, ramps and other features in the right of way or public sidewalk easements.

1.2 Technical References

In addition to the standards and design criteria in this design manual and in the Bellevue City Code, decisions regarding sight distance, horizontal and vertical alignment, signage and other criteria appropriate for the design of city streets shall be consistent with the current versions of the following documents.

1. American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets (Green Book, current version)
2. AASHTO, Load and Resistance Factor Design [AASHTO LRFD] Bridge Design Specifications
3. AASHTO, Guide for Design of Pavement Structures
4. AASHTO, Guide to the Development of Bicycle Facilities
5. AASHTO, Guide for Planning, Design and Operation of Pedestrian Facilities
6. AASHTO, Roadside Design Guide
7. American Society for Testing and Materials (ASTM)
8. Americans with Disabilities Act (ADA)
9. Public Right of Way Accessibility Guidelines (PROWAG)
10. Federal Highway Administration (FHWA), Manual on Uniform Traffic Control Devices (MUTCD)
11. National Association of City Transportation Officials (NACTO) Urban Street Design Guideline
12. NACTO, Urban Bikeway Design Guide
13. Transit Street Design Guide
14. Transportation Research Board (TRB), Highway Capacity Manual

15. WSDOT Design Manual
16. WSDOT Bridge Design Manual Load and Resistance Factor Design (LRFD)
17. WSDOT Geotechnical Design Manual

1.3 Specifications

Projects shall use the most recent City-adopted version of the Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (Standard Specifications) as supplemented or amended by the Washington State Chapter of the American Public Works Association (APWA); City of Bellevue General Special Provisions; Work Order General Notes; general or site-specific notes referenced on the plan set; other City design manuals or policies; or the Design Engineer's site-specific edits.

1.4 Deviations and Exceptions to the Standards and Requirements

Except as provided elsewhere in other city codes or resolutions, deviation from this design manual may be requested to the City based upon specific project constraints. Alternative designs may be allowed if they are based on accepted standards of engineering practices like AASHTO Policy on Geometric Design of Highways and Streets, WSDOT's Design Manual, National Association of City Transportation Officials (NACTO) publications, Public Rights-of-Way Accessibility Guidelines (PROWAG) and ADA requirements or other supporting manuals where specific project circumstances do not allow application of the standards and requirements of this design manual. Deviations from these standards may be granted by the Transportation Department Director or the Director's designated representative.

Before applying for deviation, exception, or maximum extent feasible (MEF), the Design Engineer shall clearly demonstrate the engineering design standard for which the deviation is being sought is not physically or technically possible, would have undesirable impacts to public or private infrastructure and property or would impact critical areas. If the applicant chooses to apply for a deviation, the City process below will be followed.

1. A design deviation from the City's standards may be requested by filling out the City of Bellevue Design Justification Form. All the applicable engineering justification documents to support the deviation shall be attached to the form. The deviation and supporting justification documents must be signed and sealed by a professional engineer licensed in the state of Washington with experience in the area of transportation engineering.
2. The responsibility of the Design Engineer and/or applicant is to submit all relevant data, calculations and figures as may be necessary to evaluate a request for

exception, deviation or MEF. All approved exceptions will be given in writing by the Transportation Department Director or the Director's designated representative.

3. The Review Engineer will evaluate the request and notify the applicant by email if additional information and/or modification will be required or with the completion of the development review plans for the current review cycle. Additional City review time may be required in certain circumstances and will be coordinated with the applicant.
4. Requests for deviation, exception and MEF may be submitted during construction if unforeseen physical constraints are identified. In such situations, the Design Engineer shall prepare a revised design that maintains accessibility to the greatest extent practical, and that modification shall be acted upon before constructing the design feature. The Review Engineer will review all modification requests and approve or deny the requested modification.
5. The Transportation Department Director or the Director's designated representative decision to grant, deny or modify the proposed deviation will be based on meeting or exceeding the corresponding City standard for the following applicable criteria:
    a. The functional intent of the design element
    b. The safety factors associated with the design element
    c. The operational concerns associated with the design element
    d. The maintenance concerns associated with the design element
    e. The capacity and/or efficiency of the design element
    f. The design life, historical performance and durability of the design element
    g. The aesthetic and visual impacts of the design element
    h. The cost effectiveness and availability of any replacement components or materials
    i. Consistency with the spirit and purpose of the corresponding City design standard
    j. Demonstration that the environment will not be adversely affected
    k. The design element is supported by published industry standards

1.5 Plans Review Process

When submitting civil engineering plans to the City for review, the following steps are required to ensure a complete submittal and timely approval of civil engineering plans:

Applicants are encouraged to apply for Predevelopment Services Review (DC) permit prior to developing complex design elements. This will ensure that applicants receive early, detailed feedback and direction from City staff on general requirements and concepts prior to developing the design and/or enable them to investigate issues that require in-depth analysis from City staff. The information City staff provides does not constitute a formal approval or permit and is dependent on the level of information received.

1. Prior to submitting the formal permit application, the applicant is required to apply for concurrency determination for the proposed development as per Chapter 14.10, Multimodal Concurrency Code in order to assess development impacts and to determine whether the proposed development meets the City's multimodal concurrency standard. The Multimodal Concurrency Implementation Guide and Application Form can be found at: https://bellevuewa.gov/city-government/departments/transportation/permits-and-standards/transportation-codes.

2. The City will advise on the type and number of permits required for each development project. To start the permitting review process for the Transportation Department, the applicant shall submit the following items electronically through www.MyBuildingPermit.com.

    a. A detailed/engineered plan set that meets the minimum requirements as set forth in the Preliminary Civil Plan Requirements listed in the link below https://bellevuewa.gov/sites/default/files/media/file/2020/Preliminary%20Civil%20Plans%20Requirements.pdf. This plan set must be standalone and independently convey the scope of work without further explanation.

    b. A copy of the conditions of improvement, if available. This may be a Hearing Examiner's report, recorded plat, concomitant agreement, short plat report or recorded short plat, a letter from the Development Service staff or a list of requirements placed on a commercial building permit application, as applicable.

    c. Electronic copies of all required reports and associated documents, including but not limited to, Transportation Impact Analysis Report (TIA), Geotechnical Report, street lighting AGI file and title Report.

    d. If the development project is to be phased, phasing plans must be submitted per the City's requirements.

3. Upon submittal, the plans will be reviewed for conformance with applicable local, state and federal requirements. The City will provide consolidated comments to the contact listed on the application form. The applicant shall make changes to the proposed project based upon the City's comments. Several review iterations may be required. The City will review projects in the order they are received.

4. With each resubmittal, the Design Engineer, whose signature and seal will appear on the civil engineering drawings, should provide a comment response letter with a statement that confirms the following:

   a. The standards, codes and criteria applicable to the design have been observed.

   b. The plans went under an internal QA/QC plan in which the designs, computations, drawings and other elements have been checked thoroughly and back-checked before submitting the documents to the City.

   All final plans, calculations, or reports submitted for review shall be stamped and signed by the professional Engineer.

5. When all City comments and requirements are addressed and resubmitted for review, when required, the City will issue the Staff Report (approval report) in which all requirements and conditions of approval for each City staff member and department are listed. The date of issuance will be followed by a 14-day appeal period for the issuance and the start date of the vesting period will be set.

6. The Review Engineer may start reviewing the Clearing and Grading permit (construction permit) plans submittal if the associated permit is near approval and all the transportation design elements are determined and finalized. Construction plans will be required for review and approval.

7. All proposed public right-of-way dedications and sidewalk and utilities easements shall be dedicated to the City prior to the issuance of the Clearing and Grading permit with the exception of plats and short plats. Refer to Section 14.60.90 and 14.60.100 of the Transportation Development Code for more information on right-of-way dedication and easements and tracts.

8. Prior to finalizing the right-of-way dedication and easements execution, a title report pulled within 30 calendar days of the application will be required to confirm property ownership and to verify that the portions of the property dedicated as right of way and/or easements have been cleared of encumbrances. The applicant is responsible for clearing all encumbrances the City determines to be inconsistent or in conflict with the intended purpose of the dedications. In addition, easement documents, including exhibits and descriptions, will need to be prepared and

submitted by the applicant using the City's standard forms. The applicant will work directly with the City's Real Property Agent to complete the documents.

9. For building permits, the applicant is required to submit a building plan that shows the area at each floor level of the proposed building that is included within the principal outside faces of the exterior walls. The plan is required to calculate transportation impact fees based on the impact fee rate schedule that is in effect at the time of the building permit issuance, or if a building permit is not required, at the time of issuance of the City's decision approving the development. Impact fees shall be payable by the applicant at the time of building permit issuance, or if a building permit is not required, at the time the City issues its decision approving the development.

1.6 Easements and Subsurface Clearance Requirements

Private developments shall grant easements for all public facilities and utilities required to serve the proposed development in accordance with the comprehensive plan and other adopted city plans, including the pedestrian and bicycle transportation plan. Easements may also be necessary for private roads, sidewalks, bicycle and pedestrian facilities, street lighting, traffic control devices or temporary construction needs. Additionally, specific street design features may require slope, wall and drainage easements. Refer to Section 14.60.100 of the Transportation Development Code for more details and requirements.

Furthermore, for sidewalk and utilities easement requirements, the City offers design guidance on subsurface clearance for use in the land use review process relating to proposed improvements within any existing sidewalk and utility easement area and any new sidewalk and utility easement area required to be dedicated to the City as part of a project. In offering this design guidance, the City does not waive its permitting or regulatory authority. An applicant's compliance with the Design Guidance for Subsurface Clearance does not ensure that a particular proposed subsurface improvement will be approved. Refer to Subsurface Clearance Requirements below for more information.

https://bellevuewa.gov/sites/default/files/media/pdf_document/2024/subsurface-clearance-requirements.pdf

1.7 Transportation Impact Analysis Report

A transportation impact analysis, or TIA, is a study of the potential transportation impacts of a development on the surrounding transportation system. The purpose of the study is to document the impacts and recommend on-site and off-site mitigation for those impacts.

A TIA is required for any new development, redevelopment or change of use (including tenant improvements) and should be submitted as part of the first review cycle documents.

The TIA must be prepared by a professional engineer, licensed in the state of Washington with experience in transportation engineering and TIA studies. For more information, refer to the TIA Guidelines.

1.8 Errors and Omissions

At the discretion of the Review Engineer, any significant errors or omissions in the approved plans or information used as a basis for such approvals may constitute grounds for withdrawal of the approvals and/or stoppage of any or all permitted work. It shall be the responsibility of the applicant, developer or contractor to show cause why such work should continue, and to make such changes in plans that may be required by the Review Engineer before the plans are re-approved.

1.9 Revisions to the Transportation Design Manual

Updating the Transportation Design Manual is an ongoing process and revisions may be issued regularly. The addition of new or modified design criteria to the design manual through the revision process does not imply that existing features are deficient in any way, nor does it suggest or mandate immediate engineering review or initiation of new projects.

2 Construction Requirements for Developments

2.1 Construction, Inspection, and Testing Procedure

All work to be done under an approved permit or within the right of way must be performed in a timely manner and conform to applicable City of Bellevue General Special Provisions and Standard Drawings, WSDOT Standard Specifications for Road, Bridge, and Municipal Construction and WSDOT Standard Plans, approved permit conditions and plans, as well as any special provisions required by the City. Failure to comply with these requirements may result in a stop work order, removal and replacement of unacceptable work, seizure of assurance devices or other penalties as established by City ordinance.

All transportation work associated with the permit(s) will need inspection by the City of Bellevue Right of Way inspectors prior to acceptance. The Inspector will monitor for compliance with City standards, codes and project specifications in addition to all approved permit conditions. The Inspector will also verify that existing City infrastructure is protected from damage and safe public access is maintained during construction. Any City assets damaged during the construction of a development project shall be restored to City standards prior to acceptance of the project.

Prior to the start of any transportation work, the applicant and contractor shall contact the ROW Inspector and schedule a preconstruction meeting. It is the responsibility of the developer to ensure all necessary inspections are requested in advance of any work.

The contractor shall have an approved, stamped set of permit plans on site during construction. This must include any post-revisions to the permit set. Required work outside of the scope as shown on the approved plans will require a revision to the permit or shall be constructed under a separate permit(s).

All materials used in the right of way must comply with City of Bellevue Standard Specification. Prior to start of construction, the City of Bellevue may require the developer to provide a manufacturer’s certificate of compliance, the source of supply and/or certified test reports. Certified tests shall be from an independent testing laboratory certified by WSDOT, AASHTO and/or American Concrete Institute. During construction, the City of Bellevue may require additional material testing to ensure any new infrastructure meets the City of Bellevue Standard Specification. All testing must be conducted by a certified testing organization acceptable to the City of Bellevue and shall be conducted at the expense of the permittee or contractor.

2.2 Infrastructure Acceptance Requirements

Upon completion of all required construction, the City will conduct an inspection to confirm that all required transportation infrastructure and conditions of the permit are completed. All defects, outstanding items or noncompliance work will be required to be completed or corrected prior to acceptance of the project. All transportation-related construction will need to be completed and inspected prior to acceptance and closure of the permit. The Transportation Development Review Team reserves the right to support approvals for Temporary Certificate of Occupancy (TCO), Certificate of Occupancy (CO), final plats and final short plats.

2.3 Assurance Device Requirements

Where a project meets the conditions outlined in BCC 14.60.260, the City of Bellevue may allow an assurance device to be in placed in order to support the issuance of a TCO or final short plat/plat permit approvals.

The City of Bellevue has two pre-approved forms for an assurance device: a surety bond and an assignment of savings. Other forms acceptable to the City, as outlined in the BCC 14.60.260, may be accepted upon review and approval of proposed forms.

2.3.1 Performance Assurance Device

A performance assurance device is a guarantee to the City that the developer will complete the required work for the permit as noted on the approved plans. The amount of the performance assurance device will be 150% of the estimated cost of the work to be done as shown on the approved permit. In any event, the assurance amount should not be less than $15,000. The assurance amount will be reviewed and approved by the City of Bellevue Transportation Director or the Director's designated representative.

2.3.2 Maintenance Assurance Device

A maintenance assurance device provides a warranty to the City for the completed transportation work in the right of way. Per BCC.14.60260 the developer will repair any defects within the warranty period. The warranty period shall be a minimum of 12 months from the date of acceptance. The amount of the maintenance assurance device will be 20% of the estimated cost of the work as shown on the approved permit. In any event, the assurance amount should not be less than $15,000. The assurance amount will be reviewed and approved by the City of Bellevue Transportation Director or the Director's designated representative.

3 Street Design and Construction

This section provides the geometric building blocks for planning and designing a street by describing the typical cross section elements, outlining parameters associated with horizontal and vertical alignments, providing an overview of intersection design, discussing multi-model facilities design and providing information on accessibility features for curb ramps and additional design elements. Geometric design of roadways shall conform to this manual and to the guidance and recommendations of American Association of State Highway and Transportation Officials' A Policy on Geometric Design of Highways and Streets (AASHTO Policy). It is essential that the designer carefully research the design standards to ensure that the design elements are applicable to the project conditions.

3.1 Design Controls

The selection of basic design controls and criteria occurs very early in the project development process and should consider the needs of all modes of transportation, as well as the community and context in which the project is located. The primary factors in determining street design criteria are street type, design speed, the speed at which the facilities operate, the mix and characteristics of the users, including transit vehicles, pedestrians and bicyclists and the constraints of the surrounding context.

3.1.1 Street Classifications

Each street or roadway is divided into a sub-system based on the way it is used and other characteristics. It is important to understand that travel rarely involves movement along a single roadway. Rather, each trip or sub-trip initiates at a land use, proceeds through a sequence of streets, roads and highways and terminates at a second land use.

The following are the identified types of streets and roads within the City of Bellevue.

3.1.1.1 Major Arterials

Major arterials carry moderate to high traffic volume. They serve major centers of metropolitan areas and provide a high degree of mobility. Abutting land uses can be accessed directly by driveways to specific parcels and at-grade intersections with other roadways. As major arterials are expected to provide a high degree of mobility, access to abutting properties is very restricted. In downtown areas, high intensity office, commercial and ground floor retail with high-rise residential is the typical land use for urban major arterials.

3.1.1.2 Minor Arterials

Minor arterials carry moderate traffic volume. These provide service for trips of moderate length. They interconnect and augment the higher arterial system. They provide intra-community continuity to connect community centers and facilities. A minor arterial may also serve “through traffic.” Access is partially restricted. Moderate intensity office, commercial and high-rise residential units with ground floor retail is the typical land use for minor arterials.

3.1.1.3 Collector Arterials

Urban collector arterials typically are intra-community roadways connecting residential neighborhoods with community centers and facilities. They accumulate traffic from local roadways and distribute that traffic to roadways that are higher in the hierarchy of classification. Access is partially restricted.

3.1.1.4 Local Streets

Local streets carry low-traffic volume. They provide direct access to adjacent uses and interconnect with the other portions of the functional system. There are two types of local streets that can be distinguished within the City of Bellevue. They are listed below:

3.1.1.4.1 Local Residential Streets

Local residential streets provide access to abutting residential land use and are designed to convey residential traffic to higher classification streets. A local street network usually carries no through traffic and includes a series of short, interconnected streets and cul-de-sacs. Local residential streets are not intended to serve truck traffic or through traffic. Typically, local residential streets are not striped with lane markings unless directed by the Review Engineer.

Access for 10 or more single-family lots, or dwelling units, in new subdivisions must be provided by this type of public street, and it shall be within dedicated right of way. Pavement and right-of-way widths for this type of public street in new subdivisions shall be determined by the provision of on-street parking and the number of single-family lots to be served. See Section 3.3, Cross Section Elements for more information on minimum pavement width for this type of street.

3.1.1.4.2 Local Streets in Downtown BelRed and Wilburton Areas

These streets are intended to support mixed use residential and commercial developments. Additional width may be required to provide parking in these areas. Refer to Sections 3.3 and 3.4 of this design manual for more information regarding the cross-section elements and multi-modal requirements. The majority of new streets to be built in BelRed will be this type of local street.

3.1.1.5 Half Streets

Half-streets may be required to be constructed along an edge of development to serve the access and travel needs of the development. These are typically about half of the regular width of the cross section and are permitted as an interim facility pending construction of the other half of the street by the adjacent development owner. The intent is to have the first developing parcel establish the location and alignment of the street that will eventually serve both parcels. In this situation, the first developing parcel shall construct a half street in accordance with its associated classification or type, including full frontage improvements, drainage and curbs and gutters on both sides. However, the sidewalks and planter strips on the side opposite the development shall not be required. The adjacent parcel will complete the remaining half street and all the required improvements at a later date, when it is developed.

3.1.1.6 Green Streets

Green streets are important streets that connect the street network to parks and open space. Green streets should be considered urban trails and extensions of parks and open spaces. They are important streets for pedestrians and bicyclists and are defined by their curbless design and green elements and infrastructure. The treatments may include sidewalk widening, landscaping, traffic calming and other pedestrian-oriented features. Green streets are designed to give priority to pedestrian circulation and open space over other transportation uses but ensure that emergency response for public safety is not adversely impacted. Their purpose is to enhance and expand public open space, and to reinforce desired land use and transportation patterns on appropriate City street right of way.

3.1.1.7 Shared Streets

Shared streets are designed for priority access by nonmotorized users (pedestrians and bicyclists) and very low vehicle traffic. Residences typically front on, or very close to, the shared streets. Vehicle speeds must be kept quite low, typically a pedestrian's pace or slower, to ensure safety. Shared streets shall connect at each end to other roads or access ways so that a turnaround is not required. In general, shared streets accommodate a very small number of vehicles at low speeds, as necessary, for a secondary access type that can be used for pick-up/drop-off activities, loading, service and emergency and deliveries. They are also designed to provide clarity for people with visual impairments regarding the shared pedestrian/vehicular nature of the space. Shared streets are generally not appropriate in locations where there is a need to maintain vehicle access or through travel. The Review Engineer will review any request to implement this type of street at a specific location and either approve or deny the request.

3.1.1.8 Alleyways

Alleys provide vehicular access to abutting properties and are not intended for general traffic circulation. Dead-end alleys are generally unacceptable; however, where dead-end alleys are determined suitable by the Review Engineer, for short-term or temporary applications, they shall be provided with adequate turnaround facilities at the dead-end. All new alleys shall be private. New alleys and existing alleys being improved shall meet requirements of this design manual. Alleys shall connect to the city streets via a commercial driveway apron. Alleys serving developments with loading activities at their access points shall include provisions for unimpeded vehicular circulation along the alley and provisions for adequate sight distances along both the alley at driveways and at intersections with public streets.

3.1.1.9 Pedestrians Streets

Pedestrian streets are seen as a specific type of local street that primarily supports more active pedestrian uses. These streets are important components of the open space network, offer comfortable pedestrian prioritized experiences, might support market, arts activity and outdoor dining or simply offer a quiet and green connection or respite. Pedestrian streets are designed to create a generous pedestrian realm with no vehicle traffic. However, emergency vehicle and maintenance vehicle access is provided as appropriate. Tree grates with pedestrian-scale lighting should be provided.

3.1.1.10 Private Streets

Private streets are privately owned and maintained and located in a tract or easement. In general, private streets shall be designed and constructed in accordance with the applicable public street standards. All private streets shall meet the following general requirements:

1. Private streets shall be contained in an easement or tract and will be allowed when:
   a. A covenant that provides for maintenance and repair of the private street by property owners has been approved by the City and recorded with King County; and
   b. The covenant includes a condition that the private street will remain open at all times for emergency and public service vehicles; and
   c. The private street would not hinder public street circulation; and at least one of the following conditions exists:
      - The street would ultimately serve no fewer than three lots and no more than nine lots; or
      - The street would ultimately serve more than nine lots, and the Review Engineer and the Fire Marshal determine that, due to physical site constraints or preexisting development, no other reasonable access is available. In addition, the proposed street would be adequate for transportation and fire access needs, and the private street would be compatible with the surrounding neighborhood character; or

- The private street would be part of a commercial or residential planned unit development; or
- The street would serve commercial or industrial facilities where no circulation continuity is necessary; or
- The private street would serve a dense residential development of four or more units, such as a unit lot subdivision or condominium, and the street is not part of any existing or future public streets grid.

Absent any of the above, public streets are required.

2. Private streets shall be designed such that vehicles attempting to enter them will not impede vehicles in the travel lane of the public street.

3. Private streets must meet all applicable standards for public streets unless otherwise explained in this manual, including those for sidewalks and ADA accessibility.

4. Combined vehicular access for adjoining properties is encouraged. Joint access shall be established in a tract or easement.

5. Access onto arterial streets from private streets may be denied at the discretion of the Review Engineer if alternate access is available.

6. The continued use of a preexisting private street is not guaranteed with the development of a site.

7. All abandoned private streets on the street frontage to be improved shall be removed and new curbs, gutters and sidewalks shall be installed.

8. Private street grades and configuration shall accommodate future street widening as described in adopted City plans and codes to prevent the need for major private street reconstruction.

9. No private street shall be approved where undesirable impacts, such as vehicles backing onto the public sidewalk or street, will occur.

10. Left turns to and from a private street may be restricted either at the time of development or in the future if such maneuvers are found by the City to be unsafe.

11. The City shall not permit more than one private street opening on any property having a street frontage of 200 feet or less. This paragraph shall not apply if the property's street frontage is less than 200 feet, and the property is at least three acres in area.

12. The design and construction of private streets shall conform to all the requirements as established in this manual, the Fire Department development standards and meet the following design considerations and requirements.

3.1.1.10.1 Private Street Widths

1. Private streets that serve or will serve from three to nine lots, or dwelling units, must be a minimum of 20 feet wide and placed in an easement or tract having a minimum width of 25 feet. See BCC 14.60.190 for nonmotorized facility requirements.
2. Where private streets are widened to allow parking, such parking areas may be constructed with a pervious surface to reduce water runoff.
3. Private streets shall be paved full-width for their entire length.
4. All private roads shall be constructed to public street standards per the specifications shown in Design Manual Standard Drawings RC-100-1 and RC-110-1 and Design Manual Standard SW-100-1 for curb and gutter requirements. For short plats, the Review Engineer may allow modifications such as an inverted crown or a thickened asphalt edge rather than curb, provided that stormwater treatment will be adequate and safety will not be compromised.

3.1.1.10.2 Other Design Considerations

See Section 3.1.2, Design Speeds for more information about the minimum design speed for private roads.

1. If the private street is to exceed 150 feet in length with no connection to other streets, then it shall be provided with a turnaround to accommodate emergency vehicle turnaround movements. See Section 3.2.4, Street End Designs for turnaround requirements.
2. Streetlights installed on private roads shall be owned and maintained by the property owners or Puget Sound Energy if accepted by them.
3. A geotechnical analysis of the proposed private street design may be required at the discretion of the Review Engineer.
4. New private streets will be named by the City's Parcel and Address Coordinator. Appropriate street name signing shall be provided by the developer per Design Manual Standard Drawings SG-100-1, SG-110-1, SG-140-1, SG-160-1 and SG-170-1. The developer shall coordinate with the Transportation Department Inspector prior to sign installation to determine appropriate sign locations.

3.1.1.11 *Access Roads for Mixed-Use Developments, Planned Unit Developments and Unit Lot Subdivisions*

An access road is a type of private street that provides circulation and access to parking and loading sites within mixed-use, business and industrial developments. Typically, all access roads shall meet the requirements established under Section 3.1.1.10 Private Streets. Access roads, although not owned and maintained by the City, are reviewed and inspected by the City as part of the site development for conformance with the development conditions and requirements.

3.1.2 Design Speeds

Design speed is a selected speed used to determine the various geometric features of the roadway. The design of streets and roads shall depend upon their type and usage. The City of Bellevue speed limits are established in accordance with the City Code, Title 11 Vehicles and Traffic, Chapter 11.32. Speed.

The design speed of an existing facility shall be 5 mph above the posted speed and shall in no case be less than the minimum values established in Table 3-1. On new construction or reconstruction, which alters the characteristics of the roadway, the design speed shall meet the design speed values for each street type as established in Table 3-1.

The Design Engineer should consult the City Code and coordinate with the Review Engineer to confirm the proposed design speed. All streets should be designed for consistent and safe traffic speeds and for the safety of all users and travel modes. Posted speed and the design speed per street type shall be according to Table 3-1 unless otherwise noted.

Table 3-1: Street Design Speeds

Street Classification and Type	Minimum Design Speed (mph)
Major Arterial	35-45
Minor Arterial	35-45
Collector Arterial	35-45
Local Street	25-30
Half Street	25-35
Green Street	20-25
Shared Street	15
Alleyway	15-20

In general, the design speed serves as a basis for determining geometric elements of new streets and does not imply posted or legally permissible speeds.

3.1.3 Design Vehicles

The Design Engineer shall determine the appropriate design vehicle for a facility based on street type, the presence of truck and bus routes, land use context and the relative volumes and frequencies of certain vehicle types.

Vehicle swept path analysis and turning simulation exhibits are required for the design of new developments, driveways and intersections. Exhibits shall clearly show the outermost and innermost swept path of the specified design and control vehicles negotiating an intersection or driveway.

For clarity, the design vehicle is defined as the vehicle that frequently uses a facility that should be designed without encroaching into adjacent and opposing traffic lanes, sidewalk, planter or curb and gutter (e.g., turning lane to lane). While the control vehicle is the vehicle that infrequently uses a facility, minor encroachment into adjacent or opposing traffic lanes and multiple-point turns may be allowed (i.e., using available pavement to complete a turn).

The swept path analysis shall include exhibits for the design and control vehicles entering or leaving a project site, traversing the site, maneuvering for delivery and making turns at intersections. The turning simulation exhibits shall show the design vehicle using the curb lane in a multiple-lane street to enter and leave the site unless a left turn is allowed. Furthermore, the design vehicle should make the desired right or left turn without encroaching on the adjacent lanes, curbs and gutters or conflicting with other turn movements unless otherwise approved.

More specifically, the turning simulation exhibits shall show that the appropriate design vehicle swept paths are without encroachment into:

1. **An opposing lane of traffic in a public street**. The outside of the swept path shall be at least 1 foot inside the curb or edge of outside traffic lane when entering and exiting the site on a two- or three-lane street unless otherwise approved by the Review Engineer.
2. **An opposing lane of a two-way driveway**. Adjacent swept path of entering and exiting design vehicles should show at least 1 foot of minimum separation within driveways or as determined by the Review Engineer.
3. **Any parking stalls**. No design or control vehicle swept path shall be within 2 feet of any required on-street parking stalls.

4. **Areas outside of the reinforced concrete driveway approach apron and protected driveway throat**. The inside swept paths for entering and exiting design and control vehicles should be at least 1 foot inside the reinforced concrete driveway approach apron or as determined by the review engineer.

The Design Engineer may be required to provide evidence that the design of a facility can accommodate both the design and control vehicles.

The City of Bellevue uses the following typical design and control vehicles: AASHTO SU-30, AASHTO WB-40, AASHTO WB-67, fire truck (ladder), Republic Service garbage truck, King County Metro Transit bus, and school bus, but the minimum standard design vehicle for on-site movements is AASHTO SU-30 with a 42-foot turning radius.

3.2 Geometric Design Elements

The geometric design criteria for each project have both general and specific requirements. The general requirements are based on a variety of technical references, including but not limited to:

- City of Bellevue Transportation Design Manual, including Standard Drawings
- WSDOT Design Manual
- AASHTO guidelines
- NACTO Design Guides

The specific requirements may be based upon the initial land use action, the building permit, the Review Engineer and/or other conditions pertaining to site specifics. Furthermore, the geometric design elements in this section do not represent a complete reference on any specific topic. The Design Engineer must refer to the other sources and exercise professional judgment in designing the project.

3.2.1 Sight Distance – Vehicles and Pedestrians

3.2.1.1 General

All sight distance requirements described in this section are based on the current edition of AASHTO's "A Policy on Geometric Design of Highways and Streets" unless otherwise specified.

The Stopping Sight Distance, Intersection Sight Distance and Pedestrian Sight Distance requirements set forth in 3.2.1.2, 3.2.1.3 and 3.2.1.4, respectively, shall be met at all access points and intersections, as well as at every point along the curvature of an existing, new or reconstructed street, including along a development's frontage. The Review Engineer may require sight distance improvements beyond a development's frontage only when they are determined proportionate and necessary to ensure the health, safety and general welfare of the public.

3.2.1.2 Stopping Sight Distance

Stopping Sight Distance (SSD) is the distance needed for a vehicle traveling at or near the design speed of the street to stop before reaching a stationary object in its path. The provision of SSD is fundamental to the safe operation of the street. SSD shall be determined based on the design speed of the street, consistent with Section 3.1.2, as well as a driver's eye height of 3.5 feet and an object height of 2.0 feet above the pavement. The driver's line-of-sight may extend beyond the vehicular travel way of the street; for example, on a horizontal curve the sight line will be a chord of the curve. SSD shall be measured along the centerline of the vehicle's travel lane. The minimum SSD on streets with a grade of 3% or less is shown in Table 3-2. Sufficient SSD shall be provided at all crosswalks, including intersections and mid-block crosswalks.

Table 3-2: Stopping Sight Distance on Streets with Grades of Less Than 3%

Design Speed (mph)	Stopping Sight Distance (ft)*
20	115
25	155
30	200
35	250
40	305
45	360

Source: AASHTO 2018 7th Edition, Table 3-1
*Must be adjusted when street downgrade is 3% or greater.

Table 3-3 shall be used on streets with upgrades or downgrades of 3% or greater. SSD at grades other than those shown in Table 3-3 shall be designed in accordance with AASHTO.

Table 3-3: Stopping Sight Distance on Streets with Upgrades or Downgrades of 3% or Greater

Stopping Sight Distance											
SSD (feet) for Downgrade						SSD (feet) for Upgrade					
Design Speed (mph)	3%	6%	9%	12%	15%	Design Speed (mph)	3%	6%	9%	12%	15%
20	116	120	126	132	141	**20**	109	107	104	102	101
25	158	165	173	184	198	**25**	147	143	140	137	134
30	205	215	227	242	262	**30**	200	184	179	175	171
35	257	271	287	308	335	**35**	237	229	222	216	211

Stopping Sight Distance											
SSD (feet) for Downgrade						SSD (feet) for Upgrade					
Design Speed (mph)	**3%**	**6%**	**9%**	**12%**	**15%**	**Design Speed (mph)**	**3%**	**6%**	**9%**	**12%**	**15%**
40	315	333	354	382	417	**40**	289	278	269	261	255
45	378	400	427	462	507	**45**	344	331	320	310	301

Source: AASHTO 2018 7th Edition, Table 3-2

3.2.1.3 Intersection Sight Distance

The concept of intersection sight distance (ISD) allows drivers approaching an intersection to perceive the presence of potentially conflicting vehicles in sufficient time and distance to stop, adjust speed or wait in an effort to avoid colliding in the intersection. Sufficient ISD shall be provided at all intersecting street facilities and access points, whether private or public, to provide clear sightlines for vehicles approaching an intersecting roadway. ISD shall be determined based on the design speed of the street, consistent with Section 3.1.2, as well as a driver's eye height of 3.5 feet and an object height of 3.5 feet, assuming a passenger car as the design vehicle. ISD shall be measured along the centerline of the approaching vehicle's travel lane.

The "clear sight triangle" at an intersecting roadway is defined as the area bounded by the sight line, the ISD line, and a line that connects to a point in the center of the minor street approach lane at a specific setback point. See Standard Drawing RL-100-1. Setback distances and minimum ISD requirements for various intersection types are as follows:

1. **Major street (uncontrolled) and minor street (stop-controlled).** This type of intersection is typically a street of higher classification (with higher vehicular volumes), e.g., arterial or non-arterial (referred to as the "major street") and a street of lower classification (with less vehicular volumes), including but not limited to, collectors, local streets, driveways and private streets (referred to as the "minor street"). This intersection type typically has no control in the major street and a stop sign or flashing red signal on the minor street. Private commercial driveways (which may or may not have a stop sign) used by the public for entering any city street are also included in this intersection type.

   The right and left sight lines are defined as the lines that join a point in the center of the minor street approach lane located 14.5 feet back from the edge of the traveled way on the major street (Point A), and a point in the center of the major through-street approach lane (Point B). The locations of Points A and B in the minor street approach lane and the major through-street approach lane, respectively, are specified in Standard Drawing RL-100-1.

For this intersection type, the minimum ISD on the minor street approach shall be as shown in Table 3-4:

Table 3-4: Minimum Intersection Sight Distance

Design Speed (mph)	Intersection Sight Distance (ft)*		
	Left Turn from Stop	Right Turn from Stop	Crossing Maneuver
20	225	195	195
25	280	240	240
30	335	290	290
35	390	335	335
40	445	385	385
45	500	430	430

Source: AASHTO 2018 7th Edition, Tables 9-7, 9-9, 9-11.
*The values in this table are for a stopped passenger car attempting to turn onto, or cross, a two-lane street with no median and minor street approach grades of 3% of less. For other scenarios, adjustments will be needed. Refer to subsequent paragraph 5. Adjustments.

2. **Signalized intersection.** At signalized intersections, the first vehicle stopped on one approach should be visible to the driver of the first vehicle stopped on each of the other approaches. Moreover, vehicles making permissive movements at signalized intersections (e.g., right-turn-on-red-after-stop, permissive left turns, etc.) should have sufficient sight distance to select gaps in oncoming traffic.

   For signalized intersection approaches that permit right-turn-on-red-after-stop maneuvers, the left sight line shall join a point in the center of the minor street approach lane located 14.5 feet back from the edge of the through-street approach lane (Point A) and a point in the center of the outer through-street approach lane (Point B). The locations of Points A and B are specified in Design Manual Drawing RL-100-1.

   The minimum ISD required for the right-turn-on-red-after-stop maneuver shall be per Table 3-4.

3. **Residential driveway intersection (serving two or less dwelling units).** For the intersection of a residential driveway with a public street, the sight line shall join a point in the center of the driveway approach lane located 14.5 feet back from the edge of the through-street approach lane (Point A) and a point in the center of the outer through-street approach lane (Point B). For residential driveways with major obstacles or other special circumstances obscuring sight distance, the location of Point A may be reduced to a minimum of 10 feet from the edge of the traveled way, with approval of the Review Engineer, where the reduction in driver's eye location

will not adversely affect safety or operation. Examples where this may be allowed include: an intersection on the outside of a horizontal curve; an intersection where one approach is in a cut or fill; or where a bridge abutment obscures the line of sight from 14.5 feet back but not 10 feet. The locations of Points A and B are specified in Standard Drawing RL-100-1.

The minimum ISD on the driveway approach shall be per Table 3-4.

4. **Roundabouts.** For ISD at roundabouts, entering vehicles must have a clear view of traffic on the circulating roadway and on the immediate upstream approach in order to aid in judging an acceptable gap. Sufficient SSD and ISD at roundabouts shall be provided in accordance with the WSDOT Design Manual Section 1320.04(8)(a) and 1320.04(8)(b) Stopping Sight Distance and Intersection Sight Distance.

5. **Adjustments.** The ISD values provided in Table 3-4 are for a stopped passenger car attempting to turn onto, or cross, a two-lane street with no median and minor street approach grades of 3% or less. ISD values for access points or intersections that will handle heavy vehicles, as determined by the Review Engineer, allow vehicles to make a turning or crossing maneuver onto a multilane roadway (including turn lanes and median widths), or have approach grades in excess of 3%, shall be adjusted in accordance with AASHTO standards. AASHTO Chapter 9-5 Intersection Sight Distance, shall be referenced when making time gap adjustments for heavy vehicles, number of lanes or approach grades.

   Note that the time gap adjustment for the minor street approach grade is necessary only if the rear wheels of the design vehicle would be on an upgrade that exceeds 3% when the vehicle is at the stop line of the minor street approach.

   If a time gap adjustment is necessary, the ISD must be recalculated using AASHTO Formula 9-1:

$$\mathbf{ISD = 1.47\ V_{MAJOR}\ T_S}$$

   Where:
   - ISD = intersection sight distance in feet, measured along the major street.
   - V_{MAJOR} = design speed of major street in mph.
   - T_S = time gap for minor street vehicle to enter major street in seconds.

3.2.1.4 Pedestrian Sight Distance

The minimum sight distance for pedestrian safety shall be as shown in Design Manual Drawing RL-120-1 and determined as follows: The driver of an existing vehicle shall be able to view a 1-foot-high object 15 feet away from the edges of the exiting lane or lanes, measured at the back of the sidewalk, when the driver's eye is 14.5 feet behind the back of the sidewalk.

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

3.2.1.5 Sight Obstructions

1. For the purposes of this standard, sight obstructions are objects that block or obscure the view of motor vehicle operators at the intersection of two public streets or at the intersection of a public street with a driveway (or private street), or intersecting private streets to ensure the health, safety and general wellness of the public. Sight obstructions are not permitted above a line 2 feet above the street surface and below a line 7.5 feet above the street surface.
2. Development proposals shall demonstrate that no vehicle will be parked (or any sign, fence, rail, hedge, shrubbery, natural growth or other obstruction installed) that obstructs the view of motor vehicle operators at an intersection within the sight areas established in Sections 3.2.1.2, 3.2.1.3, 3.2.1.4 and between the height limits established herein.
3. Sight lines from vehicles to traffic control devices, including but not limited to, signs and signals, shall not be obscured by landscaping, street furniture, marquees, awnings or other such obstructions.
4. Every obstruction of the sort prohibited in this section hereafter installed or permitted to remain shall be deemed a violation of this sight distance standard, unless approved through a deviation.
5. All development proposals are required to meet sight distance requirements per the Transportation Development Code (Bellevue City Code 14.60.240 and 14.60.241). It shall be the applicant's responsibility to accomplish any activities necessary to provide sight distance, such as trimming or removal of vegetation or regrading of earth.

3.2.1.6 Special Circumstances

If circumstances are different from those presented in these Standards (e.g., railroad crossings, multipurpose paths, etc.), the Engineer may establish sight distance standards and requirements that generally conform with the intent of the sight distance guidelines in the latest edition of AASHTO, WSDOT Design Manual and/or other technical references specified in Section 1.2 to ensure the health, safety and general welfare of the public.

3.2.2 Horizontal Alignments

All roadway designs shall comply with the guidance in the current edition of the AASHTO Green Book, A Policy on Geometric Design of Highways and Streets and WSDOT's Design

Manual. Centerline alignment of improvements should be parallel to the centerline of right of way and the centerline of a proposed roadway extension shall be aligned with the existing centerline. Alignment should be as direct as possible consistent with topography.

3.2.2.1 Horizontal Curves

Horizontal curves shall be designed to provide the minimum radii required for vehicles to safely negotiate a turn without leaving their driving lane and shall in no case violate minimum sight distance requirements. The designer shall refer to the AASHTO Policy and WSDOT's Design Manual for a determination of minimum acceptable horizontal curves at centerline of arterial and non-arterial streets. The vehicle speed shall be the design speed as discussed in Section 3.1.2 of this design manual. Streets shall be designed with a standard pavement cross section where feasible. However, where necessary and justified, a super-elevation greater than the standard cross slope may be considered. In general, horizontal curves shall meet the minimum radii requirements shown in Table 3-5 with no impact to the minimum sight distance requirements as per Section 3.2.1, Sight Distance - Vehicles and Pedestrians.

For design speeds above 40 mph, horizontal curve design shall comply with Chapter 1250 of the WSDOT Design Manual.

Table 3-5: Minimum Horizontal Curve Radius at Centerline

Design Speed (mph)	Minimum Horizontal Curve Radius (feet)[1,2]
45	1039
40	762
35	510
30	333
25	198
20	107
15	TBD[3, 4]

[1] Refer to Table 3-13 Minimum Radii and Super-elevation for Low-Speed Urban Streets of AASHTO Green Book, 7th Edition 2018.
[2] The horizontal curve radii shown in Table 3-5 is based on -2% reversed crown at the centerline.
[3] Design speed will be determined in coordination with the Review Engineer.
[4] Horizontal curve radii for this street type will be determined by the Design Engineer based on the specified design speed.

Additional requirements for horizontal curves include:

1. Horizontal curves should meet the minimum radius requirements as shown in Table 3-5.
2. For small deflection angles up to 5 degrees, horizontal curve lengths need to be adjusted to avoid the appearance of "kink" in order to maintain driver comfort. Refer to Table 3-6 for more information on the minimum length of curve.
3. Reversing horizontal curves should be separated by at least 50 feet of tangent (100 feet on arterials).
4. Access roads with curves must be evaluated with turning templates and made wider as needed.
5. For the minimum length of super-elevation runoff, the designer shall follow AASHTO A policy On Geometric Design of Highways and Streets, Chapter 3, Section 3.3.8 Transition Design Controls and WSDOT Design Manual.

Table 3-6: Minimum Length of Curve for Small Deflection Angles up to 5 Degrees

Design Speed (mph)	Minimum Length of Curve (feet)
45	250
40	200
35	150
30	100
25	50

3.2.2.2 Tapers and Transitions

For new development projects, tapers and transitions beyond the project frontage are required as deemed necessary for safety purposes. The lane-drop taper length for posted speed of 40 mph and less shall be computed using Table 3-7, Minimum Taper Rate and shall be in conformance with the current Manual on Uniform Traffic Control Devices (MUTCD) as referenced by AASHTO.

Table 3-7: Minimum Taper Rate

Posted Speed (mph)	Taper Rate
40	27:1
35	21:1
30	15:1
25	11:1
20	7:1

The minimum transition length is equal to the taper rate multiplied by the width of the added lane or pavement widening.

In general, transitions should be made on a tangent section whenever possible and should avoid locations with horizontal and vertical sight distance restrictions. Whenever feasible, the entire transition should be visible to the driver of a vehicle approaching the narrower section. The design should be such that at-grade intersections within the transition are avoided.

In case of increasing the number of lanes, a tangential rate of change in the range of 1:4 to 1:15 may be allowed subject to the Review Engineer’s approval. For left-turn median channelization widening, refer to Design Manual Standard Drawing CH-190-1.

The street width transitions requirement may be reduced if traffic is not expected to use the shifting roadway (e.g., at the beginning or end of street frontage improvements) subject to the Review Engineer’s approval.

3.2.3 Vertical Alignments

The vertical alignment of the City’s public and private roadways should conform to the following general requirements:

1. Use a smooth grade line with gradual changes, consistent with the context identification and character of terrain. Avoid numerous breaks and short grades.
2. Avoid “roller coaster” or “hidden dip” profiles by use of gradual grades.
3. Avoid broken back grade lines with short tangents between two vertical curves.
4. Where at-grade intersections occur on roadways with moderate to steep grades, it is desirable to flatten or reduce the grade through the intersection.
5. When a vertical curve takes place partly or wholly in a horizontal curve, coordinate the two as per WSDOT Design Manual.

6. The minimum length of a vertical curve is controlled by design speed, stopping sight distance and the change in grade.
7. The maximum roadway gradient is based on the adjacent land use contexts, street type and design speed. Refer to Table 3-8 for maximum allowable grade.
8. Grade transitions shall be constructed as smooth vertical curves, without angle points, except as otherwise specified in Section 3.2.3.2, Longitudinal Grades and Grade Breaks.
9. Ensure that a landing is provided at intersections on the secondary or subordinate approach or on a stop-controlled approach.
10. Measure landings from the edge of pavement of the intersected roadway at full development and with an average grade no greater than 5% at signalized intersection or no traffic control intersection
11. The design and placement of vertical curves must consider ADA compliant crosswalk slopes and curb ramps.

3.2.3.1 Vertical Curves

A vertical curve is used to avoid the sudden change of direction when moving from one grade to another. They should be properly designed to provide adequate sight distance, safety, comfortable driving, good drainage and pleasing appearance.

The Design Engineer shall refer to the AASHTO Green Book and Chapter 1220 of WSDOT Design Manual for the vertical curves design requirements. Designing for the greatest possible stopping sight distance should be considered. See Section 3.2.1, Sight Distance - Vehicles and Pedestrians for more information.

In general, the design of the vertical curves shall conform to the following design requirements.

1. For new construction (building a street where one does not currently exist), the minimum length of the vertical curve must meet stopping sight distance or have a length at least three times the design speed, whichever is greater.

Table 3-8 gives the design stopping sight distances for grades less than 3%, the minimum curve length for a 1% grade change to provide the stopping sight distance for a crest (Kc) and sag (Ks) vertical curve, and the minimum length of vertical curve for the design speed (VCLm).

Table 3-8: Minimum Vertical Curve Length for Stopping Sight Distance

Design Speed (mph)	Design Stopping Sight Distance (ft)	Kc	Ks	VCLm (ft)
45	360	61	79	135
40	305	44	64	120
35	250	29	49	105
30	200	19	37	90
25	155	12	26	75
20	115	7	17	60

[1] Design speed for each street type will be determined in coordination with the Review Engineer.
[2] Refer to Tables 3-35 and 3-37, Design Controls for Crest and Sag Vertical Curves Based on Stopping Sight Distance of AASHTO Green Book, 7th Edition 2018.

For grades of 3% or steeper, use WSDOT Design Manual, Exhibit 1260-5 for crest vertical curve length (L) and Exhibit 1260-7 for sag vertical curve length (L) with S equal to the SSD from Table 3-9.

Table 3-9: Design Stopping Sight Distance on Grades

Design Speed (mph)	Stopping Sight Distance (ft)					
	Downgrade			Upgrade		
	-3%	-6%	-9%	3%	6%	9%
45	378	400	427	344	331	320
40	315	333	354	289	278	269
35	257	271	287	237	229	222
30	205	215	227	190	184	179
25	158	165	173	147	143	140

2. K-Sag values may be reduced to K-Crest values if adequate street lighting is present along the entire sag vertical curve.

Where approved, the sag vertical curve length as shown in Table 3-9 may be reduced to an absolute minimum as determined by the “comfort criteria” in accordance with the AASHTO Policy. In addition, the area must also have adequate fixed-source lighting (street lighting) already or as a part of the project.

3.2.3.2 Longitudinal Grades and Grade Breaks

Street grade should conform closely to the natural contour of the land; however, in some cases, a different grade may be required.

The minimum allowable grade will be 1% along the crown and vertical curb line. In general, maximum allowable grade is dependent upon the street type as shown in Table 3-10.

Table 3-10: Maximum Allowable Grade

Design Speed (mph)	Maximum Grade (%)[1, 2]
45	8
40	8
35	10
30	12
25	15
20	15
TBD	15

[1] The maximum grade may be modified on a case-by-case basis in areas where steep hills and grades are the norm, and the permissible grades cannot be attained. For the BelRed area streets, if a maximum grade of 12% cannot be attained, the Review Engineer may require the roadway surface to be concrete (rigid) pavement instead of the standard hot mix asphalt (HMA) surface.

[2] For other local streets and private streets, exceeding 15% grade will require Fire Department and Utilities Department approval to ensure additional fire protection requirements are met, and appropriate methods will be used to ensure drainage is controlled.

Grade transitions shall be constructed as vertical curves except at locations where algebraic difference is 0.5% or less. For private streets and access roads, a grade break will be allowed with algebraic difference in grade of 1% or less.

In addition, where pedestrian access routes are contained within a street right of way, the grade of the pedestrian access route shall be equal to the general grade established for the adjacent street. Where pedestrian access routes are not contained within a street right of way, a maximum grade of 5% is required.

3.2.4 Street End Designs

New streets shall be planned, designed and constructed to connect to existing or future streets except when existing right-of-way limitations or existing topography conditions might preclude this. If a connection to an existing or future street is infeasible, a turnaround facility shall be provided for all dead-end public streets and private streets greater than 150 feet in length that meet the following requirements:

1. A circular turnaround per Design Manual Drawing RC-130-1 shall be provided for streets that serve (or will serve) 10 or more dwelling units.

2. A hammerhead per Design Manual Drawing RC-130-1 may be used to fulfill the requirement to provide a turnaround facility where the street serves (or will serve) nine or fewer dwelling units.
3. A permanent turnaround area must have a minimum right-of-way radius of 50 feet. If the street or roadway section is not required to be accessed by fire trucks, a smaller radius circular turnaround may be allowed. Dedication of additional right-of-way width may be required to accommodate the turnaround. Sidewalks and utilities may be placed within a public easement at the discretion of the Review Engineer.
4. Hammerhead width may range from 90 feet to 120 feet depending upon street length. A width less than 120 feet is allowed only if all homes served by the hammerhead have sprinklers installed.
5. Alternative street end designs may be allowed subject to the review and approval of the Review Engineer and Fire Marshal.
6. Streets that temporarily dead-end and will be extended in the future need not have a turnaround facility unless determined necessary by the Review Engineer and the Fire Marshal. When no turnaround facility is provided, street end barricading shall be installed and must conform to the most recent edition of the Manual on Uniform Traffic Control Devices.
7. Turnaround facilities need to be accessible at all times and cannot be located on driveways.
8. Removal of the temporary cul-de-sac and reconstruction of the street shall be the responsibility of the developer who extends the street or road. Reconstruction shall include demolition and wastehaul of all temporary improvements, grading and subgrade preparation, extension, installation of storm drainage (if required), curbs, gutters, sidewalks and other improvements to make for a complete and whole street section.
9. The maximum cross grade of a street at the street end shall be 8%.

3.3 Cross Section Elements

The cross section as defined by AASHTO Green Book is the vertical section of the ground and roadway at right angle to the centerline of the roadway, including all of a street from back-of-curb line to back-of-curb line or right-of-way line to right-of-way line. This section provides information on cross section element requirements based on street types as established in Section 3.1.1 of this design manual. Standard design cross sections may include, but are not limited to, right-of-way lines and widths, roadway widths, planting strips, existing and new grades, slope lines, sidewalks, street trees, curbs, gutters, crowns, depression lines, thickened edges, pavement, water mains, sanitary sewers and storm drains.

3.3.1 Street and Lane Widths

Minimum street width is determined by the following key elements:

1. Street type: Some street types may need narrower lane widths to design for lower-speed environments.
2. The designation of the street as part of a truck and/or bus route.
3. The need for on-street parking to be accommodated.
4. The need for a bicycle facility.
5. The need to accommodate traffic barriers and the required shy distance.

Table 3-11: Pavement and Lanes Typical Width

Street Type[2]	Typical Number of Lanes[1]	Typical Pavement Width (feet)[3, 4, 5]	Typical Vehicular Travel Lane Width (feet)[6]
Major Arterial	3-5	34-56	11-12[7, 8]
Minor Arterial	3-5	34-56	11-12[7, 8]
Collector Arterial	2-3	34-46	11-12[7, 8]
Downtown Local Street	2	22-28	11[7, 8]
BelRed Local Street	See Appendix B, BelRed Streetscape Plan		
Residential Local Street (without parking) (with parking on one side) (with parking on both sides)	2	22 28 36	10[7, 8]
Half Street	2	22	10
Alleyway	1-2	20[9]	10-16[9]

Street Type[2]	Typical Number of Lanes[1]	Typical Pavement Width (feet)[3, 4, 5]	Typical Vehicular Travel Lane Width (feet)[6]
Private Access Road for Small Lot Subdivision and Planned Unit Development	2	20 (Minimum)	10

[1] The values presented in this table are typical number of lanes and widths for streets within the City of Bellevue; where existing conditions differ from these values, the Review Engineer may allow the Designer to match existing conditions.
[2] Right-of-way width requirements vary for each street type.
[3] Pavement width as shown on Table 3-11 does not account for bicycle lane width. Additional width may be required.
[4] Pavement width as shown on Table 3-11 (except Residential Local Street) does not account for parking lanes. Additional width may be required.
[5] When guardrails are necessary, additional pavement width may be required.
[6] All lane widths must be measured from the center of the pavement markings.
[7] Lane width on arterials, collectors and local streets is inclusive of the gutter width.
[8] A median shall be in addition to, not part of, the specified street width.
[9] A minimum width of 16 feet for a one -way alleyway may be allowed if fire access is not required and the width is approved by the Fire Marshal.

3.3.2 Parking Lanes

On-street parking may be added in urban environments if approved or required by the City. The City standard is parallel parking in public right of way along the curb, and it requires a minimum of 8 feet of paved width. Angled on-street parking may only be considered if there is adequate street width; speeds are below 25 mph; and there are other constraints, such as environmental, topographical or other unique circumstances exist. The location of bicycle lanes should be carefully considered in areas with on-street parking. On-street parking may be restricted for safety and/or functionality. Further coordination with the Review Engineer is required to determine the location of the bike lane with respect to the on-street parking lane. When determining the locations of on-street parking, designers should consider sight distance, delivery access, and emergency access for existing and proposed developments along the street. On-street parking is designated for public use and will not be counted toward the required parking space that needs to be provided by the development. Where on-street parking is provided, curb extensions also known as “curb bulbs“ should be provided at intersections (and midblock crossings to minimize crossing distance, see Section 3.8.8 for more information on curb extension design requirements. To preserve safe sight distance, on-street parking is prohibited within 20 feet of the intersection, measured from the crosswalk limit. No parking or curb activity will be allowed within 15 feet of any fire hydrant.

3.3.3 Curbs and Gutters

Curbs serve the following purposes: drainage control, pavement edge delineation, set right-of-way limits, aesthetics preservation/enhancement, pedestrian walkway delineation, maintenance operations reduction and as an aid to orderly roadside development.

1. Cement concrete traffic curbs and gutters shall be used for street edges, whenever possible, and shall always be used under the following conditions:
    a. On all public streets
    b. On all development frontage as part of the required improvements unless approved otherwise by the Review Engineer
    c. In drainage low spots where special drainage facilities are required
    d. On private streets with grades greater than 8%
2. Cement concrete traffic curbs shall be used for edges of islands and medians, provided that where emergency access across the median is required, the curb shall be a cast-in-place mountable type.
3. All other curbs and gutters shall be constructed as specified in Design Manual Drawing SW-100-1.
4. For rigid pavement and where curbs and gutters or integral curbs are used, the aggregate base should extend beyond the face of the curb.
5. All curbs and gutters shall flow into the stormwater system, which might include a catch basin, curb cut or other facility. Additional catch basins or extensions of the curbs and gutters may be required to ensure stormwater is conveyed appropriately.
6. When new curbs and gutters are constructed, they shall be located in the permanent location required for the street type and the land use zone. Additional paving shall be provided between the existing edge of pavement and the new curbs, as needed.

3.3.4 Cross Slopes

Undivided traveled way on tangents, or on flat curves, have a crown or high point in the middle and a cross slope downward toward both edges. Unidirectional cross slopes across the entire width of the traveled way may be utilized as approved by the Review Engineer using the criteria below. On divided traveled way on tangent, each one-way traveled way may be crowned separately as on two-lane streets, or it may have unidirectional cross slopes across the entire width of the traveled way subject to Review Engineer approval. The design of street shall conform to the following requirements:

1. Street cross slopes must be designed in accordance with AASHTO requirements. Cross slopes for the two lanes adjacent to the crown line shall not exceed 2%. Where three or more lanes are provided in each direction, the maximum pavement cross slope should be limited to 4% (per current AASHTO 2018, 7th Edition, A Policy on Geometric Design of Highways and Streets).
2. The design of a half street section shall consider the future permanent improvements and the cross section shall be adjusted accordingly.
3. In cases where elevations are extreme between cross section points at the property lines, the street sections may be transitioned to provide a pavement crossfall in the same direction for the full width of the street pavement.
4. Alley cross sections may be V-shaped with a transverse slope of 2.5% toward a center V gutter. Runoff will thereby be directed to a catch basin in the alley or to connecting street gutters as approved by the Utilities Department. Where alleys cross sidewalks, accessibility on sidewalks must be maintained.
5. Steeper cross slope for alleys may be approved by the Review Engineer if a concrete pavement surface is proposed by the development with a minimum thickness that can withstand the load from trash collection trucks, emergency trucks and moving trucks that will commonly be operating in the alleys.
6. If existing conditions require different cross slopes, approval by the Review Engineer is required.
7. When an alley is part of an ADA-accessible route, a portion or the entire cross slope may need to be adjusted to meet current ADA standards.
8. On rigid pavement streets with an odd number of lanes, the crown should be offset to a lane line to prevent locating a joint in the middle of a traffic lane.
9. Refer to Section 3.8.1, Design Considerations, for intersection cross slope.

Table 3-12: Standards Cross Slope Per Street Type

Street Type[1]	Allowable Cross Section[2]	Standard[3,4]
Public Streets	NC, RC	2%
Alleyway	NC, RC, VC	2.5%
Private Street	NC, RC, VC	2%
Half Street	NC	2%
Access Road	NC, RC	2%

[1] The data in this table are based on the design of a full street section.
[2] Definitions - NC: Normal Crown, RC: Reversed (superelevated) Crown, VC: V-Shape Cross Section (Inverted Crown).
[3] In areas where the pavement width is being added to an existing street or must vary to accommodate existing infrastructure, the slopes may vary from the standard cross slopes shown above.
[4] To maintain the design speed, the crown of the street centerline at the horizontal curve section may be designed as a reversed cross slope (super-elevated with -2%) to overcome part of the centrifugal force that acts on a vehicle negotiating a curve section.

3.3.5 Islands and Medians

On urban streets where left-turn movements are common, medians are often used to regulate the left-turn movements and improve street aesthetics. Median Islands shall be designed using the same geometric criteria as the street on which they will be constructed. Medians shall also meet the following requirements.

1. Medians shall be in addition to, not part of, the specified street width unless otherwise specified by the Review Engineer. Medians shall be designed so as not to limit turning radius or sight distance at an intersection. Pedestrian access across medians shall be as required by the Review Engineer and shall conform to ADA standards.

2. Medians shall be designed so as to allow for the full width needed in adjacent lanes for any existing or planned bicycle facility.

3. Median edges shall be a concrete traffic curb. Where emergency vehicle access across the median is required, the curb shall be a mountable type. See Design Manual Drawing RC-140-1.

4. The minimum width of raised medians should be no less than 4 feet as measured from the edge of pavement of the travel lane, with a maximum width as appropriate for their specific corridor. Refer to Section 1239.08(2) of WSDOT Design Manual for median design on low and intermediate speed streets. Medians may be designed for collector and local streets if approved by the Review Engineer.

5. Medians and their contents (light pole pedestals, signage, etc.) must be placed such that the required sight distance in the intersection is not obstructed.
6. Nose areas must be paved back to a minimum of 5 feet, measured from the tip of the nose or as approved by the Review Engineer.
7. AASHTO Green Book policies should be followed in the sizing of islands. Islands should be at least 100 square feet in area. A shy distance of at least 12 inches should be provided between the island and edge of the traveled way.
8. A median refuge island/median cut-through is a protected space in the center of a street to facilitate bicycle and pedestrian crossings. They should be designed to provide a minimum width of 10 feet unless otherwise approved by the Review Engineer. See Standard Drawing RC-121-1 for more information.
9. When islands are built on existing pavement, the underlying pavement should be removed to provide appropriate drainage based on the soil type, tree type and topography of the island surface.
10. For pedestrian and motorist safety, trees, shrubs and groundcover plants shall not obscure the pedestrian sight distance at the refuge islands.
11. Median hardscapes shall be stamped concrete with colors and patterns as determined to be required by the Review Engineer.
12. Restricted access driveway islands are used to restrict turning movements out of or into driveways. Turning restrictions at driveway locations shall be by one or more of the following methods as deemed appropriate by the Review Engineer.
    a. Median islands
    b. Mountable curbs or C curbs
    c. Pork chops
    d. Signage

    All islands should be designed according to Chapter 1239 of WSDOT Design Manual.
13. Other types and shapes of islands that may be designed at driveways or intersections may be reviewed on a case-by-case basis to determine their function and applicability as well as design details requirements.

3.3.6 Private Property Transitions Behind Sidewalks (Cut-and-Fill Slopes)

1. Cut-and fill-slopes shall be no steeper than 2:1 unless otherwise approved. When varying from this standard, geotechnical information may be required to support the request.
2. The toe of the fill or the top of the cut (toe/top of slope) shall be a minimum of 12 inches behind the back of the sidewalk to allow for construction and maintenance of the sidewalks and shall be sloped no steeper than 2%. Refer to RC-100-1 and RC-110-1 for more information.
3. In areas where sidewalks will not be constructed at this time, the toe/top of slope shall be a minimum of 12 inches behind the future sidewalk alignment. This 12-inch transition zone shall be sloped at 2% or flatter. Special designs differing from these typical cases can be proposed and shall be evaluated on a case-by-case basis.
4. For slopes, the designer is required to refer to Section 3.4.1.2 and Standard Drawing RS-100-1 to determine whether pedestrian safety railing is warranted behind the sidewalk.
5. Refer to Section 3.6.2 for retaining walls requirements.

3.3.7 Pavement Design

3.3.7.1 Flexible Pavement

The compacted pavement thickness for arterial and collector streets shall be 10 inches minimum; the compacted Hot Mix Asphalt (HMA) Class ½" PG 58H-22 depth should conform to WSDOT standard specification 5-04. High-traffic volume roads may require HMA class PG 58V-22. The Review Engineer may require a geotechnical report/soil analysis. Additional pavement thickness may be required; it depends on the results of the soil analysis.

3.3.7.2 Rigid Pavement

The City of Bellevue follows WSDOT Standard Specification and Standard Plans for all rigid pavement work.

- Cement Concrete Pavement Joints: WSDOT Standard Plan A-40.10-04
- Cement Concrete Pavement Rehabilitation: WSDOT Standard Plan A-60.10-03
- Roundabout Cement Concrete Curbs: WSDOT Standard Plan F-10.18-03

3.3.7.3 Permeable Pavement

The City of Bellevue Transportation Department encourages project owners and designers to utilize natural drainage practices as a method to mitigate stormwater runoff resulting from the addition of impervious surfaces to a site. Permeable pavement is an acceptable option for meeting on-site stormwater management, runoff treatment or flow control requirements and is permitted within the City of Bellevue right of way only if:

1. None of the infeasibility criteria are met as listed in the most current version of the Washington State Department of Ecology "Stormwater Management Manual for Western Washington" (BMP T5.15: Permeable Pavements).

2. All infiltration feasibility criteria requirements are met from the most current version of the City of Bellevue "Surface Water Engineering Standards."

3. The proposed pavement is for roads with very low volumes (ADT <400 per DOE SMMWW BMP T5.15: Permeable Pavements) and special design requirements and reviews will be applied.

3.3.7.4 Pavement Widening (Streets and Intersections)

If required, pavement widening shall follow Sections 3.3.7.1 and 3.3.7.2 requirements, which depends on the type of adjacent lane pavement. Regardless of the existing adjacent pavement condition, the newly placed pavement shall follow the current standard.

3.4 Multimodal Design

All multimodal facilities must be designed in accordance with the most current ADA standards and guidance and the requirements of this design manual. This section sets forth the minimum criteria to be used in the design of all multimodal requirements within the rights of way and other public easements and is based on criteria from the following references: The NACTO Urban Street Design Guide, U.S. Access Board, PROWAG, the current City of Bellevue Mobility Implementation Plan (MIP), WSDOT Standard Specifications, and all other City of Bellevue Department of Transportation requirements.

The Review Engineer will determine the specific design elements of these required facilities based upon the guides referenced above.

3.4.1 Pedestrian Design

All pedestrian improvements shall comply with the PROWAG standards for a pedestrian access route and the requirements of this design manual. The City MIP provides information for future pedestrian connectivity planned throughout the city and tools that can be used ultimately to implement a sustainable, equitable and multimodal transportation system that is safe and accessible for everyone. Additional requirements for pedestrian design are listed below:

1. Pedestrian facilities may include sidewalks, shared-use paths, trails and through-block pedestrian connections/paths. Sidewalks may be required on both sides of all city streets. Refer to the City of Bellevue Transportation Development Code, Section 14.60.190 Non-Motorized Facilities for sidewalk-specific requirements.
2. Internal pedestrian circulation systems shall be provided within and between existing, new and redeveloping commercial, multi-family and single-family developments and other activity centers and shall connect to pedestrian systems and transit facilities fronting the development. If the nonmotorized facility is intended to serve more than one property, the Review Engineer may require that it be placed within an easement as described in the City of Bellevue Transportation Development Code, Section 14.60.100.
3. Pedestrian facilities improvements like sidewalks and shared-use paths shall be constructed within the public rights of way or public easements as determined by the Review Engineer. Refer to the City of Bellevue Transportation Development Code, Section 14.60.090, 14.60.100 and Section 3.7, Utilities for easements and utility placement requirements.

3.4.1.1 Sidewalks

All public sidewalks must comply with the requirements of the most current accessibility standards and guidelines, which include requirements for sidewalk cross slopes, grades, locations, markings, surface treatments and curb ramps. In general, sidewalks are required for all public and private streets and shall be provided as listed below. Refer to the City of Bellevue Transportation Development Code, Section 14.60.190.

1. On both sides of all arterial streets.
2. On both sides of all local streets 300 feet or longer and on one side of all local streets less than 300 feet in length.
3. On both sides of all public streets that provide access to existing or planned sidewalks, activity centers, parks, schools, neighborhoods, public transit facilities or the regional trail system.
4. On one side of public dead-end streets, ending at the property line nearest the transition to a circular turnaround or hammerhead. This requirement may be waived at the discretion of the Review Engineer.
5. On one side of private dead-end streets providing access to facilities mentioned in item number 3 of this section, ending at the property line nearest the transition to a circular turnaround or hammerhead. This requirement may be waived at the discretion of the Review Engineer.

All sidewalks shall meet the following design criteria:

3.4.1.1.1 Sidewalk Accessibility

1. All public sidewalks must comply with the requirements of the most current accessibility standards and requirements for ADA and PROWAG. Furthermore, all sidewalk cross slopes shall be designed to 1.5% and not exceed 2%. The sidewalk running slope shall not exceed 5% except where the grade established for the adjacent street exceeds 5.0%. In this case, the grade of the pedestrian access route can match the grade established for the adjacent street. Refer to standard Drawing SW-110-1 for more details.

2. The grade for pedestrian access routes not contained within a street shall not exceed 5%. All sidewalks shall maintain the full required width, free of all obstructions including utilities, signage, street trees, furniture or other elements, permanent or temporary.

3. Full sidewalk widths shall be provided behind the landing of the curb ramps at intersection corners.

4. No above-ground utilities shall be permitted within planter strips, sidewalks or multi-purpose paths. Transformers and utility vaults to serve the development shall be placed inside the building or behind sidewalks or multipurpose path easements. Vaults serving a broader public purpose may be located within a public easement or right of way as approved by the Review Engineer. To the extent feasible, no utility vaults may be located within the primary walking path in any sidewalk. All new and existing utilities lids within the sidewalk must be non-slip/non-skid type per ADA requirements and as specified by the Review Engineer.

3.4.1.1.2 Sidewalk Horizontal and Vertical Alignments

Horizontal and vertical curves on all sidewalks must follow the roadway design criteria. For shared-use path criteria, see Section 3.4.1.3 for more information.

3.4.1.1.3 Meandering Sidewalks

The Review Engineer may approve meandering sidewalks away from the street without reducing the required width of the planter when the sidewalk extensions are constrained by mature trees that are required to be preserved. Additional easements may be required to accommodate the meander of the sidewalks and the surface features. Sidewalks shall maintain their full width around one side of any obstructions that cannot be relocated.

3.4.1.1.4 Landscape Planters and Street Trees

Sidewalk and other pedestrian facilities should be located adjacent to landscape strips or street trees or other physical buffers from vehicular traffic unless otherwise approved. See Section 3.4.1.6 for more information on landscape planter and street trees design.

3.4.1.1.5 Sidewalk Surfaces and Thickness

1. All sidewalks shall be constructed with 5-inch-thick Class 3000 concrete with a non-slip broom finish. Sidewalk sections at driveway approaches shall be a minimum of 6-inch-thick Class 4000 concrete with a minimum compressive strength of 3000 psi prior to opening for traffic. Sidewalk sections within commercial and heavy truck traffic entrances, including private streets and alley entrances, must be constructed with a minimum of 8-inch-thick Class 4000 concrete. Refer to the City of Bellevue Standard Drawings SW-140-1 to SW-190-1 for more details. Finishing pattern, texture and color of the sidewalk paving should continue across the private street, alley or driveway approach.

2. Specialty finishes may be allowed with the approval of the Review Engineer when the proposed material will provide an ADA-compliant non-slip surface when wet and the adjacent property owner agrees to maintain, repair and replace the specialty material at her/his own expense, even when the maintenance is made necessary because of City work. If approved, a Right-Of-Way Hold Harmless and Indemnity Agreement will be required in this case.

3. Subgrade compaction requirements shall comply with the WSDOT Standard Specifications and City of Bellevue Standard Drawing SW-110-1.

3.4.1.1.6 Sidewalk Drainage

Sidewalks should always slope away from buildings toward planter strips unless otherwise approved by the Review Engineer.

3.4.1.1.7 Sidewalk Connectivity

1. If rights of way or public easements are adequate, the applicant may be required to connect the new sidewalk to an existing sidewalk that is terminated midblock of the proposed pedestrian facility. The connection may include the associated improvements, such as curbs and gutters, and landscaping.

2. The design of all sidewalks shall provide for a gradual taper rather than an abrupt transition between sidewalks of different widths or alignments.

3. The Review Engineer may require extended off-street walkways to provide direct connections for ease and safety of pedestrians.

3.4.1.1.8 Downtown Sidewalks

Additional requirements are applied to sidewalks in the downtown area and are subject to Land Use Code 20.25A Downtown. Downtown projects are also subject to special requirements through the design review process.

1. The sidewalk and planter width in the downtown area shall be determined in accordance with Section 20.25A.090.A.1 of the Land Use Code and the relevant provisions of the Transportation Design Manual. The width of the sidewalk is measured by subtracting up to a maximum of 5 feet for the planter strip or tree pit from the total combined width prescribed in Figure 20.25A.090.A.1 of the Land Use Code. Note that the curb width is not included in this measurement. If a wider planter strip or tree pit is desired, it may be permitted, but additional width will be added to the combined sidewalk and planter width requirement.
2. If any street in the downtown area is not listed or prescribed in Figure 20.25A.090.A.1 of the Land Use Code, the minimum sidewalk width is 8 feet, exclusive of the width of the planter, tree pit or curb.
3. Sidewalk design shall be per the City of Bellevue Standard Detail DT-120-1. The surface will have a 2-foot by 2-foot square scoring pattern with a light broom finish and minimal scoring depth to allow for easy cleaning.
4. Where on-street parking is required or present, a 12-inch-wide step-off area (courtesy strip) shall be installed adjacent to the on-street parking unless otherwise approved by the Review Engineer. The step-off area width is additional to the planter and curb widths. Additionally, a 4-foot-wide sidewalk extension with a maximum spacing of 50 feet shall be provided along the frontage of the development as shown on Standard Drawings DT-120-1.
5. Full sidewalk widths shall be provided behind the landing of the curb ramps at intersection corners.
6. Curb extensions shall be integrated into corners where on-street parking is allowed, dependent upon the adjacent street geometry, presence of bus routes and bike lane or other large vehicle use, as determined by the Review Engineer. The Review Engineer shall determine specific design parameters for the corner curb extensions on a case-by-case basis, but they should be consistent with Section 3.8.8, Curb Extensions.
7. Proposed building doors are not allowed to swing open directly to a public sidewalk.
8. Doorway and entrances grades are required to be adjusted on private property without any impact to the sidewalk cross slopes and grades, as all sidewalks are required to meet ADA and PROWAG requirements.

3.4.1.1.9 Sidewalk Widths

In general, the width of a sidewalk depends on its adjacent land uses and pedestrian volume that will be generated from the proposed and adjacent developments. The sidewalk shall be a clear space, free of any obstructions and dedicated exclusively for pedestrians to travel. All above-ground elements shall be placed on private property, behind the sidewalk, or underground subject to the Review Engineer approval. Trees, light poles, signs and fire hydrants can be located in the planter strips adjacent to the sidewalks. Refer to Section 3.6.6, Lateral and Vertical Clearances for more information about clearances requirements. Concrete sidewalk widths shall be as follows:

1. For downtown sidewalk widths, see Land Use Code 20.25A.090.
2. Public streets and private streets internal to subdivisions and short subdivisions: 6 feet (minimum).
3. Non-arterial and non-collector streets outside the BelRed and Wilburton areas and external to subdivisions and short subdivisions: 6 feet (minimum).
4. Arterial and collector streets external to subdivisions and short subdivisions: 8 feet (additional width may be required as determined by the Review Engineer).
5. BelRed Subarea: See Land Use Code 20.25.D.140, BelRed Street Development Standards.
    a. Wilburton Subarea: Sidewalk width will be determined by the Review Engineer.
6. Additional 2 feet of sidewalk width is required when the sidewalk is adjacent to on-street parking and/or traffic lane.
7. Additional sidewalk width may be required for developments located in a transit-oriented development area, i.e., in the vicinity of a transit stop, RapidRide corridors, light rail stations and in the vicinity of schools and parks where higher pedestrian volume is anticipated and other design features or amenities are required to be accommodated for each condition. A pedestrian demand study may be required to determine the final sidewalk width.
8. Additional rights of way or easements may be required if any portion of the sidewalk is located outside the existing right of way. Refer to Section 14.60.100 of the Transportation Development Code for easement requirements.

Table 3-13: Minimum Sidewalk Width per Street Type

Street Type	Minimum Sidewalk Width (feet)	Landscape Planter (feet)
Major Arterial	8	5
Minor Arterial	8	5
Collector Arterial	8	5
Residential Local Street Small Lot Subdivision	6	5
Downtown Street	As per Section 3.4.1.1.8	5*
BelRed Streets Green Streets	As per Land Use Code 20.25.D.140	As per Land Use Code 20.25.D.140
Wilburton Subarea	To be determined by the Review Engineer	To be determined by the Review Engineer
Half Street	As per Street Classification or Subarea (To be determined by the Review Engineer)	As per Street location or Subarea (To be determined by the Review Engineer)
Alleyway	6	-
Private Access Road for small lot subdivision, PUD and small lot subdivision, if required	6	-

A 5-foot width requirement applies to landscape planters or tree pits.

3.4.1.2 Safety Railings

Safety railings are required when the through pedestrian zone (sidewalk, multi-use path, trail, etc.) is adjacent to a vertical drop where the lowest finished elevation is 1 foot or more below the finished surface of the sidewalk or pedestrian path or the adjacent slope is steeper than 2H:1V and the vertical drop is more than 1 foot. The required safety railing shall be provided and installed by the developer per the installation warrants of Standard Drawing RS-100-1 to RS-120-1 or as directed by the Review Engineer or the Inspector and shall conform to the following requirements:

1. All safety railings shall conform to the requirements of the Design Manual Standard Drawings RS-110-1, RS-120-1, RS-130-1 and RS-140-1.
2. For all new safety railings installation, metal railing is required unless otherwise approved by the Review Engineer.
3. Where a safety railing is placed on top of a wall, the Review Engineer may require additional sections of railing in order to prevent access behind the wall.

4. The minimum railing height for pedestrian fall protection is 54 inches.
5. If the sidewalk slope is 5% or greater, a gripping handrail may be required.
6. A combination of 5 feet shy distance and the absence of a hazardous condition at the bottom of the slope may mitigate the need for pedestrian safety railings subject to the approval of the Review Engineer.
7. The required safety railing shall be placed outside the full sidewalk width.

3.4.1.3 Multi-use Paths (Shared-use Facilities)

A shared-use path is defined as a path physically separated from the roadway for use by bicyclists, pedestrians and other micromobility users. The path must have a minimum width of 10 feet of traveled way in addition to 2-foot-wide concrete shoulders on both sides. A 12-foot-wide paved path with 2-foot concrete shoulders on both sides of the path may be required where high user volumes are expected as directed by the Review Engineer. The design of multi-use paths are required to meet the following criteria.

1. Accessibility
    a. The facility must meet the most recent ADA compliance standards (also see AASHTO Guide for the Development of Bicycle Facilities).
    b. The maximum allowable cross slope is 2%.
    c. If the multi-use path is contained within a street, the grade can match the grade established for the adjacent street. Otherwise, the grade of the multi-use path shall not exceed 5%.
    d. Standard curb ramps are to be provided at all path curb crossings to allow continuity of path use. Curb ramp width and crosswalk width shall be equal to the width of the path.
2. Design Speeds

Refer to Section 1515.02 and Exhibit 1515-2 of WSDOT Design Manual for more information on bicycle design speeds and horizontal alignments and the latest version of the Guide for the Development of Bicycle Facilities, published by AASHTO.

3. Alignment

Avoid abrupt grade changes or angle points. Vertical curves should be used to smoothly transition between grades. Refer to Chapter 1515 of WSDOT Design Manual for guidance on stopping sight distance and vertical curve length.

4. Surface Materials

    a. Acceptable surface material is concrete unless otherwise specified by the Review Engineer. Paths should be designed to sustain wheel loads of occasional emergency, patrol, maintenance and other motor vehicles that are permitted to use or cross the path.

    b. If approved, the edges of off-street asphalt paths not adjacent to a roadway shall be defined by inverted thickened edges along both sides to prevent edge deterioration.

5. Other Criteria

    a. Paths shall be located a minimum of 5 feet from the edge of the vehicular travel way. A 5-foot-wide planter shall separate the path from the travel way, and it is measured from the back of curb to the edge of the shoulder path.

    b. Rectangular rapid flashing beacons or a signal should be considered where traffic volumes and speeds on the intersecting roadway make it difficult for the multi-use path users to find a gap in traffic that allows them to cross comfortably, where motorist yielding compliance is low or where there are high volumes of path users.

    c. If asphalt path is approved, a 2-foot-wide graded shoulder is required on both sides of a paved pathway. The Review Engineer may require a wider graded shoulder if heavy pedestrian or equestrian use is anticipated.

    d. If not adjacent to a street or roadway, side slopes along shared-use paths of the embankments are no steeper than 2H:1V. Refer to Section 3.4.1.2 of this design manual for safety railing warrants and requirements.

    e. The minimum vertical clearance is 10 feet, measured from path surface to any overhead obstruction; 12 feet if equestrian accommodation is required.

    f. The designer must ensure sufficient stopping and intersection sight distance at all path intersections and curves, particularly, where steep grades are proposed at path/roadway intersections. Obstructions to the visibility of motorists or path users should be removed, or the path should be aligned around the obstruction to maximize visibility.

    g. Signs for hazards and regulatory messages should be posted. They should follow the standard signing and pavement markings as shown in MUTCD.

    h. Pedestrian-scale lightings may be required. Refer to Appendix A, Street Lighting Design Guide, for more information on pedestrian-scale lighting requirements.

3.4.1.4 Trails

Bellevue's trail system is an interconnected, multi-use trail network that guides users through Bellevue's Park and Open Space System and plays a significant role in the implementation of the City's transportation plan. Although their primary function is to provide passive recreational use, trails also provide an alternative facility and connect to larger regional systems. In general, trails are planned and constructed to provide access to a spectrum of opportunities for different users, including walkers, bicyclists, wheelchairs, joggers, skaters, hikers and equestrians. Different users may require different surfacing, widths and grades. For example, bikers or wheelchairs may require a smooth, firm, flat surface like asphalt or concrete. In general, design standards for trails within the Parks & Community Services Department facilities shall follow the Environmental Best Management Practices that can be accessed through the following link: Environmental Best Management Practices | City of Bellevue (bellevuewa.gov).

For other trails that are maintained by the Transportation Department, the design should meet the following requirements:

1. For paved trails facilities, Section 3.4.1.3 requirements are applied.
2. For gravel surface trails, unpaved trail surface should be no less than 10 feet wide with 2-foot shoulders on each side. Additional area may be needed for slope and fill maintenance.
3. Minimum vertical clearance is 12 feet in height to the first tree limb, guywire or other object.
4. Trail surface should be constructed of HMA, crushed gravel or similar materials as specified by the Review Engineer.
5. Unless otherwise approved by the Review Engineer, shoulders should allow for machine maintenance of the vegetation.
6. Placement of benches and other trail amenities should allow for machine maintenance of the vegetation with at least 10 feet of clearance around any feature and not interfere with equestrian users when applicable.
7. Where the trail intersects with a paved roadway, with no frontage improvements, the trail approach may be paved from the edge of the traveled lane to the right-of-way line. Otherwise, the pavement will start at the back of the sidewalk.
8. Appropriate signs shall be provided to indicate the location of street crossings for trails.
9. Bollards with reflective materials may be used if there is ambiguity between motor vehicle travel-way and trail crossing subject to approval by the Review Engineer.

10. Curb bulb-out may be used to enhance visibility of trail users at crossings.
11. Right-of-way priority should not automatically be assigned to motor vehicles. Trail user volumes and behavior must be considered, observed and adjusted as volumes shift over time.
12. Rectangular rapid flashing beacons or a signal should be considered where traffic volumes and speeds on the intersecting roadway make it difficult for trail users to find a gap in traffic that allows them to cross comfortably, where motorist yielding compliance is low or where there are high volumes of trail users.
13. Raised crosswalks may be considered on lower volume roadways.

3.4.1.5 Through-Block Pedestrian Connections/Paths

All existing and proposed development shall provide safe, direct and convenient pedestrian access routes (referred to as private walkways) connecting main entrances of buildings, establishments or uses on a site that allows for public access, with all other such entrances and with available access points. This includes, but is not limited to, parking sites, passenger loading zones, streets, sidewalks and transit stops. On-site walkways shall also be provided to any abutting public park, trail, major open space or other civic or institutional use. The following are the general requirements for the through-block pedestrian path.

1. Through-block pedestrian access on proposed developments shall consist of 6-foot-wide accessible, direct, clearly discernible and ADA-compliant walkways, or as required by the applicable Land Use Code.
2. Pedestrian walkways between buildings will be as required by the Building Reviewer.
3. Pedestrian walkways located on private property shall be constructed of concrete, asphalt or other firm, stable and slip-resistant material as approved by the Review Engineer.
4. Pedestrian walkways that connect to a roadway or access road shall be physically separated from vehicular surface areas by a traffic curb, except where required to cross a drive aisle; such crossings shall be perpendicular wherever practicable.
5. Pedestrian walkways may be required in areas served by any street.
6. Private pedestrian walkways shall provide general pedestrian access within the development served or as required by the Land Use Code and shall connect with all public sidewalks.

7. Objects are not allowed to protrude into the required clear width of the through-block pedestrian connection. For example, objects such as tree branches, vehicle bumpers, mailboxes, sign posts and tree grates are not allowed to reduce the minimum required clear width of the walkway.
8. The minimum vertical clearance for objects, such as trees and canopies that protrude into or overhang a walkway is 7 feet unless otherwise specified in the MUTCD.
9. The cross slope of a walkway shall be 2% maximum. It is recommended that cross slopes be designed to less than the allowed maximum to allow for some tolerance in construction.

3.4.1.6 Landscaped Planter Strip Requirements

Landscaping planters or drainage swales between curbs and sidewalks are required. The planter strip width shall be maximized based upon site conditions. The minimum planter strip width shall be 5 feet, measured from the back of curb. The downtown and BelRed subareas may have greater minimum requirements. Landscaping design must conform to Water Utility Code (BCC 24.02) requirements for water conservation. Contact the Review Engineer for projects located within the downtown or BelRed subareas for specific planter width and landscaping requirements. Spray irrigation may be required within all landscaped rights of way and public access easements. Irrigation water supply and power sources shall be fed from a private-metered water source unless the Review Engineer approves a connection to a City-owned meter. A separate right-of-way irrigation system and 24-hour outdoor accessible irrigation controller may be required. Planting types, including street trees and ground cover, is to be determined by the Review Engineer (see SW-130-1 for soil profile and root barrier).

If proposed by a private development, holiday lighting receptacles may be permitted within the planter strip area. These receptacles must be connected to the City of Bellevue power source and comply with the requirements outlined in Standard Drawing SL-370-1. Holiday lighting receptacles within a tree pit area will be reviewed on a case-by-case basis and will be subject to the Review Engineer approval.

The City will review the proposed street frontage improvements for compliance with this section and other applicable City policies and codes.

1. Preservation of Existing Street Trees and Landscaping
    a. Retention of existing vegetation may be required along city streets. When retention is not feasible, native plant species or species with a proven ability to survive in an urban environment are preferred for landscaping.

b. When permitted to remove or relocate plant materials from the right of way in connection with the widening of the street or highway, the paving of a sidewalk, or the installation of ingress or egress, the developer shall replant such trees or replace them according to the applicable City standards.

c. Any landscaping in the right of way that is disturbed by construction activity on private property, including but not limited to, damaged trees or trees that need to be removed, shall be replaced or restored to their original condition by the developer or the entity. If such replacement or restoration is not physically or practically possible, as determined by the Review Engineer, the developer may be required to instead reimburse the City for the value of the removed, damaged or destroyed landscaping. Such reimbursement value shall be determined under the methods described in the Guide for Plant Appraisal, published by the International Society of Arboriculture, now or as hereafter amended. The value of other landscape plants shall be determined by the City based upon reasonable estimates.

d. Landscaping and other improvements such as fencing and rockeries within the right of way are subject to removal by the City or at the request of the City.

2. Street Tree and Landscaping Installation Requirements

Street landscape installation or improvement is required when applicable projects are to be undertaken along any public street as identified in, and according to, the guidelines of city codes, standards, adopted street design plans and adopted city plans, including the Capital Investment Plan, Transportation Facilities Plan, Pedestrian and Bicycle Transportation Plan, Comprehensive Plan and Environmental Stewardship Initiative. Where not in conflict with other applicable code provisions, ground cover shall be provided for street frontage of the site in order to control erosion.

3. Species Selection

Refer to LUC 20.25A.060 and Chapter 20.25D LUC or Appendix B, BelRed Streetscape manual for selection of tree species. If not otherwise specified in code, tree species selection shall be listed in the City of Bellevue Environmental Best Management Practices and Design Standards, now or as hereafter amended.

4. Maintenance of Plant Materials

a. Landscaping in the right of way shall be maintained by the abutting property owner(s) unless maintenance has been accepted by the City.

b. All landscape materials in the right of way shall be maintained to industry standards. Trees shall be pruned according to ANSI A300 and ANSI Z133 standards adopted by the International Society of Arboriculture. Street trees already accepted/owned by the City shall not be pruned by adjacent property owners without approval from the Parks & Community Services Department.

c. The property owner is responsible for ensuring that landscaping fronting his/her property does not impair driver or pedestrian sight distance as described in Section 3.2.1 of this design manual.

d. Topping of street trees and other pruning that does not conform to industry standards is a civil violation under Chapter 1.18 BCC and subject to penalties set forth in BCC 1.18.045. (Ord. 6319 § 2, 2016; Ord. 6181 § 2, 2014).

5. Additional Requirements

a. The final grade of soil surfaces in planting strips must accommodate runoff from sidewalk surfaces cross-sloped to drain toward the street. Refer to Standard Drawing SW-130-1 for more information on the planter cross slope. Where steep cross slopes exist, a drainage system may be required.

b. Tree pits should be graded to provide a soil surface 1.5 inches below the adjacent sidewalks and curb elevation and be top dressed with bark, wood chips, cinders or crushed angular aggregate material that is routinely maintained to minimize the grade differential between the sidewalk and open pit area.

c. Where required, tree grates are often proposed as an architectural design element and/or as a means to maximize the pedestrian accessible area in the right of way. Tree grates may be permitted but are not recommended. When permitted, tree grates shall be maintained routinely by the property owner to ensure a flush condition between the grate surface and surrounding pavement, to replace broken segments, and to expand the opening as appropriate to accommodate the growth of the tree.

d. Within the sight distance triangle, non-plant materials and perennials should be no more than 2 feet high, and tree limbs should begin at a height of no less than 7.5 feet.

e. Street trees and streetlights must be shown on the same plan sheet with the proper separation (generally 25 feet apart).

f. Street trees are to be planted at the proper spacing from driveways (10 feet from Point A in standard drawing SW-140-1 or equivalent).

g. Trees should be located in the middle of the planting space and must be placed to ensure drivers can see all regulatory signs.

3.4.1.6.1 Pet Relief Areas

A pet relief area is defined as a location designated and designed to attract pets to relieve themselves.

Animal relief in the right of way is a public amenity to those using the public sidewalk. The amenity does not just serve those with animals but everyone as it helps the viability of the public streetscape planters. It is not the intent that this infrastructure will address all animal relief demands from adjacent private development, but it will lessen the impacts of animal relief on the public street scape planters. It is important that private development provides additional designated animal relief on private property and within the building to address the full demand for animal relief.

The adjacent property owner will own, maintain and, if given notice by the City, remove this infrastructure per a recorded indemnification and maintenance agreement with the City.

1. Animal relief shall be located at least 3 feet from the nearest tree, utility vault, bike racks or any other right-of-way feature.
2. A pet waste station may be installed in the animal relief area when it is within 15 feet of the building entrance. The adjacent property owner is responsible for emptying and refilling the station.
3. The number and location of permitted animal relief areas are to be determined through the permit review process. In no case shall there be more than one animal relief area for every 400 linear feet of public sidewalk.
4. Animal relief shall be located within 5 to 15 feet from a building entrance, measured from the closest end of the animal relief to the nearest edge of the door. The Review Engineer may not allow pet relief directly across from doors in locations where sidewalks may be narrow.
5. Target materials are permitted but must be located within the relief area and be located such that there are at least 3 feet from the face of the target material to the face of the curb.
6. A water spigot is required to be located on the building face with new development and shall be within 20 feet of the permitted animal relief area. Relief areas shall be rinsed a minimum of twice weekly by irrigation spray heads in the dry season and by hose in the wet season when irrigation is off and winterized.
7. Animal relief may not be compatible with all frontages, including those that have multi-purpose paths. In the case of a multi-purpose path, animal relief would need to be located outside of the 2-foot clear zone.
8. The slope of a planter shall be 5% or less to accommodate animal relief.

9. A recorded indemnification and maintenance agreement is required, specifying that the adjacent property owner will own, maintain, remove the animal relief and restore the area at the City's discretion.

3.4.1.7 Street Furniture

Street furniture such as benches, kiosks, newspaper stands, lighting, public art, bicycle racks, trash bins, etc., play a major role in creating an inviting and comfortable pedestrian environment and can contribute to a neighborhood's identity and character. If required by the Land Use Code, street furniture and other structure installation needs to conform to the following requirements:

1. Street furniture shall be installed along the entire street frontage of the property at the sole cost of the developer as directed by the Review Engineer.
2. All street furniture must be installed to provide a minimum of 3 feet of clearance between the face of a curb and the outermost edge of any structure.
3. Street furniture shall not intrude on the clear width of the sidewalk. Sidewalk width shall always be free from any obstructions.
4. A minimum of 2 feet of clearance distance from the front or back edge of a sidewalk shall be provided for benches and seating features.
5. Wayfinding signage and public art structural design details for the foundation shall be provided by the developer's consultant and will be reviewed and approved by the Review Engineer. The structural plan shall be included as part of the civil plan set to show the proposed location for a new or relocated existing structure.
6. Nonmotorized wayfinding signs are permitted, but may not be retroreflective, and may not be placed in such a manner that they would appear to be directed at automobile traffic.
7. A Right-of-Way Hold Harmless and Indemnity Agreement will be required for placing street furniture in the right of way or public sidewalk and utilities easements.

3.4.2 Bicycle Design

Bicycle facility construction or improvements are required for all developments, unless otherwise specified by the Review Engineer, to accommodate and meet City MIP targets and to develop bicycle routes that mitigate the direct transportation impacts resulting from development projects. Bicycle facility improvement is also required when necessary for the mitigation of adverse environmental impacts identified pursuant to the State Environmental Policy Act. Bikeways shall be designed in accordance with AASHTO's current "Guide for the Development of Bicycle Facilities," the latest adopted edition of the FHWA

MUTCD, NACTO "Urban Bikeway Design Guide," and WSDOT Design Manual. The City MIP establishes performance metrics on the bicycle network and priority bicycle corridors. The performance metrics used to describe the user experience on the bicycle network is the level of traffic stress (LTS). The concept of LTS is illustrated in Figure 3-1 below. Refer to the City MIP for more information on the applicable LTS for each bicycle facility.

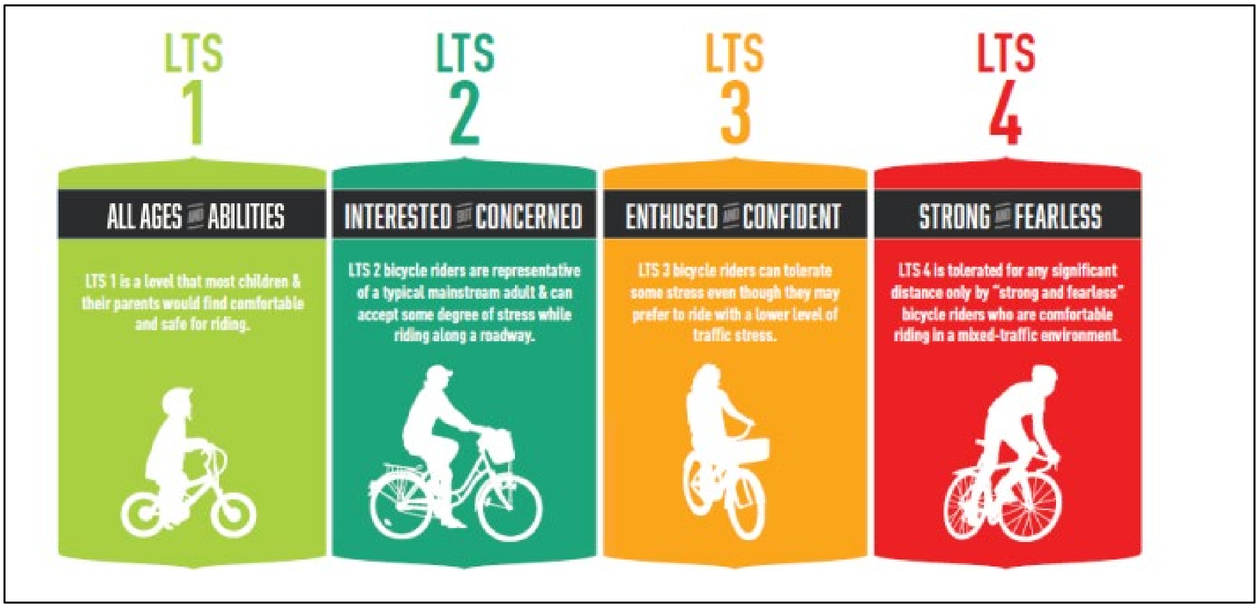


Figure 3-1: Bellevue Bicycle Level of Traffic Stress (LTS) Categories

For bicycle network corridors, LTS is a function of the posted speed limit, the average daily volume of traffic on the street and the type of bicycle facility provided. Table 3-14 shows this relationship. Table 3-15 shows how this concept applies to intersections.

Table 3-14: Bicycle Level of Service/Level of Traffic Stress

Roadway Characteristics		Bicycle Facility Components: Guideline to Achieve Intended Level of Service/Level of Traffic Stress					
Speed Limit	Arterial Traffic Volume	No Marking	Sharrow Lane Marking	Striped Bike Lane	Buffered Bike Lane (Horizontal)	Protected Bike Lane (Vertical)	Physically Separated Bikeway
</=25	<3k	1	1	1	1	1	1
	3-7k	3	3	2	1	1	1
	>/=7k	3	3	2	2	1	1
30	<10k	3	3	2	2	1	1
	10-25k	4	4	3	3	2	1
	>/=25k	4	4	3	3	3	1
35	<25k	4	4	3	3	3	1
	>/=25k	4	4	4	3	3	1
>35	Any	4	4	4	4	3	1

Table 3-15: Bicycle Intersection Treatment Selection by Target LTS

Bicycle LOS/LTS	Bike Signal	Street Crossing	Approach to Intersection	Approach to Intersection with Right Turn Lane
1	Bike Signal	Green solid or skip-stripe	Green bike box	Curb ramp to wide sidewalk, Dutch Intersection
2	Bike Signal	Skip stribe	Bike box	Green bike lane to left of turn lane
3	Green Cycle Length	Sharrow lane markings	Automatic signal actuation	Bike lane to left
4	No specific design guideline for LTS/LOS 4			
Trail or Mid-Block Crossing	Full signal or HAWK or RRFB	Green solid or skip-stripe	N/A	N/A

All new bike facilities should be designed with an asphalt lane width of at least 5 feet, measured from the edge of the pavement to the center of the bicycle lane marking or center-to-center of the bike lane markings. If a curb and gutter is present, the width of the gutter pan shall not be considered part of the bike facility. The following factors should also be considered when determining the desirable or minimum width of a bike facility:

- The minimum bike lane width of 5 feet also applies where the bicycle lane is routed between a through travel lane and a right turn.

- If no curb is present, a minimum 2-foot-wide graded shoulder is also required adjacent to the paved surface.
- The desirable bike lane width adjacent to a guardrail or other physical barrier is 2 feet wider than otherwise required in order to provide a minimum shy distance from the barrier.

In general, there are different types of dedicated bicycle facilities. Conventional bike lanes (CBLs) have a paint stripe, signing and pavement markings to provide a clear indication to bicyclists and drivers about the purpose of the facility. Buffered bike lanes (BBLs) are similar to conventional bike lanes, except they also provide a painted buffer to improve rider comfort and provide the benefit of having greater space between cyclists and motor vehicle traffic. Furthermore, separated bike lane (SBLs) also provide a painted buffer, but also include vertical elements to further improve rider comfort and improve the buffer's visibility and the driver's awareness of the buffer. The width of a bicycle lane with a buffer (BBLs and SBLs) does not include the width of the buffer. In addition, shared-use paths are another option of bicycle facilities that provides physical separation from traffic. See Section 3.4.1.3 of this design manual for more information on shared-use path design requirements. The following are more details on the different types of bicycles facilities.

3.4.2.1 Conventional (Striped) Bike Lanes

CBLs are at grade and adjacent to motor vehicle traffic lane. Refer to Figure 3-2, Roadway Bicycle Facilities for a conventional bike lane illustration. They are designated by a single, solid wide stripe between the motor vehicle lane and the bike lane. Refer to Standard Drawing CH-241-1 for more information and details. The design of a conventional bike lane shall conform to the following criteria:

1. The width shall be measured from the edge of the pavement to the center of the bicycle lane marking or center-to-center of the bike lane markings.
2. Additional width is considered when higher volumes of cyclists (such as high bicycle priority corridors) are anticipated or when adjacent to parallel on-street parking.
3. Gutter seams, drainage inlets and utility covers should be flushed with the ground and oriented to prevent conflicts with bicycle tires.
4. This type of facility is only allowed under special circumstances such as site constraints, topography limitations or other types of physical barriers and it is subject to Review Engineer approval.

3.4.2.2 Buffered Bike Lanes

BBLs are at grade with the roadway and the preferred bicycle facilities within the City of Bellevue. They include a bike lane and a buffer area. Bike markings in the bike lane and signage are employed. The lane shall conform to the following requirements.

1. A minimum width of 5 feet, not including the gutter width, is required exclusively to the bike lane to enable passing maneuvers between cyclists, and to account for the effective width needs of bicyclists when drainage features are present in the bike lane. Consider a 3-foot-wide buffer strip whenever possible. Otherwise, a 2-foot-wide bike lane is required.
2. When a buffered bike lane is positioned adjacent to an on-street parking zone, the bike lane and buffer should be adjacent to the curb and gutter and separated from the vehicular travel lane by the on-street parking lane. See NACTO's Urban Bikeway Design Guide and Urban Street Design Guide for examples.
3. Standard flexible tubular markers or delineators in the buffer strip are required to help distinguish the bicycle facility from the motor vehicle lane.
4. High bicyclist volume locations such as high bicycle priority corridors or those supported by count data should consider more width to facilitate mobility performance for this mode.

3.4.2.3 Separated Buffered Bike Lanes

SBLs are at grade with the roadway, and they include a bike lane, a buffer area and some type of vertical physical feature that reduces the likelihood of encroachment into the bike lane by motor vehicles and increases user comfort. Bike markings in the bike lane and signage are employed. The use of dual-faced curbing, raised medians or the parking zone adjoining the buffer area as directed by the Review Engineer will be required to accomplish the physical barrier requirements for this type of bike facility. The same requirements for buffered bike lanes are applied to the separated buffered bike lanes as listed below:

1. A minimum width of 5 feet is required exclusively to the bike lane to enable passing maneuvers between cyclists, and account for the effective width needs of bicyclists when drainage features are present in the bike lane. Consider a 3-foot-wide buffer strip whenever possible. Otherwise, 2-foot-wide bike lane is required.
2. When a buffered bike lane is positioned adjacent to an on-street parking zone, the bike lane and buffer should be adjacent to the curb and gutter and separated from the vehicular travel lane by the on-street parking lane. See NACTO's Urban Bikeway Design Guide and Urban Street Design Guide for examples.

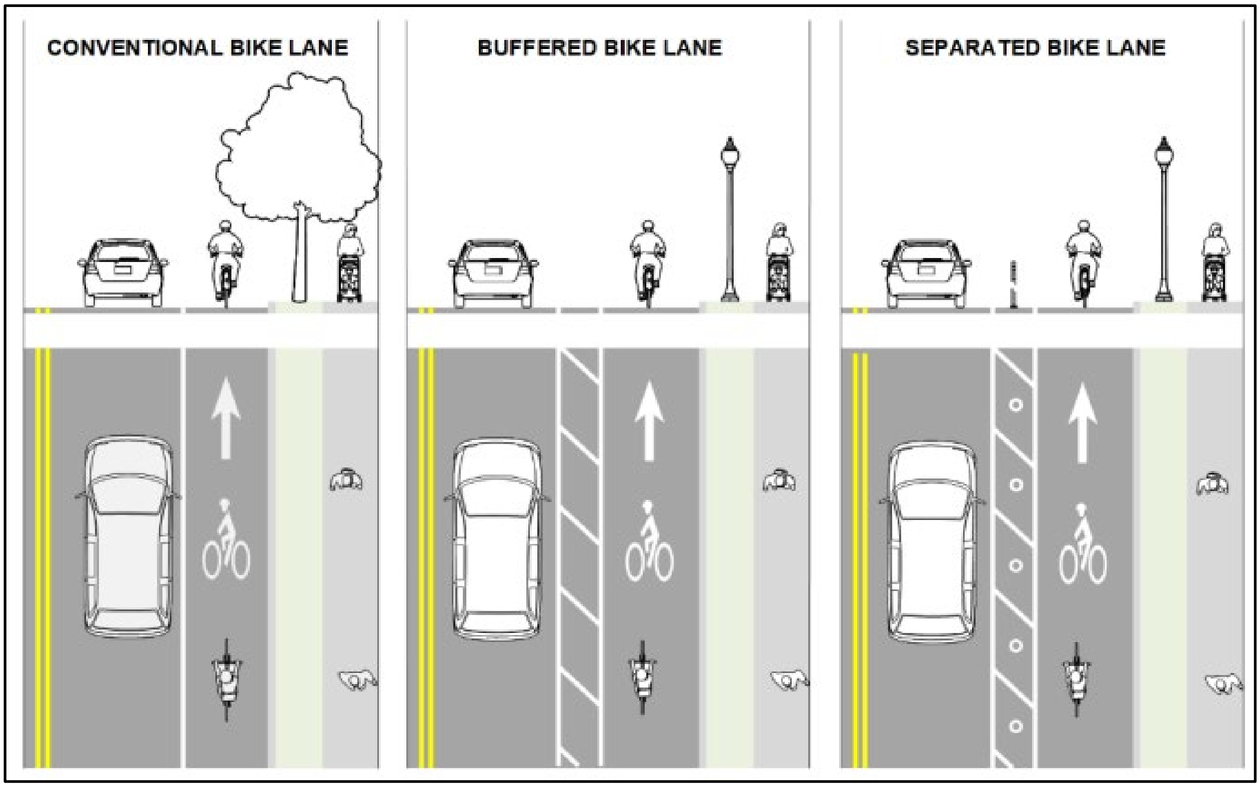
3. High bicyclist volume locations such as high bicycle priority corridors or those supported by count data should consider more width to facilitate mobility performance for this mode.

3.4.2.4 Raised and Curb-Separated Facilities

These facilities are considered protected because they are vertically separated from motor vehicle traffic. When a raised and curb-separated bicycle facility is applied, it is considered part of the streetside zone; however, it cannot be combined with other zone areas such as planter strips or sidewalks because the intent is also segregation from pedestrians. The raised and curb-separated facility is dedicated for bike users and delineated with pavement markings, signing and, in some cases, pavement material. See Figure 3-3, Examples of Protected Bike Lane Configurations. The raised and curb-separated bike lanes shall follow the following requirements:

1. A minimum width of 2.5 feet is required for the border area that separates cyclists from motor traffic. The distance is measured between the outside edge of the bike lane and the back of curb.

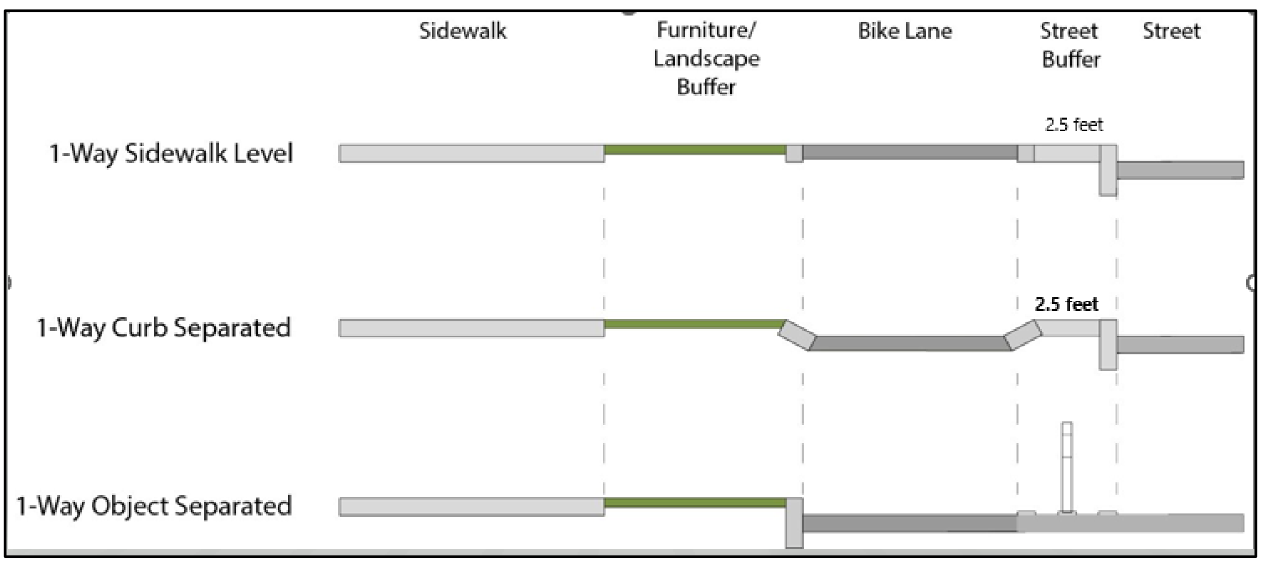
2. HMA surface is required unless otherwise specified.



Source: (Edited) Exhibit 1520-1 Exhibit 1520-1 Roadway Bicycle Facilities-WSDOT Design Manual.

Figure 3-2: Roadway Bicycle Facilities

Different types of protected bike lane configurations are shown on Figure 3-3 below.



Source: Figure T Protected Bike Lane Configuration, City of Seattle Right of Way Improvements Manual.

Figure 3-3: Examples of Protected Bike Lane Configurations

The following are general requirements applied to all bicycle facilities.

1. Safety railings shall be provided and installed by the developer when warrants for safety railings as shown in Design Manual Drawing RS-100-1 are met, or as directed by the Review Engineer or the Inspector.
2. When hard surfaces are disturbed, all junction boxes within the hard surface shall be replaced with new junction boxes with non-skid lids.
3. The bicycle facility type selection will be determined by the Review Engineer in coordination with other City staff and in accordance with the current Bellevue Pedestrian and Bicycle Transportation Plan and MIP during the permit application review process.
4. Accommodating bicycle users on the shoulder is common on some streets within the City of Bellevue. Therefore, shoulder improvements to facilitate bicycle travel including the widening of shoulders to a minimum of 4 feet and removing surface obstacles such as drain grates that are not compatible with bicycle tires may be required on certain streets as directed by the Review Engineer.

3.4.2.5 Intersection Design Treatments

The principal objective when designing intersections for bicycle mobility and safety performance is to provide a visible, distinct, predictable and clearly designated path leading to and through the intersection while managing potential conflicts between all other users and cyclists. For design criteria, refer to Chapter 1520 of WSDOT Design Manual.

Intersection treatments may include the following:

1. **Bike boxes**. These features are designated at the heads of traffic lanes at signalized intersections. They provide bicyclists a safe and visible refuge, as well as a way to get ahead of queuing traffic during the red signal phase. Bike boxes have also been found to prevent cyclist and motor vehicle encroachment into the pedestrian crossing, reducing conflicts with pedestrians at intersections.
2. **Intersection crossing markings**. Crossing markings indicate the intended path of bicyclists through the intersection. They are typically required when the approach and receiving leg both have bicycle lanes.
3. **Two-stage turn queue boxes**. These features offer a safe way to make left turns at multi-lane signalized intersections from a right-side cycle track or bike lane or right turns from a left-side cycle track or bike lane; they may be used to orient bicyclists properly for safe crossings.

4. **Median refuge island/median cut-through**. These features offer a protected space in the center of a street to facilitate bicycle and pedestrian crossings.
5. **Bicycle signals**. Bicycle signals shall be implemented at locations where the bicycle movement needs to be separated from vehicle or pedestrian movements. Refer to Section 4.1 Traffic Signals for more information on bicycle signal requirements.

Refer to Chapter 1520 of WSDOT Design Manual for additional requirements for bike facilities.

3.4.2.6 Bicycle Racks

Bike racks, if required, shall be installed to provide a 3-foot setback distance from the vehicular travel lane and oriented such that parked bicycles do not encroach on the required sidewalk full clear width or infringe in any way into the clear pedestrian's path.

In general, bike racks must have the following characteristics:

1. Have a no-maintenance finish that will chip, peel or rust. Galvanized steel finishes are preferred.
2. Have a minimum height of 32 inches so it is not a tripping hazard.
3. Are installed as close to, without being directly in front of, the main entrance(s) of a building or site.
4. Have adequate clearance from driveways, curb ramps, transit loading areas and be immediately adjacent to shelters and utility poles.
5. Must consider the widest variety of bicycles (family bikes and mobility trikes) at high volume locations and allow for greater clearances than the standards referenced above.

3.4.3 Transit Design

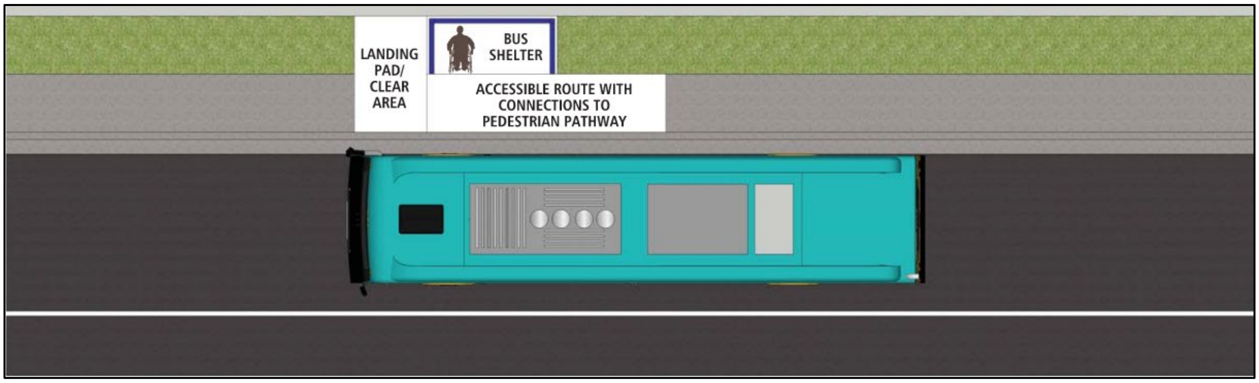
City of Bellevue is served by King County Metro and Sound Transit. Refer to King County Metro Transit Facilities Guidelines for guidance and criteria to plan and design bus stops that are easily identifiable, safe, accessible and comfortable to wait for and access a bus. Because each transit facility is located in a unique built environment, each facility is also unique and requires early coordination with the Review Engineer and King County Metro to determine and confirm the requirements. The Review Engineer may also require provisions, including easements, for transit facilities along transit streets where a need for bus stops, bus pullouts or other transit facilities within or adjacent to the development have been identified.

3.4.3.1 General Requirements

1. All transit stops, shelters and associated appurtenances must be designed and constructed per the PROWAG.
2. Placement of waste receptacles, signs, seating or any other appurtenance must not infringe on the full clear width of the sidewalk (pedestrian circulation route). Placement also must not compromise direct access between the ADA waiting area and the ADA landing area or the access between either the ADA area or the sidewalk.
3. The installation of new transit stops or improvements to existing stops, including shelter installations or associated appurtenances, requires coordination with King County Metro prior to obtaining approval from the Review Engineer during the permit review process. Coordination is necessary to confirm specific improvement requirements for transit stops and shelters. The design and configuration of bus zones are customized for each location, depending on factors such as service levels, amenities, route numbers, ridership and turning movements.
4. As part of the plan review process, the development project must evaluate transit stops, shelters and associated appurtenances for adequate sight distance.

3.4.3.2 ADA Landing Area Requirements

1. In circumstances where right of way is limited or a site is otherwise significantly constrained, landing pads or clear areas can be 5 feet wide by 8 feet deep. This is the absolute minimum allowed by ADA guidelines and should only be used where construction of larger landing pads or clear areas is not reasonably feasible.
2. Where rear-door ADA landing areas are provided, they shall comply with this section.
3. Parallel to the roadway, the grade of ADA landing areas shall be the same as the roadway. Perpendicular to the roadway, the designed grade of ADA landing areas shall be 1.5% or less.
4. ADA landing areas shall connect to streets, sidewalks or pedestrian circulation paths by ADA-accessible pedestrian access routes.



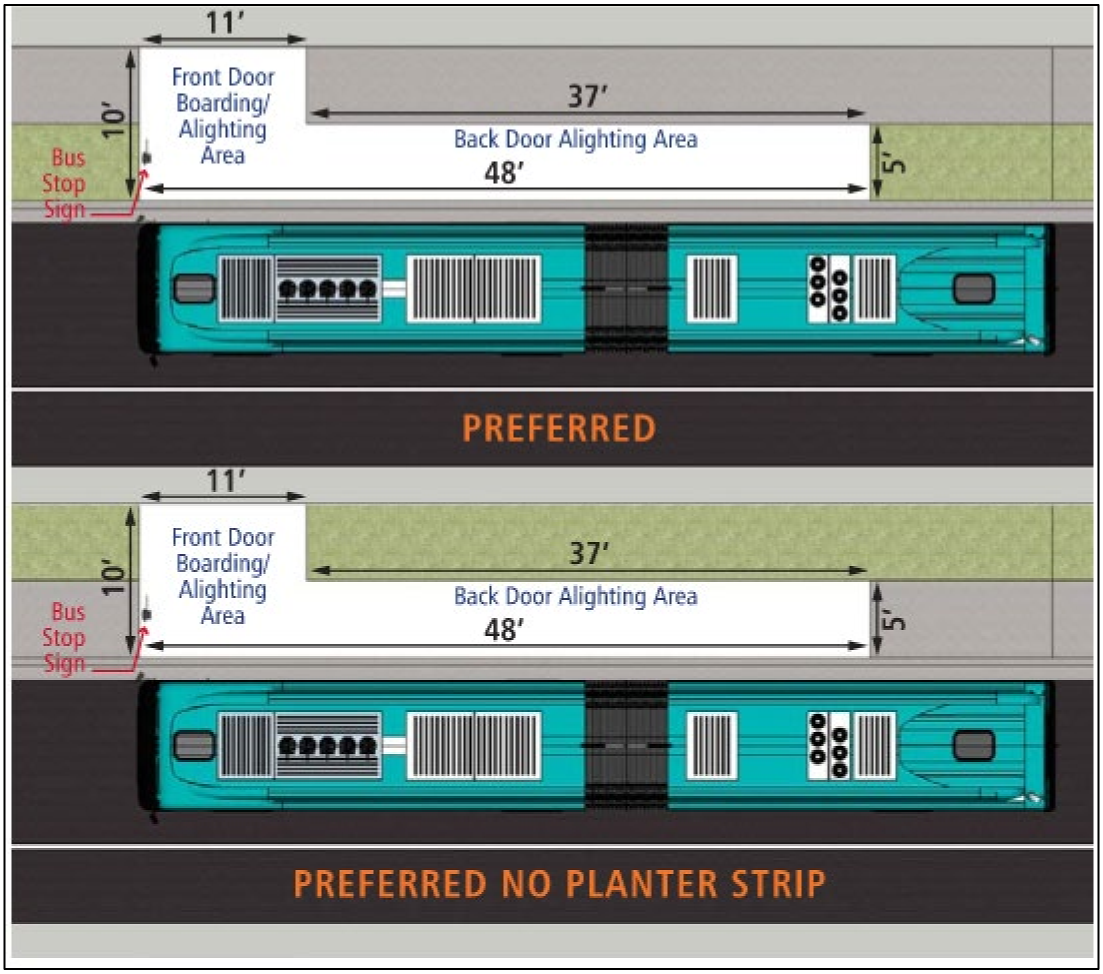
Source: King County Metro Transit Facilities Guidelines.

Figure 3-4: ADA Accessibility Requirements

3.4.3.3 Landing Pad and Clear Area Layouts

The length of the landing pads and clear areas is a 60-foot concrete pad without planting strips, trees or other vertical features and depends on the length of the bus serving the stop. This allows for the maximum space for passenger circulation when buses are loading and unloading.

1. When development of a continuous landing pad or clear area is not feasible, the following dimensions for landing pads and clear areas are required unless approved otherwise by the Review Engineer:
    a. Front door: 11 feet wide by 10 feet deep
    b. Middle door: 10 feet wide by 5 feet deep
    c. Rear door: 11 feet wide by 5 feet deep
2. The absolute minimum allowed by ADA guidelines is 5 feet wide by 8 feet deep and should only be used where construction of larger landing pads or clear areas is not reasonably feasible.
3. In areas that are only served by 40-foot coaches, two landing pads or clear areas may be installed subject to Review Engineer approval.
4. Because King County Metro has a number of different bus lengths and styles, the location for multi-door landing pads can vary. A single stop may be served by multiple buses of varying lengths and/or styles. The dimensions of the landing pads shown in Figure 3-5 is an example of landing pads that may accommodate access to all doors on all King County Metro coach types.



Source: King County Metro Transit Facilities Guidelines.
Note: Sidewalk width is for illustration purpose only. For required sidewalk width, refer to Section 3.4.1.1 for full sidewalk requirements.

Figure 3-5: Examples of Landing Pads for all Metro Coaches

3.4.3.4 Transit Shelters

Transit shelter placement and orientation must provide the following:

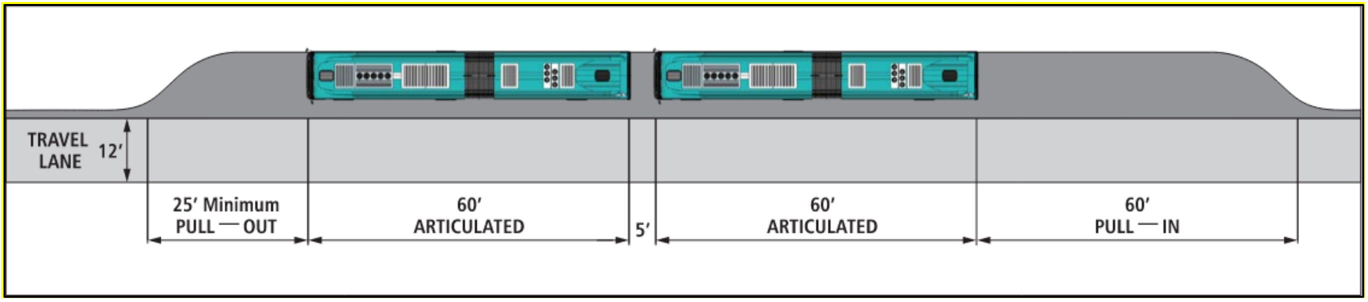
1. Be located behind the sidewalk with no encroachment on the public sidewalk.
2. Provide a minimum 5 feet of clearance from poles, hydrants and other obstacles.
3. Provide an ADA landing area adjacent to the bus stop sign and outside of the shelter.
4. Provide a clear pathway from the ADA waiting area inside the shelter to the ADA landing area.
5. Provide a clear pathway from the rear-door landing area to the pedestrian access route.

6. Provide interior lighting at the shelter for passenger visibility and security.
7. Ensure that the shelter does not block motorists' or pedestrians' lines of sight.

3.4.3.5 Transit Stop Layovers

Regular/layover stops are similar to regular stops in their design and function. These are located along bus routes and serve as designated spaces to stop to load and unload passengers. However, these areas also serve as layover stops for operators and are often located at the beginning or end of a route. Regular/layover stops are typically pull-out stops, have bus stops that are long enough to accommodate two or more buses and have comfort stations.

1. The typical component of a layover facility for multiple buses should be 60 feet of straight curb line for each bus intended. In addition to this curb line required to park the bus, space must also be provided for buses to pull in and pull out (see Figure 3-6).
2. When the adjacent travel lane is 12 feet wide or greater, 60 feet should be provided for buses to pull in and at least 25 feet for buses to pull out. Additional space is needed if the lane width is less than 12 feet.
3. An adequate pull-out length must be provided whenever buses are expected to merge back into travel lanes with competing general traffic. This length is dependent on the posted speed and the level of service of the roadway. For a high-traffic and high-speed roadway, the MUTCD is used to determine the length of the pull-out to provide adequate space for acceleration to the traffic speed.
4. Within a total dependent bus parking area, 5 feet should be provided between coaches along the curb line, recognizing that the buses would not actually park bumper-to-bumper and that space should factor into the bike rack mounted on the front of the bus.
5. The parking lane used for parking, pull-in and pull-out should be 12 feet wide.



Source: King County Metro Transit Facilities Guidelines.

Figure 3-6: Typical Dimensions for Parking Multiple Coaches at Layover Facilities and Transit Centers

3.4.3.6 Pavement Requirements for Transit Facilities

Sidewalk repairs must be completed according to standard drawing SW-100-1.

In roadway areas where buses start, stop or turn—or along roadways with high bus volumes—the following requirements may be applied:

1. Concrete pavement may be required on streets carrying a high number of buses per day.
2. A reinforced concrete pad may be required at high-volume bus stops and bus pullouts.

3.5 Access Design

Access design focuses on the location, spacing and design of driveways, private streets and alleyways. Each access location creates conflict points where vehicles interact with other vehicles or pedestrians, causing delay and potential safety concerns. Determination of permitted access, including number, location and size, shall be the responsibility of the City.

3.5.1 Driveways

A driveway under this section is defined as a private way of vehicular ingress and egress to a site, extending into the site from a public street or private street. Driveways shall be designed in accordance with Section 14.60.150 of the Transportation Development Code and shall conform to the following general requirements:

1. Driveways and parking areas shall be designed such that vehicles attempting to enter the driveway or parking area will not unreasonably impede vehicles in the travel lane of the public street.
2. The installation of driveways onto arterials may be denied at the discretion of the Review Engineer if alternate access is available.

3. Driveways onto arterials may be restricted to right-in, right-out only movements in order to improve access management along public streets.

4. The continued use of preexisting driveways is not guaranteed with the development of a site.

5. All abandoned driveways on the street frontage to be improved shall be removed and new curbs, gutters and sidewalks shall be installed, or the frontage shall be improved to match existing improvements.

6. All driveways greater than 150 feet in length shall be designed to provide fire access and an emergency vehicle turnaround area at or near the driveway termination as per Section 3.24, Street End Designs and as determined necessary by the Review Engineer and the fire marshal.

7. The City may not permit more than one driveway opening on any property having a street frontage of 200 feet or less. This requirement may not apply to a property with street frontage less than 200 feet and the property is at least three acres in area.

3.5.1.1 Access Types

Driveways are divided based on the intended land use into the following types.

1. **Commercial/industrial driveways**. Commercial use is defined in Title 14.60, Transportation Development Code as any land use other than a detached single-family dwelling. Commercial driveways may serve the following, but are not limited to, multi-family developments, offices, retail, services, mixed-use properties, institutional developments, shopping centers, parking structures or any other non-single-family dwelling developments. No commercial driveway shall be approved where backing onto the sidewalk or street will occur.

2. **Residential driveways**. This type of driveway will serve one single-family residential lot only.

3. **Residential shared-use driveways**. Shared-use driveways provide access to two single-family residential lots only. Combined or shared-use driveways for adjoining properties are encouraged. The driveways or accesses in this case shall be established in a tract or a private access easement.

   Driveways that serve three or more residential lots must be served by a private street and shall meet the requirements of Section 3.1.1.10, Private Streets of this design manual.

4. **Emergency vehicle access driveways**. This type of driveway provides access to emergency vehicles only and it is required to be gated with a Knox lock or other physical break-away barrier devices as approved by the Fire Department. Such barriers shall be constructed in such a manner that they will immediately break away in an emergency situation. Emergency driveways shall meet the requirements of this section.

3.5.1.2 Design Requirements

The following requirements shall apply to all driveway types.

1. All new or altered driveways required to meet ADA accessibility standards shall meet the PROWAG standards for a Pedestrian Access Route where there are an intersect sidewalk, multi-use path or trail.
2. Sight distance for motor vehicle operators and for pedestrian and safety shall be provided per the provisions of Section 3.2.1 Sight Distance. Where the building façade or other design element is less than 10 feet behind the sidewalk (as is typical downtown), both pedestrian and vehicular sight distances shall be maintained. Sight distance and setback requirements shall be specified per Design Manual Standard Drawings RL- 100-1 and RL-120-1.
3. For multi-use paths crossing a driveway approach, sight distance for bicyclists' safety shall be provided.
4. All driveways shall intersect the streets at a 90-degree angle, unless designated as right-turn-in/ right-turn-out only.
5. For commercial driveways located on arterials, no parking stalls shall be located closer than 20 feet from the face of the curb (or the edge of the driving lane if there is no curb) in order to preclude conflicts with entering vehicles. No such clear area is required for driveways serving multi-family developments on non-arterial streets.
6. Sidewalk sections within commercial and heavy truck traffic driveways, including private streets and alleyway entrances must be constructed with a minimum concrete thickness of 8 inches. Refer to Section 3.4.1 for more information on sidewalk requirements.
7. For driveways subject to fire access requirements, roadway base, bridges and culverts shall meet the AASHTO HL-93 design load in order to withstand the load of the fire truck ladder.

8. Where a driveway is designed with a turn, the centerline radius shall be 38 feet as a minimum, unless a larger centerline radius is necessary for safe fire truck turning.

9. Gates shall be placed a minimum of 30 feet from back of sidewalk or edge of pavement. If queues are likely to extend into the travel lane of the nearest roadway, then a queuing analysis shall be provided as required by the Review Engineer to determine the location of the gate or parking garage door. The minimum 30-foot requirements may be reduced to a minimum of 20 feet for single-family homes located on non-arterial streets.

10. All driveways shall have a minimum vertical clearance of 15 feet unless otherwise approved by the Review Engineer.

11. No fixed objects, including fire hydrants, trees, mail boxes and streetlight poles are allowed within 10 feet of a driveway edge, defined as Point A in standard drawing SW-140-1 or equivalent. Fixed objects are defined as anything with breakaway characteristics greater than a 4-inch by 4-inch wooden post.

3.5.2 Driveway Width

Table 3-16: Driveway Width

Driveway Type	Minimum Pavement Width (feet) [8, 11]
Two-way Commercial Driveway (with exclusive right- or left-turn lane)	30[1, 6, 9, 10, 12]
Two-way Commercial Driveway (without exclusive right- or left-turn lane)	26[2, 6, 9, 10, 12]
One-Way Entry or Exit Commercial Driveway	20[3, 6, 9, 10, 12]
Residential Driveway	10[4, 7]
Residential Shared-use Driveway	16[5, 7]
Emergency Vehicle Access Driveway	20[6]

[1] Two-way 36-foot-wide commercial driveways may be allowed. A two-way commercial driveway wider than 36 feet may be approved by the Review Engineer where a substantial percentage of oversized-vehicle traffic exists.
[2] The width of commercial driveways shall be as required by the Review Engineer. Two-lane commercial driveways should generally be 26 to 36 feet wide, with 36 feet preferred on the approach to an arterial street.
[3] One-way entry or exit commercial driveway width less than 20 feet will require approval from the Fire Department.
[4] A greater width, but not more than 30 feet, may be considered for new single-family and duplex residences along streets with posted speeds 30 mph or greater. A greater width, but not more than 24 feet, may be considered for new single-family and duplex residences with driveways along streets with speed limits of less than 30 mph.
[5] Greater tract or easement width up to 25 feet may be required for residential shared-use driveways to account for future expansion of the plat.
[6] Vehicle swept path analysis and turning simulation for the design vehicle are required for all commercial driveways to confirm driveway width is adequate for two-way traffic. Refer to Section 3.1.3, Design Vehicles, for more details on the auto-turn requirements.
[7] Residential and residential shared-use driveways must be paved full width for the entire length.
[8] Pavement width as shown in Table 3-16 does not include space for a median or a sidewalk.
[9] Commercial driveways shall maintain the driveway approach width for the length of the landing (see Table 3-16 and Table 3-17).
[10] Commercial driveways, including multi-family developments, shall maintain the driveway approach width for the length of the landing (see Table 3-17).
[11] Vehicle access driveway width will be confirmed by the Fire Department during the permit review process.
[12] A minimum tract or easement width of 25 feet is required for private streets.

3.5.3 Driveway Vertical Alignments and Profile Elements

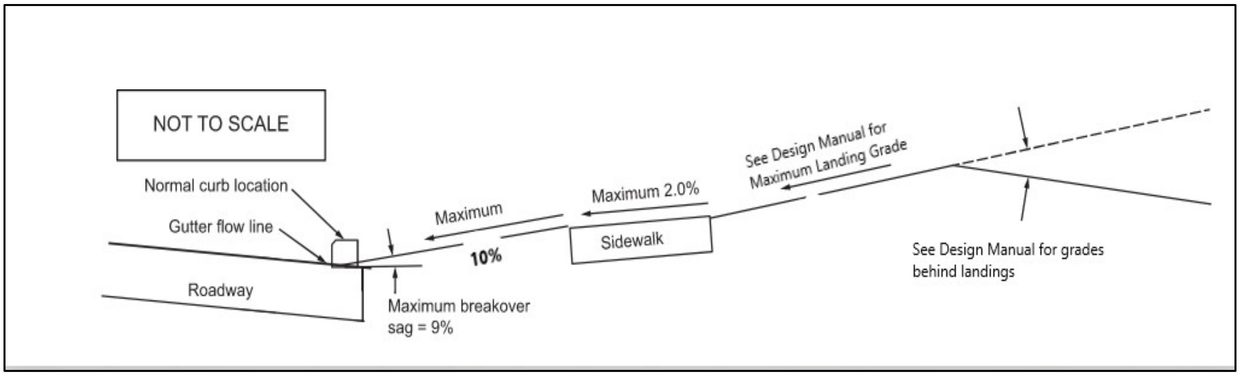
Vertical alignment elements are important in driveway design and should allow vehicles to be operated efficiently as they enter or exit the driveway. Profiles should be designed to minimize the possibility of a vehicle dragging or hanging up on the driveway. Driveway vertical profile includes the following elements:

1. **Driveway approaches**. Is the portion of the driveway lying in the public right of way and sidewalk easement between the curb face or roadway of a public street or private street and the private property line? Driveway approach grade and configuration shall accommodate planned future street widening to prevent the need for major driveway reconstruction in the future. Where a new driveway is constructed as part of the development frontage improvements, the driveway approach shall be a formed concrete structure as specified in Design Manual Standard Drawings SW-140-1 and SW-150-1. Driveways with dropped sidewalks as shown on Standard Drawings SW-160-1 and SW-170-1 will only be allowed in situations where an existing driveway is being reconstructed without the adjacent sidewalk or where it is infeasible to construct other allowed driveway options due to, but not limited to, site constraints and topography. In cases where public street improvements or sidewalks do not exist and they are not required by the Transportation Development Code, the driveway approach may be asphalt and constructed as specified in Design Manual Standard Drawings SW-180-1 and SW-190-1. If there is a taper from the driveway to the driveway approach, the taper design shall be as specified by the Review Engineer.

   The driveway approach includes the following elements:

   a. Driveway apron, which is the portion of the driveway approach extending from the gutter flow line to the front of the sidewalk. A minimum of a 5-foot-wide apron is required for all driveway types with a maximum running slope of 10% as shown on Figure 3-7 below. The Review Engineer may allow a maximum of a 1-inch drop in sidewalk elevation in order to maintain the required apron maximum slope of 10%. On a case-by-case basis, the Review Engineer may allow the apron to be extended to the side up to 8 feet beyond the driveway opening width to accommodate the turning movements of oversized vehicles. This type of configuration will only be allowed if site constraints prevent the full widening of the driveway.

   b. Side slopes (wings) are the two portions of the driveway approach that provide a transition from the normal curb or sidewalk grade to the grade of the apron by means of a sloping surface. The horizontal distances of these side slopes are measured at the curb line and illustrated on the Design Manual Drawing SW- 140-1 or equivalent.



Source: [Edited] Figure 4-12. Driveway Vertical Alignment and Profile Elements of AASHTO Green Book, 7th Edition 2018.

Figure 3-7: Driveway Vertical Alignment

2. **Sidewalks, multi-use paths or trails**. The sidewalk, multi-use path or trail shall continue across the driveway without a change of elevation unless otherwise approved by the Review Engineer. Sidewalks intersect new or altered driveways and are required to meet ADA accessibility standards and the PROWAG standards for a Pedestrian Access Route. Refer to Section 3.4.1, Pedestrian Design for more details on the requirements.

3. **Landings**. Landings are the flattened portion of a driveway or private street located on the private property and immediately past the sidewalk section for a certain length. They provide a transition, with the approach, from the traveled way to the driveway or private street. All landings shall be limited to a grade of 10% or less for 20 feet past the back of the driveway approach, as listed in Table 3-17 below, and shall be limited to a maximum grade of 15% thereafter. Landing grade requirements are necessary to accommodate sight distance requirements per Design Manual Standard Drawings RL-100-1 and RL-120-1, and Design Manual Standards 3.2.1 and 3.2.2. Grade changes must be rounded off so that vehicles do not bottom out and abrupt grade changes do not interfere with the sight distance requirements.

Table 3-17: Landing Grades for Private Streets and Driveways

Access Types	Arterial		Non-Arterial	
	Maximum Grade	Minimum Length Past Driveway Approach (feet)	Maximum Grade	Minimum Length Past Driveway Approach (feet)
Residential single-family driveway	10%	20	10%	20
Residential shared-use driveway	10%	20	10%	20
Commercial driveway with no parking garage at back of sidewalk	7%	30	10%	20
Commercial driveway with parking garage at back of sidewalk	7%	30[1]	10%	30[1]
Emergency Vehicle Access Driveway[2]	7%	30	10%	30

[1] If queues are likely to extend into the travel lane of the nearest roadway, then a queuing analysis shall be provided as required by the Review Engineer to either set the location of the parking garage door such that it will not create any spillover to the street or adjust the operation of the garage door during the business hours to minimize any waiting time or delay at the garage access.

[2] Final requirements will be confirmed by the Fire Department during the permit review process.

3.5.4 Driveway Spacing, Offsets and Setbacks from Intersections

All driveways shall be aligned with driveways, private streets and public streets located on the opposite side of the street. Offset and setback distance requirements are shown on Table 3-18 below. If compliance with this requirement is infeasible, driveway opening must meet the offset and setback distance requirement as shown on Table 3-18.

Table 3-18: Offset and Setback Distance Requirements

Driveway Type	Requirements	Minimum Distance (feet)[1, 2, 3, 4, 5]
Commercial Driveway	Offset distance from driveways, private streets, and public streets located on the opposite side of the street.	100
Commercial Driveway	Setback distance from the nearest parallel public street or intersection	150
Commercial Driveway	Setback distance from any other parallel driveway or private street.	100[6]
Commercial Driveway	Setback distance from any private property line	10
Residential Single-family Driveway Residential Shared-use Driveway	Setback distance from any other parallel residential driveways	10
Townhouses PUD Duplex or Triplex	Setback distance from any other parallel residential driveways	5

[1] The offset or setback distance from a driveway or private street approach shall be measured from Point A to Point A. Point A is defined in Design Manual Standard Drawings SW-140-1, SW-150-1, SW-160-1 and SW-170-1.
[2] The offset or setback distance from a public street or private street shall be measured from Point A to the point of tangency (PT) or point of curvature (PC) of the curb return. Point A is defined in Design Manual Standard Drawings SW-140-1, SW-150-1, SW-160-1 and SW-170-1.
[3] Conflicting access movements within the 95th percentile queue of any traffic movement should be avoided.
[4] Driveways shall be separated as far as possible from the nearest adjacent parallel public street. If the minimum separation distances shown on Table 3-18 cannot be achieved, the Review Engineer may request a safety and operational analysis study from the applicant to confirm that the proposed location will not have any adverse impacts on the adjacent public street or intersection.
[5] Emergency vehicle access driveway setbacks and offset distances will be determined by the Review Engineer during the permit review process.
[6] The offset distance from a parallel existing driveway may be reduced to a minimum of 20 feet subject to Review Engineer approval.

3.5.5 Restricted Access Driveways

Restricted access driveways are used to restrict turning movements out of or into driveways. Turning restrictions at driveway locations shall be by one or more of the following methods as deemed appropriate by the Review Engineer:

- Median islands
- Mountable curb or C curbs
- Pork chops
- Signage

3.5.6 Access Requirements at Street Ends

In cases where a development site is abutting a dead-end street or private street with no turnaround area, the new driveway or access may not be allowed to extend from the street end; instead, the owner is required to construct a new circular turnaround area as per Design Manual Standard Drawing RC-130-1 in order to create a driveway access off the public street or private street end. For a residential single-family lot, if creating a circular turnaround is infeasible due to land availability or other constraints, the Review Engineer may allow an alternative type of turnaround area such as a hammerhead or offset type hammerhead to be created at the end of the street in order to gain access off the new turnaround. In such cases, the new driveway shall not be allowed to be placed on the hammerhead branches. The hammerhead shall be fully accessible for emergency vehicles at all times. All applications will be reviewed by the Review Engineer on a case-by-case basis to determine the final requirements during the permit application process.

New driveways shall be perpendicular on the horizontal curve for the turnaround to maximize the sight lines at the driveway.

3.6 Roadside and Bridge Design

3.6.1 Bridges

1. All bridges, whether on public streets or private roads, shall meet the minimum requirements set forth in the latest edition of the AASHTO LRFD Bridge Design Specifications, the AASHTO Guide Specifications for LRFD Seismic Bridge Design and the WSDOT Bridge Design Manual. Vehicular live load design criteria shall be HL-93, as modified by the WSDOT Bridge Design Manual, except as allowed by the City of Bellevue Transportation Director. Additional loading and design considerations may be required by the Fire Marshal or the Transportation Director.
2. All bridges shall match the full width and configuration of the street, private road or path being served (traveled way plus curbs, sidewalks, walkways, bike lanes, equestrian lanes and shoulders on one or both sides). Requirements of utilities shall be considered. Traffic barriers and pedestrian railings or combination traffic barrier/pedestrian railings shall meet AASHTO specifications and the requirements of the WSDOT Bridge Design Manual. Vertical clearance shall be a minimum of 16.5 feet (or state standard, whichever is greater).

3. All information required to create the Bridge Record file as described in Chapter 1.09 of the WSDOT Bridge Inspection Manual shall be supplied by the developer prior to acceptance of the finished structure by the Transportation Department.

3.6.2 Retaining Walls and Transportation Structures

1. Retaining walls located within the right of way shall be installed to benefit the general public by supporting or protecting public transportation infrastructure and shall not be for private development gain.
2. Walls located on private property or rights of way that support or protect public transportation infrastructure shall meet the minimum requirements set forth in the latest edition of the WSDOT Design Manual, Bridge Design Manual, and the International Building Code. The wall type shall be approved by the Review Engineer, who may take into account long-term maintenance requirements, constructability and recommendations from the applicants' or third-party engineers. The Review Engineer may require a third-party structural review prior to approval of the wall. Additional easements may be required for the maintenance, operation and replacement of the wall. Rockeries that are load-bearing or over 4 feet in height are not an acceptable retaining wall type. An architectural finish or engineered block shall be chosen that fits the character of the surrounding neighborhood with approval from the Review Engineer. Timber laggings are not considered a permanent structure when building soldier pile walls and shall require a reinforced concrete finish. Concrete walls that are prone to graffiti shall be coated with a moisture barrier and anti-graffiti paint.
3. Retaining walls shall be located such that there is a minimum of 2 feet clear of the sidewalk and a minimum of 3 feet clear of the curb face where there is no sidewalk. Barriers, railings or fencing at the top of the wall may be required.
4. Private and public retaining walls shall not be built integrally. Total structural isolation is required for adjacent walls.
5. Acceptance for privately built retaining walls within the public right of way, which will be maintained and/or owned by the City of Bellevue, shall require As-Built shop drawings with final design calculations and plans to be filed with the City.

3.6.3 Clear Zone and Fixed Objects Placement

Fixed objects are defined as an object, a side slope or water that, 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. A fixed object can be either constructed or natural. Examples of fixed objects include, but are not limited to: a wooden pole or sign post (that do not have a breakaway feature) with cross-sectional areas greater than 16 square inches, trees with a diameter of 4 inches or more measured at 6 inches above the ground surface, illumination poles, camera poles, objects extending above the ground surface by more than 4 inches like boulders, signal/electrical/ITS cabinets, piers, retaining walls and drainage elements, such as culvert and pipe ends.

Clear Zone means the total roadside border area defined by the "Clear Zone Distance Table" found in Chapter 1600 of the WSDOT Design Manual, starting at the edge of traveled way and within the road right of way that is available for safe use by errant vehicles and where the placement or relocation of fixed objects is controlled.

1. A clear recovery area is a consideration when placing fixed objects along the roadside or within medians. The intent is to provide a traversable recovery area when opportunity allows. The design clear zone, as defined by the WSDOT Design Manual, is 10 feet for roadways with a speed limit of 35 mph or less. See the WSDOT Design Manual for speed limits above 35 mph. It is acknowledged by the WSDOT Design Manual that within urban areas, it will not always be practical to provide this 10-foot clear zone area.
2. When placing new fixed objects along a roadside or along a median with a traffic curb, the designer must attempt to select locations with the least likelihood of an impact by an errant vehicle and always meet the minimum operational offset of 3 feet from the face of curb to the face of the object.
    a. New fixed objects placed along a roadside or median that do not have a curb shall meet the clear zone requirements listed below. Minimum clear zone offset distance from roadside or median without a curb and with a speed limit of 35 mph or less is 10 feet subject to Review Engineer approval.
    b. Minimum clear zone offset distance from roadside or median without a curb and with a speed limit of 40 mph or greater shall be determined from the WSDOT Design Manual.
3. Fixed objects shall not be located or be allowed to remain closer than 10 feet to the edge of a driveway, identified as Point A in Design Manual Standard Drawings SW-140-1, SW-150-1, SW-160-1, SW-170-1, SW-180-1 and SW-190-1, unless modification is approved by the Review Engineer. Fixed objects shall be located such

that they do not violate the vehicle and pedestrian sight obstruction requirements of Transportation Standards as in Section 3.2.1. See Design Manual Standard Drawings RL-100-1, and RL-120-1 as well.

3.6.4 Breakaway Objects

Breakaway objects are defined as objects having properties up to and including that of a 4-inch by 4-inch wooden post. The following separation distances shall apply:

1. The minimum operational separation distance from roadside or median with a traffic curb is 3 feet.
2. The minimum operational separation distance from roadside or median without a traffic curb is 10 feet unless otherwise approved by the Review Engineer.

3.6.5 Mailboxes

1. Mailboxes shall be clustered together where practical and where reasonably convenient to the houses being served. For groupings of three or more boxes within a new residential development, a neighborhood delivery and collection box unit consisting of locked boxes on a single pedestal shall be provided.
2. When mailboxes are located within the sidewalk, the sidewalk shall be widened to provide the full design width around the mailboxes.
3. In the case of new street construction, or street reconstruction that requires mailboxes to be installed or moved, the designer and builder shall coordinate with the Station Master or Postmaster at the post office that serves the location. Mailbox locations approved by the U.S. Postal Service and approved by the City of Bellevue Transportation Department to facilitate vehicle, bicycle and pedestrian safety shall be shown on approved street construction plans and installed at the approved locations.
4. Mailboxes shall be installed as follows:
   a. The base of the box shall be 41 to 45 inches above the street, or per U.S. Postal Service requirements.
   b. The front of the mailbox shall be 1 foot behind the back of the sidewalk on walking delivery routes, or 1 foot behind the curb face on vehicular delivery routes.
   c. The mailbox shall be placed on posts strong enough to give firm support, but not to exceed the breakaway characteristics of a 4-inch by 4-inch wood post or

2-inch standard steel or aluminum diameter pipe. See Design Manual Standard Drawings RC-270-1 and RC-280-1.

d. Additional non-breakaway fixtures shall not be installed adjacent to mailbox locations. See Sections 3.6.3 and 3.6.4.

e. Clustered mailboxes mounted on new concrete pads require a right-of-way permit.

3.6.6 Lateral and Vertical Clearances

Clearances are the minimum distances between elements in, under and above the street right of way and public sidewalk easement. Clearance requirements are a key factor in how space within the right of way and on private property adjacent to the right of way can be used. Maintaining appropriate clear distances between certain elements in the right of way, sidewalk easement and on private property is necessary for a variety of reasons. Safety is a key consideration for the traveling public, the property owners and for operations and maintenance crews who must access elements in the right of way and public sidewalk easements for routine maintenance or repair. Appropriate clearances also enable the proper growth and development of trees and landscaping and help protect and maintain both overhead and underground utilities.

Table 3-19 summarizes the required minimum lateral clearances for objects and trees in the right of way and public sidewalk easement. Table 3-20 summarizes minimum lateral clearances for stair risers, fences and seating features from the sidewalk.

Table 3-19: Minimum Lateral Clearances

Features	Minimum Lateral Clearance (feet)	Limits of Measurements
Utility Poles (street lighting and signal poles)	3	Measured from face of curb to the face of the pole.
Retaining Walls	2 3	Measured from the back of the sidewalk to the face of the wall. Where there is a planned sidewalk, the clearance is measured from the back of the planned sidewalk limit to the face of the wall. Where there is no sidewalk or planned sidewalk the distance is measured from the face of curb to the face of wall.
Public Art	3	Measured from face of curb to the face of the object.
Fire Hydrants	3	Measured from face of curb to the face of the hydrant.

Features	Minimum Lateral Clearance (feet)	Limits of Measurements
Trees	3 10 25	Measured from face of curb to the tree trunk. Measured from the tree to Point A of any driveway as defined on driveway standard drawings. Measured from the center of the tree to the center of any street light or signal poles.

Table 3-20: Minimum Lateral Clearances from Sidewalk

Features	Minimum Lateral Clearance (feet)	Limits of Measurements
Stair Risers and Fences	2	Measured from the back of the sidewalk to the stair riser or fence.
Seating and Benches	2 2	Measured from the back of the sidewalk if placed on private properties. Measured from the front of the sidewalk if placed within the planter area.

Table 3-21 shows the minimum vertical clearance for any horizontal projection over the sidewalk and utilities easement area.

Table 3-21: Vertical Clearances Above Sidewalk Easements

Feature	Minimum Vertical Clearance (feet)	Measurement Limits
Removable Awnings or Canopies for Weather Protection Over Sidewalks	10[1]	Measured from the finished surface of the sidewalk to the bottom of the awning or canopy.
Awnings Over Multi-Use Paths	10	Measured from the finished surface of the multi-use path to the bottom of the awning or canopy.
Tree Limbs Over Driveways	14	Measured from the finished surface of the multi-use path to the bottom of the limbs.
Covered Commercial Driveways	15[2]	Measured from the driveway surface to the bottom of the driveway overhang.

1The minimum vertical clearance may be reduced over the sidewalk if a designated bicycle facility is present on the street.
[2] Reduced vertical clearance may be allowed for driveways that are designated for passenger cars only.

3.7 Utilities

3.7.1 Small Wireless Facilities in the Right of Way

Small wireless facilities (SWF) in the city's public right of way shall meet location and design requirements outlined in Title 6 of Bellevue City Code. Pursuant to BCC 6.02.030, prior to submitting an SWF permit, any telecommunication carrier that desires to install an SWF within the city right of way shall have a valid right-of-way use agreement with the City. Additionally, pursuant to BCC 6.08.070, if any component of the proposed SWF involves the use of a city pole, the applicant shall have a valid master license agreement with the City.

The applicant shall complete the SWF permits checklist, which shall be attached to every SWF permit application.

All plans and drawings submitted for an SWF permit must comply with the terms and requirements outlined in the SWF Standards for Plans and Drawings document. For additional information on small wireless facilities, see Appendix D.

SWF communication infrastructure shall follow the City's "Fiber Optic Design Requirements" (see Appendix C) for SWF deployments and is intended for application in new construction projects within the city.

When the installation of a new street light or the replacement of an existing street light is required as part of a development project, the developer has the option to install an aluminum roadway lighting pole per standard drawing SL-111-1 or a SWF-compatible steel roadway lighting pole per standard drawing SL-100-2.

If the temporary or permanent relocation of a street light pole that contains a SWF is required due to commercial or residential development, the developer shall consider alternate options to leave the street light pole in place. If the pole must be relocated, the developer shall coordinate with the telecommunications carrier on relocation. A separate right-of-way use permit shall be required for the relocation of the street light pole.

3.7.2 Private Utilities in Public Right of Way

1. When relocation of franchise utilities located in the right of way or city easement is necessary to accommodate public street improvements associated with a new development as per BCC 14.60.110, such relocation is subject to the terms of any applicable franchise agreement, right-of-way use agreement or state code.

2. When the street improvements are part of, or consistent with, the City's capital investment program plan, transportation improvement program, or transportation facilities plan, then some portion of the cost or expense in relocating franchise utility facilities may be the responsibility of the franchise utility, if such is provided for in a

franchise or right-of-way use agreement. Refer to BCC 14.30.185 for more information.

3. All franchise utility distribution systems in new subdivisions and short subdivisions, including power, telephone and TV cable, shall be installed underground unless otherwise provided in a franchise agreement or right-of-way agreement.
4. All existing and new franchise utility distribution systems, including power, telephone and TV cable, fronting or serving a commercial development site shall be undergrounded. The extent of the undergrounding required by this section may be limited to the nearest support or connection point(s) as determined by the Review Engineer.
5. To minimize repetitive impacts to public streets due to multiple utility installations, developers will coordinate public and franchise utility service installations and associated pavement restoration with the goal of consolidating disruption to a short time period and minimal area.
6. No above-ground utilities shall be permitted within planter strips, sidewalks or multi-purpose paths. Transformers and utility vaults to serve the development shall be placed inside the building or behind the sidewalk or multi-purpose path easement. Vaults serving a broader public purpose may be located within a public easement or right of way as approved by the Review Engineer. To the extent feasible, no utility vaults may be located within the primary walking path in any sidewalk. All new and existing utilities lids within the sidewalk must be non-slip/non-skid type per ADA.
7. No new overhead utility lines will be allowed within or across any right of way or sidewalk.
8. Easements and existing overhead lines must be relocated underground.

3.7.3 Pavement Restoration and Trench Backfill for Utilities Work

Materials and workmanship shall be in conformance with the WSDOT/APWA Standard Specifications for Road, Bridge, and Municipal Construction. Construction shall be in conformance with the Design Manual Standard Drawings, the details and conditions outlined in the Right of Way Use Permit and the following:

1. Trench restoration shall be accomplished with a patch or an overlay as required by the Pavement Restoration Requirement Map or the Review Engineer.
2. If a patch is used, the trench limits shall be sawcut prior to final patch.

3. All trench and pavement cuts shall be made by sawcuts or by grinding. The sawcuts or grinding shall have a minimum distance outside the trench width as shown in Design Manual Standard Drawings RC-190-1, RC-200-1, RC-210-1 and RC-220-1.
4. If the Right-of-Way Use Permit requires an overlay, then the contractor may use a jackhammer or drum grinder for the cutting of the existing pavement.
5. Within the top 4 feet of trenching, backfill shall be crushed surfacing materials or a controlled-density fill material conforming to Section 4-04 of the WSDOT/APWA Standard Specifications. Backfill materials must be inspected and accepted by the Review Engineer.
6. If the existing material is determined by the Inspector to be suitable for backfill and the trench is not perpendicular to a travel lane or driveway, the contractor may use the native material as long as the top 8 inches is crushed surfacing material.
7. Material used for backfill below 4 feet in depth must be approved by the Inspector.
8. All trench backfill shall be compacted to 95% maximum density, as described in Section 2-03 of the WSDOT/APWA Standard Specifications.
9. Backfill compaction shall be performed in 8-inch to 12-inch lifts. The compaction tests shall be performed in maximum backfill increments of 2 feet. The test results shall be given to the Inspector for review and approval prior to paving. Material testing will be required for trench backfill (native or imported), asphalt and concrete. Testing shall be performed by a certified independent testing laboratory. The cost of testing is the responsibility of the franchise utility or contractor. The number of tests required shall be the same as for asphalt density testing, or as directed by the Inspector. Acceptance testing may also be performed as directed by the City Materials Engineer as required.
10. Temporary restoration of trenches for overnight use shall be accomplished by using HMA or steel plates. HMA used for temporary restoration may be dumped directly into the trench, bladed out and rolled. After rolling, the trench must be filled flush with asphalt to provide a smooth riding surface.
11. HMA shall be placed to the compacted depth as shown on Design Manual Standard Drawings RC-190-1, RC-200-1, RC-210-1, RC-220-1, RC-230-1, RC-240-1 and RC-250-1, and as directed by the Review Engineer. Asphalt cement shall be paving asphalt. Materials shall conform to the WSDOT/APWA Standard Specifications.
12. Tack shall be emulsified asphalt grade CSS-1 as specified in the WSDOT/APWA Standard specifications and shall be applied to the existing pavement and edges of sawcuts as specified in the WSDOT/APWA Standard Specifications.

13. HMA shall be placed on the prepared surface by an approved paving machine and shall be in accordance with the requirements of the WSDOT/APWA Standard Specifications. Fine and coarse aggregate shall be in accordance with the WSDOT/APWA Standard Specifications. Asphalt concrete over 2 inches thick shall be placed in equal lifts not to exceed the guidelines set forth in the WSDOT/APWA Standard Specifications. See Design Manual Standard Drawings RC-100-1 and RC-110-1.
14. Cuts for trenches in all street surfaces, walks and driveways shall be either ground or sawcut. Ground joints shall be feathered and shimmed to provide a smooth surface. Feathering and shimming shall be accomplished by raking out the oversized aggregates from the mix. Surface smoothness shall conform to the WSDOT/APWA Standard Specifications. The paving shall be corrected by removal and repaving of the trench only.
15. Compaction of all lifts of asphalt shall be at an average of 92% of maximum density as determined by the WSDOT Field Operating Procedures for AASHTO 209 Test Method. The number of tests required per square foot of trenching shall be as follows:
    a. One set of three tests for less than 300 square feet of trenching area
    b. One additional test for every 200 square feet over 300 square feet of trenching area or every 100 lineal feet of trench, if applicable

    Testing shall be performed by a certified independent testing laboratory. The cost of testing is the responsibility of the franchise utility or contractor. Acceptance testing may also be performed as directed by the City Materials Engineer. The testing is not intended to relieve the contractor from any liability for the trench restoration. It is intended to show the Inspector and the City that the restoration meets these specifications.
16. All joints shall be sealed using paving asphalt.
    a. Contractors performing asphalt restoration work must be pre-qualified by the Transportation Department. To be pre-qualified, a contractor must submit qualifications in writing to the Pavement Manager. Past performance and available paving equipment will be reviewed to determine eligibility for the approved contractor list.
    b. A five-year moratorium on pavement excavation and trenching will be enforced following the completion of a new street or street overlay. This requirement restricts all street trenching except in the event of an emergency or as

authorized by the Transportation Director or his/her designee (the Right of Way Manager) per BCC 14.60.250.

c. Patch depths will vary based upon the classification of the streets being trenched. The asphalt depths shall be shown on the Right-of-Way Use Permit and the work shall be performed as required per Design Manual Standard Drawings RC-190-1, RC-200-1, RC-210-1, RC220-1, RC-230-1, RC-240-1 and RC-250-1. The minimum paving depths for all trenching shall be approved by the Inspector prior to restoration activity.

d. When trenching occurs within the street shoulder, the shoulder shall be restored to its original or better condition within 30 days of first opening the trench.

e. The final patch shall be completed within 30 days of first opening the trench. This timeframe may be adjusted if delays are due to inclement weather or other adverse conditions. Delay of the final patch or overlay work must be approved by the Review Engineer and will require an assurance device to guarantee completion.

f. Any patch or overlay located downtown shall be permanent and be completed as soon as possible.

g. Upon completion of asphalt restoration, the restored area shall be swept clear of loose material.

h. Additional pavement restoration may be required by the Inspector if warranted by field conditions.

3.8 Intersections

An intersection is the common area where two or more roadways join or cross, where speed and direction may change and conflicts may occur. Intersections must be designed to provide for the safety of motorists, pedestrians and bicyclists. By their nature, intersections are conflict locations where vehicles, pedestrians and bicycles all cross paths. Each crossing is a conflict point. Intersections should be designed to make the movements for modes of transportation intuitive and safe.

This section of the design manual is based on criteria from the following documents: AASHTO, A Policy on Geometric Design of Highways, NACTO Urban Bikeway Design and Urban Street Design Guide, NACTO Urban Street Design Guide, MUTCD – FHWA, WSDOT Design Manual.

In general, intersections shall be designed to accommodate the design vehicle appropriate for the highest classified street forming the intersection. The intersection design shall take into account the presence of any designated truck route, public bus route or school bus route. 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. The minimum design vehicle shall be an AASHTO SU-30 vehicle unless otherwise approved by the Review Engineer. Turning templates for the appropriate design vehicle(s) should be used to verify curb radii. Documentation may be requested by the Review Engineer. Refer to Section 3.1.3, Design Vehicles for more information on requirements.

Intersection design criteria will cover the following:

1. **Physical area of an intersection**. This area is defined by a line connecting the center of corner curbs (points of intersection extensions). This area is shared by traffic traveling in different directions.
2. **Functional area of intersection**. This area includes all queue storage areas, auxiliary lanes and perception and reaction lengths.

3.8.1 Design Considerations

Designers must consider all potential users of the facility in the design of an intersection. This involves addressing the needs of a diverse mix of user groups, including passenger cars, heavy vehicles of varying classifications, bicycles and pedestrians. Often, meeting the needs of one user group results in a compromise in service to others. Intersection design balances these competing needs, resulting in appropriate levels of operation for all users. In addition, the following should also consider:

- Minimize points of conflict.
- Simplify areas of conflict.
- Limit conflict frequency.
- Limit conflict severity.
- Facilitate safe and efficient flow of multi-modal traffic.
- Reduce impacts on surrounding intersections.
- Reduce pedestrian exposure.
- Accommodate future land use.

3.8.2 Intersection Horizontal Alignments

Generally, the design of intersections should be driven primarily by factors that maximize the safety of the intersection, minimizing the number of conflict points, reducing the number of legs of multi-leg intersections, where feasible, providing perpendicular crossing alignments, where feasible, and reducing driveway access points within the functional area of a controlled intersection.

Horizontal alignment for intersections includes the elements listed below.

3.8.2.1 Intersection Angles

Crossing streets should intersect at a 90-degree angle whenever possible. If a 90-degree angle is not feasible, the Review Engineer may allow an angle that varies between 85 and 95 degrees.

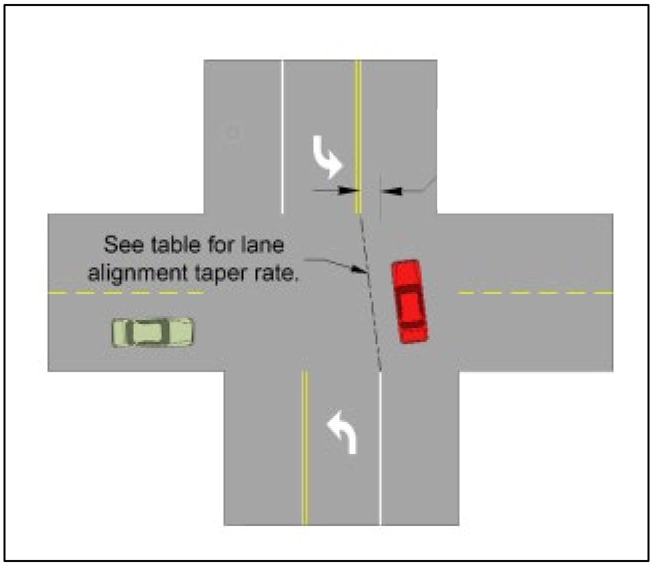
3.8.2.2 Lane Alignments

All lanes must be aligned properly through an intersection in situations where irregular intersections are created due to either successive urban developments or unaligned properties lines, which often occur at the threshold between adjacent grids, or where new or pre-existing streets cut through the conventional neighborhood layout.

Intersection design with lanes offset up to 6 feet (Figure 3-8) may be allowed given that the following conditions are met:

- Illumination is provided.
- The intersection is not within a horizontal curve, nor is it within a crest vertical curve.
- The taper rates as shown on Table 3-22 are provided.
- Lane channelization through the intersection is provided.

The designer must ensure that there is sufficient distance between new and adjacent intersections so that they form distinct intersections. A short distance between intersections should be avoided, if practical, because it tends to impede traffic operations. Intersections need to be far enough apart to operate as two intersections, or close enough to operate as one.



Source: [Edited] Exhibit 1013-1 Lane Alignment Taper Rate- WSDOT Design Manual.

Figure 3-8: Lane Alignment

Table 3-22: Lane Alignment Taper Rate

Posted Speed	Taper Rate
25	1:11
30	1:15
35	1:21
40	1:27

When feasible, locate intersections such that curves do not begin or end within the intersection area. It is desirable to locate the point of curvature (PC) and point of tangency (PT) 250 feet or more from the intersection so that a driver can settle into the curve before the gap in the striping for the intersection area. Do not locate short curves where both the PC and PT are within the intersection area.

For intersections on which a major roadway curves and a minor roadway is located tangent to that curve, it is highly desirable to realign the minor roadway as close to 90 degrees as possible.

3.8.3 Intersection Vertical Alignments

Intersections should be carefully located to avoid steep profile grades and to provide adequate approach sight distance. An intersection should not be situated just beyond a short crest vertical curve or on a sharp horizontal curve. When there is no practical alternate to locating an intersection on a curve, the approach sight distance on each leg shall be provided and the horizontal or vertical curves lengthened to provide the required sight distance. The vertical profile of an intersection includes the elements listed below.

3.8.3.1 Approach Grades and Landings

The grades of the intersecting streets should be as flat as practical on those portions that will be used for storage of stopped vehicles. This is referred to as the intersection landing. The desirable grade of landing is 2% wherever practical but the maximum grade on each intersecting leg within the expected storage distance on the leg should not exceed 5%.

At a minimum, the storage platform should be at least 100 feet long for arterials and non-arterial streets unless greater length is required to accommodate queued vehicles. The landing length is measured in feet from the nearest intersecting curbline or edge of pavement.

3.8.3.2 Grades Through Intersections

The cross slope within both marked and unmarked crosswalks should be limited when establishing roadway profiles at intersections such that the crosswalk is accessible to and usable by individuals with disabilities. To achieve this cross slope, the intersection area may need to be tabled, which will affect the vertical alignment of the roadway and intersection drainage. More specifically, cross slope of the pedestrian accessible route (PAR) contained within an intersection crosswalk depends on the intersection traffic control as follows:

- Crosswalks at yield or stop-control devices. The cross slope shall not exceed 2.0%.
- Crosswalks at uncontrolled approaches. The cross slope shall not exceed 5%.
- Crosswalks at Traffic Control Signals or Pedestrian Hybrid Beacons. The cross slope shall not exceed 5%.
- Crosswalks at midblock and roundabouts. The cross slope shall not exceed street grade.

For intersection design, the following requirements should be considered:

1. Where the minor street is stop-controlled, the profile and cross section of the major street will be maintained through the intersection. The cross slope of the minor street legs will be transitioned to match the major street cross slope and profile.

2. If both intersecting streets have approximately equal importance, the designer may want to consider transitioning both roadways to form a plane section through the intersection.

3. At a signalized intersection or one to be signalized in the future, the most desirable rotation option will be to transition all approach legs into a plane section through the intersection. The grade of the approach roadway where vehicles may be stored should not be steeper than 2% where practical. A grade steeper than 5% should be avoided.

4. When a minor street intersects an existing major street, the new minor street profile should tie into the major street's travel lane cross slope as shown in Figure 3-9 below. However, it will be acceptable for the minor street profile to tie into the major street's shoulder cross slope. Actual field conditions will determine the final design.

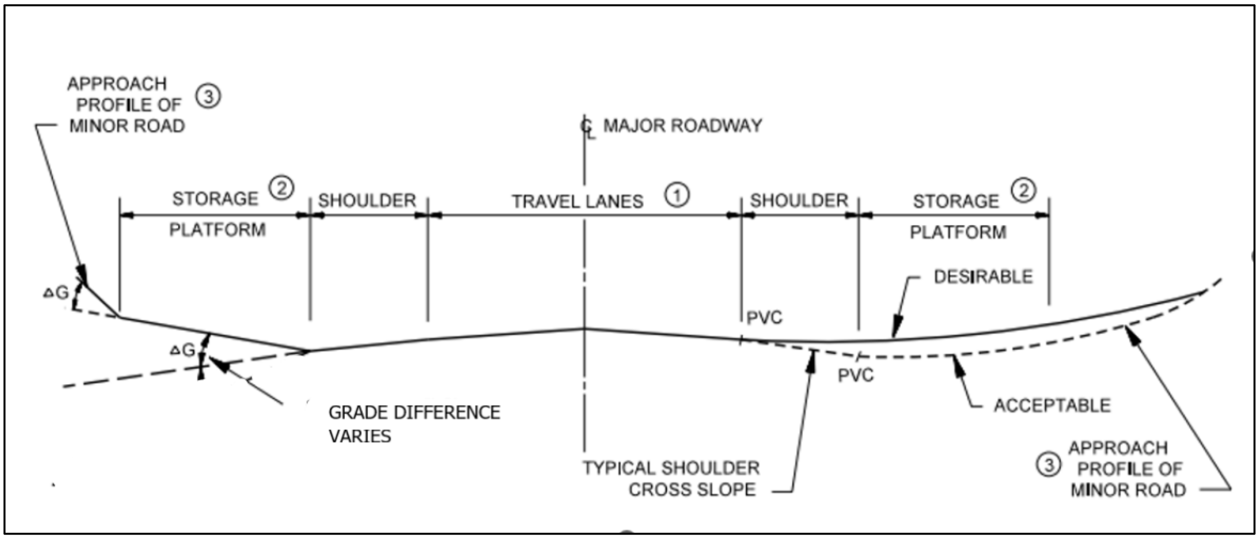


Figure 3-9: Intersection Cross Section and Alignment

5. Where the cross section of the approach is warped to meet grade requirements, a vertical curve to transition to the required grade will need to be created by the designer. The vertical curve at the intersection approach should be designed for full stopping sight distance as discussed in Section 3.8.3, Intersection Vertical Alignments. The profile and transitions at each intersection should be evaluated for impacts on drainage.

3.8.4 Intersection Spacing

The minimum distance between adjacent parallel non-arterial streets shall be 150 feet, measured from nearest curb edge to nearest curb edge. For intersections on arterial streets, the minimum spacing distance between intersections will be advised by the Review Engineer on a case-by-case basis and will depend on the proposed type of traffic control.

When creating a new intersection, the designer must ensure that there is sufficient distance between the new and adjacent intersections so that they form distinct intersections.

3.8.5 Corners and Curb Returns

Intersections should be designed with corner radii adequate for the selected design and control vehicles, See Section 3.13 for information on design and control vehicles. See Table 3-23 for information on minimum turning radius. At intersections, there are two distinct radii that need to be considered: the effective turning radius of the turning vehicle and the radius of the curb return (see Figure 3-10). The effective turning radius is the minimum radius appropriate for turning from the right-hand travel lane on the approach street to the appropriate lane of the receiving street. If a bicycle lane or on-street parking exists on both intersecting streets the effective turning radius is required to be checked using the appropriate design vehicle for the streets being designed and the lane on the receiving street into which that design vehicle will turn.

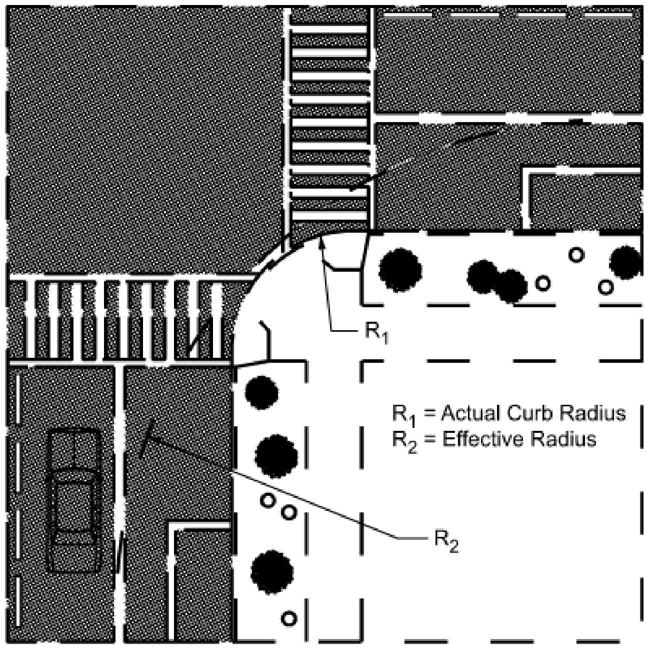


Figure 5-3. Actual Curb Radius and Effective Radius for Right-Turn Movements at Intersections

Source: Figure 5-3. Actual Curb Radius and Effective Radius for Right-Turn Movements at Intersections, AASHTO Green Book, 7th Edition 2018.

Figure 3-10: Actual Curb Radius and Effective Radius for Right-Turn Movements at Intersections

The selected design and control vehicles at the intersection will make a right turn while maintaining approximately a 2-foot clearance from the pavement edge or face of the curb and, at a minimum, will not come closer than 1 foot.

The typical curb radius at intersections is shown in Table 3-23:

Table 3-23: Typical Curb Radius at Intersections

Intersection Type	Curb Radius Dimension (feet)
Non-Arterial Street ADT*<400	15
Non-Arterial Street ADT*>400	20
Arterial	25
Bus/Truck Route	30
Where Turn is Illegal	10

The Review Engineer may determine that additional right of way is required at or near intersections to accommodate auxiliary traffic lanes and equipment for existing or future traffic signals and street lights.

3.8.6 Turn Lanes

The need for left- or right-turn lanes shall be based on a traffic operational analysis and as dictated by the City of Bellevue Transportation Facilities Plan, City Capital Improvement Program, or the applicable Land Use Code. The following general rules will apply:

- Queue storage estimates shall be based upon a traffic operational analysis.
- Left-turn lanes, when provided, shall have a storage queue of at least 100 feet.
- Left- or right-turn lanes analysis shall be based on Chapter 1310 of WSDOT Design Manual and City of Bellevue Standard Drawings CH-190-1, CH-200-1 and CH 210-1.

Turn lane length may be modified by the Review Engineer if necessary.

3.8.7 Sight Distances

Sight distances shall be determined and approved according to Section 3.2.1 Sight Distance of this design manual.

3.8.8 Curb Extensions

Curb extensions extend the line of the curb into the traveled way, reducing the width of the street. They are typically placed at intersections (Figure 3-11) but can be used at mid-block locations to shadow the width of a parking lane, bus stop or loading zone, if allowed by the City. In general, curb extensions can provide the following benefits:

1. Reduce pedestrian crossing distances and exposure to traffic.
2. Improve driver and pedestrian sight distances and visibility at intersections.
3. Separate parking maneuvers from vehicles turning at the intersections.
4. Visually and physically narrow the traveled way, resulting in a calming effect.
5. Encourage and facilitate pedestrian crossings at preferred locations.
6. Keep vehicles from parking too close to intersections and blocking crosswalks.
7. Provide wider waiting areas for pedestrians at crosswalks and intersection bus stops.
8. Reduce the effective curb return radii and slow-turning traffic.
9. Enhance ADA requirements by providing space for level landings.

Curb extension design should meet the following requirements:

1. Reduce crossing width at intersections and mid-block crossings by extending the curbline into the street no more than 5 to 7 feet from the curb of the adjacent parking lane, providing additional width to the roadway for turning movements. Ensure curb extension does not extend into travel or bicycle lanes.
2. Apply a minimum of 20 feet for curb return radius in the design of a curb extension. If necessary, use three-centered or asymmetric curb returns to accommodate design vehicles.
3. If required, curb extensions can be used at bus stops or bus layover areas to define the location of the stop and create additional waiting areas and space for pedestrian facilities. Refer to Section 3.4.3, Transit Design for more information on curb extensions and layover design requirements.
4. Align ramps, curb extensions and crosswalks with no unnecessary meandering.
5. Design curb bulbs such that they do not reduce the resulting width of the traveled way below the requirement for the street type.
6. Ensure that curb bulbs do not impede current or future planned bicycle and travel lanes. Curb bulbs may be designed with protected or elevated/separated intersection elements to allow for appropriate bicycle access.

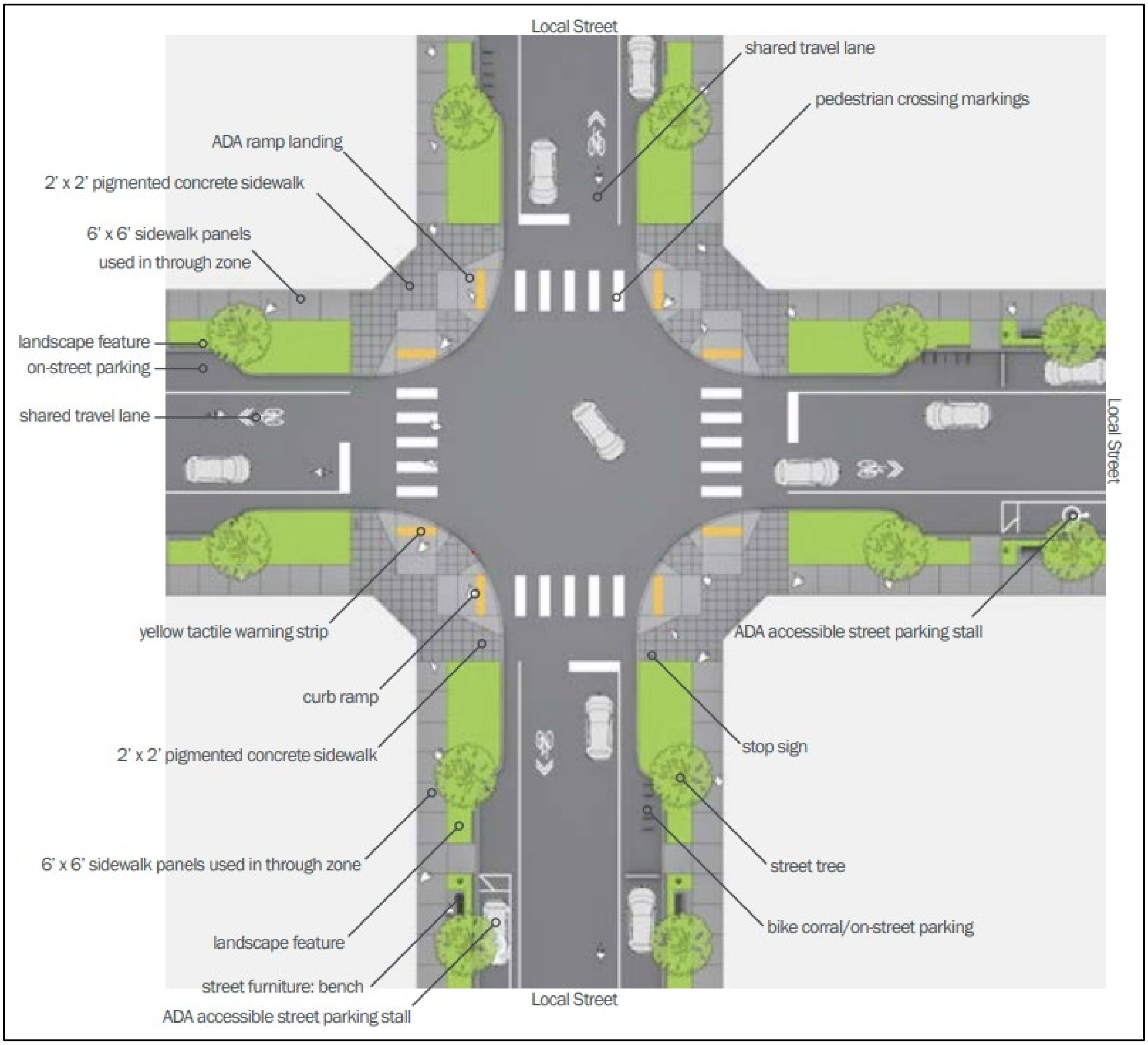


Figure 3-11: Example of an Intersection with Curb Extension

7. Select and place site features such as landscaping, cabinets, poles, benches, planters, bollards and newspaper stands so they do not obstruct the vision of pedestrians or drivers within curb extension areas.

3.8.9 Private Intersections

If permitted, a private intersection opening shall be designed per Section 3.8, Intersections of this design manual and Standard Drawing CH-290-1. When a private intersection opening is allowed, the following criteria must be met:

- Projected driveway usage is greater than 2,000 vehicles per day.
- Traffic signalization and easements are provided if approved by the Review Engineer.
- A 100-foot minimum storage area shall be provided between the face of the curb (or edge of the travel lane where no curb exists) and any turning or parking maneuvers within the site.
- The opening is at least 150 feet from the near-side face of the curb (or edge of the travel lane where no curb exists) of the nearest intersecting street.
- The opening is at least 100 feet away from any other driveway on the property frontage under the control of the property owner.

3.8.10 Curb Ramps

Curb ramps provide an accessible connection from a raised sidewalk down to the roadway surface. A curb ramp, or combination of curb ramps, is required to connect pedestrian accessible routes (sidewalks, multi-use paths and any other pedestrian facilities) to crosswalks (marked or unmarked) where curbs and sidewalks are present, except where pedestrian crossing is prohibited. For new construction projects, provide curb ramps oriented in each direction of pedestrian travel within the width of the crosswalks they serve. Refer to R203.6.1.1 of the PROWAG. “At an intersection corner, one *curb ramp* or *blended transition* shall be provided for each *crosswalk*, or a single *blended transition* that spans all *crosswalks* at the intersection corner may be provided.”

For reconstruction of existing ramps, curb ramps oriented in each direction of pedestrian travel within the width of the crosswalk they serve are required. Every curb ramp must have a curb ramp at the other end of the crosswalk it serves unless there is no curb or sidewalk on that side (RCW 35.68.075). Curb ramps are also required at mid-block crossings where curbs and sidewalks are present.

The following are a few standard ADA curb ramps:

1. **Perpendicular curb ramps (Type 1)**. These ramps are aligned to cut through the curb and meet the gutter grade break at a right angle. The landing is to be located at the top of the curb ramp. See standard drawing SW-230-1.
2. **Parallel curb ramps (Type 2)**. These ramps are aligned with their running slope in line with the direction of sidewalk travel, parallel to the curb. The landing is located at the bottom of the curb ramp. See standard drawing SW-210-1.
3. **Combination curb ramps**. In applications where a combination of perpendicular and parallel types of curb ramps are used, landings may be shared by multiple ramps. Buffer areas and pedestrian curbing that define the pedestrian path of travel

are inherent design elements for this type of curb ramp. See standard drawing SW-220-1.

4. **Directional cement concrete curb ramp (Type 3)**. See standard drawing SW-240-1.
5. **Blended transitions curb ramps**. See Figure 3-12. This type of curb ramp is only allowed when the other types are infeasible due to site and topography constraints.

Figure 3-12: Example of Blended Transitions Curb Ramp - Main Street, Bellevue

3.8.10.1 Accessibility Criteria for Curb Ramps

The accessibility criteria for pedestrians' facilities also apply to curb ramps unless superseded by the following accessibility criteria specifically for curb ramps.

3.8.10.1.1 Curb Ramp Widths

The clear width of curb ramps and their landings shall be 6 feet, excluding flares. For directional ramps in the downtown area, the minimum clear width is 8 feet.

3.8.10.1.2 Running Slopes

The running slope of curb ramps shall not exceed 8.3% maximum. It is recommended that running slopes be designed to be less than the maximum to allow for some tolerance in construction. For example, designing for a maximum 7.5% curb ramp running slope (rather than the 8.3% maximum). The curb ramp maximum running slope shall not require the ramp length to exceed 15 feet.

3.8.10.1.3 Cross Slopes

The cross slope of curb ramps shall not be greater than 2%, measured perpendicular to the direction of travel. It is recommended that cross slopes be designed between 0.5% minimum to 1.5% maximum to allow for some tolerance in construction. Instances where curb ramps are at mid-block crossings, the cross slopes are permitted to match the street grade.

3.8.10.1.4 Landings

A landing of at least 4 feet minimum length by 6 feet minimum width, is required either at the top or bottom of a curb ramp. The running and cross slopes of a curb ramp landing shall not exceed 2% maximum. It is recommended that cross slopes be designed between 0.5% minimum to 1.5% maximum to allow for some tolerance in construction. At shared-use paths, the landing must be as wide as the shared-use path.

3.8.10.1.5 Flares and Pedestrian Curbing

Flared sides are to be used where a pedestrian circulation path crosses the curb ramp from the side. Flared sides are to have a maximum slope of 10% for a maximum flare length of 7.5 feet, measured parallel to the back of curb. Pedestrian curbs are to be used only where there is landscaping or other appurtenances that prevent cross travel by pedestrians. Pedestrian curbs are to be located outside the pedestrian path (sidewalk or multi-use path).

3.8.10.1.6 Counter Slopes

The counter slope of the gutter or street at the foot of a curb ramp or landing shall be 5% maximum.

3.8.10.1.7 Detectable Warning Surfaces

Detectable warning surfaces are required where curb ramps or landings connect to a street. Detectable warning surfaces shall contrast visually with the adjacent walkway surface, gutter or street (see the City Standard Plans for placement details and other applications).

3.8.10.1.8 Construction Materials

Construction materials of curb ramps shall meet the sidewalk surface and thickness specified in Section 3.4.1.1 of this design manual. Gratings, access covers, utility objects and other appurtenances shall not be located on curb ramps, landings or gutters.

3.8.10.1.9 Grade Breaks

Grade breaks at the top and bottom of curb ramps shall be perpendicular to the direction of travel. Surface slopes that meet at grade breaks shall be flush.

3.8.10.1.10 Clear Space

A clear space, to facilitate pedestrian turning maneuvers, is required within the roadway for all non-directional curb ramps. The 4-foot (minimum) by 4-foot (minimum) clear space shall be located beyond the curb face where the bottom of a non-directional curb ramp or landing meets the gutter, contained within the width of the crosswalk and located completely outside the parallel vehicle travel lane.

3.8.10.1.11 Curb Ramp Drainage

Stormwater runoff from the roadway can flood the lower end of a curb ramp. Measures to prevent ponding at the base of curb ramps and landings (see Figure 3-13) must be taken. Verify that drainage structures will not be located in the PAR. Coordination with the Utilities Department will be required.

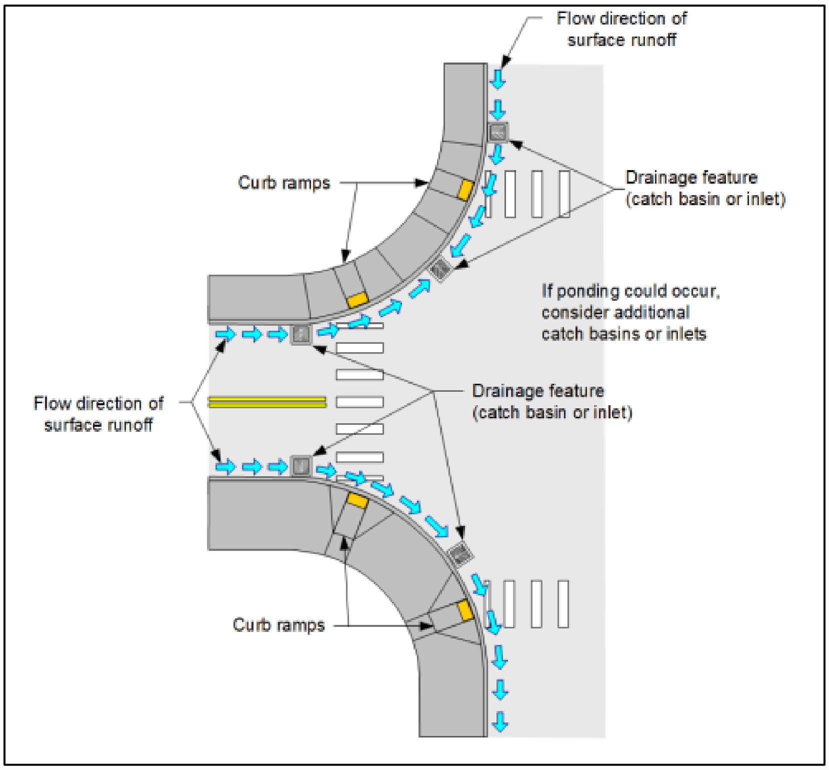


Figure 3-13: Typical Curb Ramp Drainage

3.8.10.2 Companion or Receiving Ramps

All curb ramps at the receiving ends of crosswalks are required to be verified for meeting the current ADA standards and the City of Bellevue requirements for curb ramp design criteria. Uncompliant companion ramps need to be upgraded to meet ADA standards regardless of whether the receiving end of the crosswalk is located within or outside the project scope of work.

4 Traffic Engineering

4.1 Traffic Signals

Traffic signal design requirements should be utilized for design of new, modified and temporary traffic signal systems. The documents submitted should include the information needed to provide a complete and fully functional traffic signal system.

New traffic signals are signals that are designed and installed at a location that does not currently have a traffic signal system or completely replaces one traffic control system for another.

A modified traffic signal is a signal that exists today; however, only a portion of the system is being replaced. Common traffic signal modifications include development or capital projects that rebuild one corner of an existing traffic signal, or projects that trigger replacement of ADA curb ramps and thereby also trigger modifications to existing pedestrian detection and traffic signal indication changes resulting from new channelization or operations at an intersection.

In addition to the information provided in this design manual, the Design Engineer preparing to design traffic signal plans shall:

1. Utilize the latest editions of the WSDOT Standard Plans and Standard Specifications for Road, Bridge, and Municipal Construction.
2. Utilize the latest edition of the City of Bellevue Standard Special Provisions.
3. Utilize the latest edition of the City of Bellevue Design Manual and Standard Drawings.
4. Utilize the latest edition of the MUTCD-recommended design practices adopted by WSDOT, where applicable.
5. Be in accordance with the National Electric Code.
6. Utilize the NACTO Design Guides, where applicable.
7. Reference the latest edition of the WSDOT Design Manual Chapter 1330 Traffic Control Signals where design guidance is not specified in this document.

4.1.1 Signal Operations

4.1.1.1 Signal Phasing and SCATS Staging

The City operates and maintains hundreds of traffic signals that are programmed using The Sydney Coordinated Adaptive Traffic System (SCATS). This traffic signal system utilizes a series of traffic movement stages in its programming in place of the more widely used eight stage “ring-and-barrier” phase diagram. Prior to plan development, the Design Engineer shall confirm both the SCATS signal staging and an equivalent phase diagram for equipment identification with the City’s Smart Mobility team.

4.1.1.2 Pedestrian Phases

Signalized pedestrian crossings shall be provided for every approach to the signalized intersection unless otherwise approved by the Review Engineer. Written justification for the lack of pedestrian crossings must be documented and provided to the Review Engineer. For signal modification, the closed pedestrian crossing may remain closed if the original or new justification is still valid for the closed crossing. If the justification for the closed crossing is no longer relevant, a new pedestrian crossing shall be added during signal modification.

For additional information about pedestrian signal operations, refer to the current version of the Bellevue Pedestrian Signal Operations Guidelines, which can be provided by the City’s Smart Mobility upon request.

4.1.1.3 Left-turn Phasing

Signalized left-turn movements may be permissive-only, protected-only or protected-permissive, depending on geometry and operational demands. Left-turn phasing may alternate between these modes based on current traffic conditions. Restricted left-turn movements may be considered in cases of geometry constraints, access restriction or other traffic operations factors that indicate improvement to safety and efficiency.

1. **Permissive-only left-turn movements**. Indicates turns made on the green ball or flashing yellow arrow after yielding to oncoming traffic and pedestrians.
   a. Evaluation of Bellevue’s permissive left-turn guidelines must be completed to implement permissive left-turn operations. This evaluation must include, but is not limited to, the following considerations:
      - Speed
      - Collision history
      - Sight distance
      - Number of opposing lanes
      - Presence of a U-turn
      - Turning volume
      - Cross product of turning volume and conflicting movement(s)
      - Delay

b. When no dedicated left-turn lane is present at an approach, the preferred signal indication control is:

   - A green ball signal indication when permissive left-turn movement is allowable
   - Split-phase operations or restricted left-turn movement when permissive left-turn movement is not allowable
   - When a left-turn lane is present at an approach, the preferred signal indication control is:
     - A four-section flashing yellow arrow signal indication when permissive left-turn movement is allowable
     - A three-section left arrow signal indication when permissive left-turn movement is not allowable (protected only)

c. If multiple left-turn lanes are present, protected three-section left-turn arrow signal indications shall be used.

d. Alternative left-turn signal indications or phasing not outlined in this document must be approved by the City's team.

2. **Protected-only left-turn movements**. Indicates turns made only when the left-turn green arrow signal is displayed.

3. **Protected-permissive left-turn movements**. Indicates both modes occur on an approach during the same cycle.

4.1.1.4 Right-turn Phasing

Signalized right-turn movements may be permissive, protected or protected-permissive, depending on geometry and operational demands. Right-turn movements may only be protected or protected-permissive when there is a dedicated right-turn lane present. Restricted right-turn movements may be considered in cases of geometry constraints, access restriction or other traffic operations factors that indicate improvement to safety and efficiency. When a right-turn lane is present, a signal indication face shall be provided for and aligned with the right-turn lane.

1. **Permissive right-turn movements**. These movements may be controlled either by a green ball indication or a flashing right-turn yellow arrow indication. A green ball indication is standard practice for permissive right-turn movements when there is not an independent right-turn lane present. A green ball indication may also be used for a right-turn lane when there is minimal conflicting volume with the permissive right-turn movement, for example, the adjacent pedestrian phase or oncoming permissive left turns.

A flashing right-turn yellow arrow indication is standard practice when:

- A right-turn lane is present.
- The right turn would benefit from a protected right-turn or overlap phase.
- The right turn may utilize the flashing arrow feature while the adjacent crosswalk is serving a pedestrian phase to increase awareness of nonmotorized users.
- At intersections with fewer stages or phases, for example T-intersections.

2. **Protected right-turn movements**. These movements may only be used when a right-turn lane is present unless otherwise approved by the City's Smart Mobility team. Protected right turns may be controlled by a three-section right arrow display.

3. **Protected-permissive right-turn movements**. These movements may be controlled by a four-section right flashing arrow display, or a four-section bimodal display. If multiple right-turn lanes are present, protected-only, three-section right-turn arrow signal indications shall be used.

It is desirable to include right-turn overlap phases where possible. Typically, a right-turn overlap may be combined with the receiving approach left-turn phase when a U-turn is not present for the left turn.

4.1.2 Traffic Signal Displays

Signal equipment may be relocated if it meets current City specifications and City staff confirm substantial life remains for the asset.

Signal head numbering shall follow standard drawing SL-280-1.

4.1.2.1 Vehicle Signals

All signal displays shall conform to the current MUTCD edition. All vehicle signal displays shall have 12-inch lenses and backplates with reflective tape. Signal displays shall be spaced at 8 feet minimum unless physical constraints exist. Signal display spacing under 8 feet must be approved by the Review Engineer. Signal displays shall be positioned to ensure visibility to the associated driver(s) and a minimum vertical clearance from the roadway as shown in standard drawing SL-360-1. WSDOT Standard plan J-75.20-01 Type M mounting of signal heads on the mast arms is preferred. Alternate mounting types may be used to meet vertical signal head clearances or other requirements and must be approved by the Review Engineer.

For through movements, there shall be at minimum two signal displays provided for the through movement. These signal displays typically shall be three-section ball indications, but may be combined with larger displays, such as a bimodal four-section display, or use arrow indications depending on the geometry and phasing of the intersection. When there is one through lane, at least one of the signal displays must be positioned within the approach through lane. When there are two or more through lanes, signal displays shall be centered over each approach lane.

When there is no through movement, at minimum two signal displays shall be provided for the major movement of the approach.

For left-turn lanes, there shall be one signal display per left-turn lane and one “follow-through” display mounted on the far-left corner of the intersection from the left-turn lane(s). The “follow-through” display shall be placed and oriented such that a driver has a clear view of the display as they complete their turn into the receiving lane. When possible, the “follow-through” head should also be oriented such that a driver behind a larger vehicle obstructing the overhead signal displays, may see the “follow-through” signal display.

For right-turn lanes, one signal display per right-turn lane shall be provided and shall be centered over the turn lane.

Signal displays shall be positioned such near side displays that do not block the view of the far-side displays for the approaching driver or cyclists.

Signalization of right-turn slip lanes should be considered when:

- There are high pedestrian volumes crossing the slip lane.
- There are high volumes on the receiving lanes.
- The originating or receiving approach exceeds 30 mph.

A ”No Right Turn” symbol blank-out sign shall be provided with the right-turn signal indication when there is a protected bicycle or high-volume nonmotorized phase that would conflict with the right-turn movement.

4.1.2.2 Pedestrian Signals

The pedestrian signal system includes pedestrian detection and pedestrian signal displays. For each pedestrian signal crossing, accessible pedestrian signal (APS) pushbutton detection, LED countdown-style pedestrian signal display, crosswalk markings and a compliant pedestrian path shall be provided unless the pedestrian movement is prohibited.

If a pedestrian signal display is updated to LED countdown-type, the paired pedestrian signal display across the crosswalk shall also be updated to LED countdown-type. Pedestrian signal display location shall be in accordance with the MUTCD.

It is desirable to maintain all pedestrian crossings during construction whenever possible. Closure of any pedestrian pathways or crossings must include ample signage guiding pedestrians to alternate paths. When construction impacts access to the permanent pedestrian signal, temporary pedestrian detection and signal indications must be installed whenever a traffic control officer is not present to guide pedestrian movement. It is preferred to use APS pushbuttons for temporary pedestrian detection; however alternate pedestrian detection, like video detection, may be permitted with approval from the City's Smart Mobility team.

4.1.2.3 Bicycle Signals

Bicycle signal displays shall be installed at traffic signals with protected bike movements. Conditions where a protected bicycle movement is warranted include, but are not limited to:

- Providing a bicycle jump interval
- Providing an unusual movement through the intersection specific to bicyclists
- Where heavy turn movements are present and conflict with the bicycle crossing

Bicycle detection shall be included for all bike lanes, protected bicycle phases, and multi-purpose paths at traffic signals as described in Section 4.1.3.3.

Turn-on-red restriction must be provided where a bicycle signal is provided and a turning vehicle on red would cross the protected bicycle crossing.

At minimum, one 12-inch, three-section bicycle signal display shall be provided at the far side of the intersection for a protected bicycle movement. The far-side bicycle display shall include a sign indicating the display is for bicyclists. A near-side bicycle signal display is desirable to supplement the far-side bicycle signal display when it improves visibility of the bicycle phase to cyclists. In cases where bicyclists should use the pedestrian signal display as guidance, a R9-5 "[bicycle] use ped signal" or equivalent sign shall be provided.

4.1.2.4 Transit Signals

Transit signal displays shall be included for all locations where a transit-specific movement is present, including transit jump operations. Light rail transit signal displays as described by MUTCD Chapter 8C shall be used for all signalized light rail movements. Light rail transit signal displays or programmable three-section vehicle displays with a supplemental sign may be used for signalized bus exclusive movements.

4.1.3 Detection

Detection shall be provided for each mode and movement at a traffic signal.

4.1.3.1 Vehicles

Vehicle detection shall be provided for each lane at a signalized intersection. Induction vehicle detection shall be installed at every intersection per standard drawings SL-290-1, SL-300-1, SL-310-1, SL-320-1, SL-330-1 and SL-340-1. For advanced detection in a turning lane, the advance detection may either be placed in accordance with the loop distance table provided in standard drawing SL-290-1 or at the end of the turning lane, whichever is shorter.

A junction box shall be provided adjacent to the stop bar detection and each series of advance detection for every approach to minimize sawcut length in the roadway.

Induction loop detection installation shall adhere to the following:

- For full-depth HMA roadway sections or roadways with at least 3 inches of overlay over concrete pavement, induction loops shall be installed using sawcuts after completion of pavement construction.
- For cement concrete roadway sections, induction loops shall be pre-formed and placed wholly within a concrete slab. An induction loop shall not span across a joint in the roadway.

Permanent or temporary video detection may be permitted when:

- An approach to a signalized intersection falls outside of right of way, such as a private driveway.
- Loop detection is not anticipated to be reliable, such as during construction.

Detection of all lanes must be maintained during construction.

4.1.3.2 Pedestrians

APS push-button detection must be provided for every signalized pedestrian crossing. See MUTCD for guidance of push-button placement. Push buttons should be placed in locations that are safe and accessible to all users. Pedestrians should have sidewalk and curb ramps or other physical separation from vehicle traffic in the waiting area. Push buttons shall be placed such that a clear, level area is provided in front of the push button. Users should not have to reach more than 6 inches beyond the clear, level area to activate the push button. Extension arms may be used for push buttons installed on poles or standards set behind the sidewalk, curb ramp or guard rail to minimize reaching distance.

When curb ramps or other pedestrian-accessible routes are being altered at a signalized intersection, the associated pedestrian push button(s) shall be updated and relocated to meet city, PROWAG and MUTCD requirements. There shall not be a mix of pedestrian push button types or generations at an intersection. If some push buttons are required to be updated at the intersection, the remaining push buttons must be the same type and generation by the conclusion of work. Coordinate replacement of any additional pedestrian push buttons with City staff.

4.1.3.3 Bicycles

Thermal video detection shall be used for dedicated bicycle signal phases. Bicycle detection is required for bike lanes at traffic signals. Bicycle detection may be:

- Thermal video detector
- Video image detector
- Induction loop
- Pushbutton activation

Video type detection, thermal or imagery, is preferred where bicyclists may not stop at a precise location to maintain activation of an induction loop or where vehicles may track over the bicycle detection zone. Induction loop or pushbutton detection may be used instead of or to supplement video-type detection if bicyclists will be waiting in close proximity to pedestrians, such as mixing zones, or if there is no good location to install a video-type detection for a clear view of the bicycle detection zone. Push buttons are not a preferred detection type as they are difficult to place in a convenient location for bicyclists and cannot detect whether a bicyclist is no longer present after initial detection.

Video-type detection, thermal or imagery, must be used during construction that impacts existing detection to maintain bicycle detection. Consider advanced bicycle detection on high-volume bicycle routes with protected bicycle movements at the traffic signal.

4.1.4 Signal Poles

The placement of signal poles shall adhere to the following:

- Minimize visibility obstruction to drivers and other roadway users.
- Avoid conflict with other roadway features and utilities.
- Meet equipment placement requirements.
- Meet pole and equipment clearance requirements.
- Ensure an accessible pedestrian pathway is provided around the corner.
- Provide clear space from face of curb to minimize likelihood of pole strikes from errant vehicles.

City of Bellevue standard type II and III pre-approved mast arm poles shall be used at all signal locations unless otherwise approved by the Review Engineer. Mast arm attachment heights shall be in accordance with meeting signal display attachment height standards, (see standard drawing SL-360-1). Dimensions of pre-approved poles may be provided by the Smart Mobility Team upon request. Each mast arm pole shall have a terminal cabinet installed facing away from the intersection. Mast arm foundations shall be designed per WSDOT standard plan J-26.10-03 using geotechnical soil information at the foundation location and wind load calculations. If no geotechnical investigation has been conducted, foundations shall be sized assuming a lateral bearing pressure of 1000 psf. Wind load calculation assumptions shall be noted on the traffic signal plan sheets beneath the signal standard detail chart.

Signal pole consolidation is desirable; however, mast arm poles may be placed at back of or behind the sidewalk instead of being consolidated in sidewalks to improve visibility and accessibility around the corner, minimize likelihood of damage from a vehicle collision or maximize compatibility with future projects.

Unless otherwise approved by the Review Engineer, pot-holing for utility conflicts is required prior to approval of the signal plans and should be conducted prior to the 90% submittal.

4.1.5 Preemption

Emergency preemption shall be provided for all approaches at every signal. Emergency preemption shall have both infrared and GPS capabilities. Typically, one infrared preemption sensor is placed on each signal mast arm pole and one GPS preemption sensor is placed on the pole closest to the signal cabinet. Alternate or additional infrared preemption sensor locations may be used to ensure there are no obstructions between the sensor and its related approach lanes. Preemption conductors shall not be broken or spliced and shall have a continuous wire run between the unit and the controller cabinet.

4.1.6 Signing

Determination of sign placement shall be in accordance with the MUTCD and City of Bellevue Standard Pole Chart.

Each signal pole mast arm shall have one street name sign that is clearly visible from all approach lanes. Typically, the street name signs are placed to the far right of all signal heads, close to or on the vertical shaft of the pole. See Bellevue Standard Drawing SG-170-1 for street name sign specifications.

4.1.7 Controllers and Cabinets

The controller cabinet should be placed so that an operator can see the traffic signal while accessing the controller. The door to the controller cabinet shall always open in the direction away from the intersection and the intersection indications must be clearly visible from the cabinet location. The controller cabinet shall be placed such that there is a level space in front of the controller cabinet clear of any obstructions that would inhibit opening the cabinet door or operating the equipment within the cabinet. The controller cabinet shall be placed in a location such that it should not require relocation if widening of the intersection happens in the future. Where possible, the controller cabinet should be located outside of sight triangle lines for safe right-turn-on-red turning movements.

Communication shall be provided to every signal cabinet following City Fiber Optic Design Requirements (Appendix C).

The signal service cabinet shall be located adjacent to the controller cabinet. See Bellevue Standard Drawings SL-200-1 and SL-210-1 for controller cabinet and service foundation dimensions and placement.

4.1.7.1 Power Sources

The location of power sources shall be identified on the plans. If possible, the location should be in the same corner as the service cabinet. The power source shall be 120/240 volt single phase.

It is the responsibility of the Design Engineer to contact the power company to determine the power location and add hook-up coordination instructions to the plans prior to plan approval. The signal design shall include enough cable and conduit for the contractor to bring the power cable to the power source and leave enough left over for the utility company for hook-up.

4.1.8 Wiring, Conduit and Junction Boxes

Underground conduit and junction boxes shall be used for all signal wiring. Overhead signal wiring may only be permitted for temporary signal systems and must be approved by the Review Engineer.

Whenever possible, separate junction boxes and conduit runs shall be provided for signal wiring runs and should not be shared with illumination, communications or SWFs.

4.1.8.1 System Wiring

Signal head termination numbering shall follow standard drawing SL-350-1. Signal conductor sizing and use shall follow Table 4-1.

Table 4-1: Signal Conductor Sizing

Cable	Area (inch by inch)	Use of Cable
#12	0.026	Power
#10	0.033	Power
#8	0.056	Illumination/Ground
#6	0.073	Controller-Service
#0/3	0.113	Service-Power Source
2cs-#14	0.090	Pedestrian Push Buttons
3cs-#20	0.070	Emergency Preemption
5c-#14	0.140	Vehicle/Pedestrian Heads

Cable	Area (inch by inch)	Use of Cable
7c-#14	0.170	4 Section Vehicle Heads (FYA)
3PR-#12 or #14	See SL-320-1	Loop Lead In
6PR-#12 or #14	See SL-320-1	Loop Lead In
2cs-#14	0.090	Loops
CCTV	See Special Provisions	Video Camera

Each signal display shall have its own conductor cable between the signal display and the terminal cabinet. Between the terminal cabinet and the controller, one conductor cable may service up to three signal displays sharing the same phase.

4.1.8.2 Conduit

All conduit shall be schedule 40 PVC for signal systems. Conduit runs shall not exceed 250 feet in length or 360 degrees of total bend.

Conduit size is based on total area of cable enclosed in the conduit and shall be determined by Tables 4-2 and 4-3. See City of Bellevue Special Provisions for cable and conduit type.

Table 4-2: Conduit Fill Area

Size (inches)	Max Cable Fill – New Conduit (sq. inches)	Max Cable Fill – Existing Conduit (sq. inches)
1	0.22	0.33
1.5	0.52	0.79
2	0.89	1.36
3	1.95	3.00

Typical conduit runs between junction boxes, poles and cabinets shall follow Table 4-3. Number and size of conduit runs shall be confirmed by conduit capacity calculations at every submittal and may vary from Table 4-3.

Table 4-3: Conduit Run Sizing

Size (inches)	Number of Conduits	Run Description
1 (signal)	1	From PPB Post
2 (signal)	1	From Ps or Type 1 Pole
3 (signal)	1	From Mast Arm
2 (illumination)	1	Or Strain Poles
3 (signal)	2	Roadway Crossing
3 (signal)	2	To Signal Cabinet
2 (service)	2	To Service Cabinet

4.1.8.3 Junction Boxes

Junction boxes shall be provided at each corner of a signalized intersection. Typically, at least one Type 8 junction box shall be provided at each corner for pole and roadway crossing connections. At least one Type 8 junction box shall be provided next to the signal controller cabinet. Type 1 or 2 junction boxes shall be provided adjacent to each set of loops at the intersection. Additional junction boxes shall be provided as needed for capacity or to meet the requirements described in this design manual. For junction boxes located in landscape areas or on a steep slope, where overgrowth or the slope may make it difficult to open the junction box lid, the junction box shall follow Bellevue Drawing SL-160-1. Junction boxes carrying the wire between the service cabinet and the power source shall have a locking lid and shall not contain any other wires. All junction boxes carrying signal equipment and/or interconnect and/or illumination wires shall have the letters “TS/SL” or “COB COMM” inscribed on the lid.

Junction boxes shall be placed according to the following guidelines:

1. When space permits, place junction boxes outside of pedestrian walking paths, such as at the back of a sidewalk or behind a sidewalk.
2. Do not place junction boxes in locations that would conflict with vegetation, irrigation or other elements that would limit access for maintenance. Place junction boxes away from the curb when possible to provide safe access for maintenance.
3. Do not place junction boxes in curb ramps or at grade breaks.
4. Do not place junction boxes at locations that minimize the length and number of bends in conduit runs between boxes.
5. Do not place junction boxes adjacent to the pole(s) or loop(s) they are servicing.

Existing junction boxes within the project footprint shall be replaced if:

1. The junction box does not meet current standards and specifications, such as if the junction box does not have a non-skid lid.
2. There are significant grade changes at the junction box location.
3. Additional conduits are being added to the junction box that require the junction box to be upsized.
4. The junction box has multiple systems (such as both signal and illumination conduits) and the scope and footprint of the project can accommodate separating those systems.

4.1.9 Signal Calculations

The Design Engineer should complete each of the following signal design calculations as is applicable to the extent of work.

1. **Conduit fill calculations**. Conduit fill calculations shall be completed for each conduit run with proposed conduits being added. The results of the conduit fill calculations may be included on the plans or provided to the Review Engineer separately upon each submittal. Reference Section IV, Tables IV-1 and IV-2 for conduit and conductor areas. The requirements for conduit fill calculations are as follows:
   a. Maximum allowable conduit fill for existing conduit is 40% of the total inside conduit area.
   b. Maximum allowable conduit fill for proposed conduit is 26% of the total inside conduit area.
2. **Junction box sizing**. All junction boxes, existing or proposed, with proposed conduit being added as part of the signal installation must undergo junction box sizing calculations. See Table-4-4 for maximum allowable total conduit area for each junction box.

Table 4-4: Maximum Allowable Conduit Areas in Junction Boxes

Junction Box Type	Total Allowable Conduit Area
Type 1	6 inches
Type 2	12 inches
Type 8	24 inches

3. **Wind load and signal pole foundation sizing.**
    a. Wind-load calculations shall assume 9.2 square feet of area for a 3-section signal head, and 11.6 square feet for a 4-section signal head.
    b. Wind load calculations shall round the total X*Y*Z square footage up to the nearest hundred. The wind load value used to determine foundation size shall be the calculated total wind load plus 500 CF or 25% of the calculated wind load total, whichever is greater, to account for potential future loading.
4. **Signal poles**. Signal pole foundation sizing shall be based on the soil-bearing pressure reported in the geotechnical findings at each intersection corner and the total wind load that accounts for possible future loading.
5. **Signal loads**. Signal load calculations shall include the total load (watts) for each piece of signal equipment at the intersection.

The Design Engineer shall submit the signal design calculations with the PS&E documents to the Review Engineer.

4.1.10 Construction and PS&E

All traffic signal plans shall follow City of Bellevue Design and PS&E Submittal Requirements.

For signal modifications, if construction replaces roadways, sidewalks or other finished surfaces where existing traffic signals are in place, the project shall:

1. Ensure the existing traffic signal is maintained and operational until a temporary or new traffic signal system is ready for turn-on.
2. Ensure construction does not undermine or impact the structural integrity of the traffic signal poles and foundations unless it is part of removal efforts.
3. Replace any traffic signal poles, foundations and equipment that were damaged during construction.
4. Update the equipment, conduit and junction boxes within the footprint of the project to meet current City specifications unless otherwise approved by City staff.
5. Replace pole(s) and foundation(s) within the project footprint unless otherwise approved by City staff.

Mast arm signal poles and foundations may be protected in place if the pole and foundation are less than 15 years old and show no signs of damage.

Age and condition of existing signal equipment, foundations and poles shall be confirmed with the City's Smart Mobility team.

When signal modification work triggers construction that must turn off part or all of the existing signal system without the new system being ready for turn-on and uniform police officers cannot manage traffic at the intersection during the change-over period, a temporary traffic signal plan must be developed and installed.

4.1.11 Clearances

Signal poles shall be placed such that the face of the poles are no closer than 3 feet from the face of the curb. For locations that do not have a sidewalk, the WSDOT requirements for clear zone distance apply (see Figure 700-1 of the WSDOT Design Manual).

Traffic signal foundations shall be placed at least 5 feet, measured edge to edge from the nearest underground utilities unless otherwise approved by the Review Engineer.

Traffic signal equipment or signage installed on traffic signal poles shall not protrude into the roadway prism except when mounted on mast arm or spanwires and meet vertical clearance requirements. Pole mounted traffic signal equipment shall maintain 3 feet horizontal clearance between edge of equipment and face of curb.

4.2 Illumination

The street lighting system should be a complete, unified design that addresses the various mobility needs within the City of Bellevue in accordance with BCC 14.60.210.

Street lighting system designs shall follow the City's Street Lighting Design Guide (see Appendix A) and must be stamped by a licensed engineer experienced with lighting design.

- Illumination plan sheets shall be submitted with every submittal. Illumination plans should be separate from other plans, including signal plan sheets. Illumination installed on signal poles for signalized intersections shall be on the signal plans.
- An AGI32 file shall be submitted with every submittal.
- Materials must be submitted to and approved by the City prior to procurement.

Street lighting system design requirements are as follows:

1. Designs shall contain luminaire with pole type and location, illumination level, uniformity ratio, line losses, power source, the electrical and physical layout, installation details and plans and specifications.
2. The lighting system shall default to City-owned street lights, metered via Puget Sound Energy power, unless otherwise allowed by the Review Engineer.

3. Electrical service cabinet installations may be required if an existing service is not in the vicinity of the project. This requires the owner to work directly with Puget Sound Energy on finding service locations and coordinating power connections prior to turn-on.
4. All street lights shall be LED.
5. Street light poles cannot be relocated or reused in new locations.
6. When required, street light pole bases and foundations shall be removed in their entirety.

A combined street tree and street light plan is required for review and approval prior to completion of engineering and landscape plans for installation. The goal is to provide the optimum number of street trees while not compromising the light and safety provided by streetlights. Street trees and street lights must be shown on the same plan sheet with the proper separation (generally 25 feet apart) and the proper spacing from driveways (10 feet from Point A in Design Manual Standard Drawings SW-140-1, SW-150-1, SW-160-1 and SW-170-1).

Street lighting is preferred but not required along private roads. Street lighting systems for private roads shall be designed and constructed on a separate power source from the public street lighting system. All street light maintenance, installation and power costs for private road systems shall be paid by the property owner, homeowner or homeowner’s association.

Temporary illumination shall be required under the scenarios described in the Street Lighting Design Guide (Appendix A), unless otherwise approved by the Review Engineer. A temporary illumination plan shall be designed and stamped by a licensed engineer with experience in lighting design and provided with the right-of-way permit and approved by the Review Engineer. The temporary illumination plan must meet light levels presented in the Street Lighting Design Guide (Appendix A), regardless of it being a temporary condition.

4.3 Channelization and Signing

Channelization and signing plans should be shown on a separate plan and prepared by a licensed engineer. The channelization and signing information shall not be placed on other discipline sheets.

1. All signs, including street name and nonmotorized, shall be clearly indicated on the plans with construction notes. A signing schedule and sign details shall be provided on the plans indicating sign removals, relocations and additions. Sign details shall show all legend and background sizing and color. Standard MUTCD signs do not need a sign detail but sizing shall be called out specifically in the sign schedule.

2. Sign installations shall be verified and approved by the Review Engineer and the Inspector in the field. It is the responsibility of the property owner to ensure that signs are maintained in good condition until the development is accepted and the right-of-way permit is closed by the City. Any damaged signs must be replaced by the property owner at her/his expense.
3. The channelization plan sheet shall show all removals and installations of new channelization with construction notes and stationing.
4. 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 Review Engineer prior to permanent installation by the contractor.
5. Temporary traffic control and construction zone signing and barricades to ensure traffic safety during construction activities shall be provided by the developer.
    a. Temporary traffic control signing and channelization must meet City of Bellevue standards and specifications.
6. The Review Engineer shall review and approve all traffic control devices. All traffic control devices used on public streets and private roads shall conform to the MUTCD.

4.4 Communication System

The City operates and maintains an expansive, citywide fiber optic communication system that provides network connectivity for critical city functions. These critical functions include, but are not limited to, network connectivity for traffic signal operations, traffic cameras, emergency services and operations at off-site city facilities. Bellevue requires available conduit and fiber optic infrastructure to establish network connections and accommodate future system expansion.

For projects where the fiber optic system is impacted, or where new communication systems are required, designs must follow the City's "Fiber Optic Design Requirements" (see Appendix C) and be stamped by a licensed engineer with experience in fiber optic design.

4.5 Traffic Calming

Bellevue's Vision Zero initiative aims to eliminate traffic deaths and serious-injury collisions on city streets by 2030. To achieve this goal, the Bellevue City Council adopted the Safe System approach—a holistic-based approach to road safety that bundles strategies focused on people, streets, speeds and vehicles safety, as well as the supporting elements of leadership, culture, partnerships and data. An aspect of that directly flows out of the safe speeds strategy of the Safe Systems Approach is that of traffic calming and speed management.

The City's Neighborhood Traffic Safety program has a long-standing history of managing vehicle speeds and traffic through traffic calming measures. The City has employed many traffic calming measures to reduce speeds, support livability and improve safety and mobility. In consultation with the community, these tools work to discourage excessive vehicle speeds, minimize cut-through traffic and support a multimodal transportation system, including walking and biking.

Traffic calming measures are self-enforcing in that they modify the streetscape with horizontal deflection (e.g., traffic circles, mini roundabouts, chicanes, lateral shifts and lane/roadway narrowing), vertical deflection (e.g., speed humps, speed cushions, raised crosswalks and raised intersections), signing, pavement markings and other cues to remind drivers to travel at appropriate speeds for the context of the roadway. Traffic calming is most effective when applied with multiple tools or measures (e.g., sidewalks with curb extensions and raised crosswalks).

Traffic calming should be considered based on engineering judgment whenever there is a need to reduce vehicle speeds and/or cut-through traffic on a roadway. Increased consideration should be given to the following areas: 1) along the City's high-injury network (HIN), 2) in locations or facilities that generate high concentrations of bicyclists and pedestrians, and/or 3) to support transitions from higher speed to lower speed contexts. The traffic calming measures listed within this section can be found in the City’s Residential Traffic Guidebook (Guidebook) and the Speed Management Plan (SMP). The Guidebook and SMP detail additional information and traffic considerations for each tool.

4.4.1 Traffic Calming Considerations

When considering traffic calming on a roadway, there are numerous site-specific and traffic calming-specific contexts that should be evaluated during the planning, scoping, design, construction and maintenance phases. The Design Engineer should consider the following guidelines that apply to the City's traffic calming measures. Prior to designing any traffic calming measure, the Design Engineer shall consult and coordinate with the Review Engineer, Neighborhood Traffic Safety Services staff and Traffic Engineering staff to confirm the need and appropriateness for the traffic calming measure.

1. Traffic calming measures should be designed consistently to create a predictable roadway environment. Many traffic calming measures in Bellevue have a

corresponding, adopted standard drawing associated with them to impart standard designs into roadway projects.

2. Traffic calming measures can be used in a variety of roadway contexts and in many different street types and areas, including urban core and commercial land uses. Some measures may be more effective in certain conditions. Traffic volumes, speed limits, adjacent land use context, presence of pedestrians and bicyclists, presence of curves, roadway grade and other traffic and roadway considerations should be evaluated to determine appropriateness of the use of traffic calming measures.
3. Vertical deflection like speed humps and raised crosswalks can delay emergency response vehicles such as fire trucks. Coordination with the Fire Department is critical during the planning and design phases when considering traffic calming measures to ensure the proposed countermeasures do not unreasonably impact response times. The City's transportation network has identified primary and secondary emergency response routes that indicate, generally, which streets are used the most when responding to calls.
4. The design and placement of traffic calming measures should not degrade the pedestrian and biking environment.
5. Traffic calming—while helpful in addressing the top transportation-related concerns from residents (speeding, for example)—can still create unintended consequences such as increased noise. Any traffic calming project requires a commitment to working with the community and adjacent households to ensure the project is aligned with community concerns.
6. When applicable, standard signing and pavement markings shall be consistent with the MUTCD.

4.4.2 Type of Traffic Calming Measures

The following are traffic calming measures commonly used in Bellevue. A brief description of the measure is provided along with considerations for implementation. The standard drawing associated with the measure is referenced, if applicable. The Guidebook and SMP provide additional information and traffic considerations for each measure in more detail.

1. **Chicanes/slow points/lateral shifts**. Chicanes are a series of two to three curb extensions that alternate from one side of the street to the other forming S-shaped curves on what would be an otherwise straight roadway. Slow points are curb extensions that narrow a roadway, sometimes allowing only one car at a time to pass. Lateral shifts alter the path of the travel lane to disrupt the propensity to travel unabated in an effort to reduce vehicle speeds.

If implementing chicanes or lateral shifts along a two-way road with two full-width lanes, a centerline treatment should be considered to prevent drivers from cutting a straight path across the centerline. Along roads with bike lanes, continuing the bike lanes straight through and between the curb extension and the curb or edge of roadway should be considered.

2. **Curb extensions**. Curb extensions narrow the roadway by extending the curb toward the center of the street helping to reduce vehicle speeds. Curb extensions can be applied at intersections to increase visibility of pedestrians and narrow the roadway, as well as at mid-block locations to narrow the roadway and shorten pedestrian crossing distances. They can be installed in conjunction with speed humps or raised crosswalks. Consideration should be given to potential effects to bicyclists.

3. **Medians**. Medians are raised islands placed in the center of a roadway to separate opposing traffic. They can be placed mid-block or at entrances into neighborhoods. Medians are used to narrow the roadway and are often landscaped to provide a visual enhancement and create a perception of a narrower roadway. Designs should consider how well landscaping can be established and maintained. If landscaping is not feasible or determined appropriate for the context, medians can also be hardscaped. For more guidance on medians, refer to Section 3.3.5 Islands and Medians.

   Standard drawing: RC-121-1 Median Nose Layout (Updated).

4. **Neighborhood entrances**. A neighborhood entrance is a raised island in the center of a roadway and/or a raised concrete pavement treatment with a decorative brick pattern that identifies the entrance into a neighborhood. Neighborhood entrances typically include Bellevue's custom blue "residential area" sign to alert drivers they are entering a neighborhood with a lower speed limit. Patterned concrete entry treatments should be placed far enough away from the intersection so that they do not impede the pedestrian access route and are not located in the same space as the crosswalk.

   Standard drawing: RC-160-1 Patterned Concrete Entry Treatment.

5. **Raised crosswalks**. A raised crosswalk is an area of roadway pavement that has been raised approximately 3 inches and includes a crosswalk marked on top. Raised crosswalks are typically implemented on streets where speed control at pedestrian crossings is desired, such as in school zones or adjacent to neighborhood parks. Raised crosswalks can be used in conjunction with other traffic calming measures such as speed humps, speed cushions or curb extensions to maximize effectiveness

of reducing speeds, increase visibility of crossing pedestrians and shorten pedestrian crossing distances.

Standard drawings: CW-120-1 Raised Crosswalk, CW-130-1 Raised Crosswalk with Perpendicular Curb Ramp, CW-140-1 Raised Crosswalk with Parallel Curb Ramp, CW-150-1 Raised Crosswalk Signing, CW-160-1 Raised School Crosswalk Signing.

6. **Raised intersections.** A raised intersection is an elevated area covering an intersection with ramps for drivers on all legs of the intersection. This treatment improves intersections for pedestrian and bicyclist use by slowing driver operating speeds and increasing visibility of pedestrians and bicyclists. Since raised intersections are typically flush with the sidewalk and create blended transitions, curb ramps are typically not required. However, care should be taken in the design of raised intersections to ensure that all other ADA requirements are still met, such as providing detectable warning surfaces. In addition, bollards may be required to delineate corners and pedestrian areas from the raised intersection. Raised intersections can be implemented at signalized or all-way stop-controlled intersections with three or more legs near locations with high-transit and high-pedestrian volumes. The maximum running slope of the roadway should not exceed 8%.

7. **School zone flashing beacons**. To reinforce reduced speed limits near schools, flashing beacons are installed in combination with a speed limit sign to establish a 20-mph school speed zone. These round, yellow beacons are installed in school zones alerting drivers to slow to 20 mph during school start and dismissal times.

   Standard drawings: SL-151-1 Typical School Zone Flashing Beacon Assembly, SL-212-1 'Tiny' Service Cabinet Foundation Detail, SL-221-1 'Tiny' Service Cabinet Detail. If used in combination with a school crosswalk, see CW-160-1 Raised School Crosswalk Signing and CW-170-1 At-Grade School Crosswalk Signing.

8. **Speed cushions, speed humps, split-speed humps**. These traffic calming measures create a change in the height of the roadway pavement that produces sufficient discomfort for drivers and encourages them to slow down. The ideal placement of these measures is 150 to 300 feet apart from one cushion or hump to another. During the design and construction, special attention should be paid toward the running slope of the roadway to ensure that the raised approaches offer sufficient deflection to ensure that drivers slow down. The maximum running slope of the roadway should not exceed 8%. The design should consider space at the edge of the hump/cushion and the curb/edge of the pavement to ensure there is space for people biking to travel through with minimal vertical deflection.

a. Speed cushions consist of two or more raised and rounded areas of pavement placed laterally across a road. There are gaps that allow for the expedient passing of emergency vehicles.

b. Speed humps are raised areas of roadway pavement, 3 inches in height, which encourage drivers to reduce their speed when traveling over them.

c. Split-speed humps are modified speed humps that allow emergency vehicles to navigate around them. Multiple speed humps should be placed along a corridor to increase speed reduction efficacy.

Standard drawing: RC-170-1 Speed Hump, RC-180-1 Elongated Speed Hump, RC-181-1 Speed Cushion for Two-Lane Roadways and RC-182-1 Speed Cushion Signing for Two-Lane Roadways.

9. **Speed dots**. A speed dot is a small circular or oval island located in the center of the road at mid-block locations. It reduces vehicle speeds by narrowing the roadway and redirecting vehicles around the circle. Multiple speed dots can be applied along a corridor to maximize speed reduction efficacy.

10. **Speed mounds**. Speed mounds are slightly raised areas of pavement that guide drivers through a designated area. Unlike traffic circles that force drivers around the device, speed mounds allow vehicles to pass over the raised pavement.

11. **Vehicle speed feedback signs**. Vehicle speed feedback signs or stationary radar signs direct a driver's attention to the posted speed limit and digitally display the speed of the driver's vehicle on a message board. This instant feedback results in a greater awareness of the speed limit and encourages motorists to adjust their speed accordingly. Vehicle speed feedback signs are used on any functional class of street. These signs have shown to be most effective on streets in the uphill direction but have proven effective at reducing speeds on streets with a variety of street contexts.

    When installing and maintaining vehicle speed feedback signs, several factors should be considered, including, but not limited to:

    a. Existing and future landscape and vegetation that could impact sign visibility should be considered.

    b. Whenever possible, vehicle speed feedback signs should be located near an existing power source and should be located in an area with sufficient space to install the required service cabinet.

    c. Consistent with the MUTCD, when used to supplement a horizontal alignment warning sign with an advisory speed plaque, the feedback sign shall be an independent installation placed downstream of the warning sign near the point of curvature of the horizontal curve.

Standard drawing: SL-152-1 Typical Radar Feedback Sign Assembly, SL-212-1 'Tiny' Service Cabinet Foundation Detail, SL-221-1 'Tiny' Service Cabinet Detail.

12. **Traffic circles**. A traffic circle is a raised circular island located in the center of an intersection. This design requires vehicles to keep right and travel through the intersection in a counterclockwise direction around the island. Traffic circles can be placed at four-legged and three-legged intersections. Careful attention should be paid to the available lane width and turning radius used with traffic circles. Traffic circles may include center landscaping and are typically not mountable.

    Standard drawing: RC-140-1 Traffic Circle Details (Updated), RC-150-1 Traffic Circle Dimensions.

13. **Mini-roundabouts or compact modern roundabouts.** A mini-roundabout is a raised island placed at an unsignalized intersection. The center island design requires vehicles to keep right and travel through the intersection in a counterclockwise direction. Roundabouts shall be designed in accordance with roundabout design principles and designed so that all vehicles can circulate counterclockwise. The center island is typically partially or fully mountable to accommodate trucks, buses and emergency vehicles. Spitter islands should be included in the design on all approaches to direct traffic entering the circle and create enough deflection to slow vehicles and discourage one movement from free flowing into the intersection. Traffic entering the intersection yields to vehicles within the roundabout.

14. **Travel lane width reduction.** The designed width of traffic lanes has direct effects on driving speed, pedestrian crossing distances and the ability to add facilities for other modes such as pedestrian refuge islands, bike lanes, sidewalks and landscaping. Roadways may have existing lane widths that unintentionally encourage high driving speeds. Narrowing travel lanes can promote slower driving speeds while also providing new or enhanced facilities for other modes by repurposing the reclaimed space for other uses, such as bike lanes, sidewalks, shoulders, bus lanes, parking, landscaping or pedestrian refuge islands. At signalized intersections, narrower lanes can reduce the pedestrian crossing distance, allowing for shorter pedestrian crossing phase lengths and reducing pedestrian exposure. For more guidance on street and lane widths, refer to Section 3.3.1 Street and Lane Widths.

5 Appendices

Appendix A	Street Lighting Design Guide (includes Street Light Level Map)
Appendix B	BelRed Streetscape Plan
Appendix C	Fiber Optic Design Requirements
Appendix D	Small Wireless Facilities
Appendix E	Preliminary Civil and Traffic Plans Requirements
Appendix F	Wilburton Transit Oriented Design (TOD) Access Concepts Design Guide

Transportation Design Manual and Complete Streets Guide

Volume 1

Part 2

Transportation Standard Drawings

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SL-101-1	Steel Roadway Lighting Pole Details (Small Wireless Facility Compatible)
SL-102-1	Steel Roadway Lighting Pole Details (Small Wireless Facility Compatible)
SL-103-1	Steel Roadway Lighting Pole Details (Small Wireless Facility Compatible)
SL-104-1	Steel Roadway Lighting Pole Details (Small Wireless Facility Compatible)
SL-105-1	Roadway Lighting Pole Foundation at Sidewalk (SWF Compatible)
SL-106-1	Roadway Lighting Pole Foundation within Unpaved Area (SWF Compatible)
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DOWNTOWN

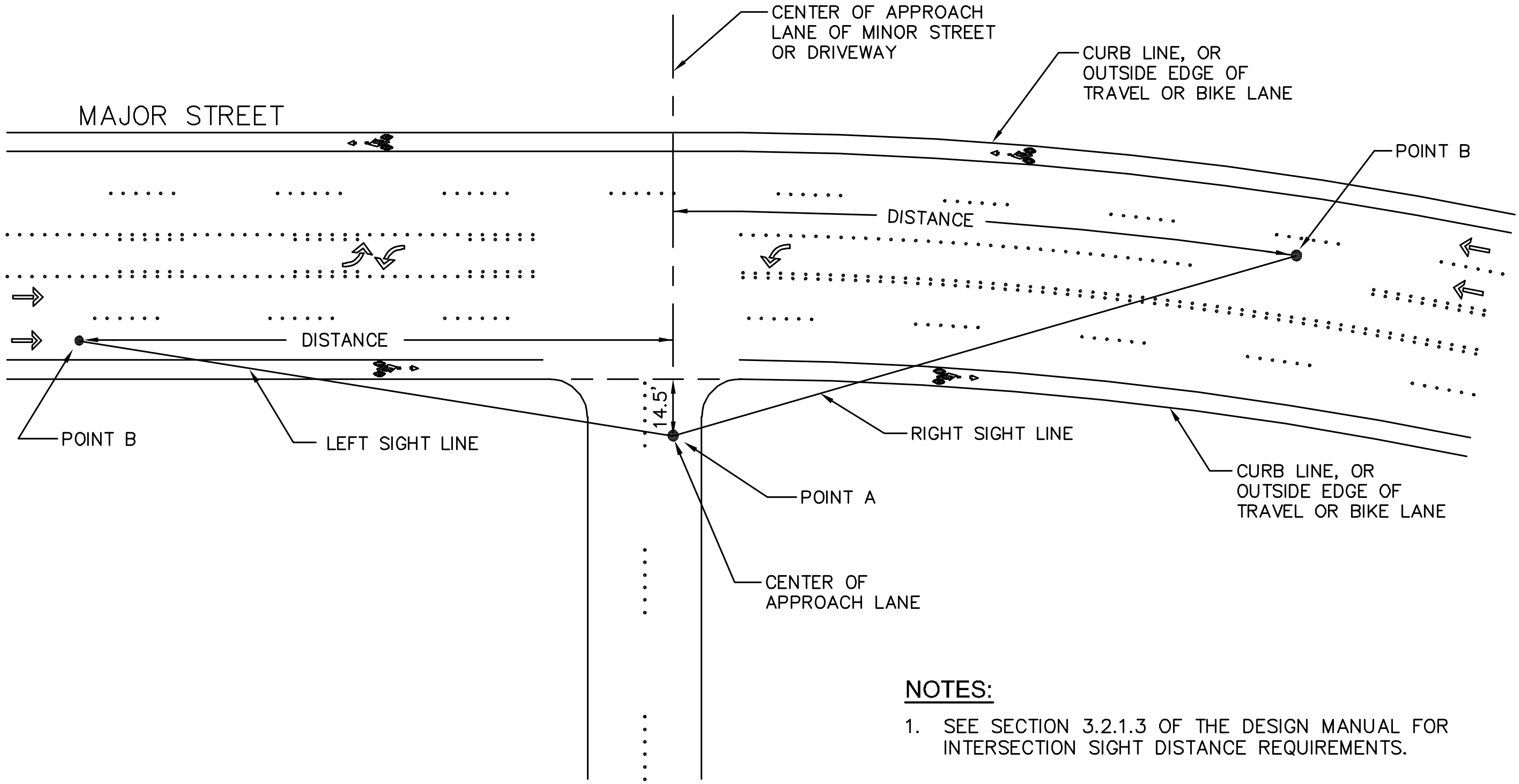
BELRED CORRIDOR

TRANSPORTATION DESIGN MANUAL

RL Drawings

Roadside Layout

CITY OF BELLEVUE
WASHINGTON



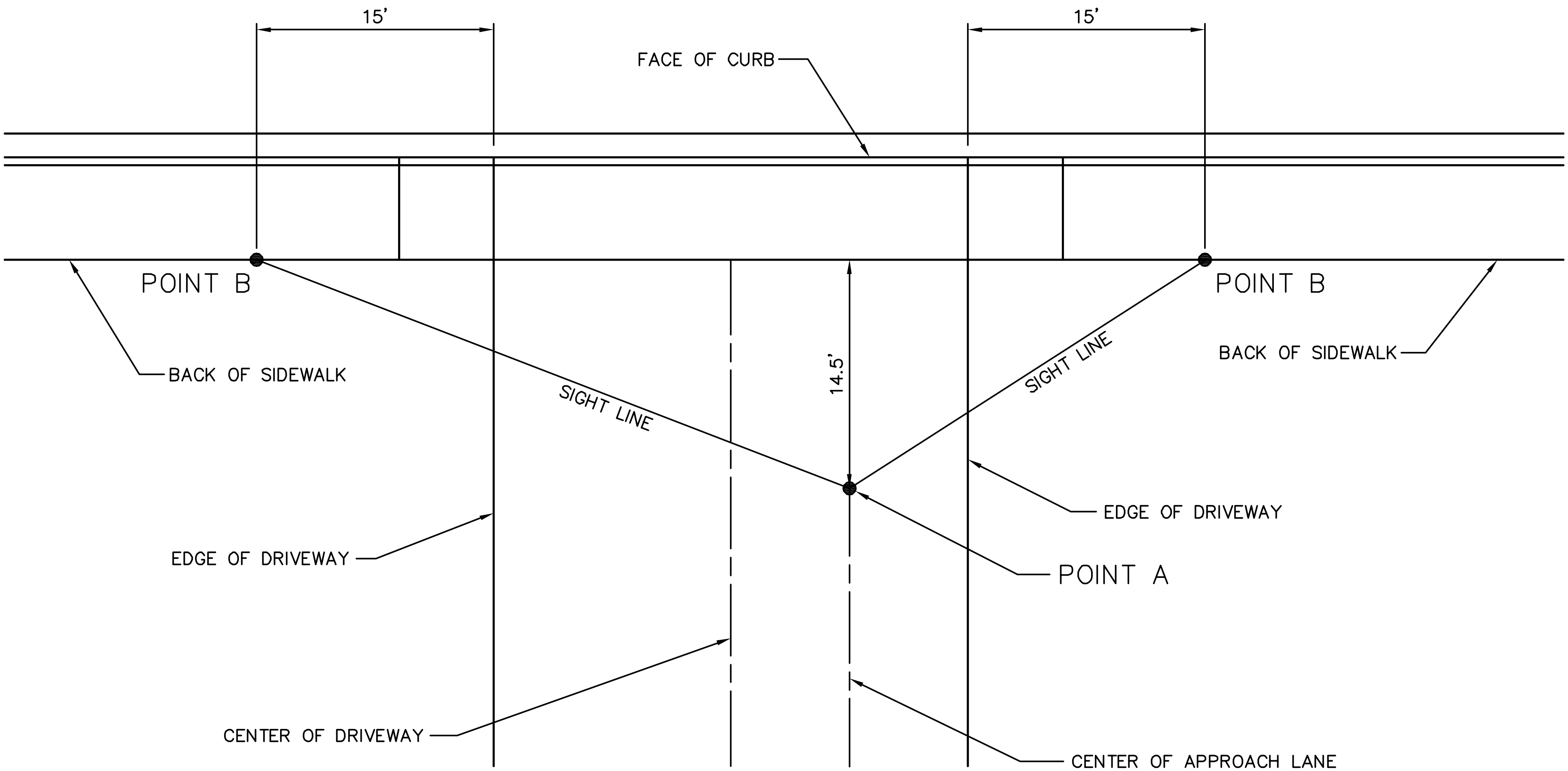
NOTES:

1. SEE SECTION 3.2.1.3 OF THE DESIGN MANUAL FOR INTERSECTION SIGHT DISTANCE REQUIREMENTS.
2. FOR RESIDENTIAL DRIVEWAYS, DISTANCE OF POINT A FROM EDGE OF TRAVEL LANE IS TEN FEET.
3. SEE STD. DWG. RL–120–1 FOR PEDESTRIAN SIGHT DISTANCE.

City of Bellevue

INTERSECTION SIGHT DISTANCE

DRAWING NUMBER	RL–100–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



NOTES:

1. SEE SECTION 3.2.1.4 OF THE DESIGN MANUAL FOR PEDESTRIAN SIGHT DISTANCE.

City of Bellevue

PEDESTRIAN SIGHT DISTANCE

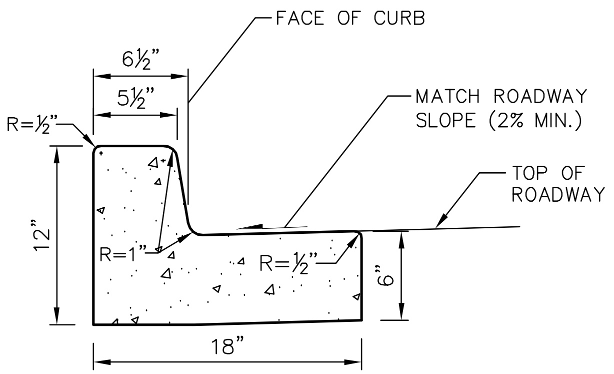
DRAWING NUMBER	RL–120–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

TRANSPORTATION DESIGN MANUAL

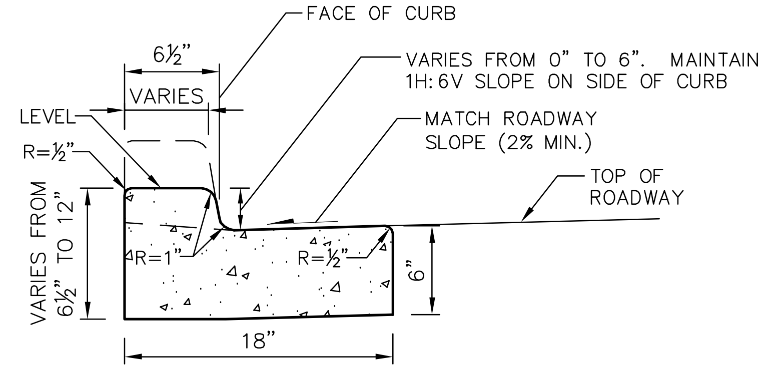
SW Drawings

Sidewalks, Curb Ramps, and Driveways

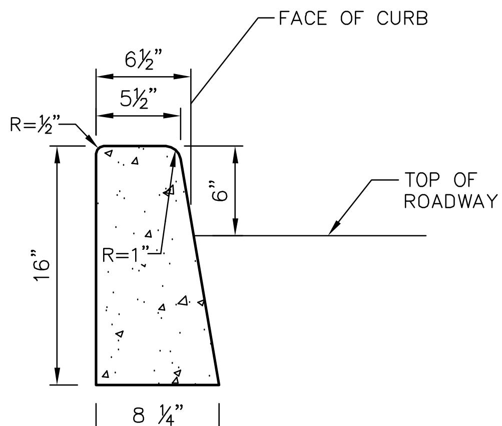
CITY OF BELLEVUE
WASHINGTON



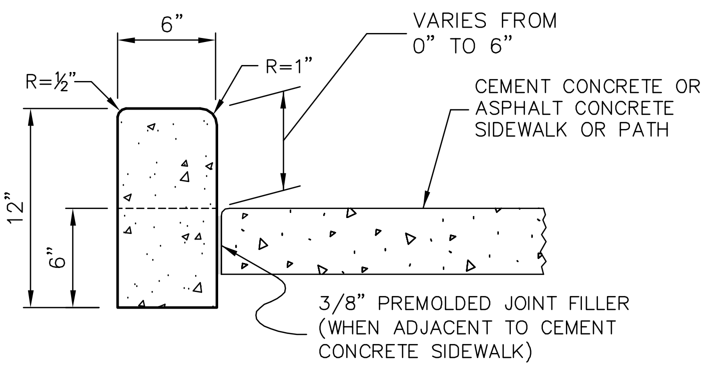
CEMENT CONCRETE
TRAFFIC CURB AND GUTTER



DEPRESSED CURB SECTION



CEMENT CONCRETE
VERTICAL TRAFFIC CURB



CEMENT CONCRETE
PEDESTRIAN CURB

NOTES:

1. ALL CEMENT CONCRETE CURBS SHALL BE CONSTRUCTED WITH AIR ENTRAINED CONCRETE CLASS 3000 CONFORMING TO WSDOT STD. SPEC. 6-02 EXCEPT AS SPECIFIED IN NOTE 2.

2. CEMENT CONCRETE CURB OR CURB AND GUTTER ALONG THE FULL WIDTH OF A DRIVEWAY ENTRANCE SHALL BE CONSTRUCTED WITH AIR ENTRAINED CONCRETE CLASS 4000 CONFORMING TO WSDOT STD. SPEC. 6-02.

3. REMOVAL/REPLACEMENT OF CEMENT CONCRETE CURB SHALL BE FROM EXPANSION JOINT TO EXPANSION JOINT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

City of Bellevue

CEMENT CONCRETE CURBS

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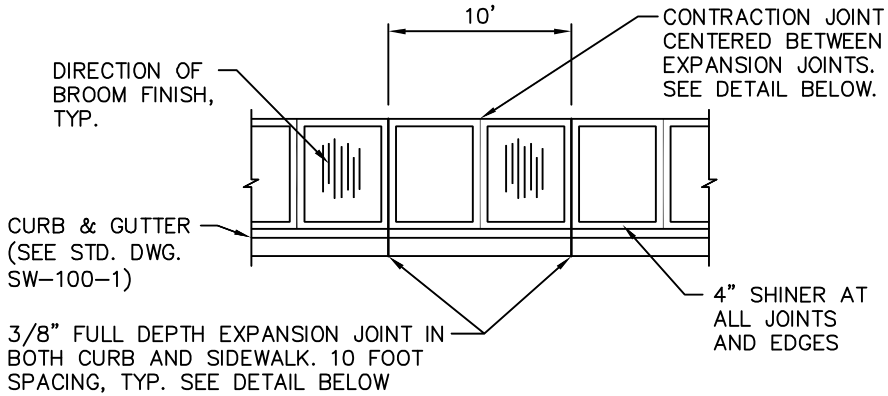
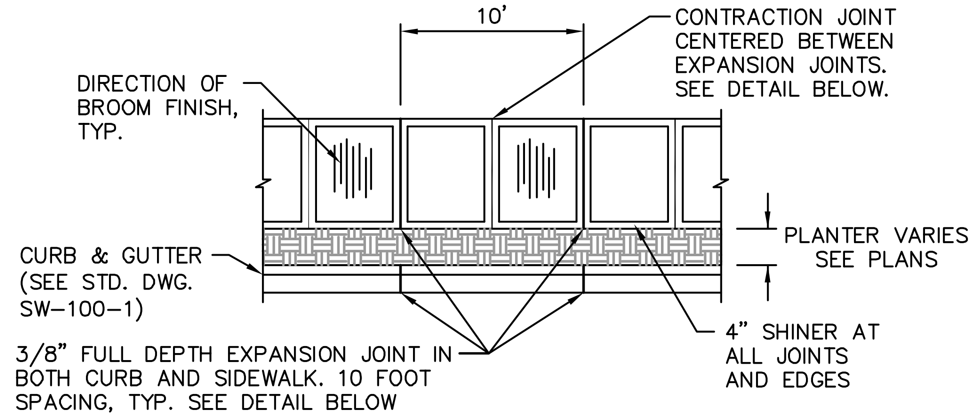
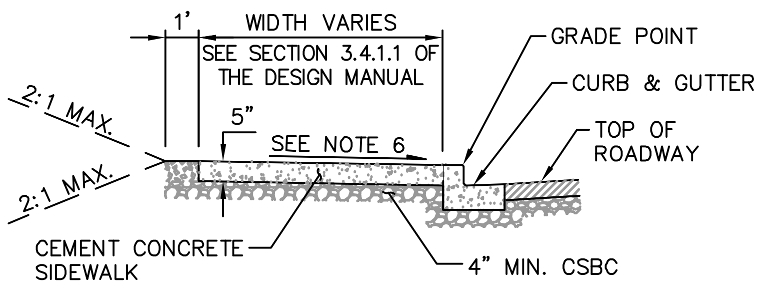
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



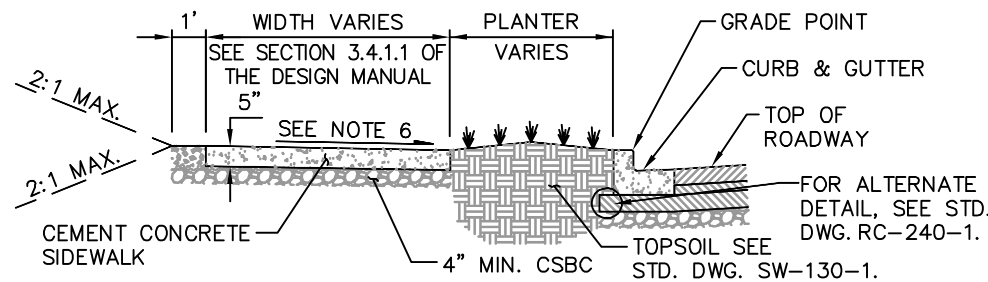
PLAN - CURBSIDE SIDEWALK



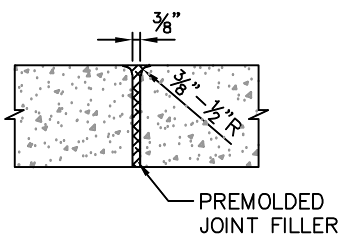
PLAN - SIDEWALK WITH PLANTER STRIP



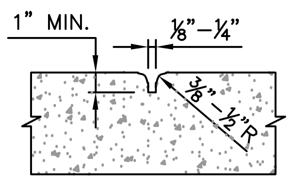
SECTION - CURBSIDE SIDEWALK



SECTION - SIDEWALK WITH PLANTER STRIP



FULL DEPTH EXPANSION JOINT DETAIL



CONTRACTION JOINT DETAIL

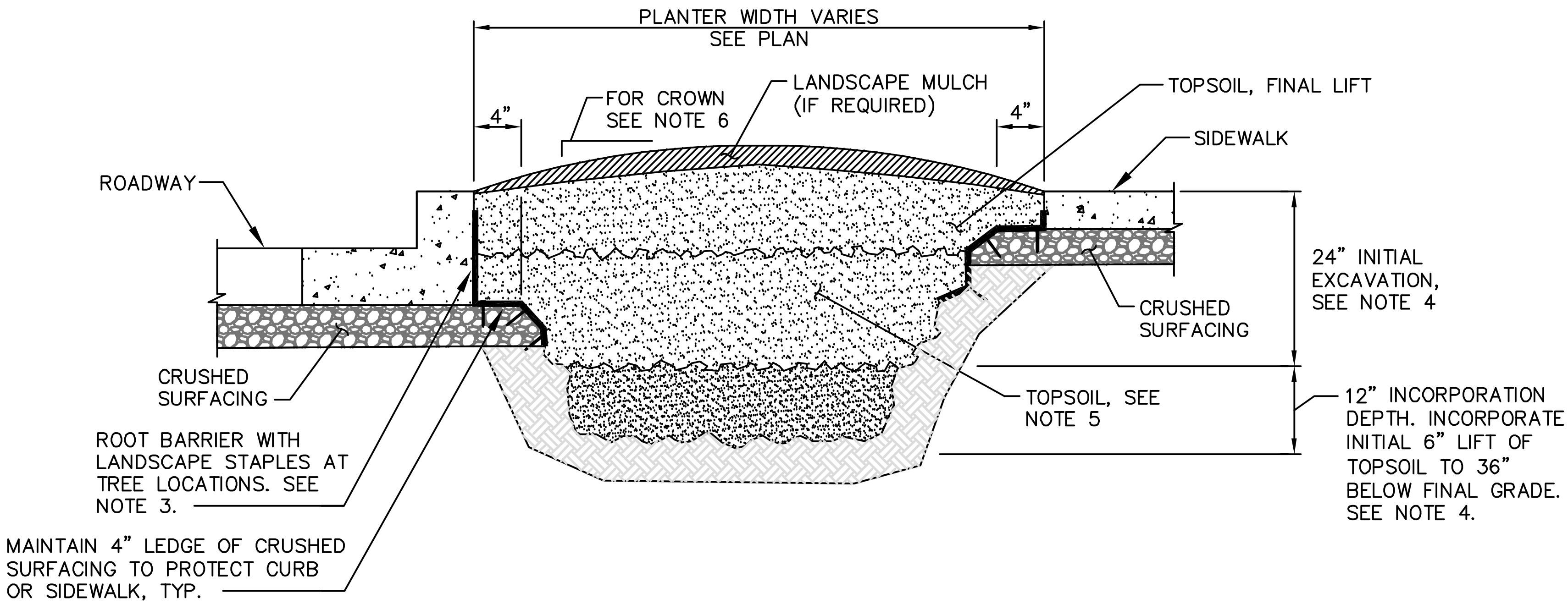
NOTES:

1. CONCRETE SHALL BE AIR ENTRAINED CLASS 3000 PER SECTION 6–02 OF WSDOT STANDARD SPECIFICATIONS.
2. FINISH: BRUSHED WITH A STIFF BRISTLED BROOM PERPENDICULAR TO THE TRAVEL DIRECTION OF THE SIDEWALK.
3. CSBC (4" MIN.) SHALL BE COMPACTED TO 95% MAX. DENSITY.
4. REMOVAL/REPLACEMENT OF CEMENT CONCRETE CURB AND SIDEWALK SHALL BE FROM EXPANSION JOINT TO EXPANSION JOINT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
5. LIDS FOR JUNCTION BOXES AND UTILITY VAULTS SHALL BE NON–SLIP AS SPECIFIED BY THE ENGINEER.
6. CROSS SLOPE 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% UNLESS OTHERWISE APPROVED BY ENGINEER.

City of Bellevue

SIDEWALK

DRAWING NUMBER	SW–110–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



SOIL PREPARATION NOTES

1. EXCAVATE EXISTING SOIL TO 24"± DEPTH FROM TOP OF ADJACENT CURB OR SIDEWALK. AVOID UNDERMINING ADJACENT CURB OR SIDEWALK.
2. ROOT BARRIER SHALL BE FLEXIBLE MESH MATERIAL, 100% NYLON, RASCHEL KNIT CONSTRUCTION, MINIMUM BURST STRENGTH 250 LBF (ASTM D 3787–89 BURST OF KNIT GOODS).
3. INSTALL ROOT BARRIER WITH A MINIMUM WIDTH OF 18", SECURE WITH LANDSCAPE STAPLES AS NECESSARY. ROOT BARRIER SHALL BE INSTALLED IN 10' LENGTHS AT TREE LOCATIONS, CENTERED TO EXTEND 5' EITHER SIDE OF TREE, AND SHALL BE INSTALLED NO HIGHER THAN 2" BELOW THE TOP OF CURB OR SIDEWALK. ROOT BARRIERS SHALL NOT BE INSTALLED AT LOCATIONS WHERE STRUCTURAL SOIL OR SOIL CELLS EXIST.
4. EXCAVATE TO 24" BELOW FINAL GRADE. ADD 6" LIFT OF TOPSOIL AND INCORPORATE TO 36" BELOW FINAL GRADE (12" INTO THE SUBGRADE). ADDITIONAL LIFTS SHALL BE ADDED AS SPECIFIED IN NOTE 5.
5. INSTALL 12"± LIFT OF TOPSOIL TYPE A AND LIGHTLY TAMP BETWEEN LIFTS.
6. INSTALL FINAL LIFT OF TOPSOIL TYPE A TO ACHIEVE FINISH GRADE, FLUSH WITH THE TOP OF CURB OR SIDEWALK WITH A CENTER CROWN, AND LIGHTLY TAMP. PROVIDE 1" CENTER CROWN PER 12" OF PLANTER WIDTH.
7. INSTALL 1.5" LANDSCAPE MULCH, FULL DEPTH IN THE CENTER AND FEATHERED AT THE EDGES TO BECOME FLUSH WITH CURB OR SIDEWALK.

City of Bellevue

SOIL PREPARATION FOR LANDSCAPE STRIPS

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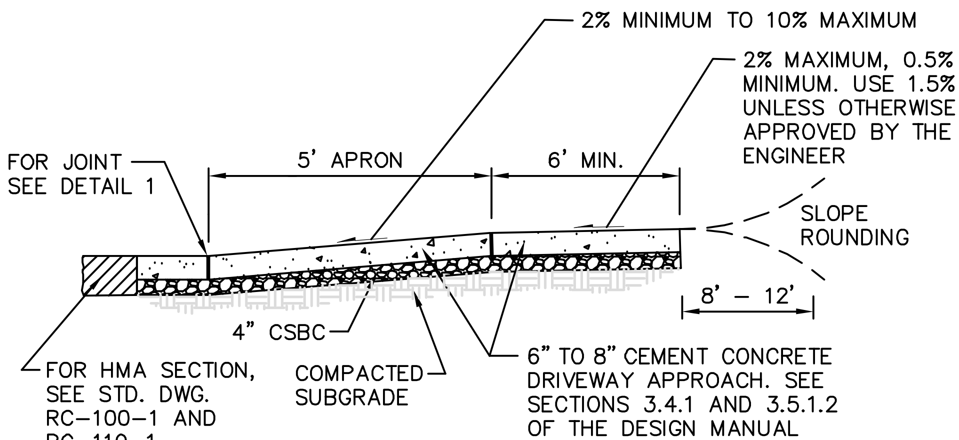
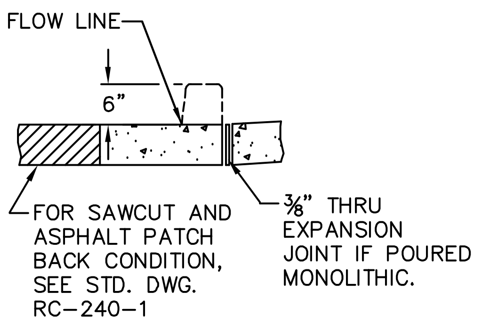
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



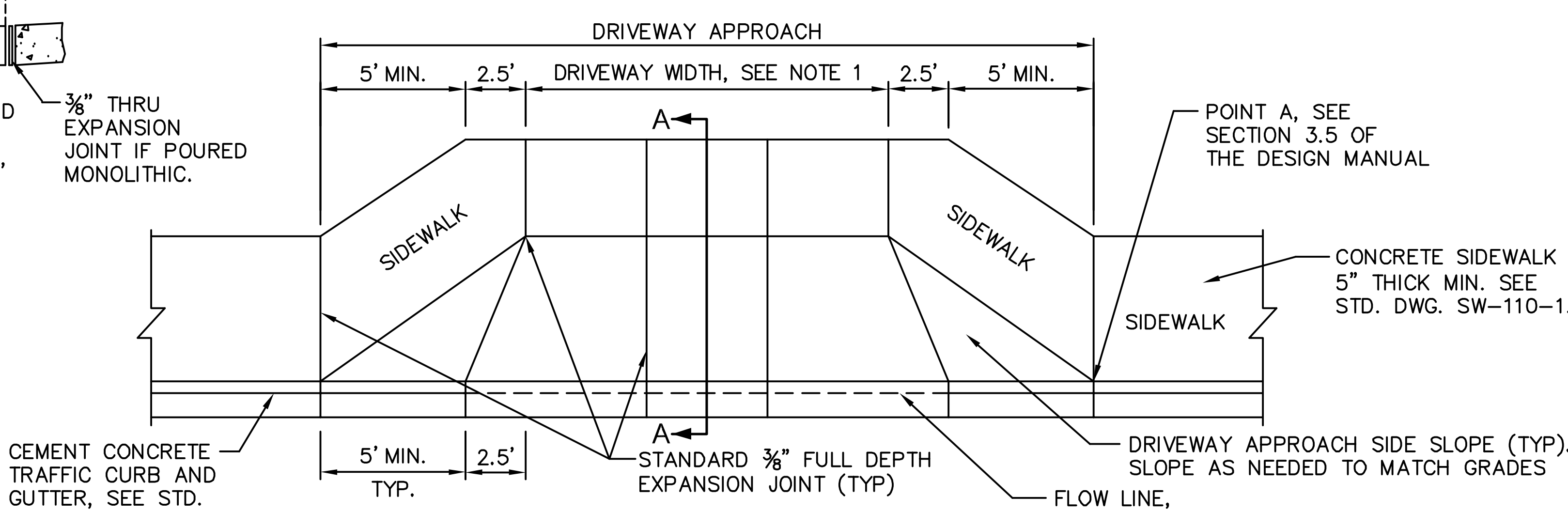
SECTION A-A

NOTES:

1. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR DRIVEWAY WIDTH, DESIGN DETAILS, AND REQUIREMENTS. DRIVEWAY WIDTH DOES NOT INCLUDE ADJACENT SIDE SLOPES (WINGS).
2. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR GRADE REQUIREMENTS. SLOPE ROUNDING IS REQUIRED AT DRIVEWAY GRADE TRANSITIONS AS SHOWN IN SECTION A–A.
3. CONCRETE SHALL BE 6" TO 8" CLASS 4000 P.C.C. MIX WITH A COMPRESSIVE STRENGTH OF 3000 PSI WITHIN 3 DAYS (CURB, GUTTER, DRIVEWAY APRON, SIDE SLOPES, SIDEWALK, AND ALL OTHER ITEMS SPECIFIED BY THE ENGINEER).
4. CONCRETE PAVEMENT FINISH: BRUSHED WITH STIFF BRISTLED BRUSH PERPENDICULAR TO THE TRAVEL DIRECTION OF THE SIDEWALK.
5. CSBC (4" MIN.) SHALL BE COMPACTED TO 95% MAX. DENSITY.
6. ⅜" THRU EXPANSION JOINTS SHALL BE PLACED AT BACK, SIDES AND FRONT. MAXIMUM EXPANSION JOINT SPACING IS 14' CENTER TO CENTER.



DETAIL 1

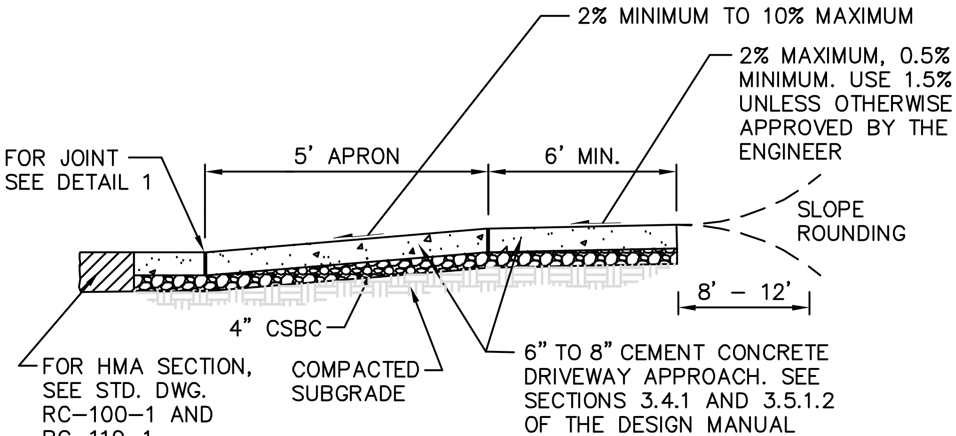


DRIVEWAY APPROACH PLAN

City of Bellevue

DRIVEWAY OR PRIVATE ROAD APPROACH WITH SIDEWALK (OPTION 1)

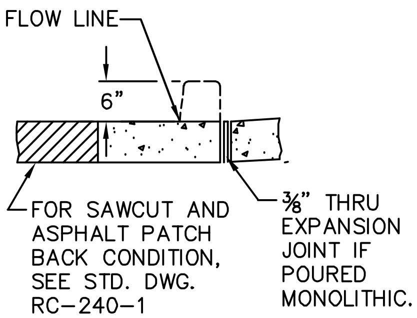
DRAWING NUMBER	SW–140–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



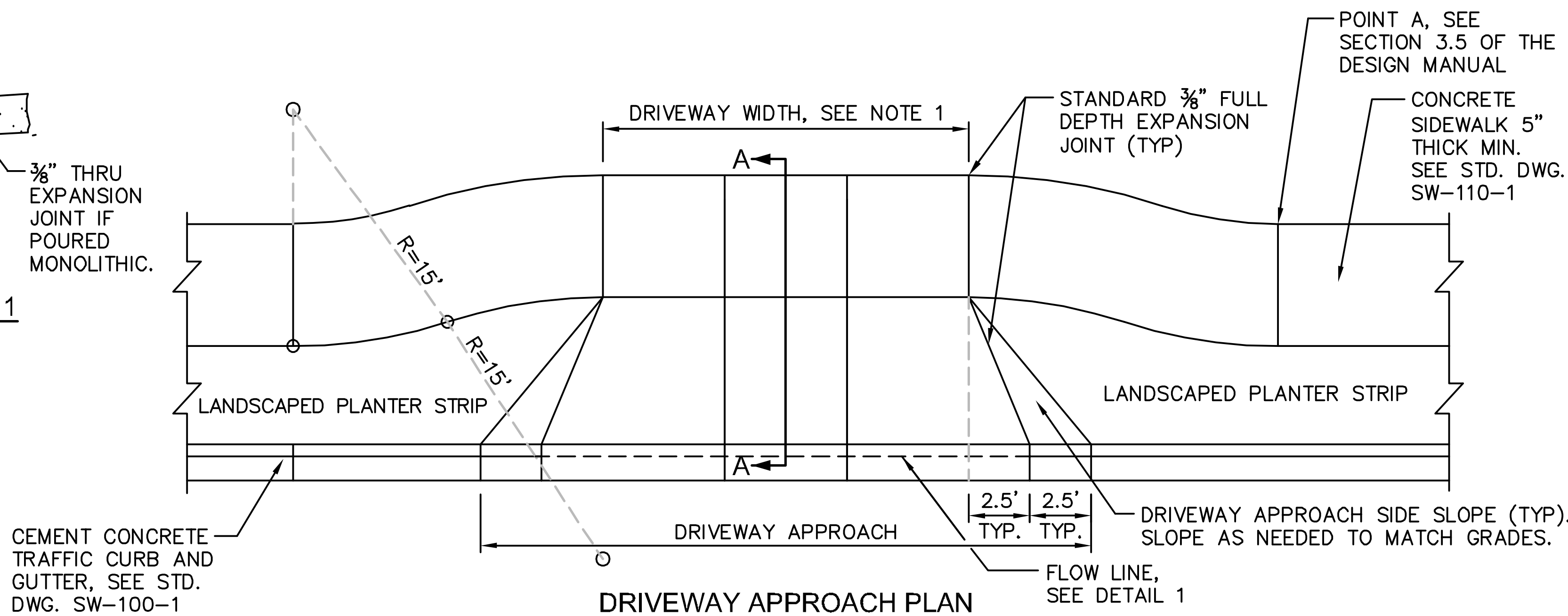
SECTION A-A

NOTES:

1. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR DRIVEWAY WIDTH, DESIGN DETAILS, AND REQUIREMENTS. DRIVEWAY WIDTH DOES NOT INCLUDE ADJACENT SIDE SLOPES (WINGS).
2. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR GRADE REQUIREMENTS. SLOPE ROUNDING IS REQUIRED AT DRIVEWAY GRADE TRANSITIONS AS SHOWN IN SECTION A–A.
3. CONCRETE SHALL BE 6" TO 8" CLASS 4000 P.C.C. MIX WITH A COMPRESSIVE STRENGTH OF 3000 PSI WITHIN 3 DAYS (CURB, GUTTER, DRIVEWAY APRON, SIDE SLOPES, SIDEWALK, AND ALL OTHER ITEMS SPECIFIED BY THE ENGINEER).
4. CONCRETE PAVEMENT FINISH: BRUSHED WITH STIFF BRISTLED BRUSH PERPENDICULAR TO THE TRAVEL DIRECTION OF THE SIDEWALK.
5. CSBC (4" MIN.) SHALL BE COMPACTED TO 95% MAX. DENSITY.
6. ⅜" THRU EXPANSION JOINTS SHALL BE PLACED AT BACK, SIDES AND FRONT. MAXIMUM EXPANSION JOINT SPACING IS 14' CENTER TO CENTER.



DETAIL 1



DRIVEWAY APPROACH PLAN

City of Bellevue

DRIVEWAY OR PRIVATE ROAD APPROACH WITH SIDEWALK (OPTION 2)

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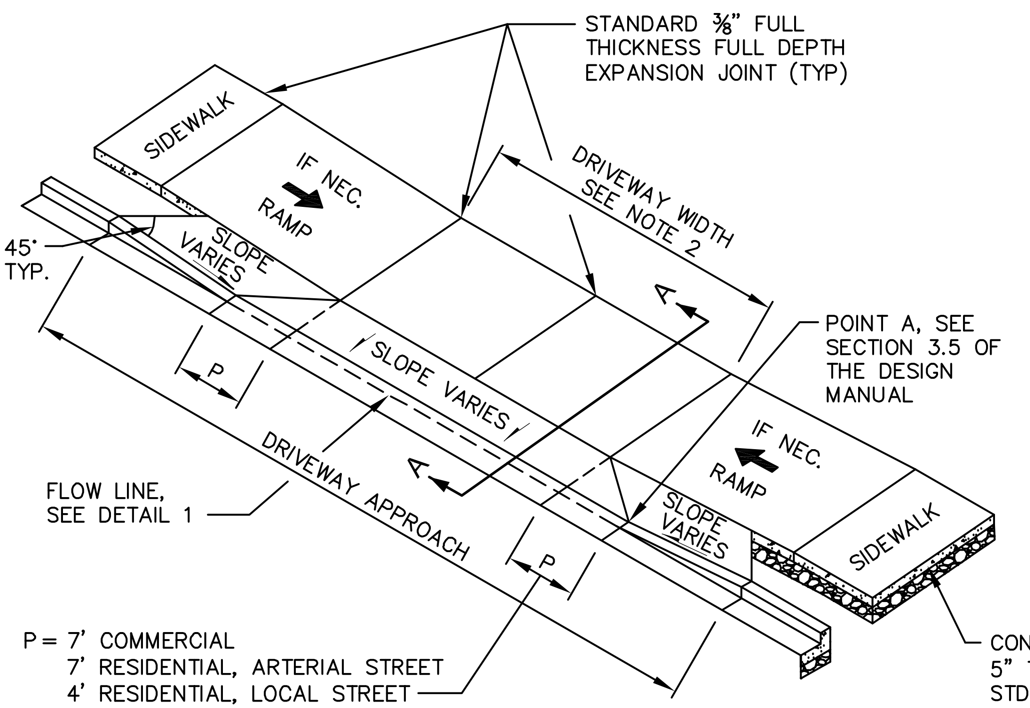
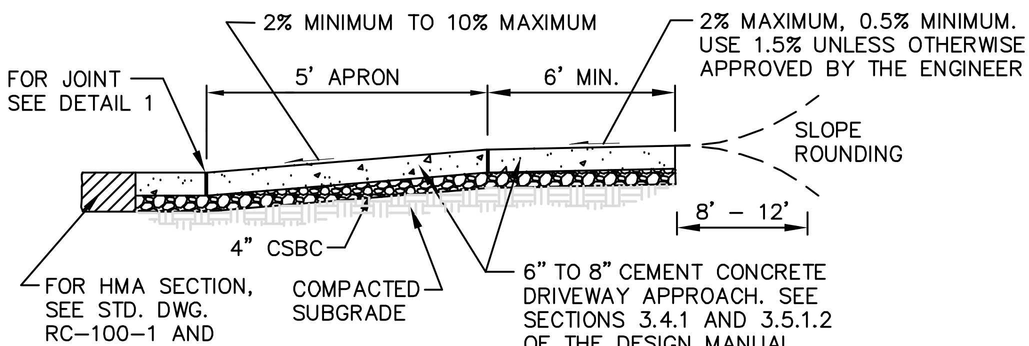
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



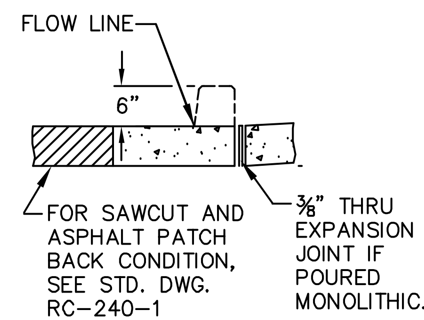
DRIVEWAY APPROACH DETAIL

NOTES:

1. THIS DRIVEWAY APPROACH LAYOUT IS ONLY ALLOWED IN SPECIAL CASES SUBJECT TO APPROVAL BY THE REVIEW ENGINEER. SEE SECTION 3.5.3 OF THE DESIGN MANUAL.
2. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR DRIVEWAY WIDTH, DESIGN DETAILS, AND REQUIREMENTS. DRIVEWAY WIDTH DOES NOT INCLUDE ADJACENT SIDE SLOPES (WINGS).
3. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR GRADE REQUIREMENTS. SLOPE ROUNDING IS REQUIRED AT DRIVEWAY GRADE TRANSITIONS AS SHOWN IN SECTION A–A.
4. CONCRETE SHALL BE 6" TO 8" CLASS 4000 P.C.C. MIX WITH A COMPRESSIVE STRENGTH OF 3000 PSI WITHIN 3 DAYS (CURB, GUTTER, DRIVEWAY APRON, SIDE SLOPES, SIDEWALK, AND ALL OTHER ITEMS SPECIFIED BY THE ENGINEER).
5. CONCRETE PAVEMENT FINISH: BRUSHED WITH STIFF BRISTLED BRUSH PERPENDICULAR TO THE TRAVEL DIRECTION OF THE SIDEWALK.
6. CSBC (4" MIN.) SHALL BE COMPACTED TO 95% MAX. DENSITY.
7. ⅜" THRU EXPANSION JOINTS SHALL BE PLACED AT BACK, SIDES AND FRONT. MAXIMUM EXPANSION JOINT SPACING IS 14' CENTER TO CENTER.

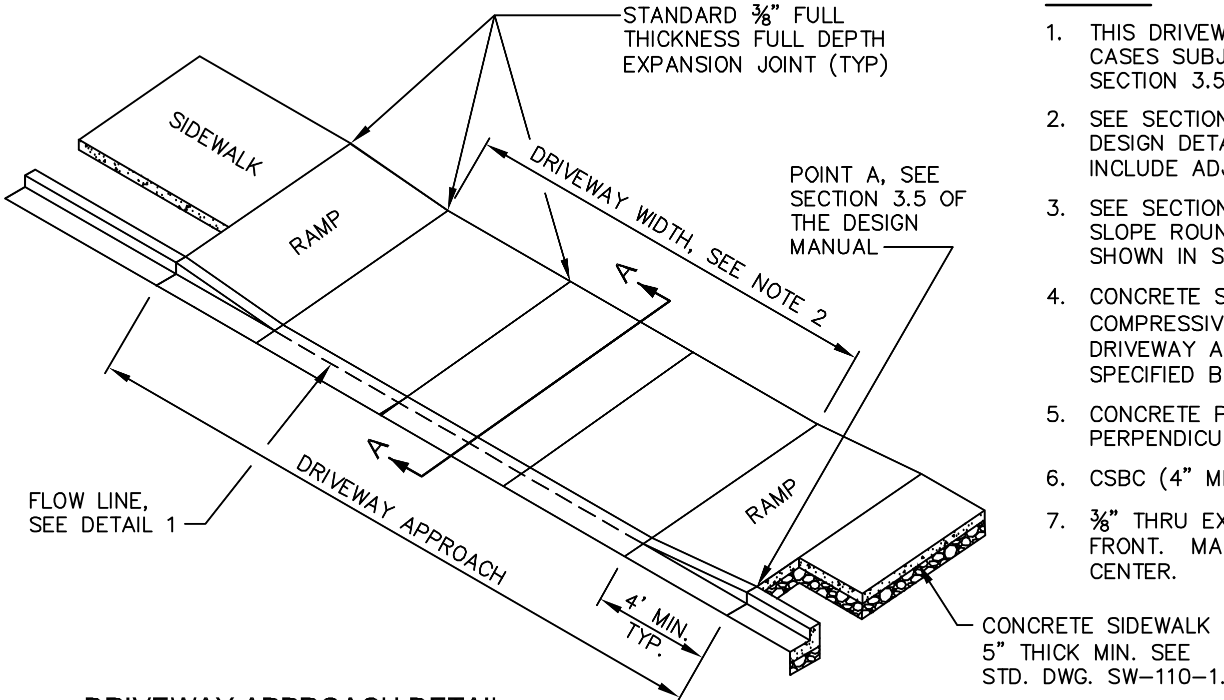


SECTION A-A



DETAIL 1

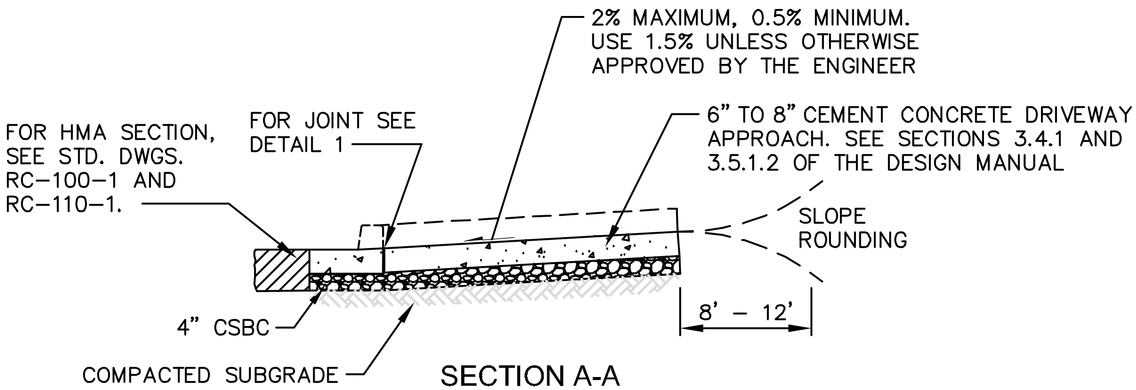
City of Bellevue	DRIVEWAY OR PRIVATE ROAD APPROACH WITH SIDEWALK (OPTION 3)	DRAWING NUMBER	SW–160–1
		SCALE	NONE
		REVISION DATE	1/25
		DEPARTMENT	TRANS



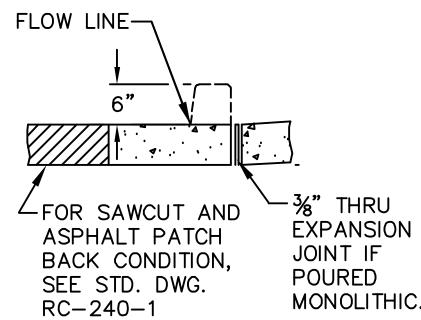
DRIVEWAY APPROACH DETAIL

NOTES:

1. THIS DRIVEWAY APPROACH LAYOUT IS ONLY ALLOWED IN SPECIAL CASES SUBJECT TO APPROVAL BY THE REVIEW ENGINEER. SEE SECTION 3.5.3 OF THE DESIGN MANUAL.
2. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR DRIVEWAY WIDTH, DESIGN DETAILS, AND REQUIREMENTS. DRIVEWAY WIDTH DOES NOT INCLUDE ADJACENT SIDE SLOPES (WINGS).
3. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR GRADE REQUIREMENTS. SLOPE ROUNDING IS REQUIRED AT DRIVEWAY GRADE TRANSITIONS AS SHOWN IN SECTION A-A.
4. CONCRETE SHALL BE 6" TO 8" CLASS 4000 P.C.C. MIX WITH A COMPRESSIVE STRENGTH OF 3000 PSI WITHIN 3 DAYS (CURB, GUTTER, DRIVEWAY APRON, SIDE SLOPES, SIDEWALK, AND ALL OTHER ITEMS SPECIFIED BY THE ENGINEER).
5. CONCRETE PAVEMENT FINISH: BRUSHED WITH STIFF BRISTLED BRUSH PERPENDICULAR TO THE TRAVEL DIRECTION OF THE SIDEWALK.
6. CSBC (4" MIN.) SHALL BE COMPACTED TO 95% MAX. DENSITY.
7. ⅜" THRU EXPANSION JOINTS SHALL BE PLACED AT BACK, SIDES AND FRONT. MAXIMUM EXPANSION JOINT SPACING IS 14' CENTER TO CENTER.



SECTION A-A

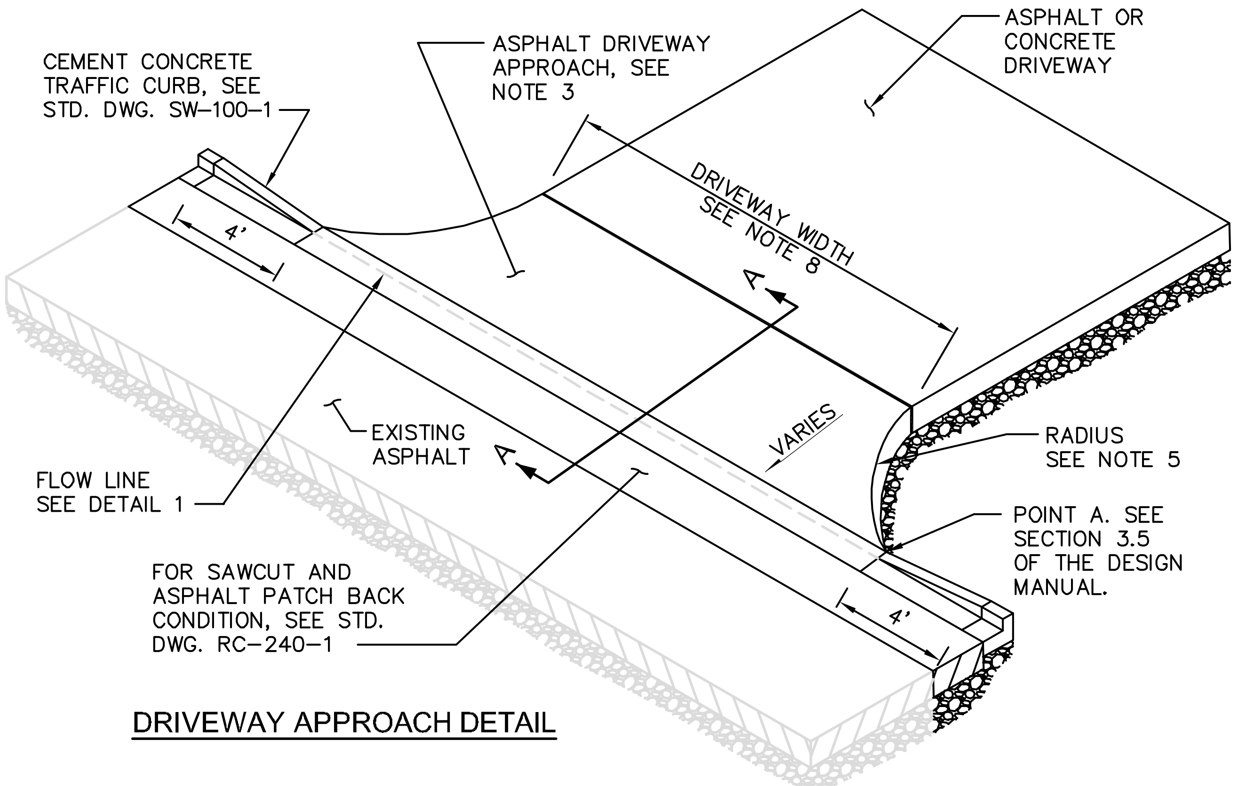


DETAIL 1

City of Bellevue

DRIVEWAY OR PRIVATE ROAD APPROACH WITH SIDEWALK (OPTION 4)

DRAWING NUMBER	SW-170-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



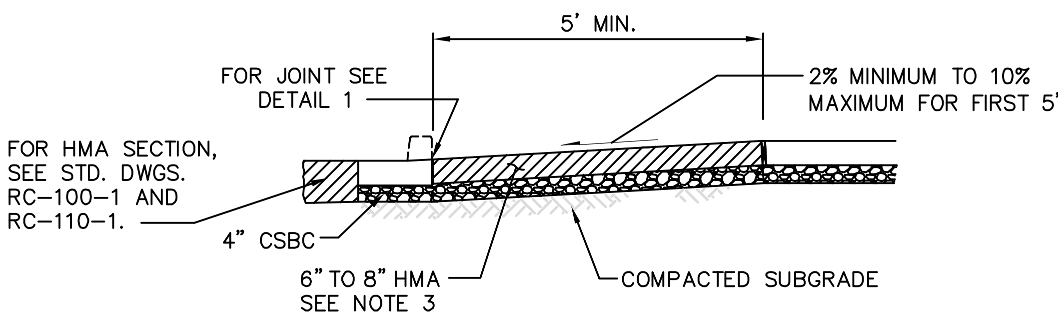
DRIVEWAY APPROACH DETAIL

NOTES:

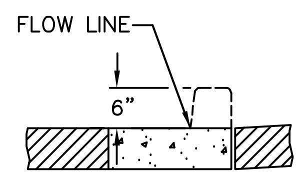
1. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR DRIVEWAY WIDTH, DESIGN DETAILS, AND GRADING REQUIREMENTS.
2. AT SAWCUT, TACK COAT EXISTING SURFACES WITH CSS-1 AND SEAL IN ACCORDANCE WITH WSDOT STD. SPEC. SECTION 5-03.
3. DRIVEWAY APPROACH TO BE 6" TO 8" HMA CLASS ½" PG 58H-22 ASPHALT IN 2" LIFTS FOR MINIMUM 5' BEHIND CURB.
4. HOT MIX ASPHALT OR CONCRETE TO BE PLACED OVER COMPACTED SUBGRADE AND 4" OF CSBC COMPACTED TO 95%.
5. TYPICAL EDGE RADIUS:

COMMERCIAL	15'
RESIDENTIAL, ARTERIAL STREET	10'
RESIDENTIAL, LOCAL STREET	5'

6. CONCRETE DRIVEWAY IN THE RIGHT-OF-WAY SHALL NOT CONTAIN REINFORCING STEEL.
7. CONCRETE DRIVEWAY IN THE RIGHT-OF-WAY FINISH SHALL BE BRUSHED WITH STIFF BRISTLED BRUSH PARALLEL TO THE CURB.
8. DRIVEWAY WIDTH DOES NOT INCLUDE WINGS.



SECTION A-A

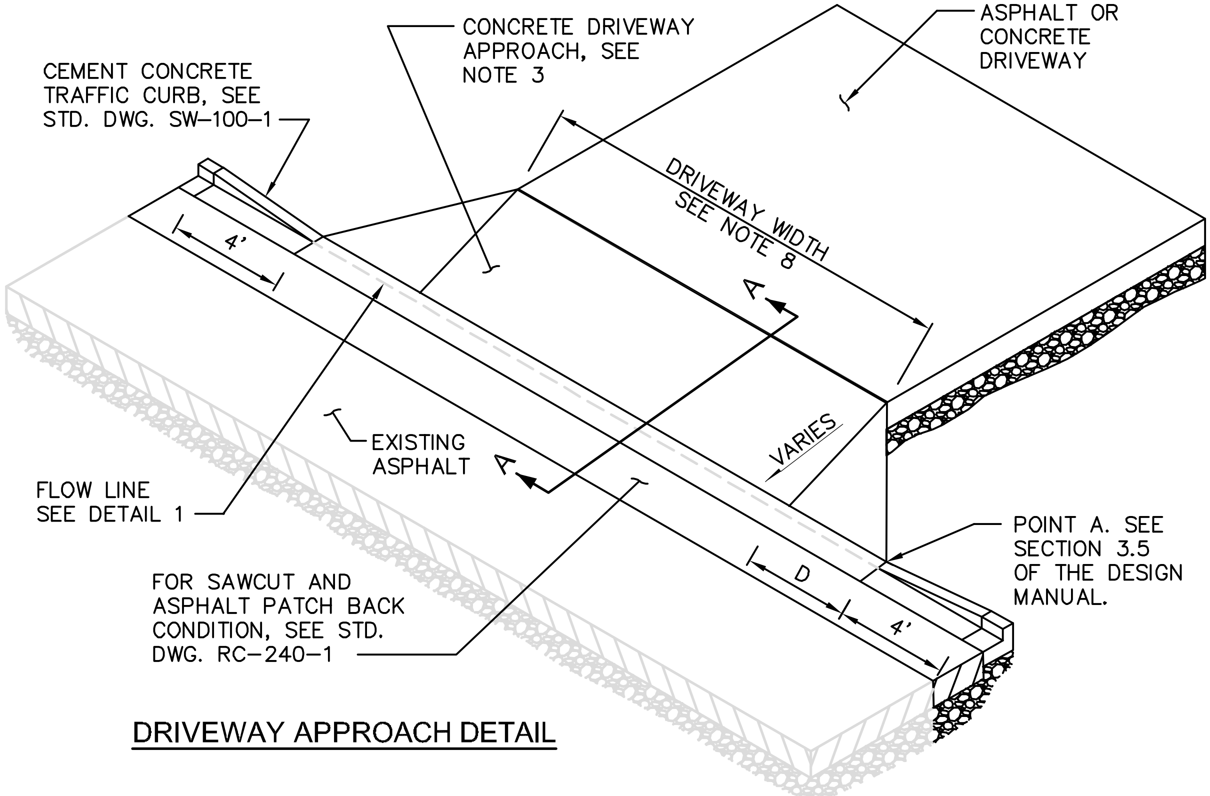


DETAIL 1

City of Bellevue

ASPHALT DRIVEWAY APPROACH
WHERE CURB-GUTTER EXISTS (NO SIDEWALK)

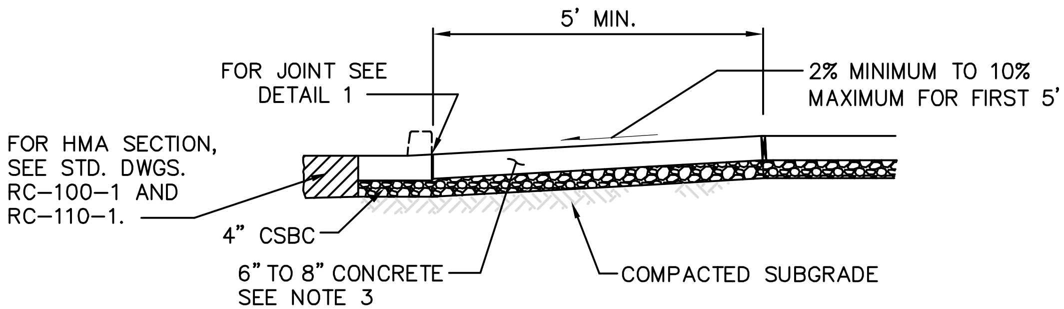
DRAWING NUMBER	SW-180-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



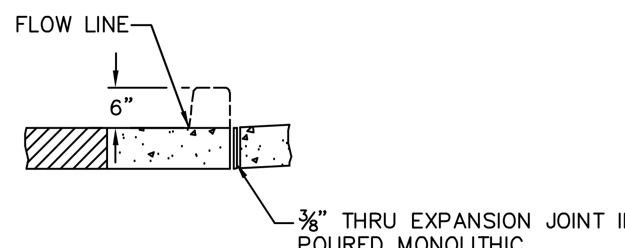
DRIVEWAY APPROACH DETAIL

NOTES:

1. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR DRIVEWAY WIDTH, DESIGN DETAILS, AND GRADING REQUIREMENTS.
2. AT SAWCUT, TACK COAT EXISTING SURFACES WITH CSS–1 AND SEAL IN ACCORDANCE WITH WSDOT STD. SPEC. SECTION 5–03.
3. DRIVEWAY APPROACH TO BE 6" TO 8" CLASS 4000 P.C.C. MIX WITH COMPRESSIVE STRENGTH OF 3000 PSI WITHIN 3 DAYS, FOR MINIMUM 5' BEHIND CURB.
4. HOT MIX ASPHALT OR CONCRETE TO BE PLACED OVER COMPACTED SUBGRADE AND 4" OF CSBC COMPACTED TO 95%.
5. EDGE DIMENSION D:
   - COMMERCIAL 15'
   - RESIDENTIAL, ARTERIAL STREET 10'
   - RESIDENTIAL, LOCAL STREET 5'
6. CONCRETE DRIVEWAY APPROACH AND CONCRETE DRIVEWAY IN THE RIGHT–OF–WAY SHALL NOT CONTAIN REINFORCING STEEL.
7. CONCRETE DRIVEWAY APPROACH AND CONCRETE DRIVEWAY IN THE RIGHT–OF–WAY FINISH SHALL BE BRUSHED WITH STIFF BRISTLED BRUSH PARALLEL TO THE CURB.
8. DRIVEWAY WIDTH DOES NOT INCLUDE WINGS.



SECTION A-A



DETAIL 1

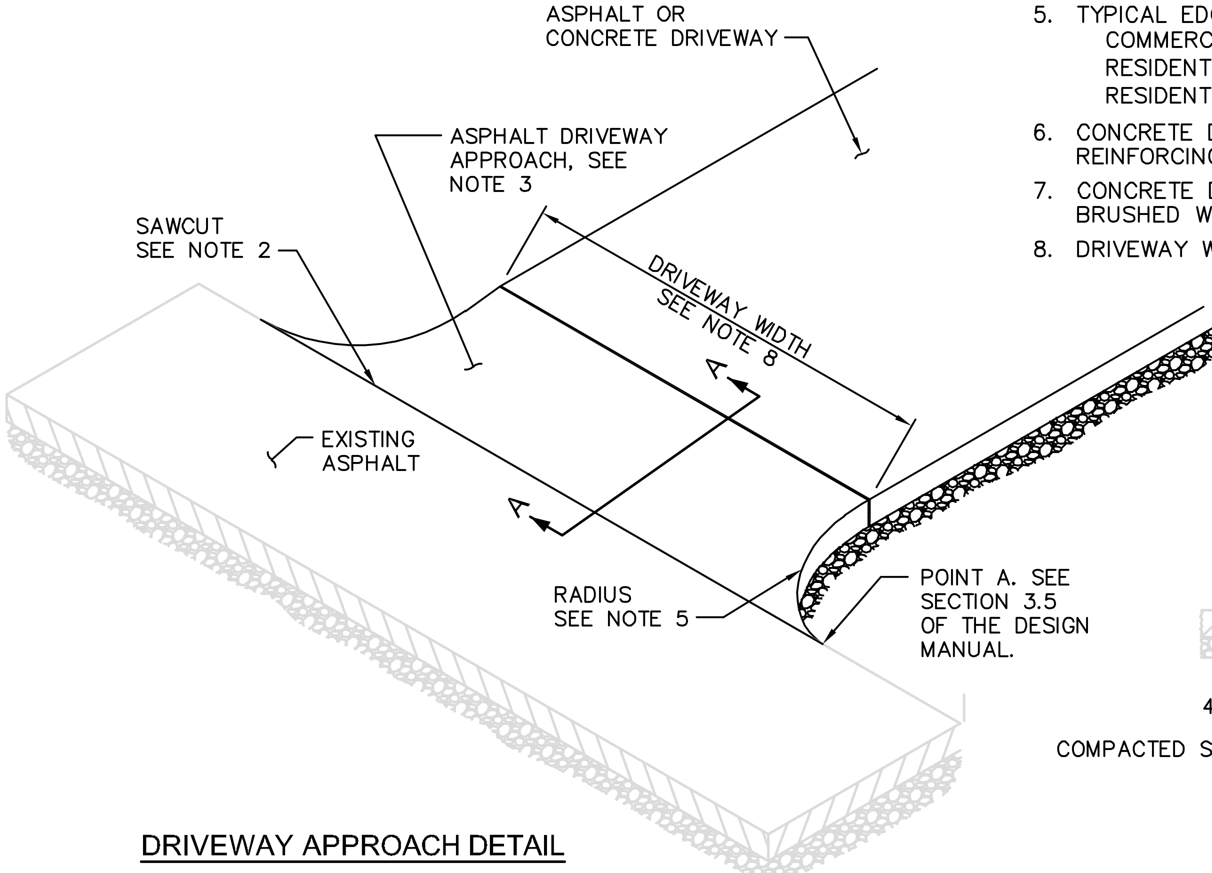
City of Bellevue	CONCRETE DRIVEWAY APPROACH WHERE CURB–GUTTER EXISTS (NO SIDEWALK)	DRAWING NUMBER	SW–181–1
		SCALE	NONE
		REVISION DATE	1/25
		DEPARTMENT	TRANS

NOTES:

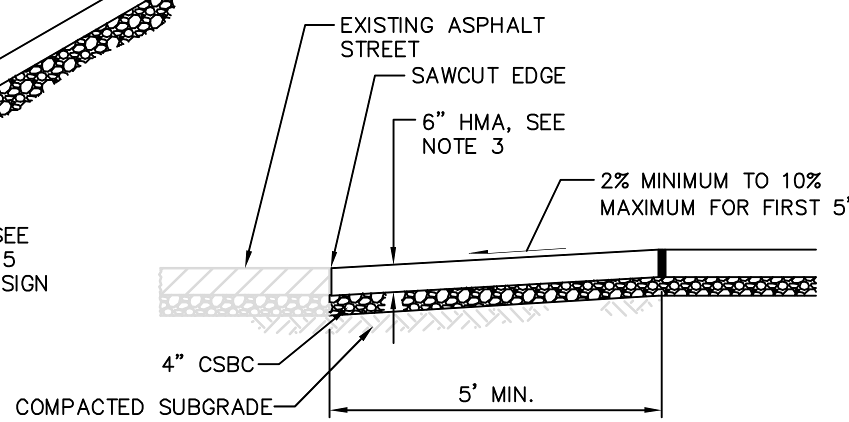
1. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR DRIVEWAY WIDTH, DESIGN DETAILS, AND GRADING REQUIREMENTS.
2. AT SAWCUT, TACK COAT EXISTING SURFACES WITH CSS–1 AND SEAL IN ACCORDANCE WITH WSDOT STD. SPEC. SECTION 5–03.
3. DRIVEWAY APPROACH TO BE 6" TO 8" HMA CLASS ½" PG 58H–22 ASPHALT IN ONE OR TWO 2" LIFTS OVER 4" LIFT.
4. HOT MIX ASPHALT OR CONCRETE TO BE PLACED OVER COMPACTED SUBGRADE AND 4" OF CSBC COMPACTED TO 95%.
5. TYPICAL EDGE RADIUS:

COMMERCIAL	15'
RESIDENTIAL, ARTERIAL STREET	10'
RESIDENTIAL, LOCAL STREET	5'

6. CONCRETE DRIVEWAY WITHIN RIGHT–OF–WAY SHALL NOT CONTAIN REINFORCING STEEL.
7. CONCRETE DRIVEWAY WITHIN RIGHT–OF–WAY FINISH SHALL BE BRUSHED WITH A STIFF BRISTLED BRUSH PARALLEL TO THE CURB.
8. DRIVEWAY WIDTH DOES NOT INCLUDE WINGS.



DRIVEWAY APPROACH DETAIL



SECTION A-A

City of Bellevue

DRIVEWAY APPROACH
WHERE NO CURB–GUTTER EXISTS

DRAWING NUMBER	SW–190–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

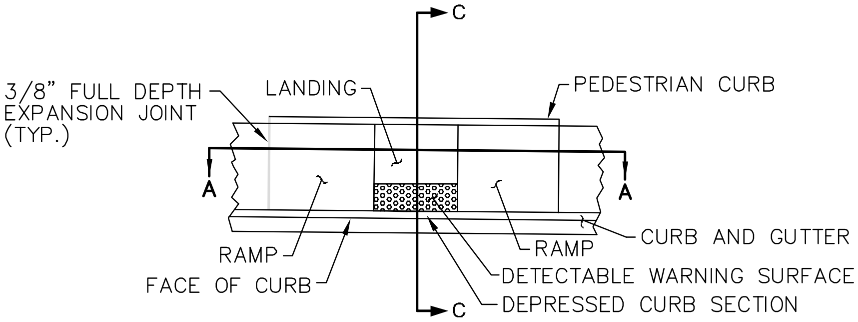
CURB RAMP NOTES FOR CURB RAMP STANDARD DRAWINGS

1. CURB RAMPS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE DESIGN MANUAL AND WITH THE PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG) FINAL RULE, TO THE MAXIMUM EXTENT FEASIBLE.
2. A SEPARATE CURB RAMP SHALL BE PROVIDED FOR EACH MARKED OR UNMARKED CROSSWALK. CURB RAMP LOCATION SHALL BE PLACED WITHIN THE WIDTH OF THE ASSOCIATED CROSSWALK OR AS SHOWN IN THE CONTRACT PLANS WHEN NO MARKED CROSSWALK IS PRESENT. PRIOR APPROVAL BY THE ENGINEER SHALL BE OBTAINED IF ONLY ONE RAMP IS TO BE PROVIDED.
3. CURB DESIGN TYPE, WIDTH, AND SLOPES SHALL BE INDICATED ON THE DESIGN DRAWINGS AND AS PER THE STANDARD DRAWINGS.
4. A 4'x4' CLEAR AREA SHALL BE PROVIDED IN FRONT OF THE DEPRESSED CURB AND WITHIN THE WIDTH OF THE CROSSWALK. THE CLEAR AREA SHALL BE LOCATED OUTSIDE THE VEHICLE AND BICYCLE LANES THAT RUN PARALLEL TO THE CROSSWALK.
5. MAXIMUM SLOPES ARE INCLUSIVE OF ALL CONSTRUCTION TOLERANCES. IT IS RECOMMENDED THAT 1.5% AND 7.5% ARE USED IN DESIGN OF ELEMENTS WITH MAXIMUM SLOPES OF 2% AND 8.33% RESPECTIVELY.
6. SEE STD. DWG. SW-100-1 FOR CEMENT CONCRETE TRAFFIC CURB AND GUTTER, DEPRESSED CURB SECTION, CEMENT CONCRETE TRAFFIC CURB, AND CEMENT CONCRETE PEDESTRIAN CURB DETAILS.
7. PEDESTRIAN CURB MAY BE OMITTED IF THE GROUND SURFACE AT THE BACK OF THE CURB RAMP AND/OR LANDING WILL BE THE SAME ELEVATION AS THE CURB RAMP OR LANDING AND THERE WILL BE NO MATERIAL TO RETAIN.
8. SEE STD. DWG. SW-110-1 FOR SIDEWALK DETAILS.
9. CURB RAMP, LANDING, AND FLARE SURFACES SHALL BE BROOM FINISHED AND MINIMUM 5" THICK AS PER STD. DWG. SW-110-1.
10. CEMENT CONCRETE FOR RAMPS SHALL BE AIR ENTRAINED CONCRETE CLASS 3000, CONFORMING TO WSDOT STD. SPEC. 6-02.
11. REMOVAL/REPLACEMENT OF CEMENT CONCRETE CURB, SIDEWALK, AND RAMPS SHALL BE FROM EXPANSION JOINT TO EXPANSION JOINT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
12. GRADE BREAKS FOR RAMPS SHALL BE PERPENDICULAR TO DIRECTION OF TRAVEL.
13. AT GRADE BREAKS, THE ENTIRE LENGTH OF THE GRADE BREAK BETWEEN THE TWO ADJACENT SURFACE PLANES SHALL BE FLUSH.
14. GRATINGS, JUNCTION BOXES, ACCESS COVERS, OR OTHER APPURTENANCES SHALL NOT BE PLACED IN FRONT OF THE CURB RAMP OR ON ANY PART OF THE CURB RAMP OR LANDING, UNLESS APPROVED IN ADVANCE BY THE ENGINEER.
15. CURB RAMPS SHALL BE DESIGNED TO PROVIDE AND MAINTAIN POSITIVE DRAINAGE TOWARDS THE ROADWAY. GRADES AND GUTTER FLOW LINE SHALL BE CHECKED TO ENSURE PROPER DRAINAGE PRIOR TO PLACEMENT OF CONCRETE.
16. PAY LIMITS ON CITY-FUNDED PROJECTS SHALL BE AS PER WSDOT STD. PLANS F-40.12-03, F-40.14-03, F-40.15-04, AND F-40.16-03.

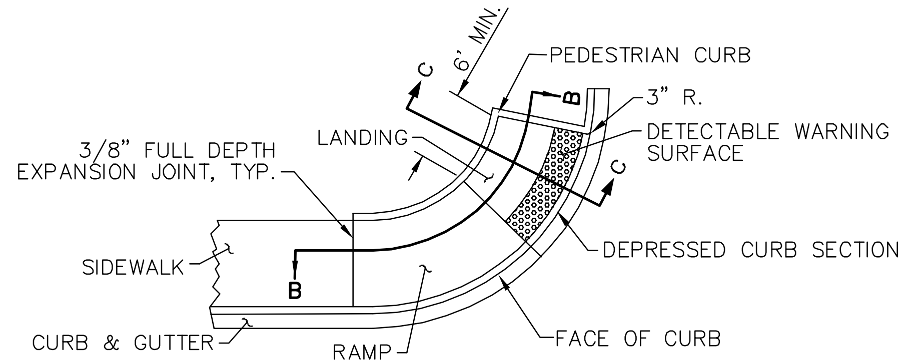
City of Bellevue

CURB RAMP CONSTRUCTION NOTES

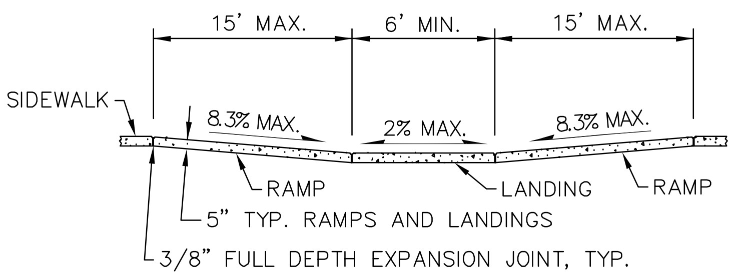
DRAWING NUMBER	SW-200-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



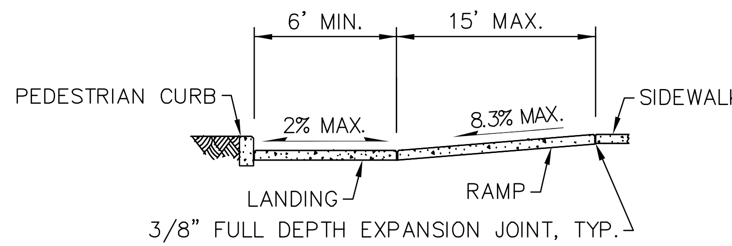
CURB RAMP TYPE PARALLEL A



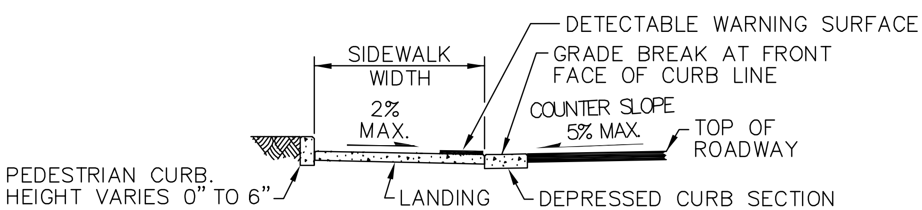
CURB RAMP TYPE PARALLEL B



SECTION A-A



SECTION B-B



SECTION C-C

LEGEND

SLOPE IN EITHER DIRECTION

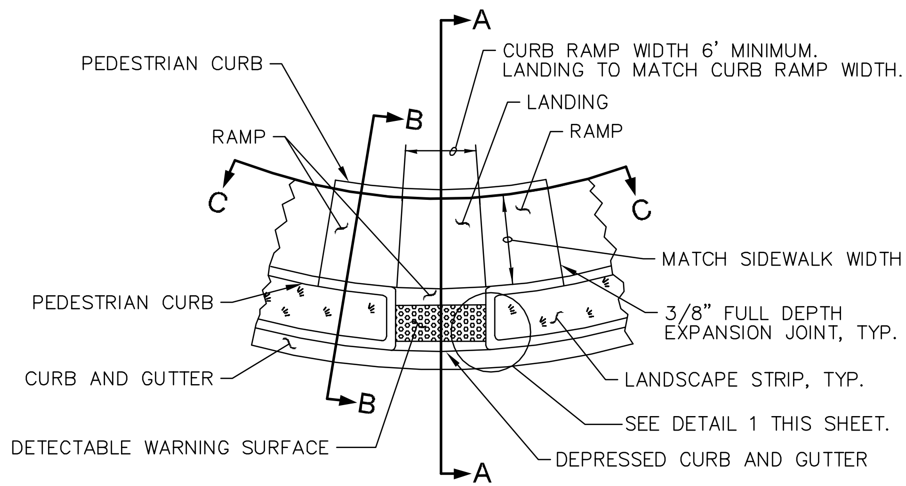
NOTES:

1. CROSS SLOPE OF RAMPS AND SIDEWALKS 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% IN DESIGN.
2. CROSS SLOPE AND RUNNING SLOPE OF LANDINGS 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% IN DESIGN.
3. RUNNING SLOPE OF RAMPS 8.3% MAXIMUM. USE 7.5% IN DESIGN.
4. RAMP LENGTH NOT REQUIRED TO EXCEED 15 FT. TO MEET MAXIMUM SLOPE, DESIGN JUSTIFICATION REQUIRED. LENGTH MEASURED AT BACK OF SIDEWALK FOR RAMPS CONSTRUCTED ON RADIUS.
5. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR SIDEWALK WIDTH REQUIREMENTS.
6. SEE STD DWG SW–200–1 FOR CURB RAMP CONSTRUCTION NOTES.

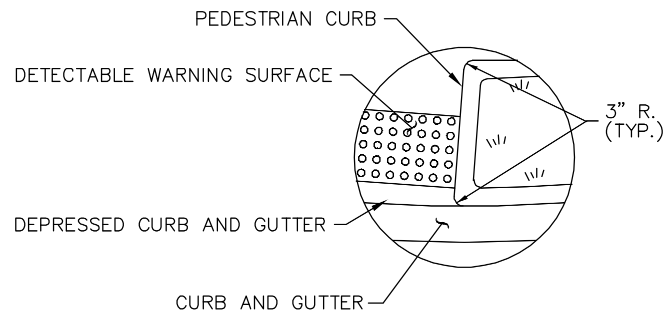
City of Bellevue

PARALLEL CEMENT CONCRETE CURB RAMP

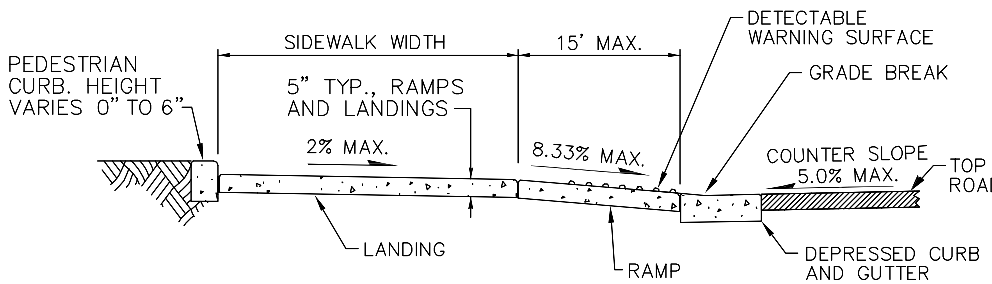
DRAWING NUMBER	SW–210–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



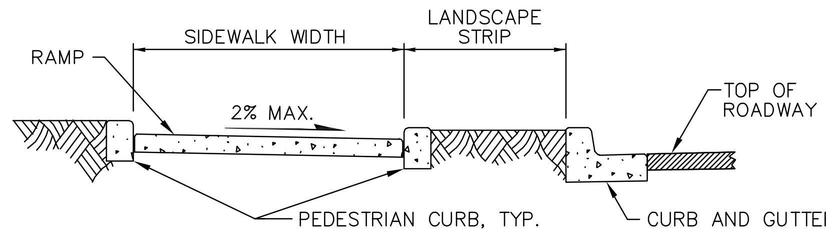
CURB RAMP TYPE COMBINATION



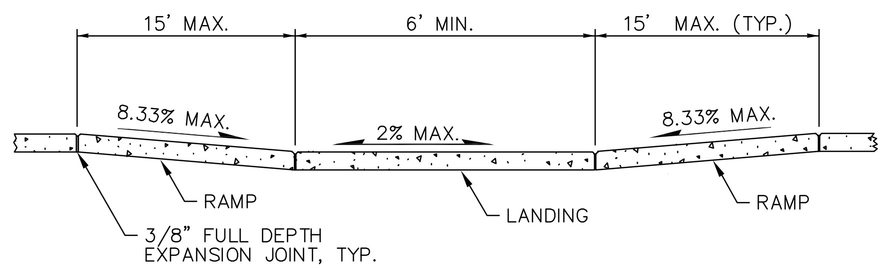
DETAIL 1



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:

1. CROSS SLOPE OF RAMPS AND SIDEWALKS 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% IN DESIGN.
2. CROSS SLOPE AND RUNNING SLOPE OF LANDINGS 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% IN DESIGN.
3. RUNNING SLOPE OF RAMPS 8.3% MAXIMUM. USE 7.5% IN DESIGN.
4. RAMP LENGTH NOT REQUIRED TO EXCEED 15 FT. TO MEET MAXIMUM SLOPE, DESIGN JUSTIFICATION REQUIRED. LENGTH MEASURED AT BACK OF SIDEWALK FOR RAMPS CONSTRUCTED ON RADIUS.
5. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR SIDEWALK WIDTH REQUIREMENTS.
6. SEE STD DWG SW-200-1 FOR CURB RAMP CONSTRUCTION NOTES.

LEGEND

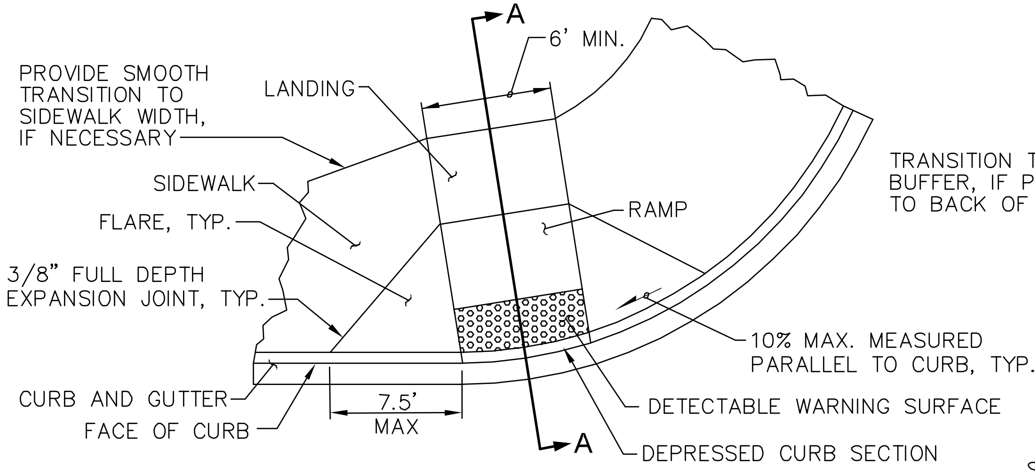
SLOPE IN EITHER DIRECTION

City of Bellevue

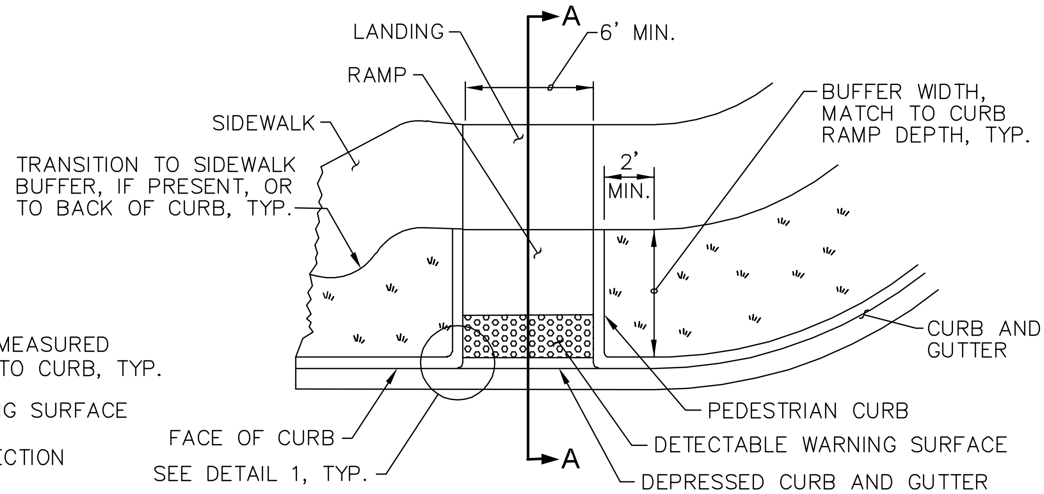
CITY OF BELLEVUE WASHINGTON

COMBINATION CEMENT CONCRETE CURB RAMP

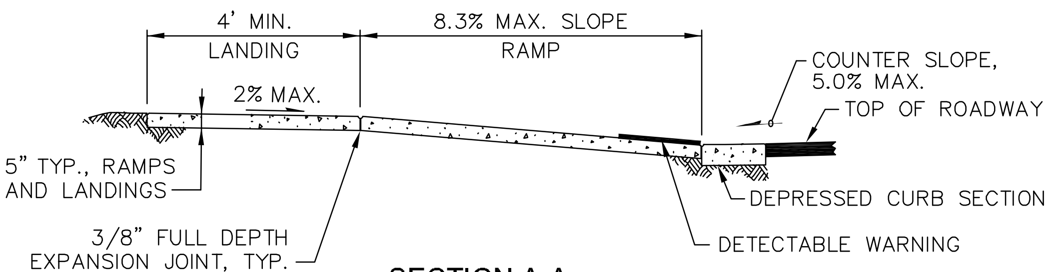
DRAWING NUMBER	SW-220-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



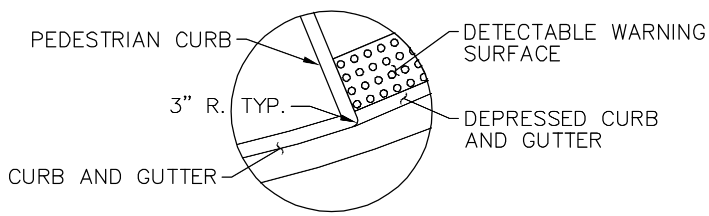
CURB RAMP TYPE PERPENDICULAR A



CURB RAMP TYPE PERPENDICULAR B



SECTION A-A



DETAIL 1

NOTES:

1. CROSS SLOPE OF RAMPS AND SIDEWALKS 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% IN DESIGN.
2. CROSS SLOPE AND RUNNING SLOPE OF LANDINGS 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% IN DESIGN.
3. RUNNING SLOPE OF RAMPS 8.3% MAXIMUM. USE 7.5% IN DESIGN.
4. RAMP FLARE SLOPE 10% MAX. FLARE LENGTH MEASURED AT BACK OF CURB NOT REQUIRED TO EXCEED 7.5 FT. TO MEET MAXIMUM SLOPE. DESIGN JUSTIFICATION REQUIRED.
5. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR SIDEWALK WIDTH REQUIREMENTS.
6. SEE STD DWG SW-200-1 FOR CURB RAMP CONSTRUCTION NOTES.

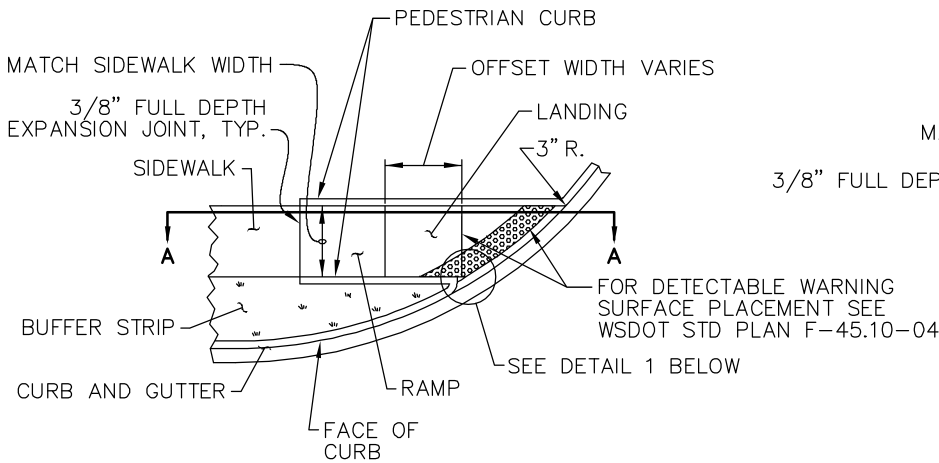
LEGEND

⟷ SLOPE IN EITHER DIRECTION

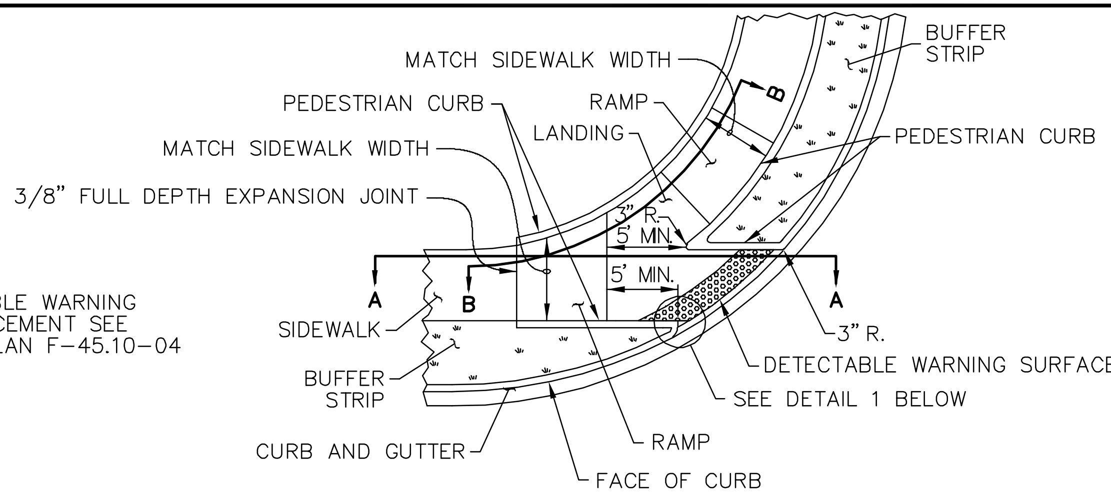
City of Bellevue

PERPENDICULAR CEMENT CONCRETE CURB RAMP

DRAWING NUMBER	SW-230-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



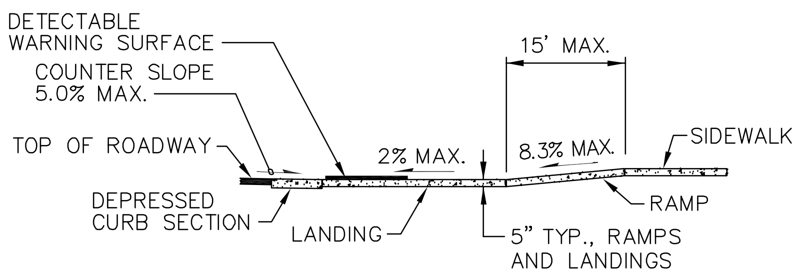
CURB RAMP TYPE DIRECTIONAL A



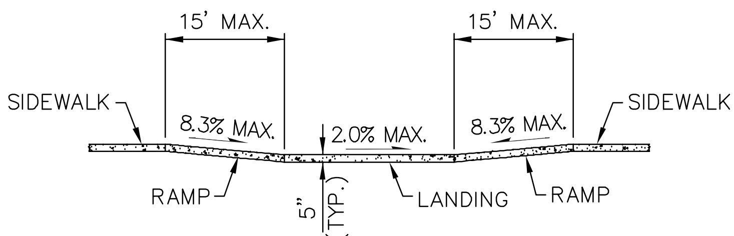
CURB RAMP TYPE DIRECTIONAL B

NOTES:

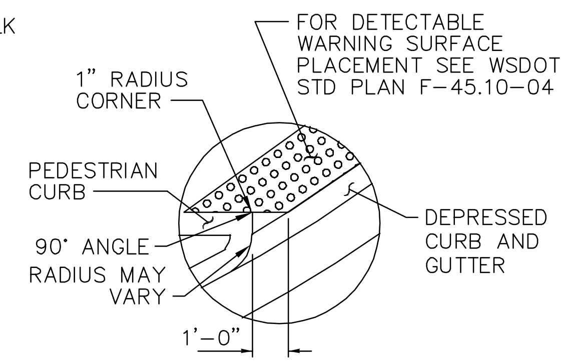
1. CROSS SLOPE OF RAMPS AND SIDEWALKS 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% IN DESIGN.
2. CROSS SLOPE AND RUNNING SLOPE OF LANDINGS 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% IN DESIGN.
3. RUNNING SLOPE OF RAMPS 8.3% MAXIMUM. USE 7.5% IN DESIGN.
4. RAMP LENGTH NOT REQUIRED TO EXCEED 15 FT. TO MEET MAXIMUM SLOPE, DESIGN JUSTIFICATION REQUIRED. LENGTH MEASURED AT BACK OF SIDEWALK FOR RAMPS CONSTRUCTED ON RADIUS.
5. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR SIDEWALK WIDTH REQUIREMENTS.
6. SEE STD DWG SW-200-1 FOR CURB RAMP CONSTRUCTION NOTES.



SECTION A-A



SECTION B-B



DETAIL 1

LEGEND

⟷ SLOPE IN EITHER DIRECTION

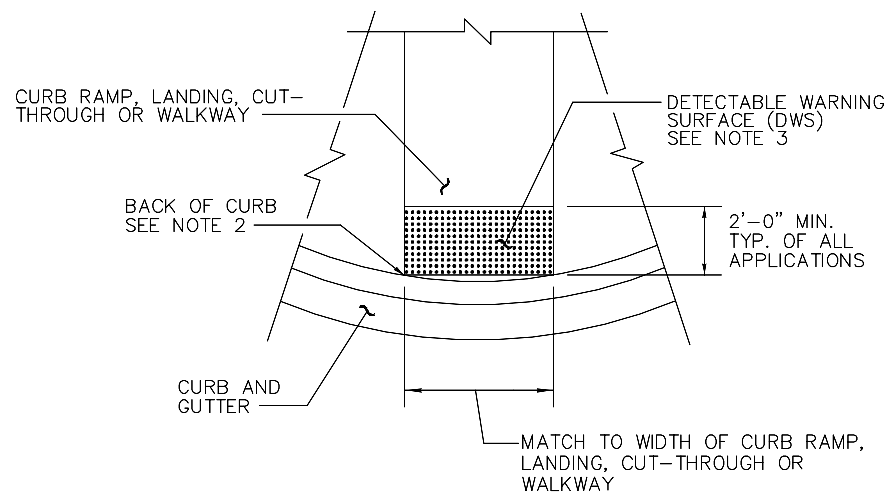
City of Bellevue

DIRECTIONAL CEMENT CONCRETE CURB RAMP

DRAWING NUMBER	SW-240-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

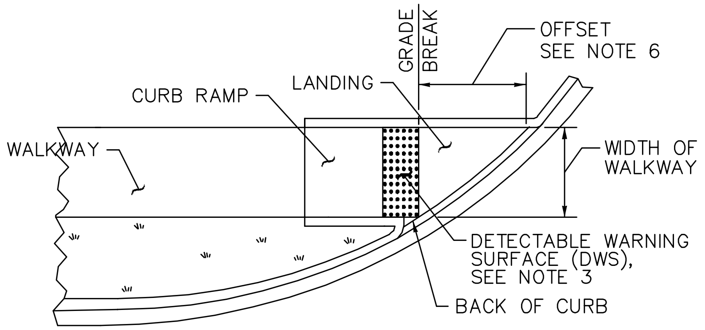
DETECTABLE WARNING SURFACE NOTES

1. THE DETECTABLE WARNING SURFACE (DWS) SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP, LANDING, OR OTHER ROADWAY ENTRANCE AS APPLICABLE. EXCEPTION: IF THE MANUFACTURER OF THE DWS REQUIRES A CONCRETE BORDER AROUND THE DWS, A VARIANCE OF UP TO 2 INCHES ON EACH SIDE OF THE DWS IS PERMITTED.
2. THE DETECTABLE WARNING SURFACES (DWS) SHALL BE PLACED ON A MINIMUM 4-INCH THICK CONCRETE PAD. THE DWS PANEL SHALL BE PLACED ADJACENT TO THE BACK OF THE CURB AND WITH NO MORE THAN A 2-INCH GAP BETWEEN THE DWS AND THE BACK OF THE CURB MEASURED AT THE CENTER OF THE DWS PANEL. EXCEPTION: IF THE MANUFACTURER OF THE SELECTED DWS REQUIRES A CONCRETE BORDER AROUND THE DWS, A VARIANCE OF UP TO 2 INCHES FROM THE BACK OF THE CURB IS PERMITTED (MEASURED AT THE LEADING CORNERS OF THE DWS PANEL).
3. THE ROWS OF TRUNCATED DOMES SHALL BE ALIGNED TO BE PARALLEL TO THE DIRECTION OF TRAVEL, AND PERPENDICULAR TO THE GRADE BREAK AT THE BACK OF CURB.
4. IF CURB OR CURB AND GUTTER ARE NOT PRESENT, SUCH AS A SHARED-USE PATH CONNECTION, RAISED CROSSWALK OR INTERSECTION, MEDIAN CUT-THROUGH, OR ISLAND CUT-THROUGH, THE DETECTABLE WARNING SURFACE SHALL BE PLACED AT THE PAVEMENT EDGE.
5. AT PEDESTRIAN RAIL CROSSINGS, THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE RAIL CROSSING SHALL BE 6 FEET MINIMUM AND 15 FEET MAXIMUM FROM THE CENTERLINE OF THE NEAREST RAIL. IF A CURB RAMP IS REQUIRED, THE DETECTABLE WARNING SURFACE SHALL BE AT THE BOTTOM OF THE CURB RAMP AND WITHIN THE REQUIRED DISTANCE FROM THE RAIL CROSSING.
6. WHEN THE GRADE BREAK BETWEEN THE CURB RAMP AND THE LANDING IS LESS THAN OR EQUAL TO 5 FT. FROM THE BACK OF THE CURB AT ALL POINTS, PLACE THE DETECTABLE WARNING SURFACE ON THE BOTTOM OF THE CURB RAMP DIRECTLY ABOVE THE GRADE BREAK.
7. FOR NEW CONCRETE CONSTRUCTION, DETECTABLE WARNING SURFACE MATERIAL SHALL BE "CAST-IN-PLACE" BY ARMOR-TILE, ADA SOLUTIONS, OR ALERTTILE APPLIED INTEGRAL TO THE CONCRETE POURING OF THE RAMP. FOR RETROFIT CONCRETE APPLICATIONS, DETECTABLE WARNING MATERIAL SHALL BE "SURFACE APPLIED" BY ARMOR-TILE, ADA SOLUTIONS, OR ALERTTILE. NO SUBSTITUTIONS WILL BE PERMITTED WITHOUT PRIOR WRITTEN APPROVAL BY THE ENGINEER. DETECTABLE WARNINGS SHALL BE FEDERAL YELLOW. INSTALLATION SHALL CONFORM TO MANUFACTURER'S SPECIFICATIONS.



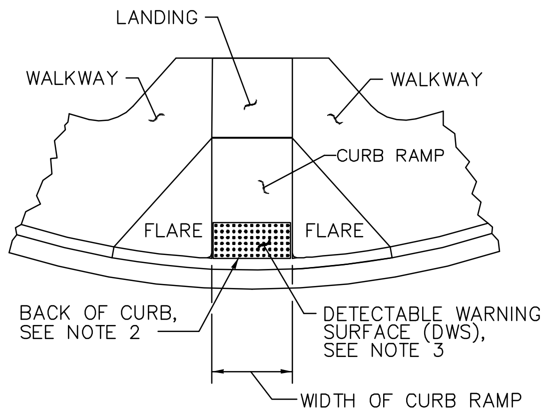
DETECTABLE WARNING SURFACE DETAIL

City of Bellevue	DETECTABLE WARNING SURFACE	DRAWING NUMBER	SW-250-1
		SCALE	NONE
		REVISION DATE	2/24
		DEPARTMENT	TRANS

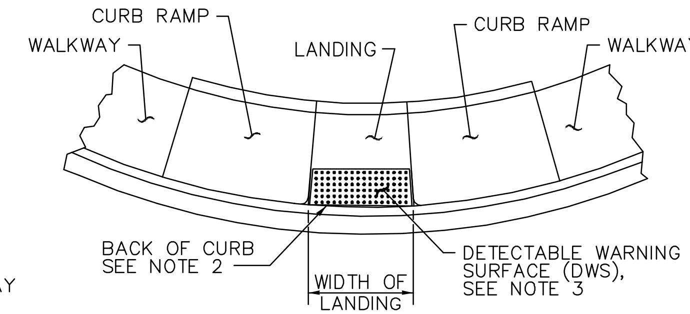


SINGLE DIRECTION CURB RAMP

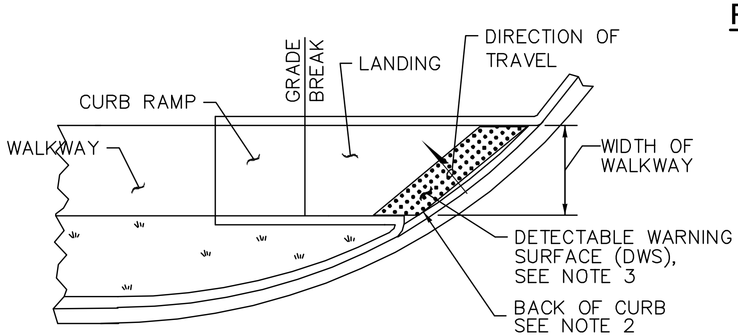
(GRADE BREAK BETWEEN CURB RAMP AND LANDING ≤ 5 FT. FROM BACK OF CURB)



PERPENDICULAR CURB RAMP

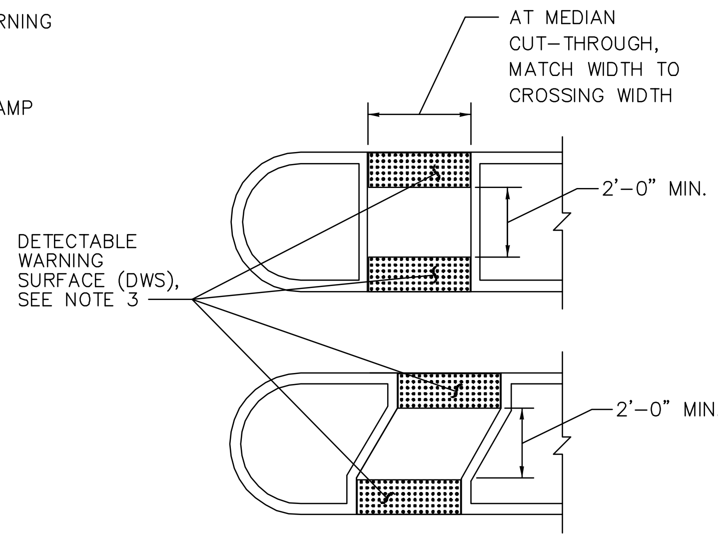


PARALLEL CURB RAMP



SINGLE DIRECTION CURB RAMP

(GRADE BREAK BETWEEN CURB RAMP AND LANDING > 5 FT. FROM BACK OF CURB)



MEDIAN CUT-THROUGH

NOTES REFERENCED ARE LOCATED ON STD. DWG. SW–250–1

City of Bellevue

DETECTABLE WARNING SURFACE PLACEMENT

DRAWING NUMBER	SW–260–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

CITY OF BELLEVUE
WASHINGTON

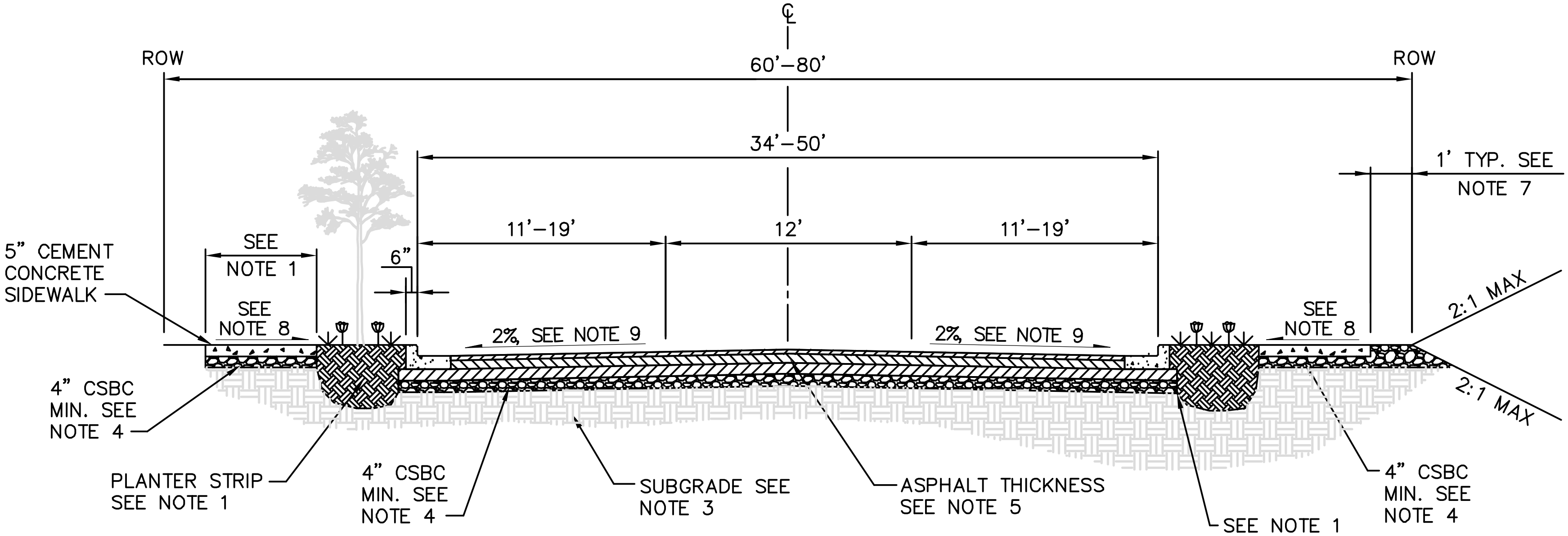
TRANSPORTATION DESIGN MANUAL

RC Drawings

Roadway Construction

CITY OF BELLEVUE

WASHINGTON



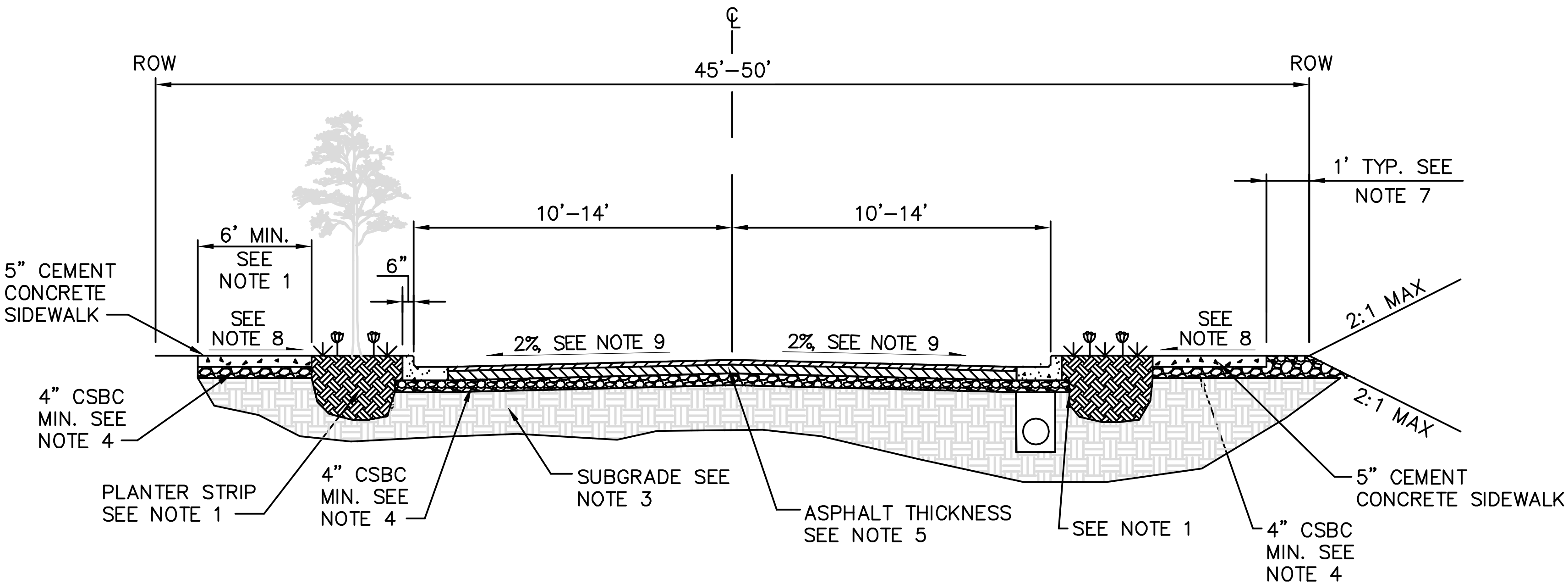
NOTES:

1. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR REQUIRED SIDEWALK AND LANDSCAPED PLANTER STRIP WIDTHS. SEE STD. DWG. RC–240–1 FOR ASPHALT DETAIL ADJACENT TO LANDSCAPED STRIP AND STD. DWG. SW–130–1 FOR SOIL PREPARATION.
2. RIGHT–OF–WAY AND TRAVEL LANE WIDTHS SHOWN ARE TYPICAL RANGES. REQUIRED WIDTHS WILL BE SPECIFIED BY THE ENGINEER.
3. REQUIRED SUBGRADE MATERIALS (GRAVEL BORROW, ETC.) AND THICKNESS WILL BE BASED ON A GEOTECHNICAL REPORT/SOIL ANALYSIS UNLESS OTHERWISE SPECIFIED BY THE REVIEW ENGINEER.
4. CSBC (4" MIN.) SHALL BE COMPACTED TO 95% MAX. DENSITY.
5. MINIMUM PAVEMENT THICKNESS SHALL BE 10 INCHES OF HOT MIX ASPHALT PLACED IN THE FOLLOWING COURSES TO CONFORM TO WSDOT STANDARD SPECIFICATION 5–04.3(9): 2 INCHES OF HOT MIX ASPHALT CLASS ½" PG 58H–22 WEARING COURSE, OVER TWO 4 INCH LIFTS OF HOT MIX ASPHALT CLASS ½" PG 58H–22. A GEOTECHNICAL REPORT/SOIL ANALYSIS MAY BE REQUIRED BY THE ENGINEER, AND ADDITIONAL PAVEMENT THICKNESS MAY BE REQUIRED. PG 58V–22 MAY BE REQUIRED FOR HIGHER VOLUME ROADS.
6. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR THICKNESS OF SIDEWALK AT DRIVEWAY APPROACHES.
7. ONE FOOT SETBACK DISTANCE REQUIRED FROM ALL SLOPED AREAS AS SHOWN.
8. CROSS SLOPE 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% UNLESS OTHERWISE APPROVED BY THE ENGINEER.
9. CROSS SLOPE 2% UNLESS OTHERWISE APPROVED BY THE ENGINEER.

City of Bellevue

TYPICAL ARTERIAL STREET

DRAWING NUMBER	RC–100–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



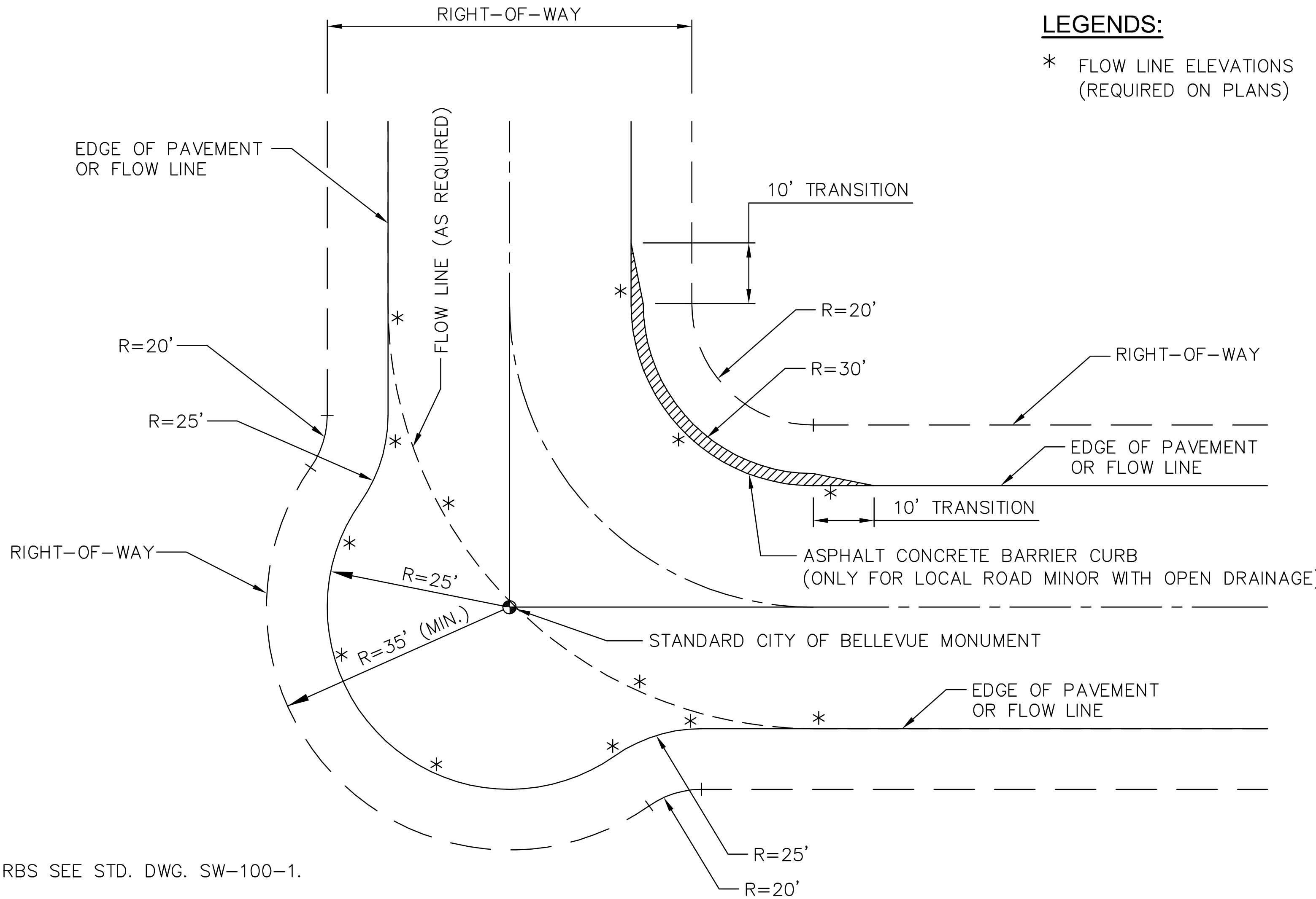
NOTES:

1. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR REQUIRED SIDEWALK AND LANDSCAPED PLANTER STRIP WIDTHS. SEE STD. DWG. RC–240–1 FOR ASPHALT DETAIL ADJACENT TO LANDSCAPED STRIP AND STD. DWG. SW–130–1 FOR SOIL PREPARATION.
2. RIGHT–OF–WAY AND PAVEMENT WIDTHS SHOWN ARE TYPICAL RANGES. REQUIRED WIDTHS WILL BE SPECIFIED BY THE ENGINEER.
3. REQUIRED SUBGRADE MATERIALS (GRAVEL BORROW, ETC.) AND THICKNESS WILL BE BASED ON A GEOTECHNICAL REPORT/SOIL ANALYSIS UNLESS OTHERWISE SPECIFIED BY THE REVIEW ENGINEER.
4. CSBC (4" MIN.) SHALL BE COMPACTED TO 95% MAX. DENSITY.
5. MINIMUM PAVEMENT THICKNESS SHALL BE 2 INCHES OF HOT MIX ASPHALT CLASS ½" PG 58H–22 OVER 4 INCHES OF HOT MIX ASPHALT CLASS ½" PG 58H–22. IF REQUIRED, ADDITIONAL PAVEMENT THICKNESS WILL BE SPECIFIED BY THE ENGINEER.
6. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR THICKNESS OF SIDEWALK AT DRIVEWAY APPROACHES.
7. ONE FOOT SETBACK DISTANCE REQUIRED FROM ALL SLOPED AREAS AS SHOWN.
8. CROSS SLOPE 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% UNLESS OTHERWISE APPROVED BY THE ENGINEER.
9. CROSS SLOPE 2% UNLESS OTHERWISE APPROVED BY THE ENGINEER.

City of Bellevue

TYPICAL LOCAL STREET

DRAWING NUMBER	RC–110–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



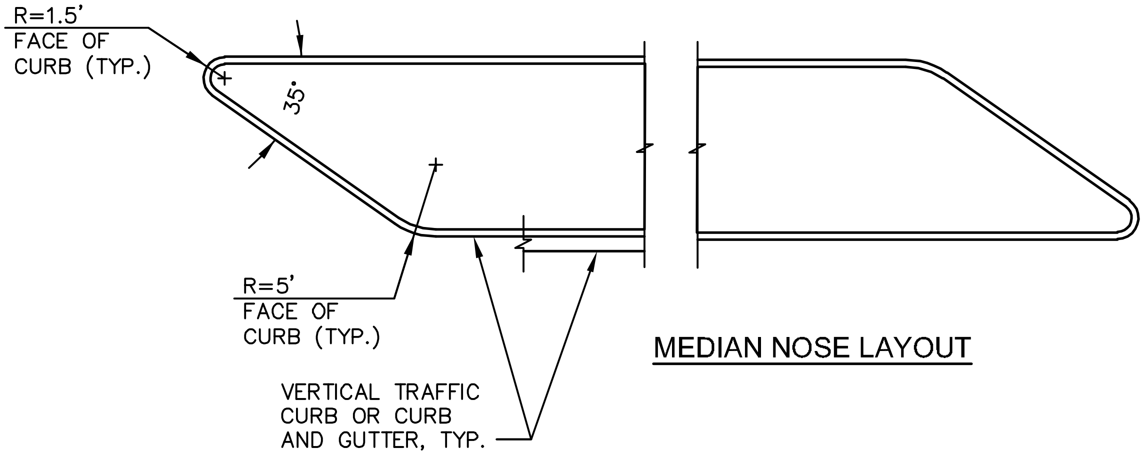
NOTES:

1. FOR CURBS SEE STD. DWG. SW-100-1.

City of Bellevue

RIGHT ANGLE "L" INTERSECTION

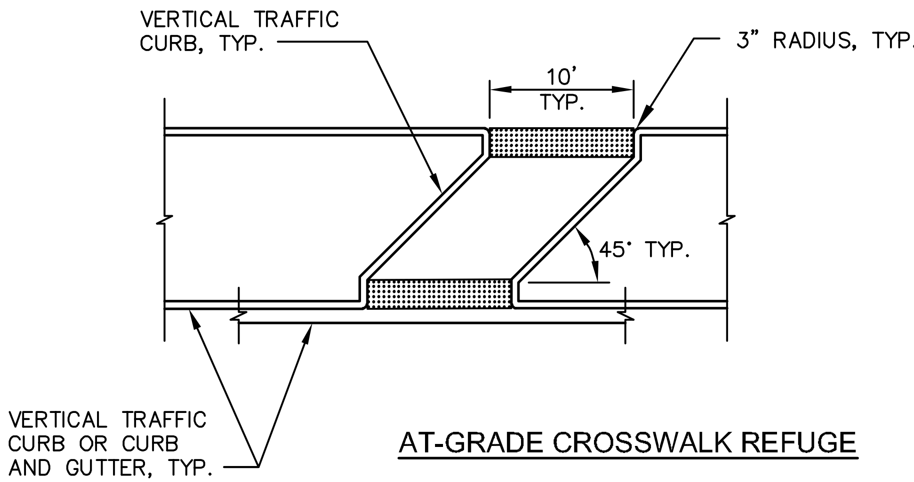
DRAWING NUMBER	RC-120-1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS



MEDIAN NOSE LAYOUT

NOTES:

1. FOR TYPICAL CHANNELIZATION AT MEDIAN ISLAND, SEE STD. DWG. NO. CH–220–1.
2. IF MEDIAN IS LESS THAN 8' IN WIDTH, ANGLING OF CROSSWALK REFUGE MAY NOT BE REQUIRED, AS DETERMINED BY REVIEW ENGINEER.
3. FOR MEDIAN WITH PATTERNED COLORED CONCRETE SURFACE, COLOR SHALL BE 417 APPLE RED BY SOLOMON, OR APPROVED EQUAL, AND PATTERN SHALL BE CONTINUOUS RUNNING BOND, 8"x4" UNIT.

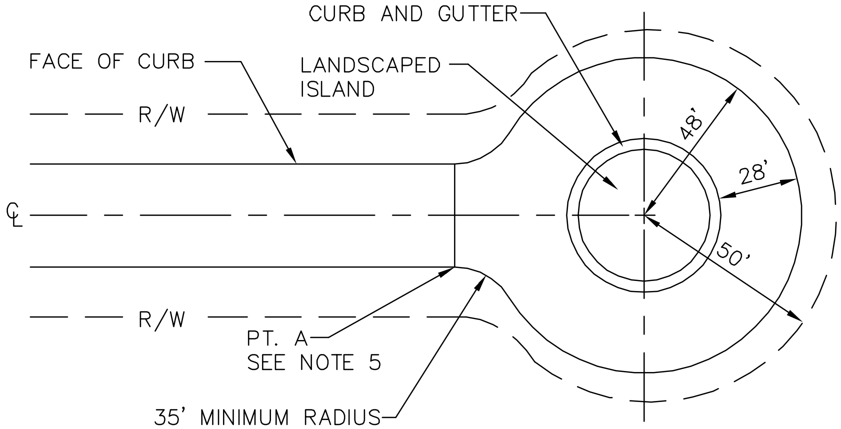


AT-GRADE CROSSWALK REFUGE

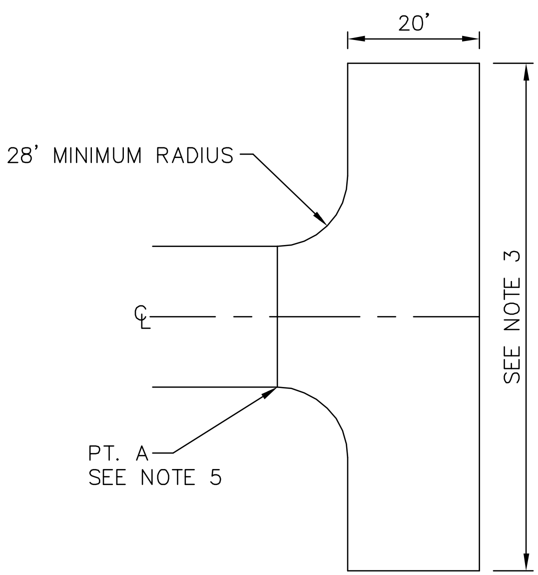
City of Bellevue

MEDIAN ISLAND DETAILS

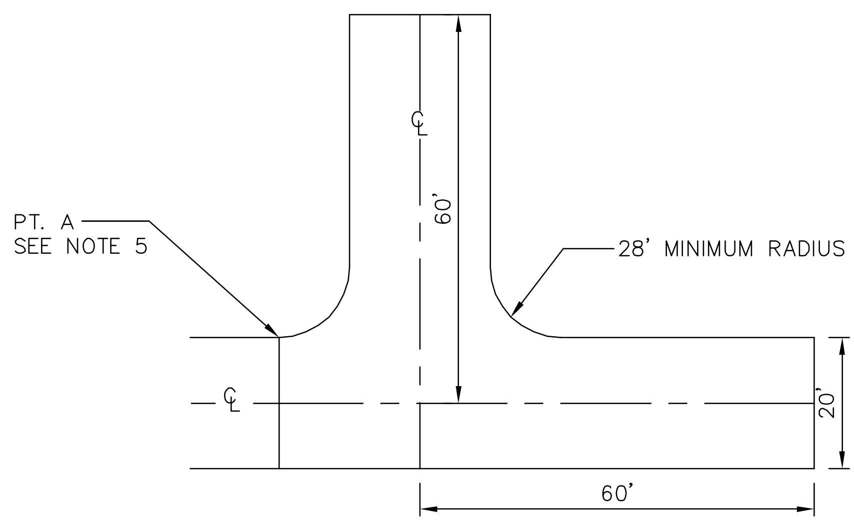
DRAWING NUMBER	RC–121–1
SCALE	NONE
REVISION DATE	2/25
DEPARTMENT	TRANS



CIRCULAR TURNAROUND



HAMMERHEAD



OFFSET HAMMERHEAD

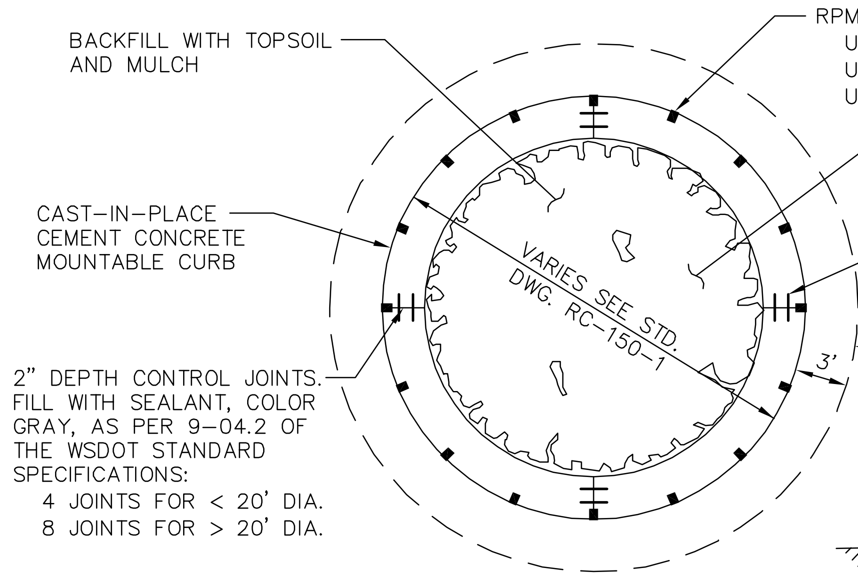
NOTES:

1. LANDSCAPED ISLAND WITH VERTICAL CURB AT CENTER OF CIRCULAR TURNAROUND IF REQUIRED.
2. CIRCULAR TURNAROUNDS SHALL BE PLACED WITHIN A 50' MINIMUM RIGHT-OF-WAY RADIUS. SIDEWALKS AND UTILITIES MAY BE PLACED WITHIN A PUBLIC EASEMENT AT THE DISCRETION OF THE REVIEW ENGINEER.
3. HAMMERHEAD WIDTH MAY RANGE FROM 90' TO 120' DEPENDING UPON ROAD LENGTH. A WIDTH LESS THAN 120' IS ALLOWED ONLY IF ALL HOMES SERVED BY THE HAMMERHEAD ARE SPRINKLERED.
4. TURNAROUND FACILITIES CANNOT BE LOCATED ON DRIVEWAYS.
5. POINT A (LOCATED AT THE START OF RADIUS) REPRESENTS THE MEASURED END OF THE STREET/ROAD LENGTH AS REFERENCED IN BCC 14.60.170 (STREET ENDS).
6. ALL STREET ENDS SHALL BE SIGNED PER THE MUTCD.
7. CIRCULAR TURNAROUND SHALL BE USED FOR PUBLIC STREETS.

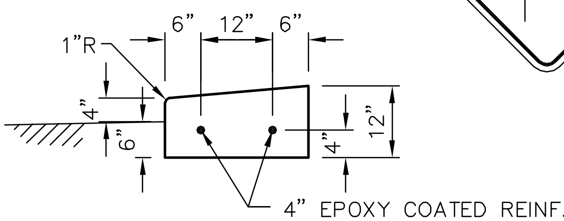
City of Bellevue

TURNAROUND FACILITIES

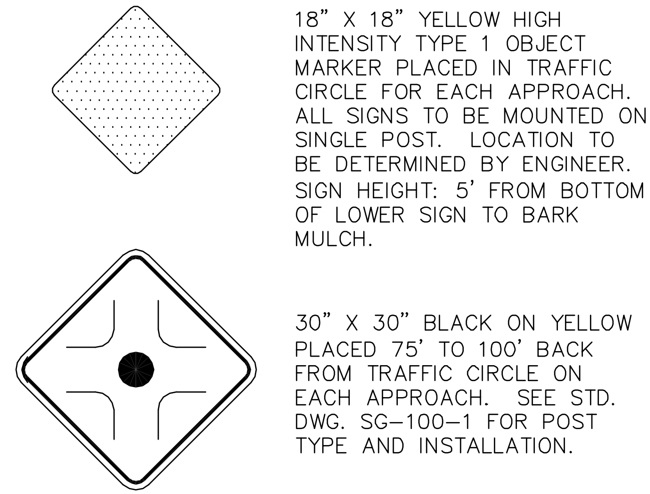
DRAWING NUMBER	RC-130-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



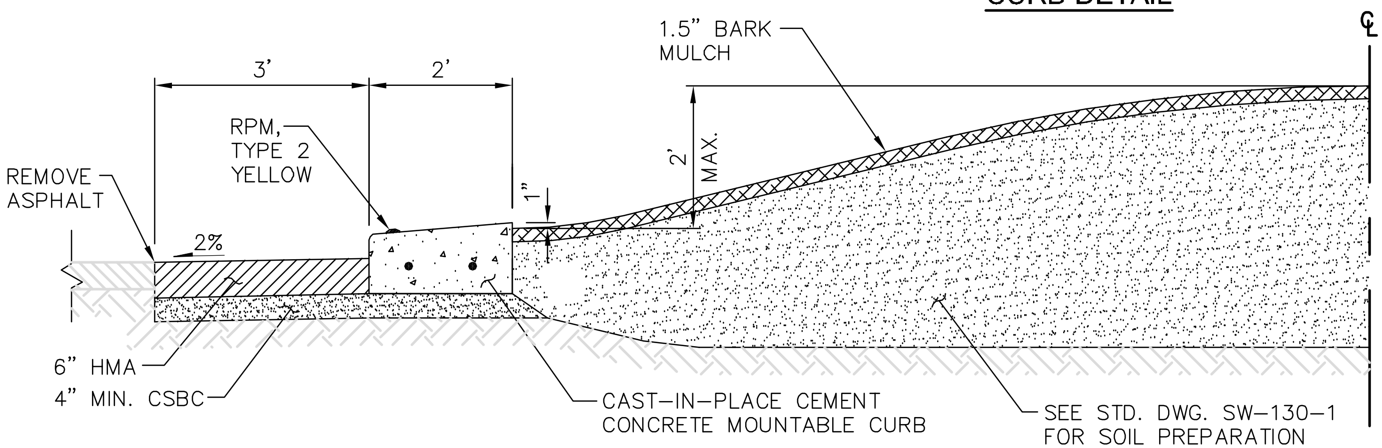
TYPICAL TRAFFIC CIRCLE



CURB DETAIL



SIGNING



TYPICAL SECTION

NOTES:

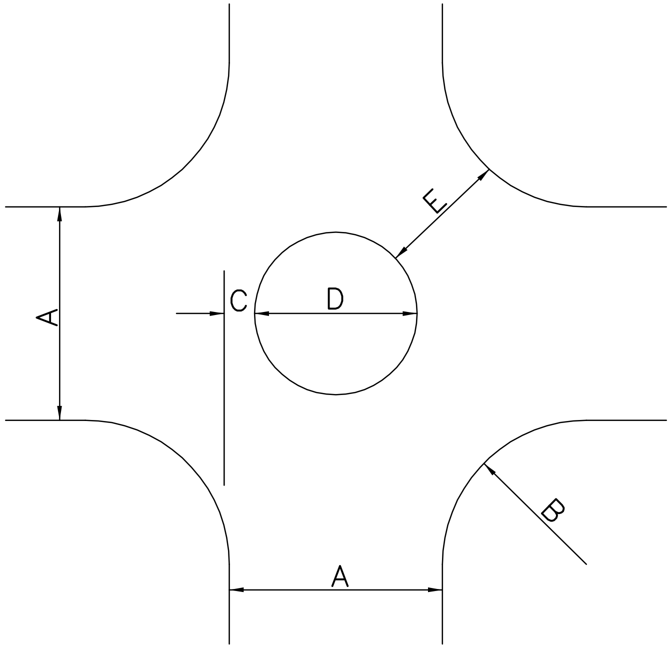
1. LANDSCAPING TO BE DETERMINED BY TRANSPORTATION/PARKS STAFF.
2. MONUMENT PROTECTION/PRESERVATION: NOTIFY C.O.B. SURVEYING PRIOR TO MONUMENT ADJUSTMENT. RAISE MONUMENT TO GRADE IN APPROPRIATE CASING.
3. CONCRETE SHALL BE AIR ENTRAINED CLASS 4000 PER SECTION 6-02 OF WSDOT STANDARD SPECIFICATIONS.
4. SOIL UNDER PAVED AREAS OR SHOULDERS MUST BE UNDISTURBED NATIVE OR APPROVED FILL COMPACTED TO 95% DENSITY.
5. PROVIDE MIN. ONE INCH GAP BETWEEN TOP OF CURB AND TOP OF ARBORIST WOODCHIP MULCH.

City of Bellevue

TRAFFIC CIRCLE DETAILS

DRAWING NUMBER	RC-140-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

GEOMETRY



DIMENSIONS

A STREET WIDTH	B CURB RETURN RADIUS	C OFFSET DISTANCE	D CIRCLE DIAMETER	E OPENING WIDTH
20'	<15'	RECONSTRUCT CURBS		
	15'	5.5'	9'	16'+
	18'	5.0'	10'	17'+
	20'	4.5'	11'	18'–
	25'	4.0'	12'	19'+
24'	<12'	RECONSTRUCT CURBS		
	12'	5.5'	13'	16'
	15'	5.0'	14'	17'–
	20'	4.5'	15'	18'+
	25'	3.5'	17'	20'–
25'	<12'	RECONSTRUCT CURBS		
	12'	5.5'	14'	16'+
	15'	5.0'	15'	17'–
	18'	4.5'	16'	18'–
	20'	4.5'	16'	18'+
	25'	3.5'	18'	20'–
30'	10'	5.5'	19'	16'+
	12'	5.0'	20'	17'–
	15'	5.0'	20'	17'+
	18'	4.5'	21'	18'+
	20'	4.0'	22'	19'+
	25'	3.0'	24'	20'
32'	10'	5.5'	21'	16'+
	12'	5.0'	22'	17'–
	15'	4.5'	23'	18'–
	18'	4.0'	24'	19'–
	20'	4.0'	24'	19'+
	25'	2.5'	27'	20'
36'	10'	5.0'	26'	17'–
	12'	5.0'	26'	17'+
	15'	4.5'	27'	18'+
	18'	4.0'	28'	19'+
	20'	3.5'	29'	20'–
	25'	1.5'	33'	20'
40'	10'	5.0'	30'	17'+
	12'	4.5'	31'	18'+
	15'	4.0'	32'	19'–
	18'	3.5'	33'	20'–
	20'	3.0'	34'	20'
	25'	1.0'	38'	20'

NOTES:

1. USE DIMENSION SCHEDULE AS A DESIGN GUIDE. FINAL DIMENSIONS TO BE DETERMINED BY THE ENGINEER.
2. FOR PLANTER ISLAND SPECIFICATIONS SEE TRAFFIC CIRCLE DETAIL RC–140–1.

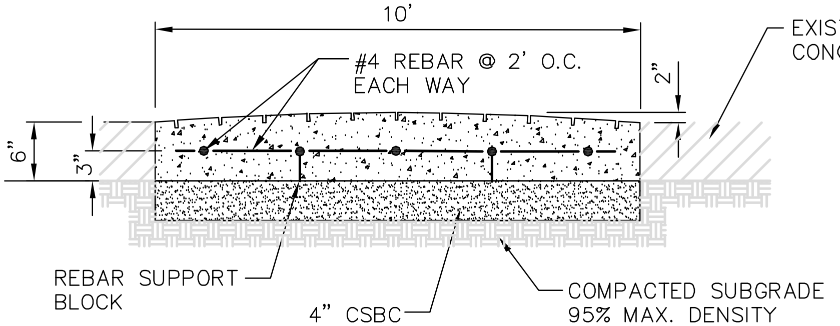
OPTIMUM CRITERIA

OFFSET DISTANCE (C)	OPENING WIDTH (E)
5.5' MAX.	16' MIN.
5.0'	17' ±
4.5'	18' ±
4.0'	19' ±
3.5' OR LESS	20' ±

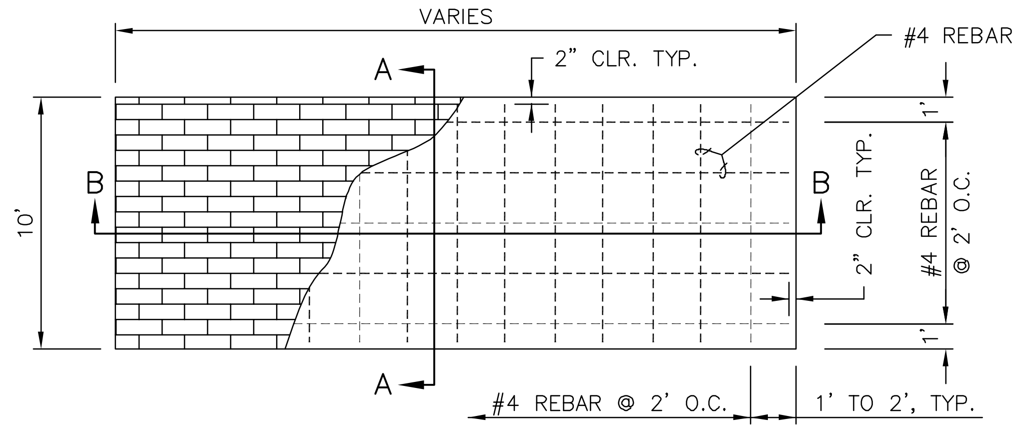
City of Bellevue

TRAFFIC CIRCLE DIMENSIONS

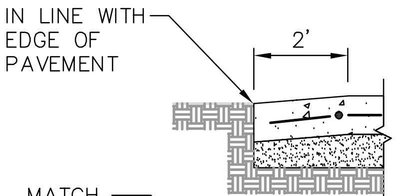
DRAWING NUMBER	RC–150–1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS

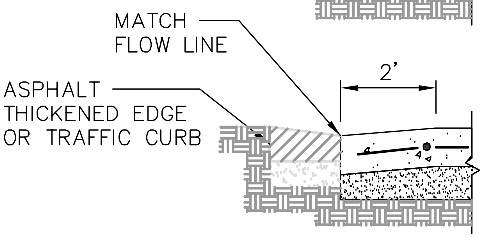


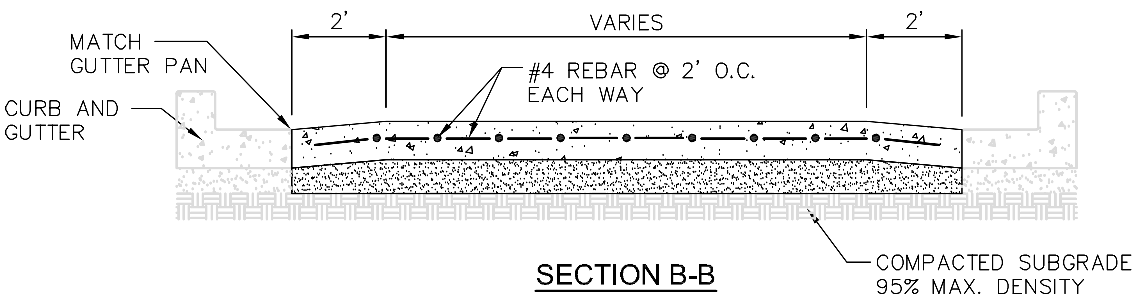
SECTION A-A



PLAN







SECTION B-B

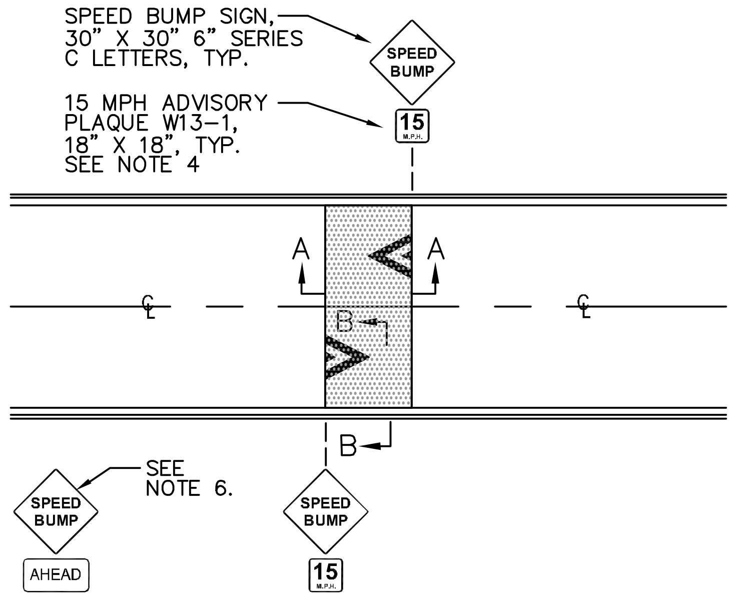
NOTES:

1. MATERIAL SHALL BE PATTERNED, COLORED CONCRETE WITH COLOR INTEGRAL TO THE CONCRETE.
2. COLOR SHALL BE 417 APPLE RED BY SOLOMON, OR APPROVED EQUAL.
3. PATTERN SHALL BE CONTINUOUS RUNNING BOND, 12"X6" UNIT.
4. FINAL DECORATIVE PATTERN LAYOUT TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION.

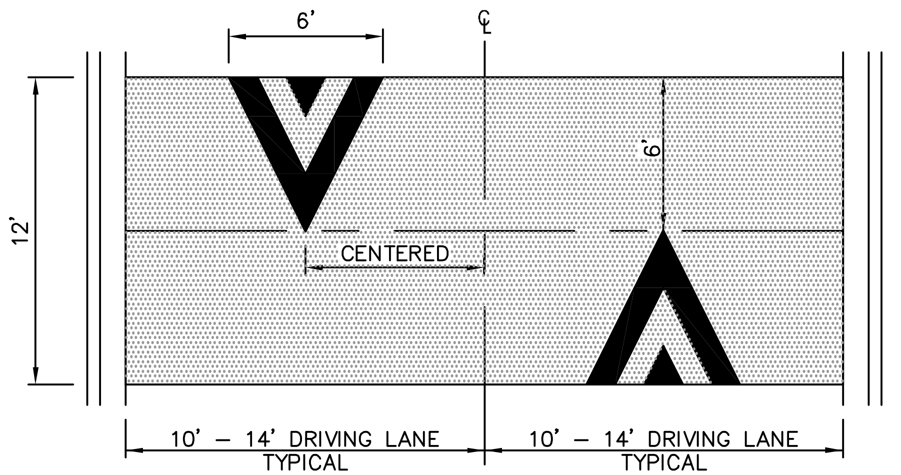
City of Bellevue

PATTERNED CONCRETE ENTRY TREATMENT

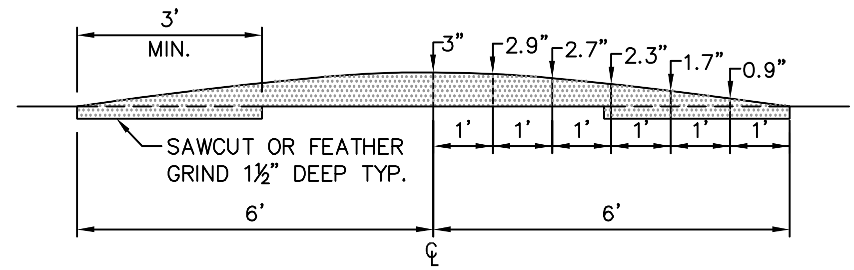
DRAWING NUMBER	RC-160-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



SPEED HUMP MARKING AND SIGNING



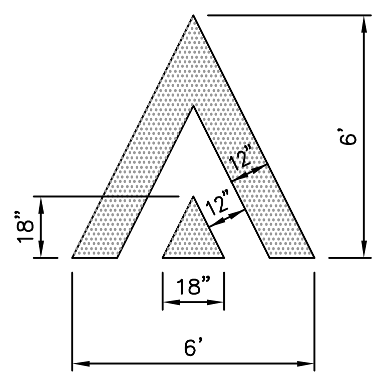
MARKING DETAIL



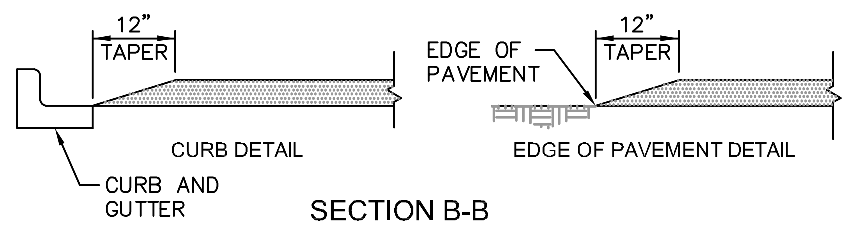
SECTION A-A

NOTES:

1. SAWCUT OR FEATHER GRIND TO KEY IN SPEED HUMP. SEE SECTION A–A.
2. SIGN LOCATIONS SHALL BE VERIFIED BY THE ENGINEER PRIOR TO INSTALLATION.
3. SPEED HUMP CHEVRON MARKING SHALL BE THERMOPLASTIC, HEAT FUSED PREFORMED, 90 MIL., OR EQUAL APPROVED BY THE ENGINEER.
4. FOR A SERIES OF SPEED HUMPS IN CLOSE PROXIMITY, THE ADVISORY SPEED PLAQUE MAY BE ELIMINATED ON ALL BUT THE FIRST SPEED BUMP SIGN IN THE SERIES FOR EACH DIRECTION OF TRAVEL.
5. SPEED HUMP SHALL BE CONSTRUCTED ON TOP OF NEW OR EXISTING WEARING COURSE USING CITY PROVIDED TEMPLATE, 48 HOURS NOTICE REQUIRED.
6. ADVANCE SIGNING MAY BE REQUIRED BY REVIEW ENGINEER.



CHEVRON DETAIL

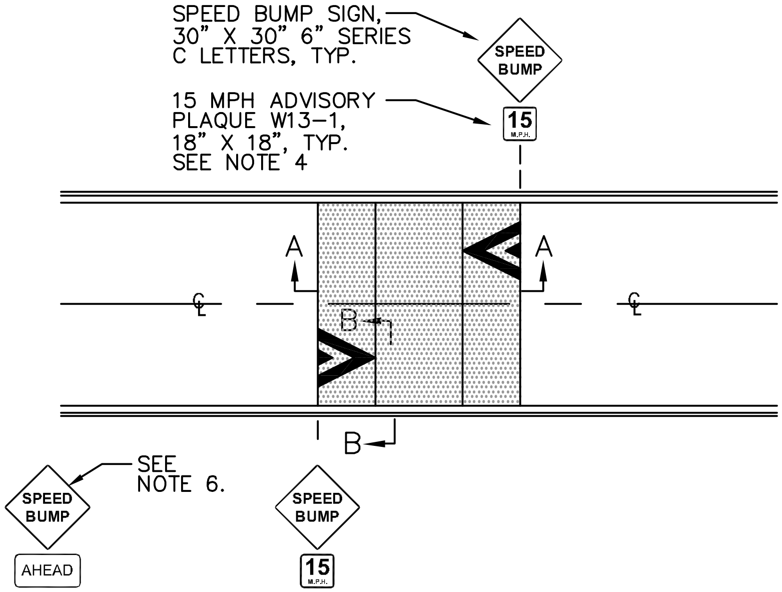


SECTION B-B

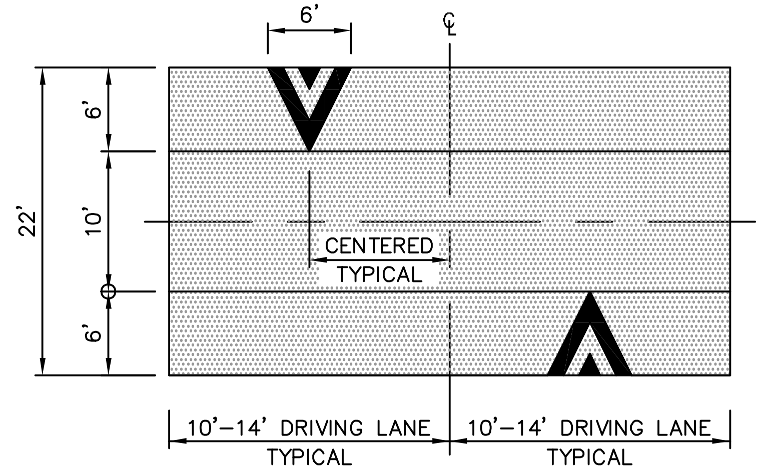
City of Bellevue

SPEED HUMP

DRAWING NUMBER	RC–170–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



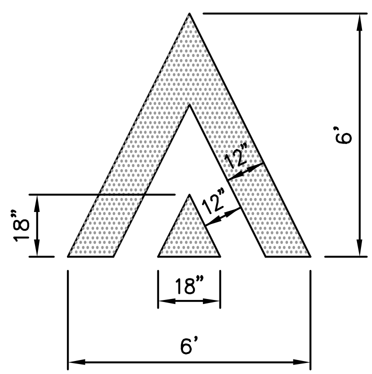
SPEED HUMP MARKING AND SIGNING



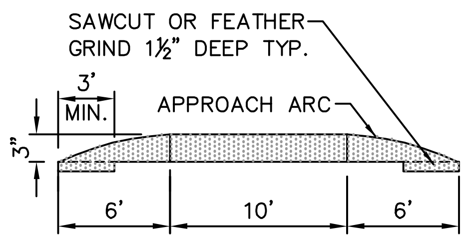
MARKING DETAIL

NOTES:

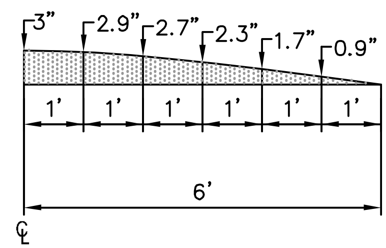
1. SAWCUT OR FEATHER GRIND TO KEY IN SPEED HUMP. SEE SECTION A–A.
2. SIGN LOCATIONS SHALL BE VERIFIED BY THE ENGINEER PRIOR TO INSTALLATION.
3. SPEED HUMP CHEVRON MARKING SHALL BE THERMOPLASTIC, HEAT FUSED PREFORMED, 90 MIL., OR EQUAL APPROVED BY THE ENGINEER.
4. FOR A SERIES OF SPEED HUMPS IN CLOSE PROXIMITY, THE ADVISORY SPEED PLAQUE MAY BE ELIMINATED ON ALL BUT THE FIRST SPEED BUMP SIGN IN THE SERIES FOR EACH DIRECTION OF TRAVEL.
5. SPEED HUMP SHALL BE CONSTRUCTED ON TOP OF NEW OR EXISTING WEARING COURSE USING CITY PROVIDED TEMPLATE, 48 HOURS NOTICE REQUIRED.
6. ADVANCE SIGNING MAY BE REQUIRED BY REVIEW ENGINEER.



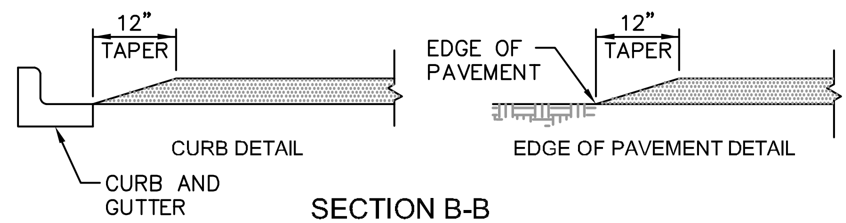
CHEVRON DETAIL



SECTION A-A



APPROACH ARC DETAIL

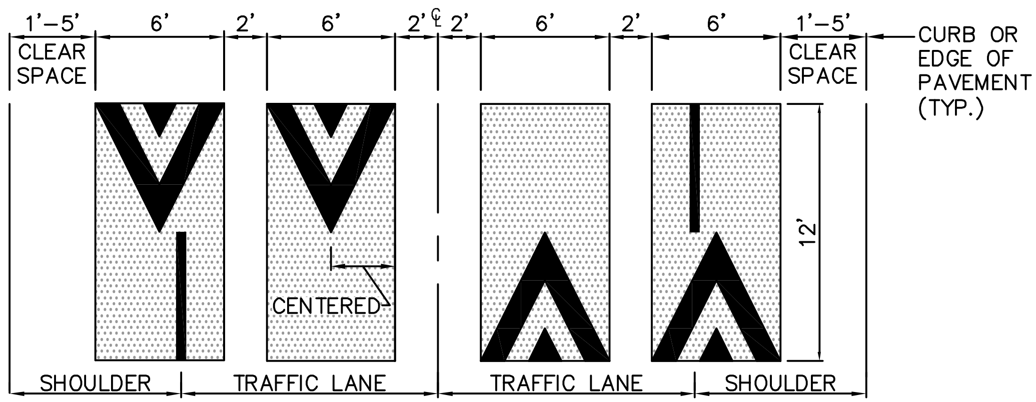


SECTION B-B

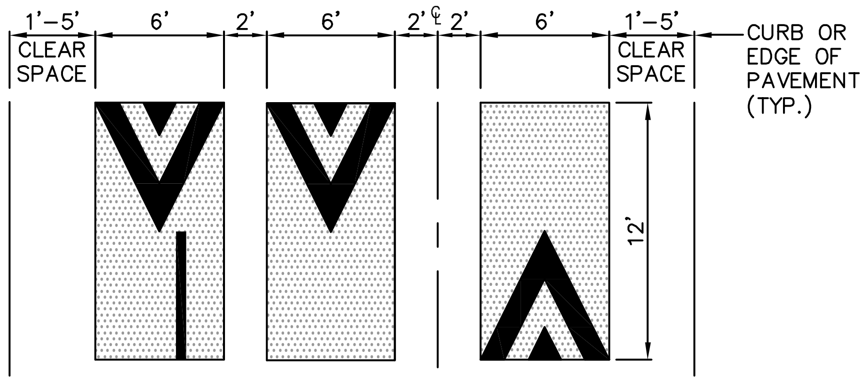
City of Bellevue

ELONGATED SPEED HUMP

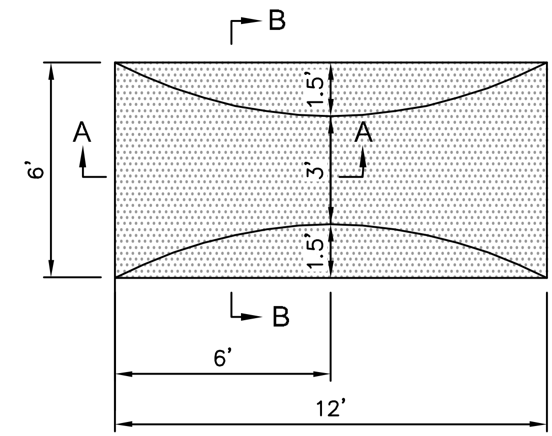
DRAWING NUMBER	RC–180–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



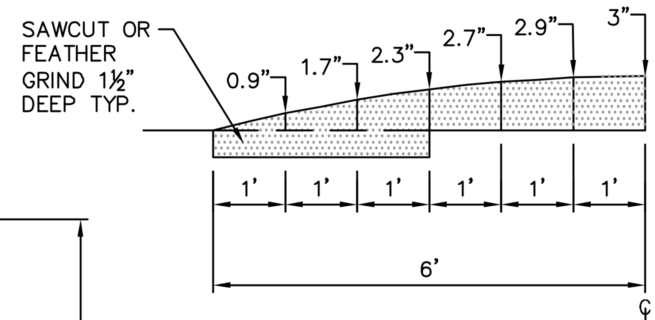
FOUR CUSHION LAYOUT



THREE CUSHION LAYOUT



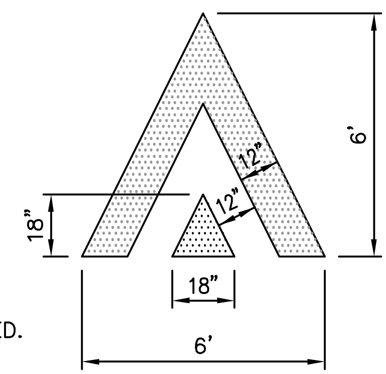
GRADING DETAIL



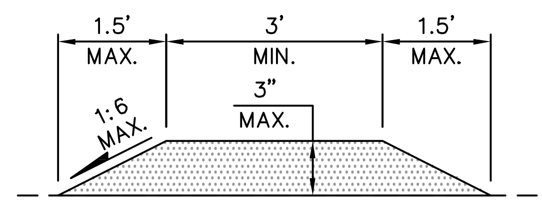
SECTION A-A

NOTES:

1. APPLICATIONS OF THE FOUR AND THREE CUSHION LAYOUTS ARE LIMITED TO TWO–LANE ROADWAYS WITH SHOULDER ON ONE OR BOTH SIDES. IF EXISTING EDGE LINE EXISTS, STRIPE PER STD. DWG. RC–182–1.
2. SAWCUT OR FEATHER GRIND TO KEY IN SPEED CUSHION. SEE SECTION A–A.
3. SPEED CUSHION SHALL BE CONSTRUCTED ON TOP OF NEW OR EXISTING WEARING COURSE USING CITY PROVIDED TEMPLATE, 48 HOURS NOTICE REQUIRED.
4. SPACE SPEED CUSHION SETS IN SERIES 250 TO 500 FEET APART.
5. SPEED CUSHION CHEVRON MARKING SHALL BE THERMOPLASTIC, HEAT FUSED PREFORMED, 90 MIL., OR EQUAL APPROVED BY THE ENGINEER.



CHEVRON DETAIL



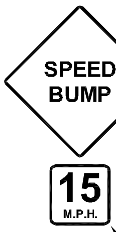
SECTION B-B

City of Bellevue

SPEED CUSHION FOR 2–LANE ROADWAYS

DRAWING NUMBER	RC–181–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

①

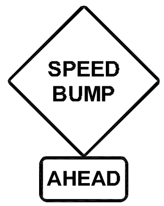


W17–1
30"x30"
SINGLE LANE
36"x36"
MULTI–LANE

W13–1P
18"x18"

SEE NOTE 4

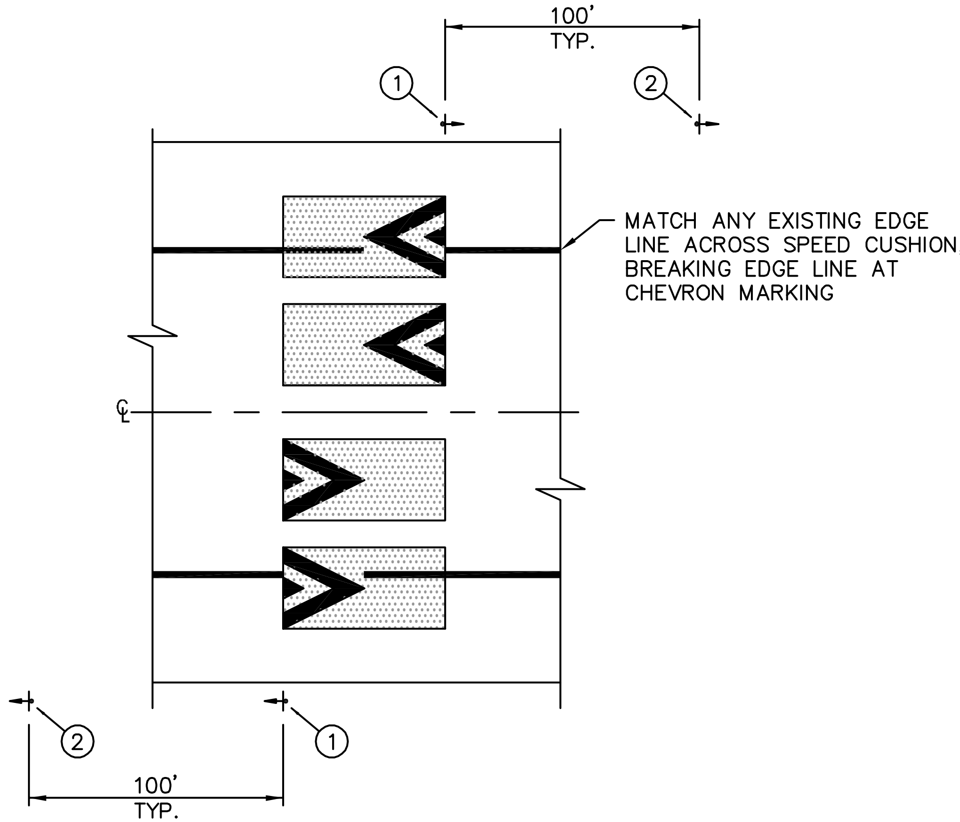
②



W17–1
30"x30"
SINGLE LANE
36"x36"
MULTI–LANE

W16–9P
24"x12"

(OPTIONAL – SEE
TRAFFIC ENGINEER)



SPEED CUSHION SIGNING

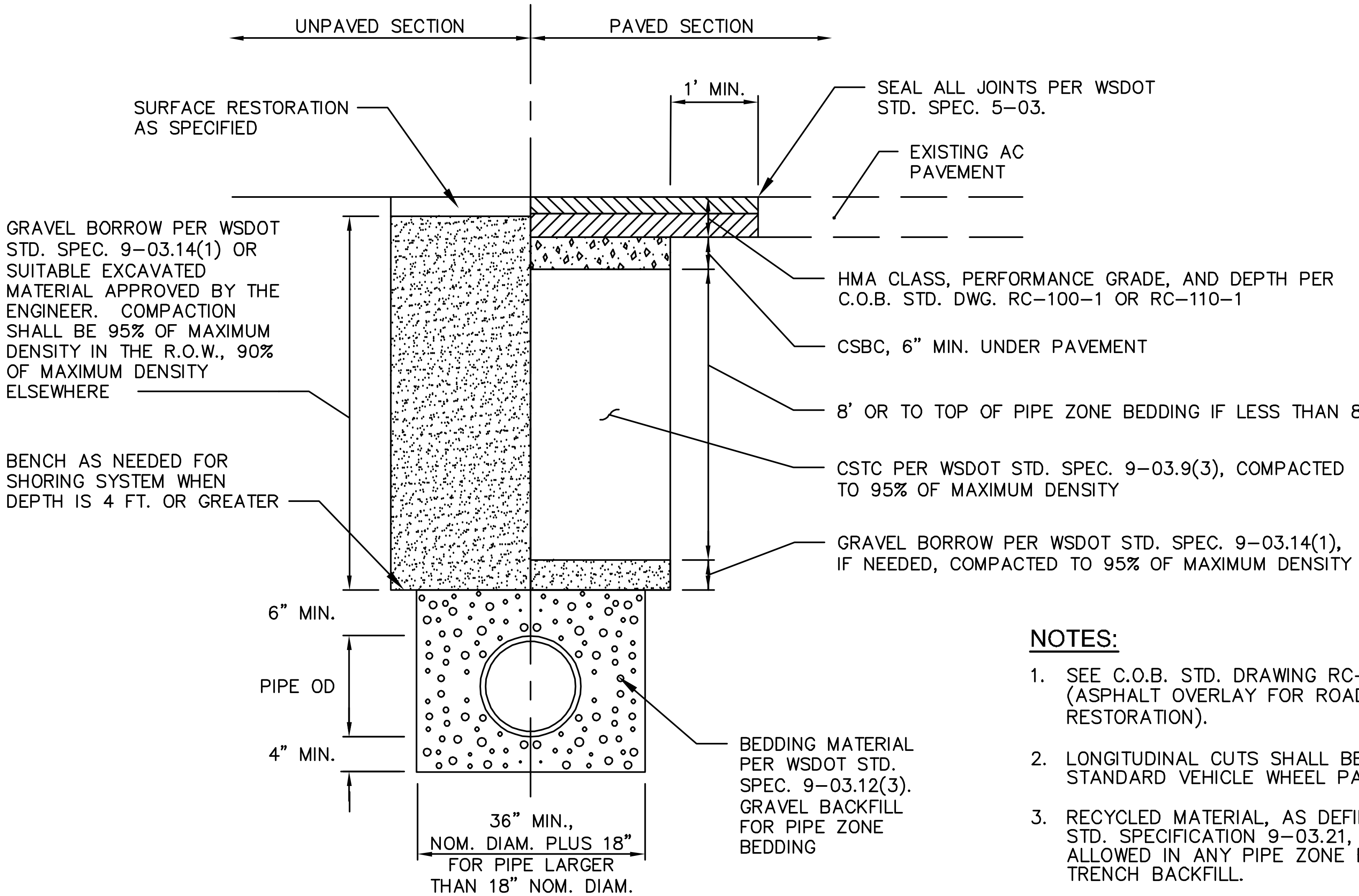
NOTES:

1. SIGNS SHALL HAVE YELLOW BACKGROUND WITH BLACK LEGEND AND BORDER.
2. MATCH ANY EXISTING CENTERLINE THROUGH SPEED CUSHION AREA. THE ADDITION OF CENTERLINE IS NOT NECESSARY IF NO EXISTING CENTERLINE EXISTS.
3. SIGN LOCATIONS SHALL BE VERIFIED BY THE ENGINEER PRIOR TO INSTALLATION.
4. FOR A SERIES OF SPEED CUSHIONS IN CLOSE PROXIMITY, THE ADVISORY SPEED PLAQUE MAY BE ELIMINATED ON ALL BUT THE FIRST SPEED BUMP SIGN IN THE SERIES FOR EACH DIRECTION OF TRAVEL.

City of Bellevue

SPEED CUSHION SIGNING FOR 2–LANE ROADWAY

DRAWING NUMBER	RC–182–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



CROSS SECTION

NTS

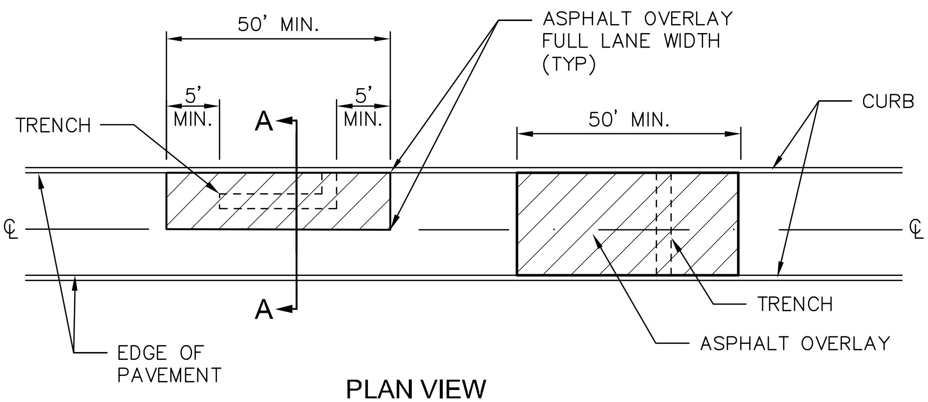
NOTES:

1. SEE C.O.B. STD. DRAWING RC-200-1 (ASPHALT OVERLAY FOR ROADWAY TRENCH RESTORATION).
2. LONGITUDINAL CUTS SHALL BE OUTSIDE STANDARD VEHICLE WHEEL PATH.
3. RECYCLED MATERIAL, AS DEFINED BY WSDOT STD. SPECIFICATION 9-03.21, WILL NOT BE ALLOWED IN ANY PIPE ZONE BEDDING OR TRENCH BACKFILL.
4. FOR CONDUIT TRENCH DETAILS, SEE STD. DWG. SL-122-1.

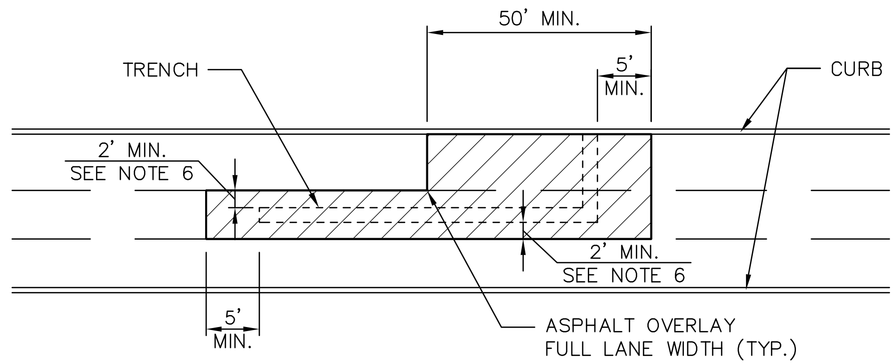
City of Bellevue

TYPICAL PIPE TRENCH IN RIGHT-OF-WAY

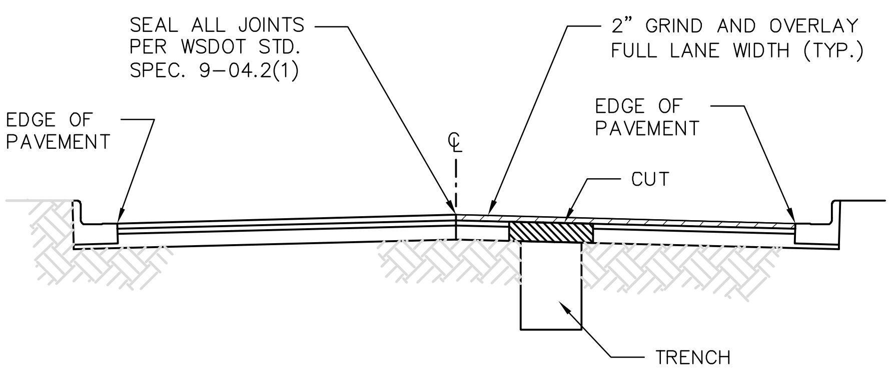
DRAWING NUMBER	RC-190-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



PLAN VIEW
NTS



PLAN VIEW
NTS



SECTION A-A
NTS

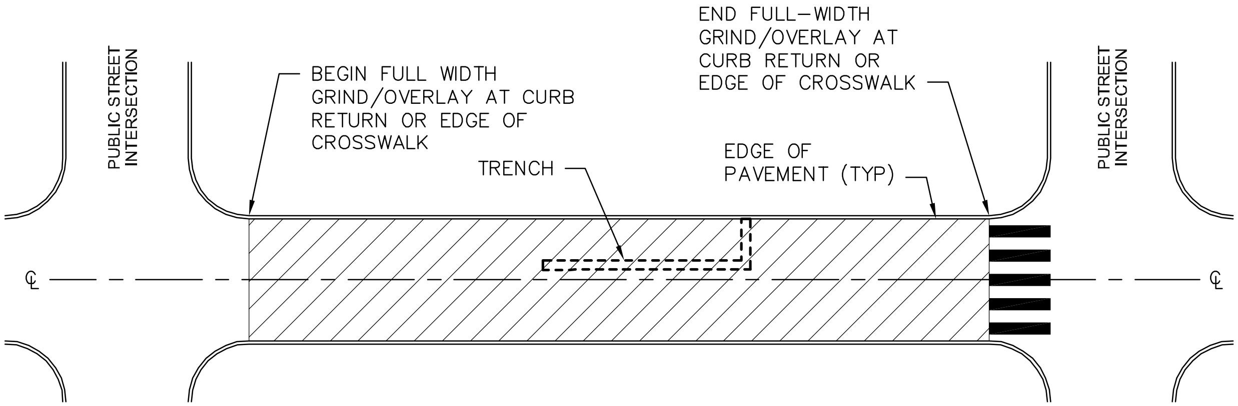
NOTES:

1. THIS STANDARD APPLIES TO ALL CUTS IN ROADWAY DESIGNATED ON THE CURRENT TRENCH RESTORATION MAP.
2. GRIND/OVERLAY WITHIN SIGNAL LOOP DETECTION ZONE MAY BE EXTENDED TO INCLUDE ADDITIONAL LANES AND/OR DETECTORS
3. OVERLAY AREA MAY BE EXTENDED AT THE DISCRETION OF THE TRANSPORTATION ENGINEER TO ENCOMPASS ADJACENT STREET CUTS OR PREVIOUS RESTORATIONS.
4. ADJUST ALL UTILITY CASTINGS TO FINISHED GRADE AFTER OVERLAY AND RESTORE CHANNELIZATION AND LOOP DETECTION.
5. WHERE NO MARKED LANE LINE EXISTS, GRIND SHALL EXTEND TO CENTERLINE OF TRAVELED WAY OR PHYSICAL CROWN OF ROADWAY.
6. IF EDGE OF TRENCH IS LESS THAN 2-FT FROM LANE LINE, OVERLAY SHALL INCLUDE FULL WIDTH OF ADJACENT LANE.

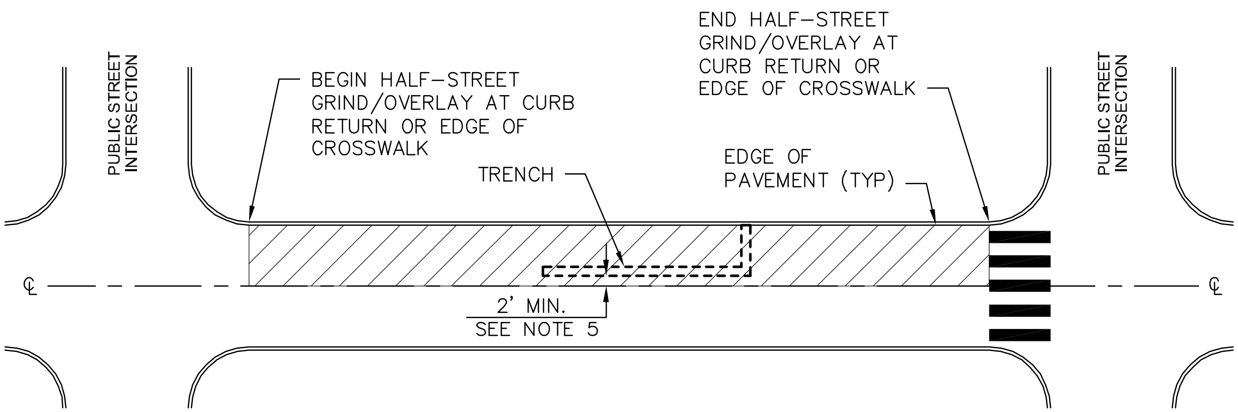
City of Bellevue

ASPHALT OVERLAY FOR ROADWAY TRENCH RESTORATION

DRAWING NUMBER	RC-200-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



RESTORATION LIMITS (0-2 YEARS FOLLOWING PAVEMENT OVERLAY OR NEW STREET CONSTRUCTION)
NTS



RESTORATION LIMITS (2-5 YEARS FOLLOWING PAVEMENT OVERLAY OR NEW STREET CONSTRUCTION)
NTS

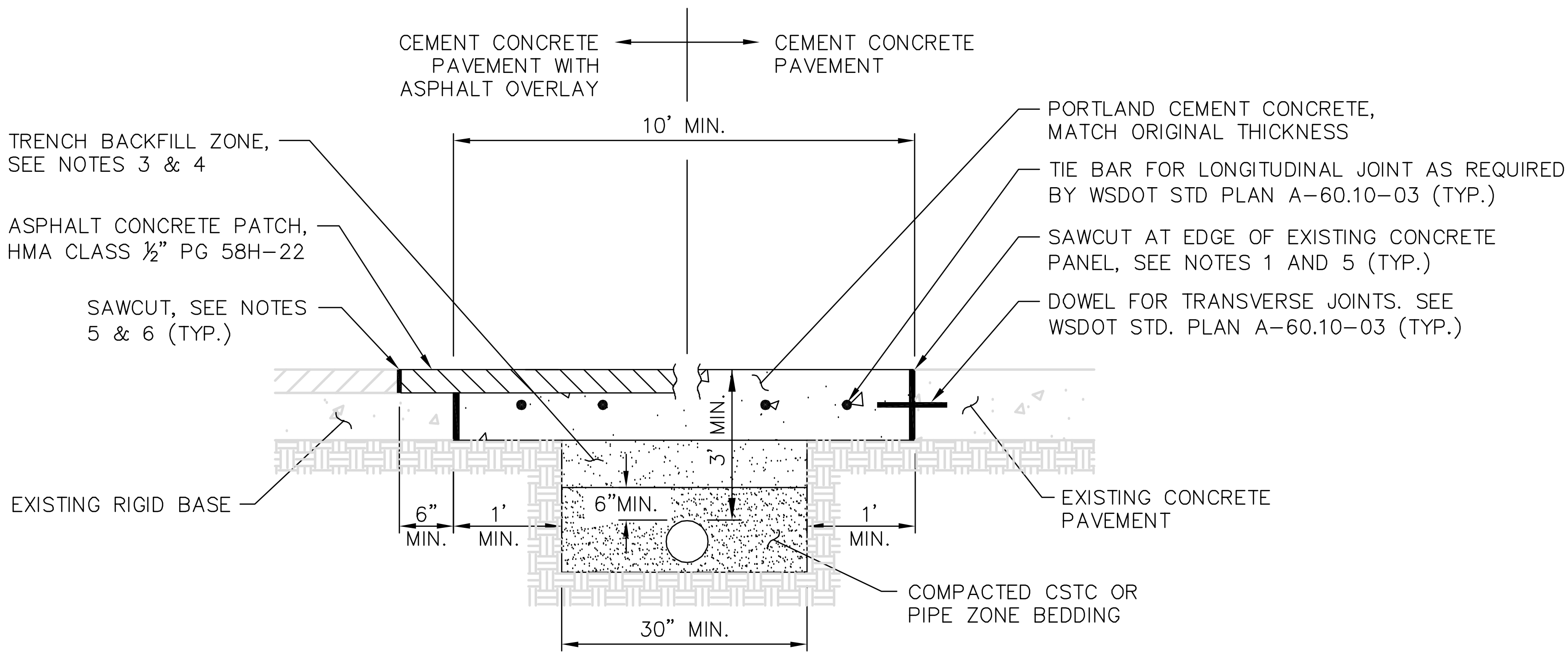
NOTES:

1. A FIVE-YEAR MORATORIUM ON PAVEMENT TRENCHING IS EFFECTIVE UPON COMPLETION OF NEW STREET CONSTRUCTION AND UPON PAVEMENT OVERLAY OF AN EXISTING STREET. SEE BELLEVUE CITY CODE 14.60.250.
2. THIS STANDARD APPLIES TO ALL CUTS IN PAVEMENT DESIGNATED "NO CUT" ON THE CURRENT TRENCH RESTORATION MAP.
3. GRIND/OVERLAY DEPTH SHALL BE 2.0 INCHES UNLESS OTHERWISE SPECIFIED BY THE CITY OF BELLEVUE.
4. ALL UTILITY CASTINGS SHALL BE ADJUSTED TO FINISHED GRADE AFTER OVERLAY AND CHANNELIZATION AND TRAFFIC SIGNAL INDUCTION LOOPS SHALL BE RESTORED.
5. IF EDGE OF TRENCH IS LESS THAN 2 FEET FROM THE ROADWAY CENTERLINE OR CROWN, A FULL WIDTH OVERLAY WILL BE REQUIRED.

City of Bellevue	ASPHALT OVERLAY FOR TRENCH RESTORATION ON 'NO CUT' ROADWAYS	DRAWING NUMBER	RC-201-1
		SCALE	NONE
		REVISION DATE	2/24
		DEPARTMENT	TRANS

NOTES:

1. CEMENT CONCRETE PANEL REPLACEMENT SHALL BE FULL PANEL REPLACEMENT AS PER WSDOT STD. PLAN A-60.10-03 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. FOR CONCRETE ROADWAY WITH EXISTING ASPHALT OVERLAY, REPLACEMENT OVERLAY SHALL BE ½ INCH HMA PG 58H-22 AND MATCH EXISTING THICKNESS. GRIND/OVERLAY LIMITS OF ASPHALT SHALL BE DETERMINED BY THE ENGINEER.
3. ALL TRENCH BACKFILL SHALL BE CSTC OR CONTROLLED DENSITY FILL.
4. CONTROL DENSITY FILL SHALL MEET WSDOT STD. SPEC. 2-09.3(1)E.
5. ALL SAW CUTS SHALL BE VERTICAL AND IN STRAIGHT LINES.
6. SEAL ALL JOINTS PER WSDOT STD. SPEC. 9-04.2(1).
7. RECYCLED MATERIAL, AS DEFINED BY WSDOT STD. SPECIFICATION 9-03.21, WILL NOT BE ALLOWED IN ANY PIPE ZONE BEDDING OR TRENCH BACKFILL..

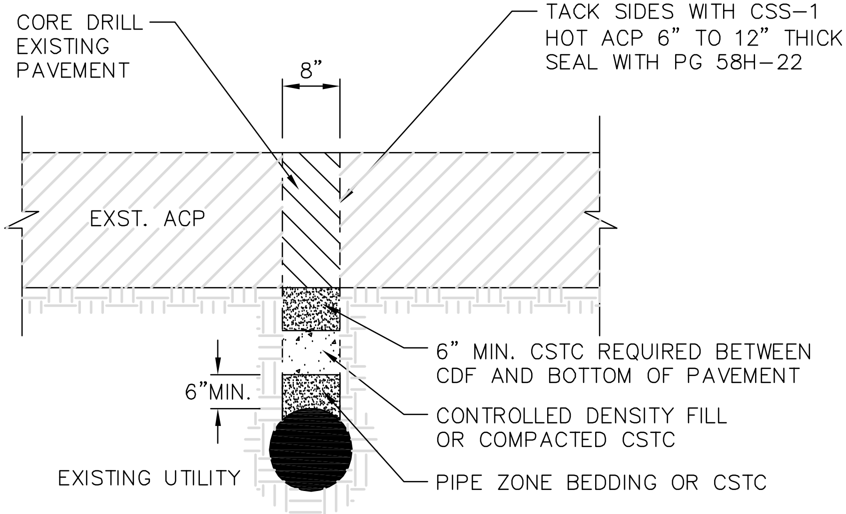


SECTION

City of Bellevue

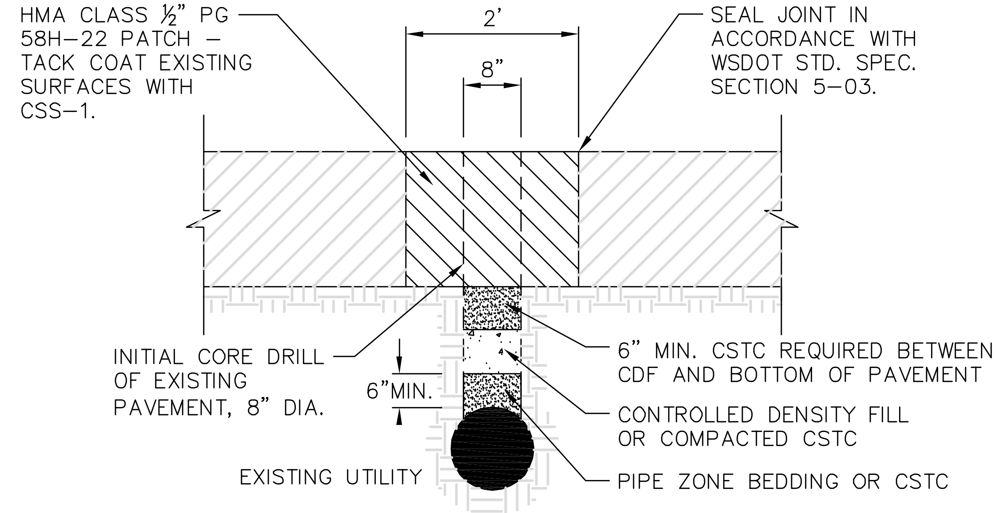
RIGID PAVEMENT PATCHING AND RESTORATION DETAILS

DRAWING NUMBER	RC-210-1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS



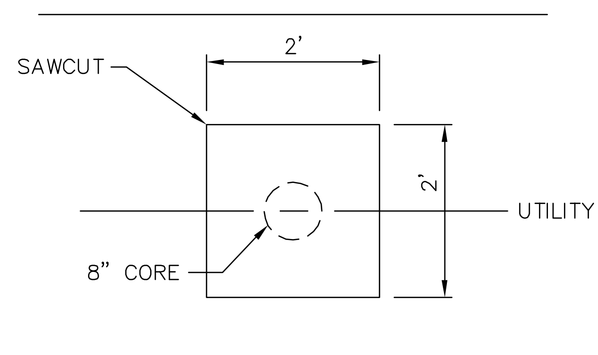
ALTERNATE REPAIR

WHEN REQUIRED BY ENGINEER



NOTES:

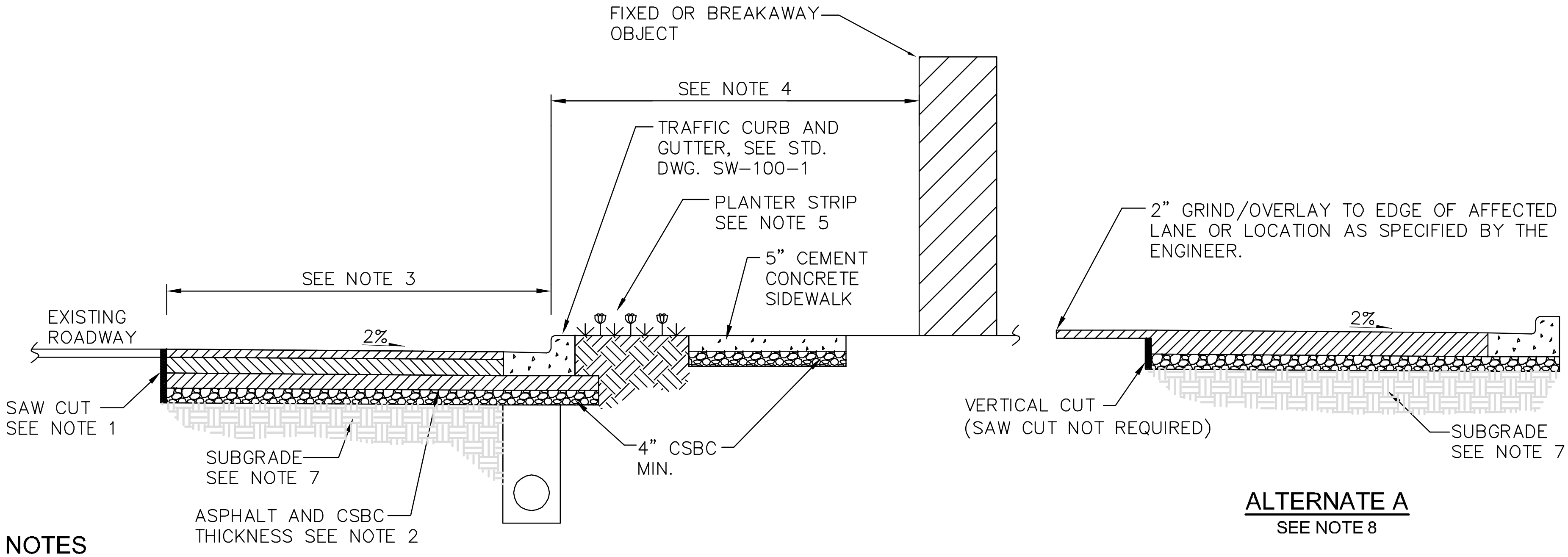
1. TO BE USED FOR NO-CUT AND GRIND & OVERLAY STREET RESTORATION CLASSIFICATIONS
2. THE EXISTING PAVEMENT SHALL BE CUT FULL DEPTH WITH AN EIGHT INCH DIAMETER CORE DRILL. THE SUBBASE MATERIAL SHALL BE REMOVED USING A VACUUM EXCAVATOR, KEEPING THE EXCAVATION AS MINIMAL AS POSSIBLE.
3. BACKFILL THE EXCAVATION WITH A SIX INCH CUSHION OF PIPE ZONE BEDDING OR CSTC OVER THE UTILITY THEN PLACE THE REMAINING VOID WITH CDF OR COMPACTED CSTC, WITH 6" MIN. CSTC BETWEEN CDF AND BOTTOM OF PAVEMENT.
4. REPAIR THE CORED PAVEMENT SECTION WITH HMA CLASS ½" PG 58H-22 AND SEAL THE JOINT.
5. IF THE EXCAVATION BELOW THE ASPHALT PAVEMENT IS LARGER THAN THE 8 INCH CORE, THE PAVEMENT RESTORATION WILL INCLUDE A 2' BY 2' TEE PATCH FULL DEPTH OF THE ASPHALT CENTERED ON THE EXCAVATION, AS SHOWN ABOVE AS ALTERNATE REPAIR.
6. IF THE EXCAVATION IS LARGER THAN 2' BY 2', THE STANDARD GRIND AND OVERLAY RESTORATION SHALL BE USED.
7. RECYCLED MATERIAL, AS DEFINED BY WSDOT STD. SPECIFICATION 9-03.21, WILL NOT BE ALLOWED IN ANY PIPE ZONE BEDDING OR TRENCH BACKFILL.
8. TWO OR MORE WINDOW CUTS WITHIN 50' OF EACH OTHER IN A LANE OF TRAVEL WILL REQUIRE GRIND/OVERLAY RESTORATION.
9. FOR CROSSINGS PERPENDICULAR OR NEAR PERPENDICULAR TO THE ROADWAY, THREE OR MORE POTHOLES WILL REQUIRE GRIND/OVERLAY RESTORATION.



City of Bellevue

PAVEMENT RESTORATION FOR WINDOW CUTS

DRAWING NUMBER	RC-220-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



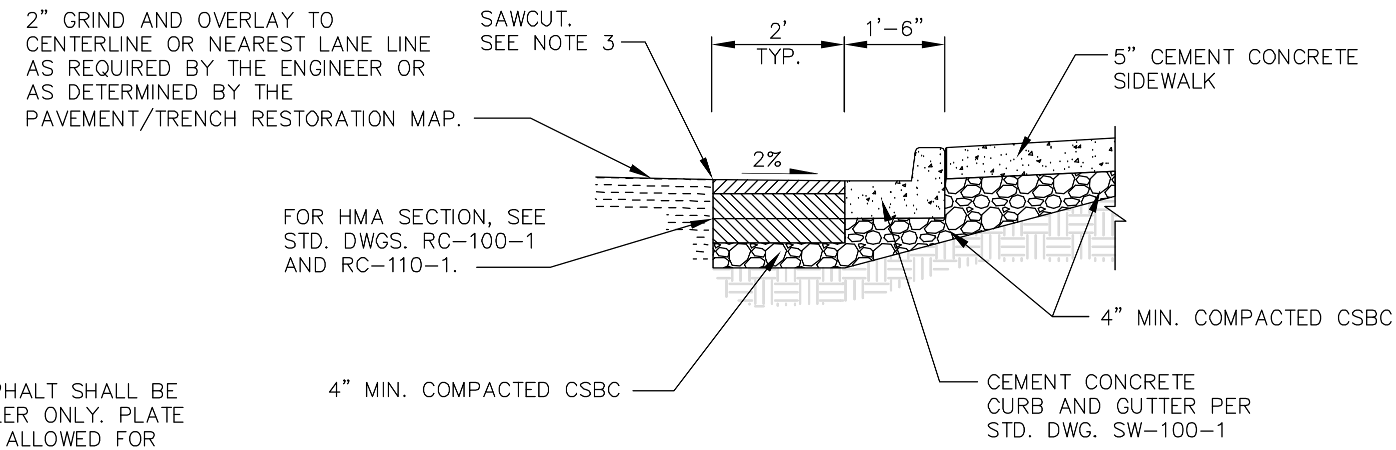
NOTES

1. SAW CUT TO REMOVE IRREGULARITIES. ALL SAW CUTS SHALL BE VERTICAL AND IN STRAIGHT LINES AS DIRECTED BY THE ENGINEER. SEAL ALL SAW CUTS WITH CSS-1. TACK FACES OF ALL SAW CUTS.
2. PAVEMENT AND CSBC THICKNESS WILL BE SPECIFIED BY THE REVIEW ENGINEER. SEE STD. DWGS. RC-100-1 AND RC-110-1 FOR MINIMUM THICKNESS REQUIREMENTS. A GEOTECHNICAL REPORT/SOIL ANALYSIS MAY BE REQUIRED.
3. PAVEMENT WIDENING TO FACILITATE STREET FRONTAGE IMPROVEMENTS MAY BE REQUIRED. REQUIRED WIDTH WILL BE SPECIFIED BY THE ENGINEER.
4. SEE SECTIONS 3.6.3, 3.6.4, AND 3.6.6 OF THE DESIGN MANUAL FOR REQUIRED CLEARANCE BETWEEN FIXED AND BREAKAWAY OBJECTS AND THE FACE OF CURB.
5. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR SIDEWALK AND LANDSCAPED PLANTER WIDTH AND REQUIREMENTS. SEE STD. DWG. RC-240-1 FOR ALTERNATE ASPHALT DETAIL ADJACENT TO PLANTER STRIP. SEE STD. DWG. SW-130-1 FOR SOIL PREPARATION.
6. NO UTILITIES SHALL BE LOCATED BELOW THE SIDEWALK (UNLESS NO OTHER ALTERNATIVE EXISTS).
7. REQUIRED SUBGRADE MATERIALS AND THICKNESS WILL BE SPECIFIED BY THE ENGINEER. AT A MINIMUM, SUBGRADE SHOULD MATCH SUBGRADE OF EXISTING ROADWAY. SOIL UNDER PAVED AREAS OR SHOULDER MUST BE UNDISTURBED NATIVE SOIL OR APPROVED FILL COMPACTED TO 95% DENSITY.
8. AT THE DISCRETION OF THE ENGINEER, ALTERNATE "A" WILL BE ALLOWED OR MAY BE REQUIRED. ALTERNATE "A" MODIFIES STREET CUT METHOD ONLY. NO CHANGES IN MATERIALS OR PAVEMENT AND SUBGRADE THICKNESS ARE ALLOWED WITH THE USE OF ALTERNATE "A".

City of Bellevue

COMMERCIAL PROJECT SITE–STREET FRONTAGE IMPROVEMENTS

DRAWING NUMBER	RC-230-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

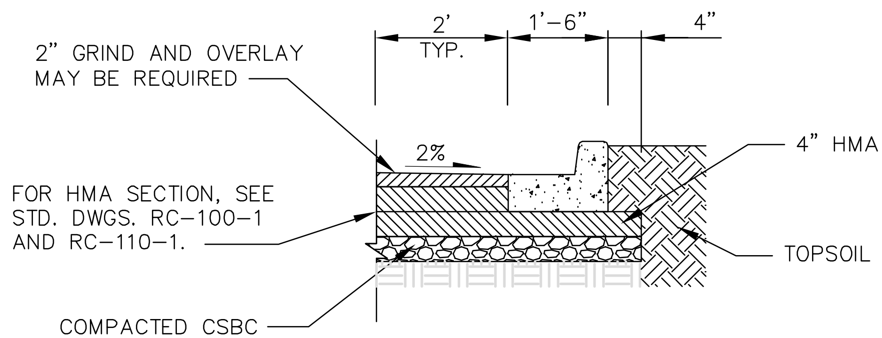


TYPICAL ASPHALT PAVEMENT DETAIL AT CURB/GUTTER INSTALLATION

NTS

NOTES:

1. TOP COURSE OF ASPHALT SHALL BE COMPACTED BY ROLLER ONLY. PLATE COMPACTION IS NOT ALLOWED FOR TOP COURSE.
2. WIDTH OF SAWCUT FROM GUTTER LINE OR CURB FACE MAY BE INCREASED AT THE DISCRETION OF THE ENGINEER. DECREASE IN WIDTH SHALL BE APPROVED IN ADVANCE BY THE REVIEW ENGINEER.
3. TACK COAT EXISTING SURFACES WITH CSS-1 AND SEAL IN ACCORDANCE WITH WSDOT STD. SPEC SECTION 5-03.
4. ALTERNATE DETAIL IS REQUIRED ADJACENT TO NATURAL DRAINAGE PRACTICE FEATURE, AND IS REQUIRED ADJACENT TO LANDSCAPE STRIP AS DETERMINED BY THE REVIEW ENGINEER.
5. SOIL UNDER PAVED AREAS OR SHOULDERS MUST BE UNDISTURBED NATIVE SOIL OR APPROVED FILL COMPACTED TO 95% DENSITY



ALTERNATE ASPHALT PAVEMENT DETAIL FOR CURB/GUTTER ADJACENT TO LANDSCAPE STRIP OR NATURAL DRAINAGE PRACTICE FEATURE

NTS

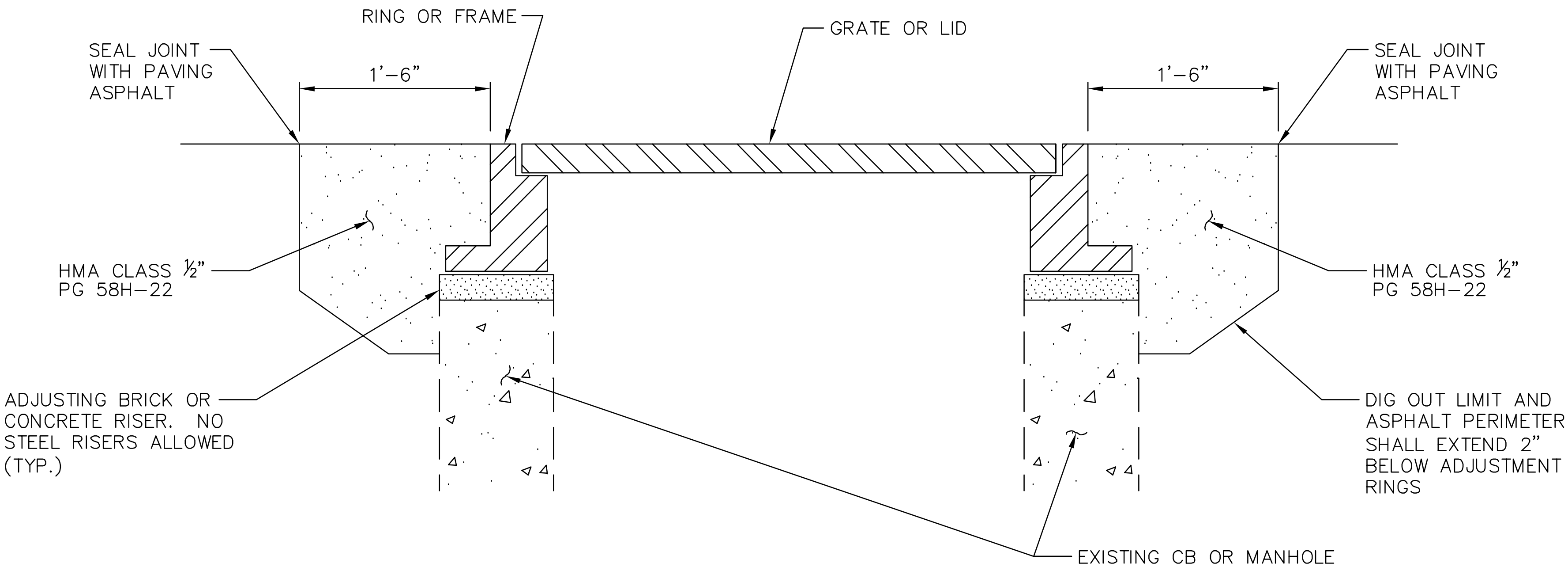
City of Bellevue

TYPICAL ASPHALT PAVEMENT DETAILS AT CURB AND GUTTER INSTALLATION

DRAWING NUMBER	RC-240-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

UTILITY MANHOLE AND VAULT ADJUSTMENT

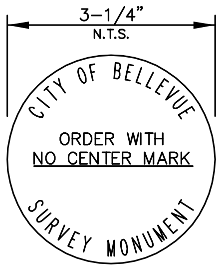
THE EXISTING IRON FRAME AND COVER OR GRATE SHALL BE REMOVED AND THOROUGHLY CLEANED FOR REINSTALLATION TO THE NEW ELEVATION. THE EXISTING STRUCTURE SHALL BE RAISED OR LOWERED TO THE REQUIRED ELEVATION USING CONCRETE BLOCKS, BRICK, AND/OR CONCRETE RINGS. EACH JOINT SHALL BE GROUTED USING A ¾ INCH LAYER OF NON–SHRINK MORTAR, PLASTERED SMOOTH INSIDE AND OUT. COVERS SHALL BE SEATED ON A UNIFORM LAYER OF GROUT TO PREVENT ROCKING.



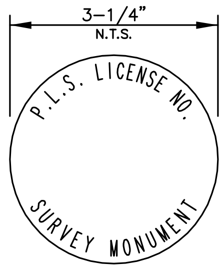
UTILITY ADJUSTMENT DETAIL

NTS

City of Bellevue	UTILITY ADJUSTMENT DETAIL	DRAWING NUMBER	RC–250–1
		SCALE	NONE
		REVISION DATE	2/22
		DEPARTMENT	TRANS



CAP DETAIL A
CAP LAYOUT FOR
COB CAPITAL PROJECTS

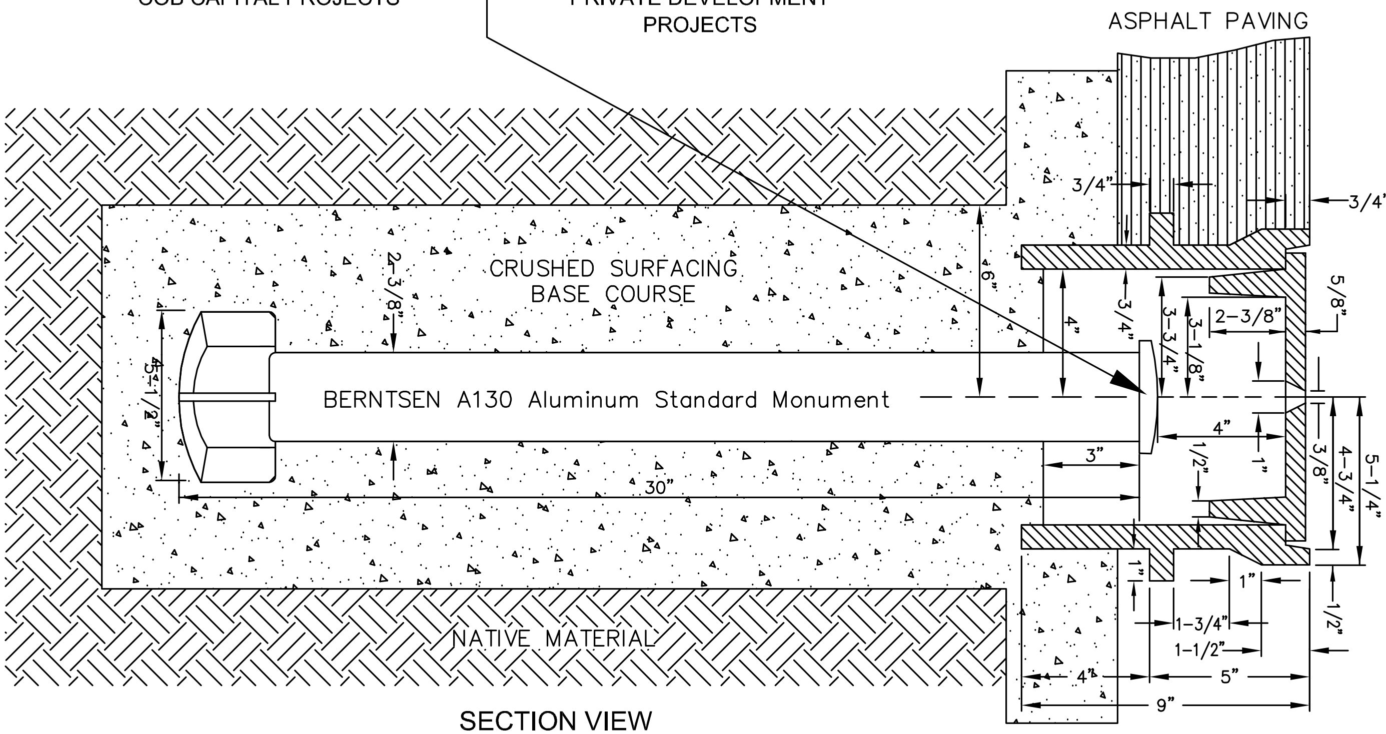


CAP DETAIL B
CAP LAYOUT FOR
PRIVATE DEVELOPMENT
PROJECTS

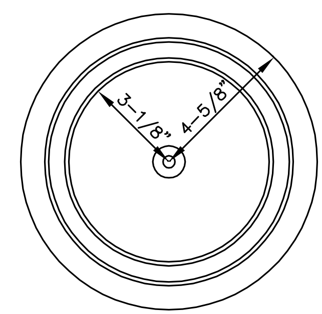
NOTES:

1. THE CASTING MATERIAL SHALL CONFORM TO ASTM-A48, CLASS 30. THE COVER AND SEAT SHALL BE MACHINED SO AS TO HAVE PERFECT CONTACT AROUND THE ENTIRE CIRCUMFERENCE AND FULL WIDTH OF BEARING SURFACE.

APPROXIMATE WEIGHTS STANDARD	
CASE	60 LBS
COVER	20 LBS
TOTAL	80 LBS

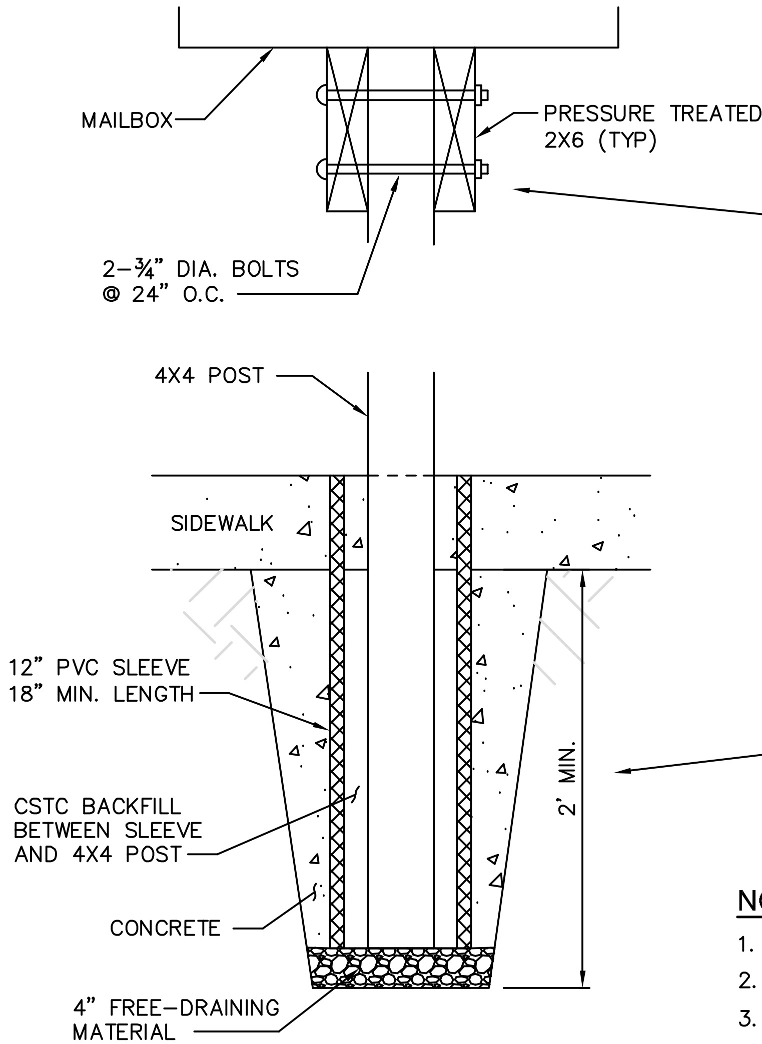


SECTION VIEW
MONUMENT & CASE

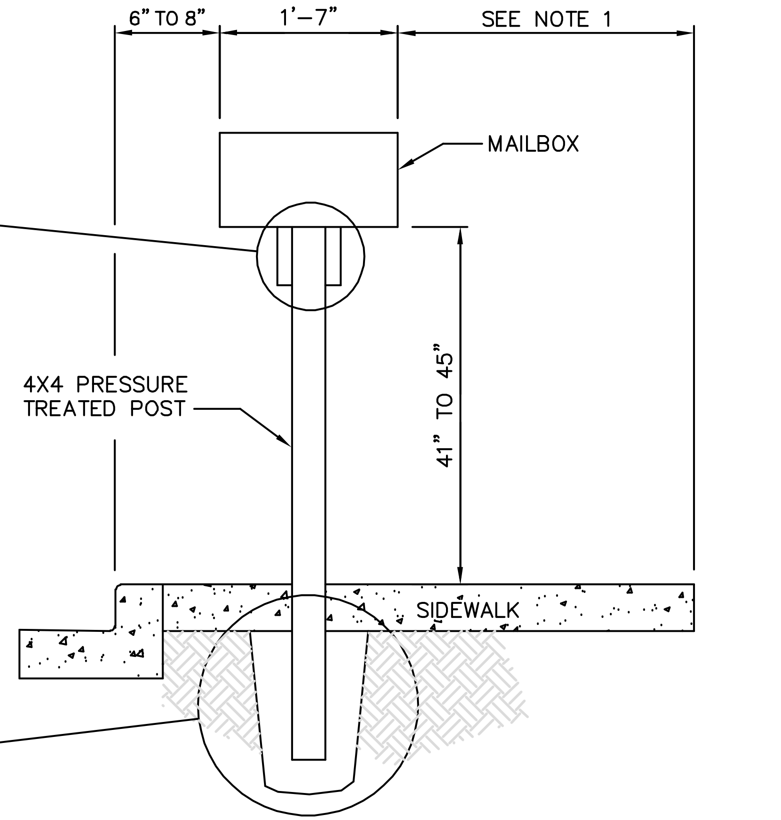


PLAN VIEW
COVER

City of Bellevue	PIPE MONUMENT, CASE AND COVER	DRAWING NUMBER	RC-260-1
		SCALE	NONE
		REVISION DATE	12/16
		DEPARTMENT	TRANS



DETAILS



SECTION

NOTES:

1. MEANDER SIDEWALK AROUND MAILBOX TO MAINTAIN FULL WIDTH OF SIDEWALK.
2. COORDINATE LOCATION OF MAILBOX WITH LOCAL POSTMASTER.
3. SECURED MAILBOXES RECOMMENDED FOR MAJOR RESIDENTIAL DEVELOPMENTS.
4. SEE SECTION 3.6.3 OF THE DESIGN MANUAL FOR CLEAR ZONE REQUIREMENTS.
5. SEE SECTION 3.6.4 OF THE DESIGN MANUAL FOR BREAKAWAY REQUIREMENTS.

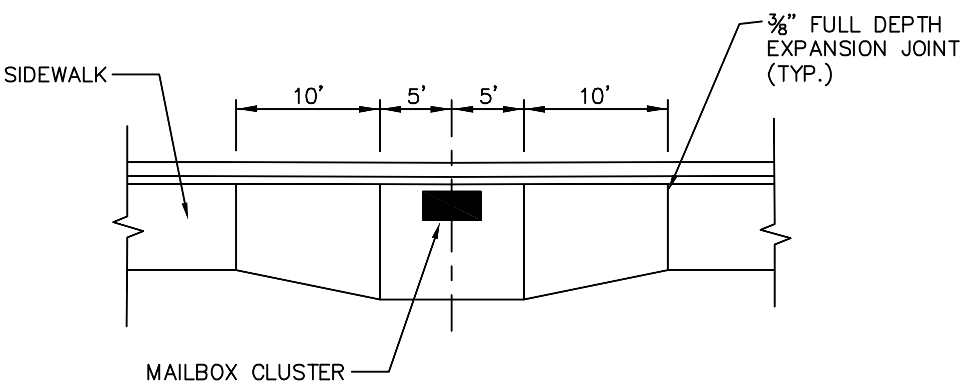
City of Bellevue

MAILBOX STAND

DRAWING NUMBER	RC–270–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

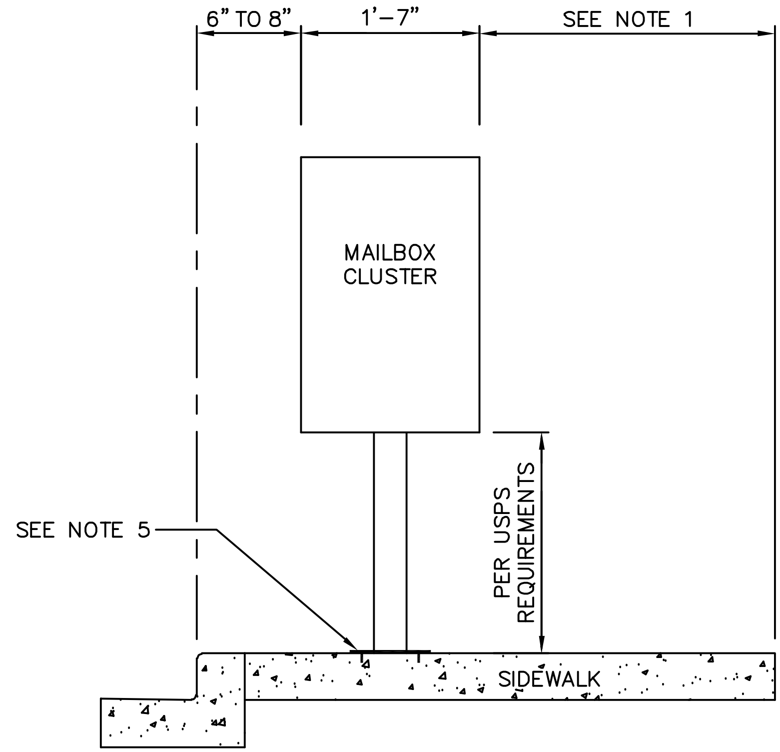
NOTES:

1. MEANDER SIDEWALK AROUND MAILBOX TO MAINTAIN FULL WIDTH OF SIDEWALK.
2. COORDINATE MAILBOX LOCATION WITH LOCAL POSTMASTER AND ENSURE MAILBOX SHALL NOT IMPACT SIGHT LINES.
3. ADDITIONAL REQUIREMENTS PER REVIEW ENGINEER FOR INSTALLATION ALONG ARTERIAL STREETS.
4. FOR USE WITH USPS APPROVED MAILBOXES ONLY.
5. ANCHOR BOLTS SHALL BE CUT FLUSH TO MOUNTING SURFACE.
6. ALL SIDEWALK INSTALLED PER C.O.B. STD. DWG. SW–110–1.
7. FOR INSTALLATION AT LOCATION WITHOUT CURB, TOP OF CONCRETE PAD SHALL BE FLUSH WITH GROUND SURFACE. PLACEMENT SHALL BE APPROVED IN ADVANCE BY REVIEW ENGINEER.
8. SEE SECTION 3.6.3 OF THE DESIGN MANUAL FOR CLEAR ZONE REQUIREMENTS.
9. SEE SECTION 3.6.4 OF THE DESIGN MANUAL FOR BREAKAWAY REQUIREMENTS.



SIDEWALK TRANSITION DETAIL

NTS



SECTION

NTS

City of Bellevue	CLUSTER MAILBOX DETAIL	DRAWING NUMBER	RC–280–1
		SCALE	NONE
		REVISION DATE	1/25
		DEPARTMENT	TRANS

CITY OF BELLEVUE
WASHINGTON

TRANSPORTATION DESIGN MANUAL

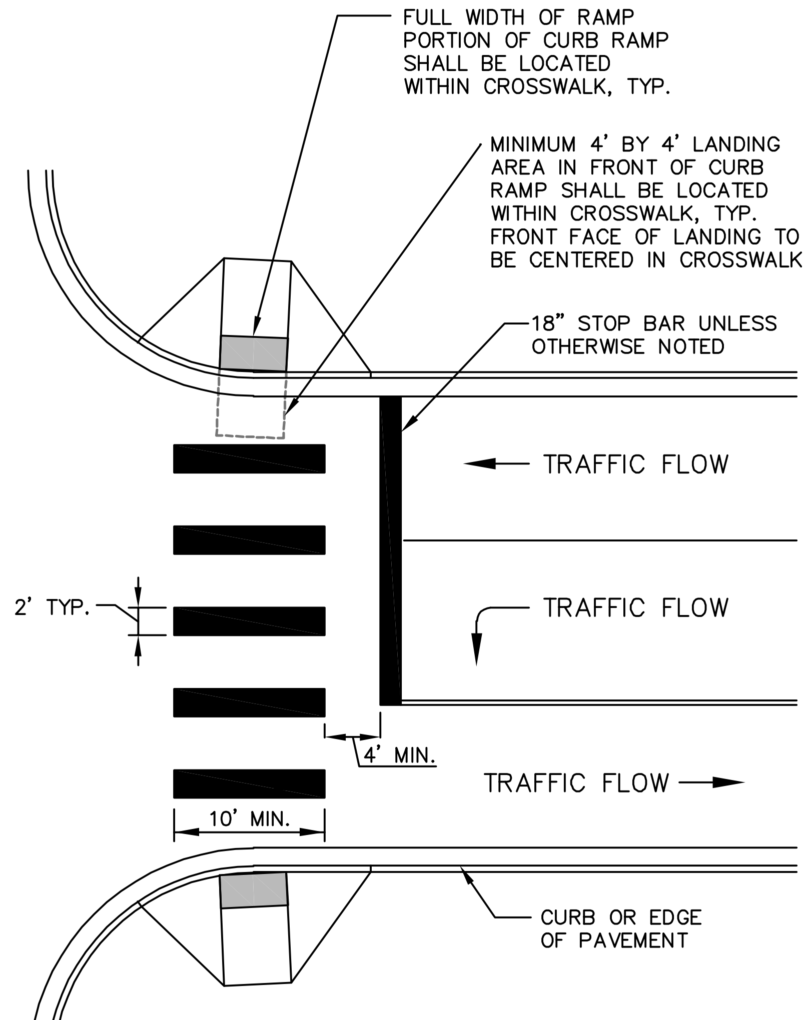
CW Drawings

Crosswalks

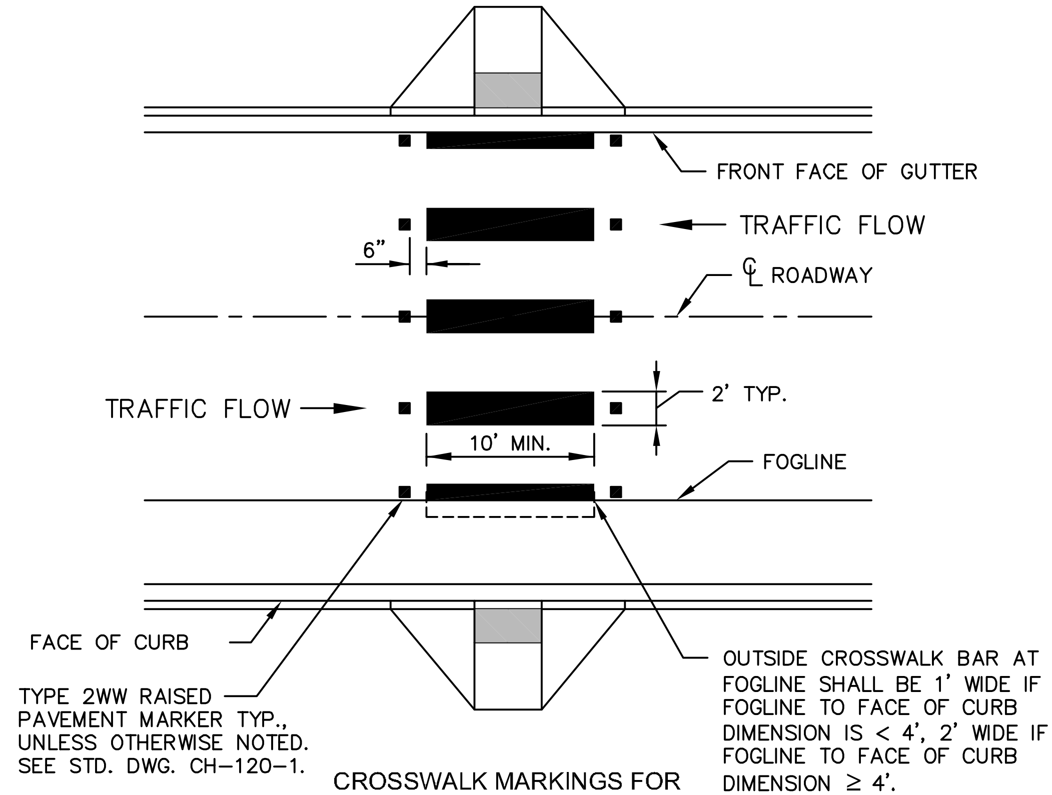
CITY OF BELLEVUE
WASHINGTON

NOTES:

1. MATERIAL SHALL BE THERMOPLASTIC, HOT APPLIED OR HEAT FUSED PREFORMED (90 MIL. MIN.) ON HMA SURFACES, AND LIQUID COLD APPLIED METHYL METHACRYLATE ON PORTLAND CEMENT CONCRETE SURFACES, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. GAP WIDTH SHALL BE 2' MINIMUM.
3. ALL CROSSWALK MARKINGS SHALL BE CONTINENTAL STYLE UNLESS OTHERWISE APPROVED IN ADVANCE BY THE ENGINEER.
4. BARS SHALL BE SPACED TO AVOID WHEELPATHS TO THE MAXIMUM EXTENT FEASIBLE. FINAL LAYOUT SHALL BE APPROVED BY THE TRAFFIC ENGINEER.
5. INTERIM UPGRADES TO EXISTING CROSSWALK MAY CONSIST OF NEW CONTINENTAL BARS INSTALLED WITHIN PARALLEL BARS.

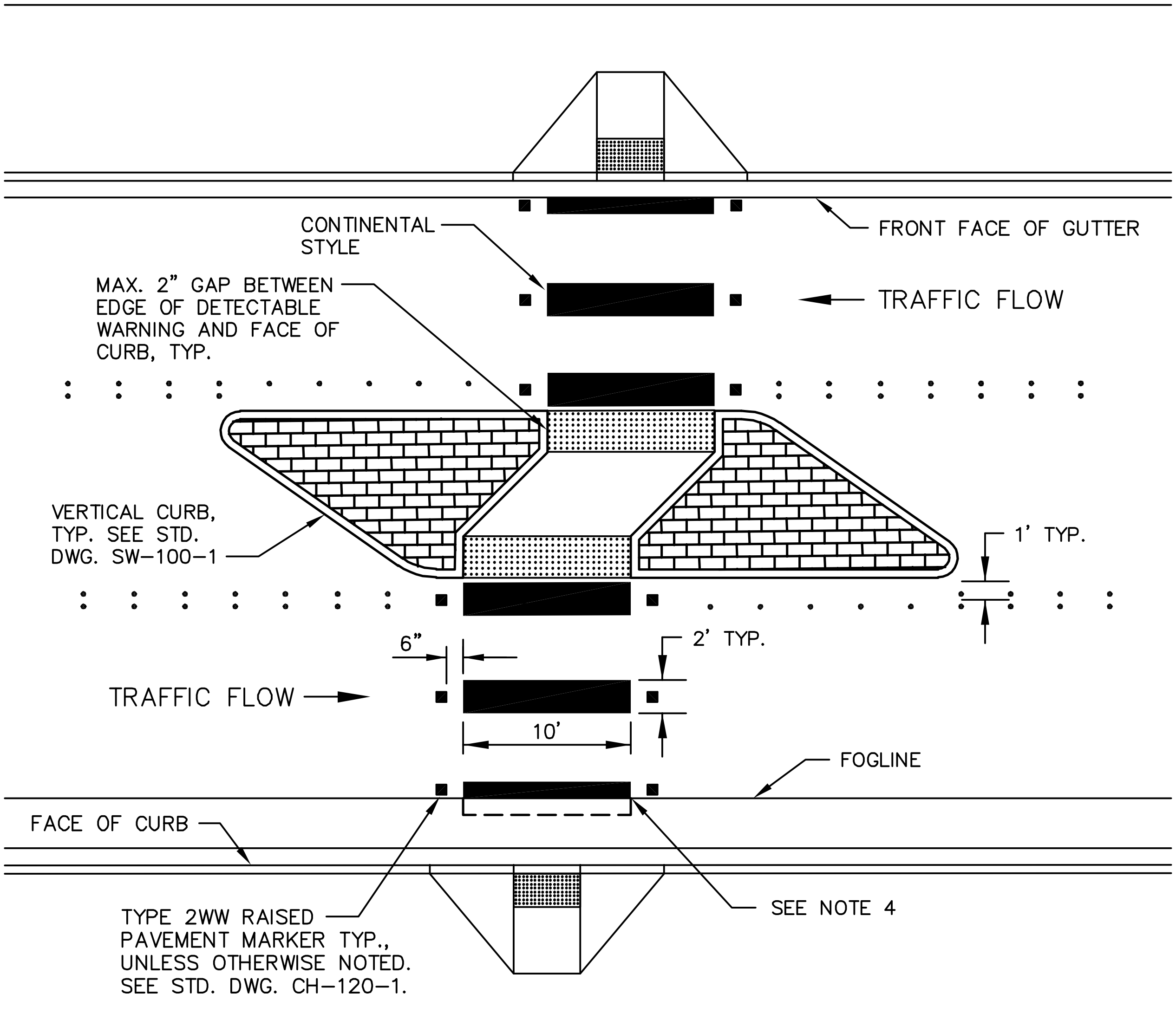


CROSSWALK MARKINGS FOR INTERSECTIONS



CROSSWALK MARKINGS FOR MIDBLOCK LOCATIONS

City of Bellevue	CROSSWALK MARKINGS	DRAWING NUMBER	CW-100-1
		SCALE	NONE
		REVISION DATE	1/25
		DEPARTMENT	TRANS



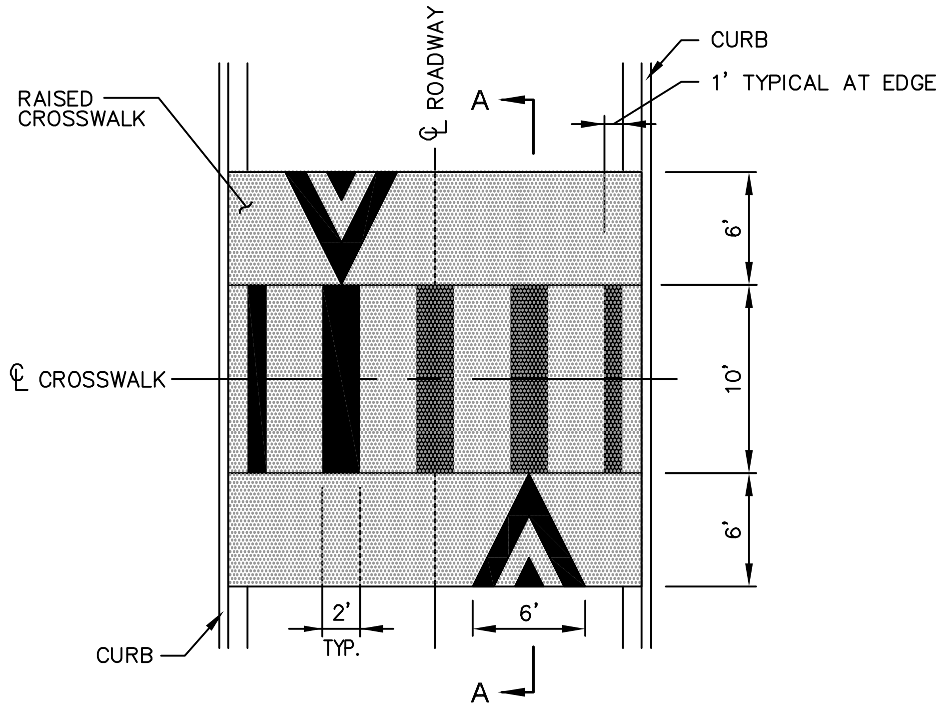
NOTES:

1. MATERIAL SHALL BE THERMOPLASTIC, HOT APPLIED OR HEAT FUSED PREFORMED (90 MIL. MIN.) ON HMA SURFACES, AND LIQUID COLD APPLIED METHYL METHACRYLATE ON PORTLAND CEMENT CONCRETE SURFACES, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. DISTANCE BETWEEN DETECTABLE WARNINGS IN MEDIAN SHALL BE 2' MINIMUM.
3. IF THERE IS NO CURB AND GUTTER CONTACT TRAFFIC ENGINEER FOR LAYOUT AT EDGE OF ROAD.
4. OUTSIDE CROSSWALK BAR AT FOGLINE SHALL BE 1' WIDE IF FOGLINE TO FACE OF CURB DIMENSION IS < 4', 2' WIDE IF FOGLINE TO FACE OF CURB DIMENSION ≥ 4', CENTERED ON FOGLINE.

City of Bellevue

CROSSWALK MARKINGS AT MEDIAN

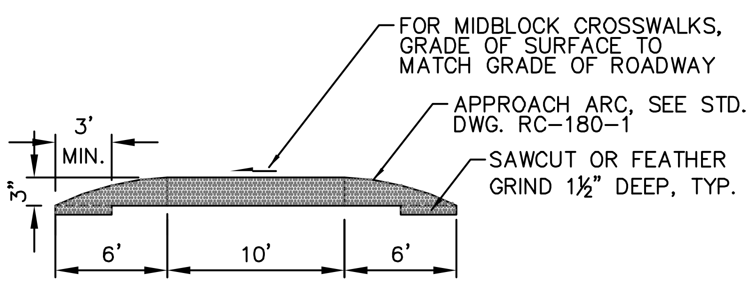
DRAWING NUMBER	CW-110-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



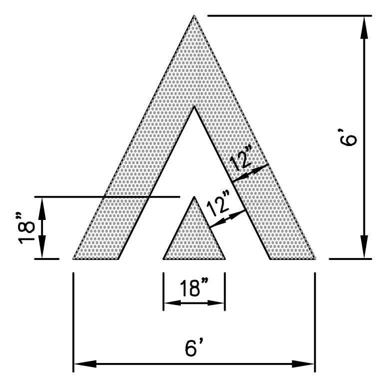
MARKING DETAIL

NOTES:

1. FOR DETAILS OF RAISED ASPHALT SECTION, SEE STD. DWG. RC–180–1.
2. FOR CURB RAMP DETAILS AT RAISED CROSSWALK, SEE STD. DWGS. CW–130–1 AND CW–140–1.
3. FOR RAISED CROSSWALK SIGNING, SEE STD. DWGS. CW–150–1, CW–160–1, AND CW–170–1.



SECTION A-A

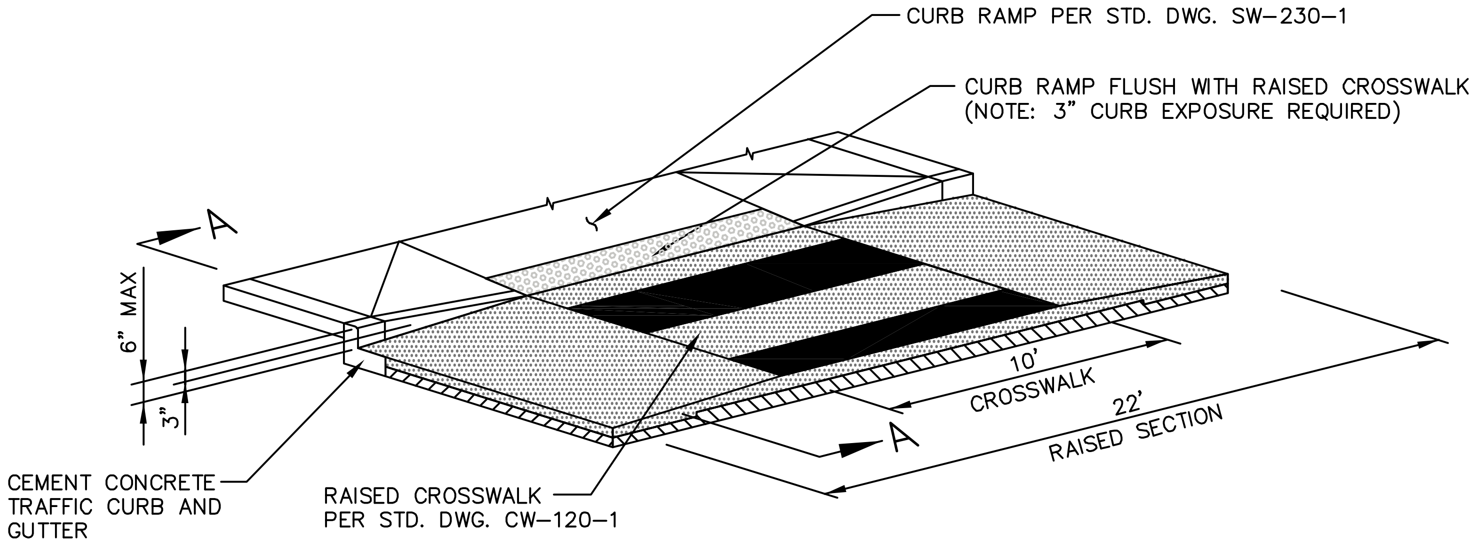


CHEVRON DETAIL

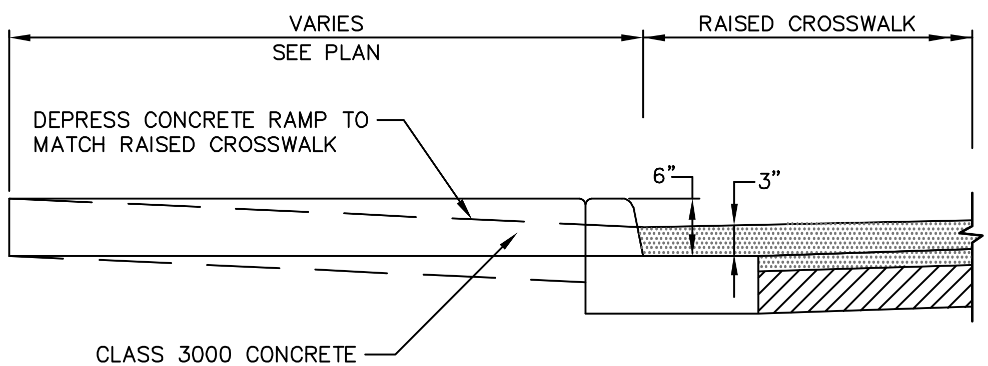
City of Bellevue

CROSSWALK MARKING AT RAISED CROSSWALK

DRAWING NUMBER	CW–120–1
SCALE	NONE
REVISION DATE	2/25
DEPARTMENT	TRANS



MODIFIED PERPENDICULAR CURB RAMP

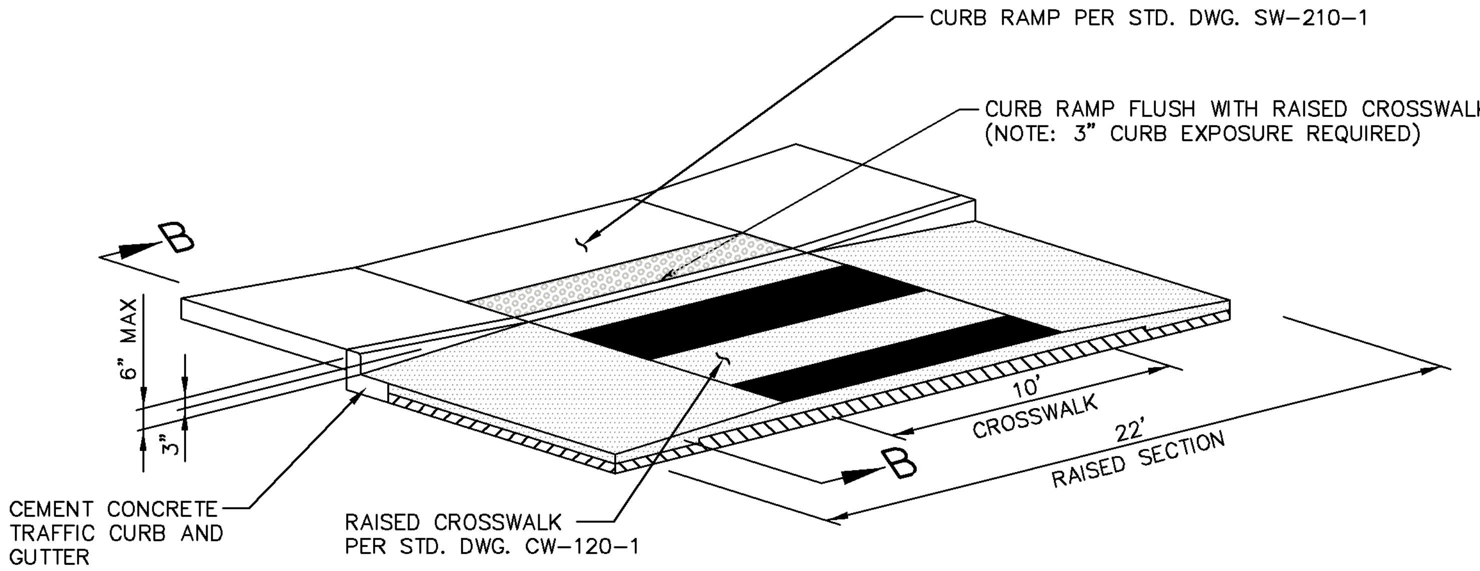


SECTION A-A

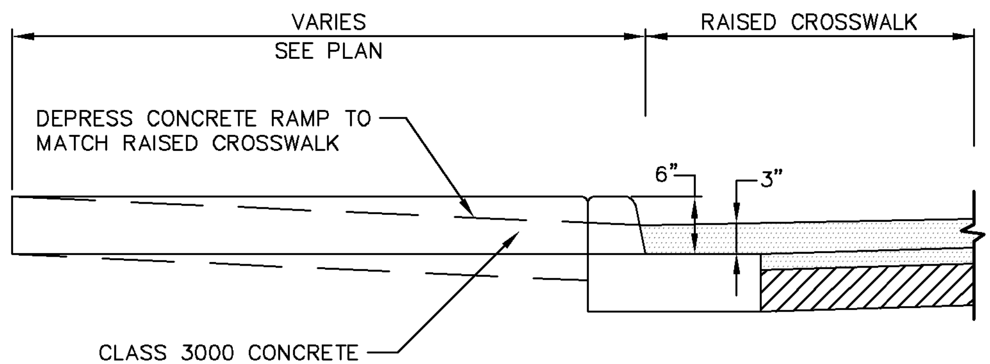
City of Bellevue

RAISED CROSSWALK
WITH PERPENDICULAR CURB RAMP

DRAWING NUMBER	CW–130–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



MODIFIED PARALLEL CURB RAMP

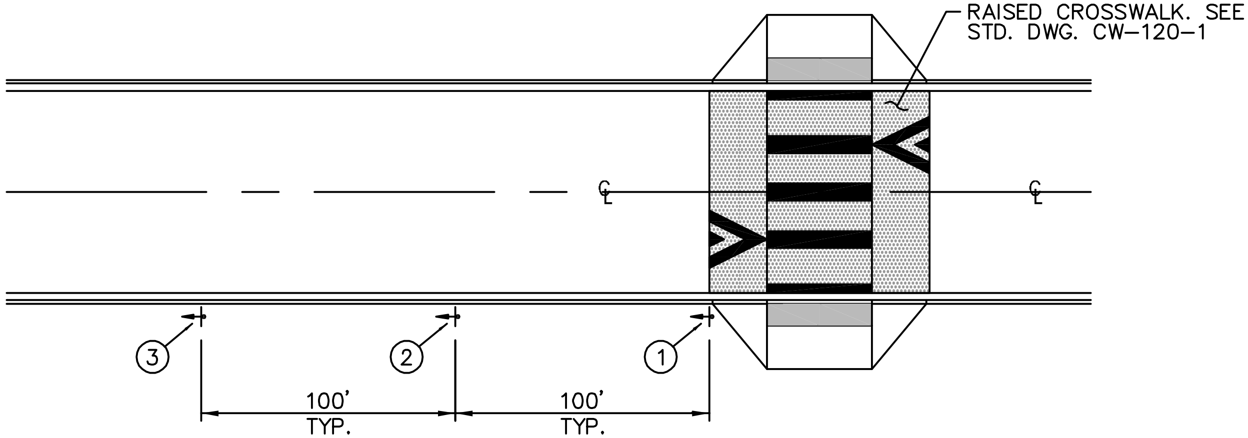


SECTION B-B

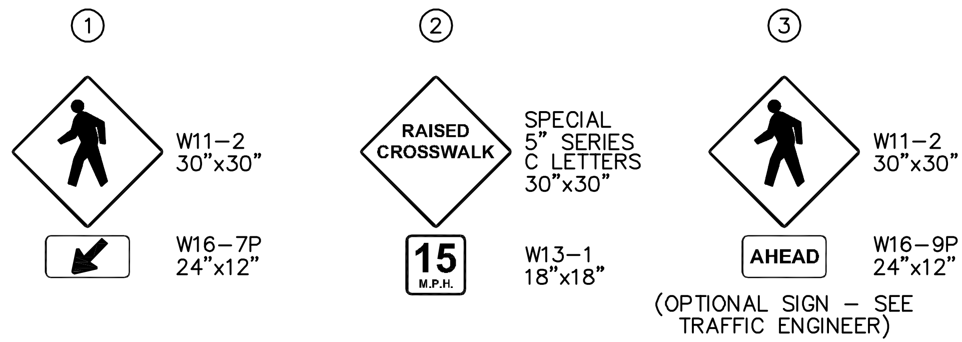
City of Bellevue

RAISED CROSSWALK WITH PARALLEL CURB RAMP

DRAWING NUMBER	CW–140–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



SIGNING PLACEMENT



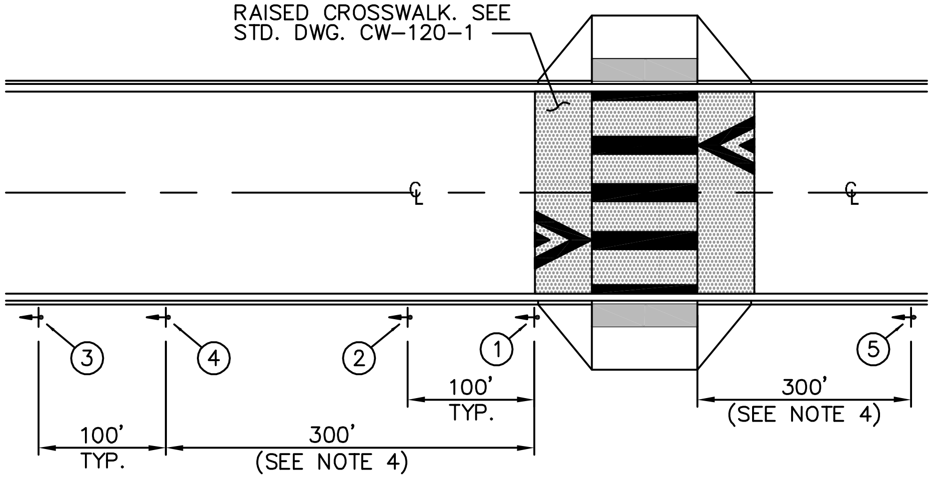
NOTES:

1. SIGNS SHALL HAVE YELLOW BACKGROUND WITH BLACK LEGEND AND BORDER.

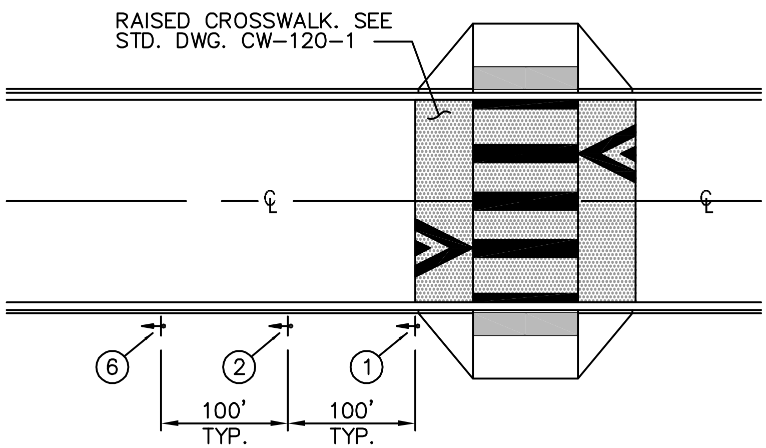
City of Bellevue

RAISED CROSSWALK SIGNING

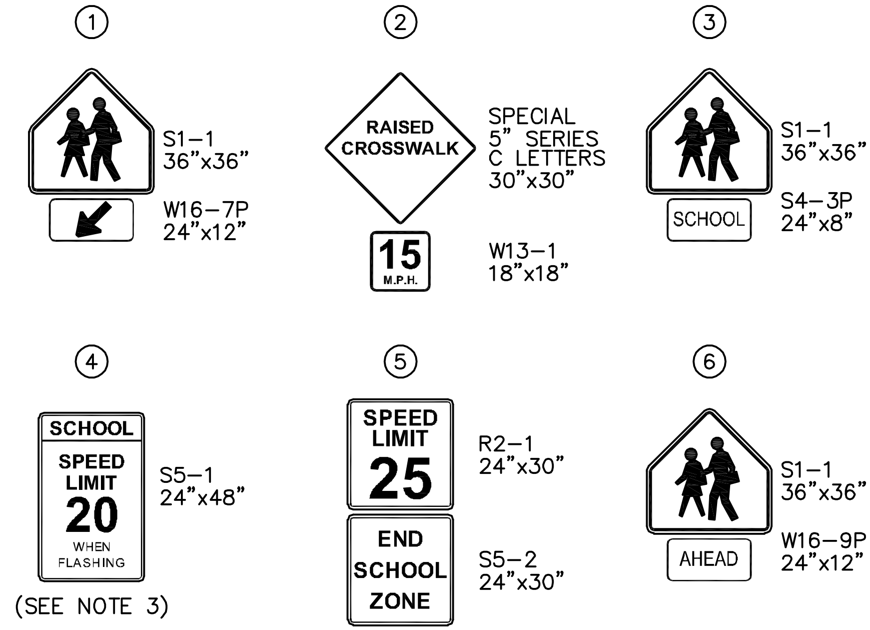
DRAWING NUMBER	CW-150-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



WITHIN SCHOOL SPEED ZONE



OUTSIDE SCHOOL SPEED ZONE



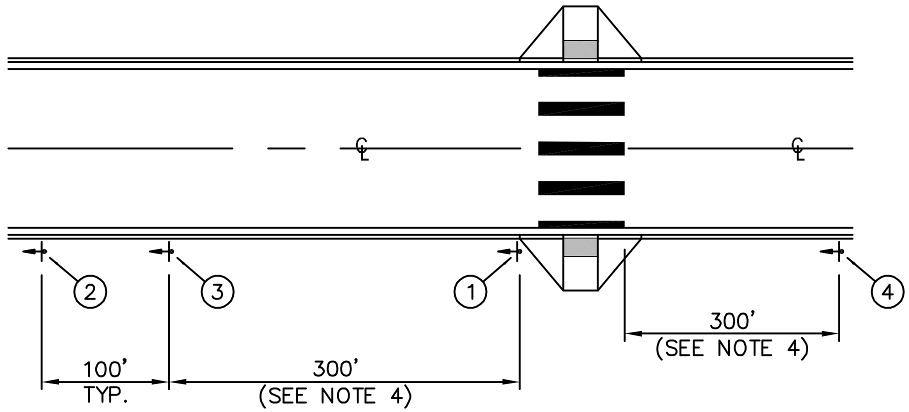
NOTES:

1. SIGN COMBINATIONS 1, 2, 3, 6, THE "SCHOOL" LEGEND ON SIGN 4 AND ANY ADDITIONAL PLAQUES SHALL BE FLUORESCENT YELLOW-GREEN WITH BLACK LEGEND AND BORDER.
2. SIGN SPACING MAY BE ADJUSTED TO REFLECT SITE CONDITIONS AND SHALL BE APPROVED BY THE ENGINEER.
3. IN SCHOOL SPEED ZONES WITHOUT FLASHING BEACONS, USE BOTTOM MESSAGE "WHEN CHILDREN ARE PRESENT" OR AS DIRECTED BY THE ENGINEER.
4. IF ROADWAY BORDERS A SCHOOL, THIS DISTANCE MAY INCREASE AS PER RCW 46.61.440.

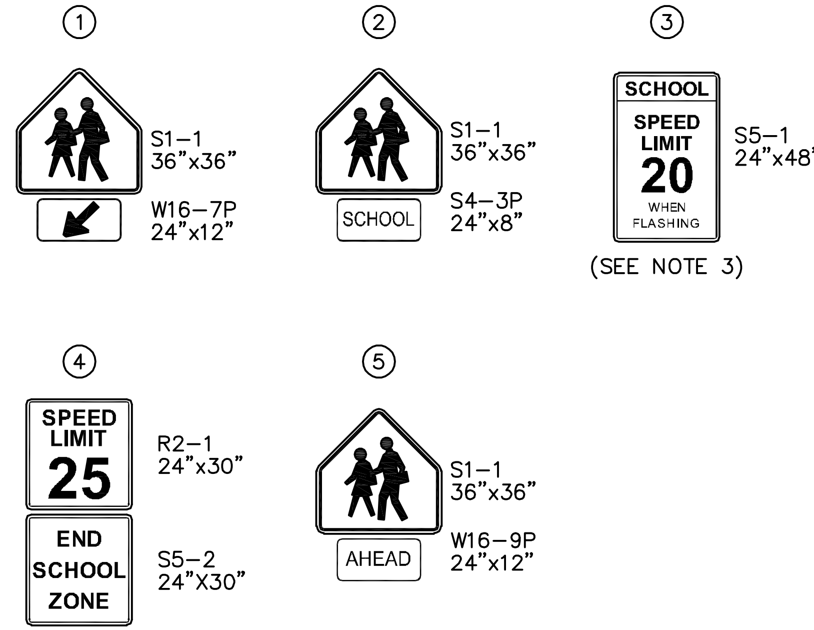
City of Bellevue

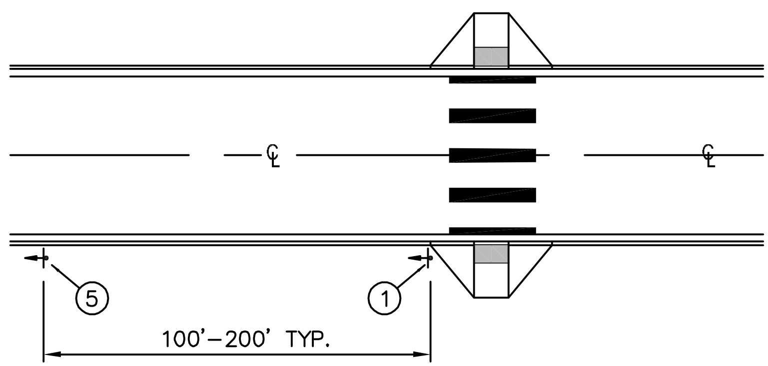
RAISED SCHOOL CROSSWALK SIGNING

DRAWING NUMBER	CW-160-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



WITHIN SCHOOL ZONE





OUTSIDE SCHOOL ZONE

NOTES:

1. SIGN COMBINATIONS 1, 2, 5, THE "SCHOOL" LEGEND ON SIGN 3 AND ANY ADDITIONAL PLAQUES SHALL BE FLUORESCENT YELLOW–GREEN WITH BLACK LEGEND AND BORDER.
2. SEE STD. DWG. CW–100–1 FOR CROSSWALK MARKINGS.
3. IN SCHOOL SPEED ZONES WITHOUT FLASHING BEACONS, USE BOTTOM MESSAGE "WHEN CHILDREN ARE PRESENT" OR AS DIRECTED BY THE ENGINEER.
4. IF ROADWAY BORDERS A SCHOOL, THIS DISTANCE MAY INCREASE AS PER RCW 46.61.440.

City of Bellevue

AT GRADE SCHOOL CROSSWALK SIGNING

DRAWING NUMBER	CW–170–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

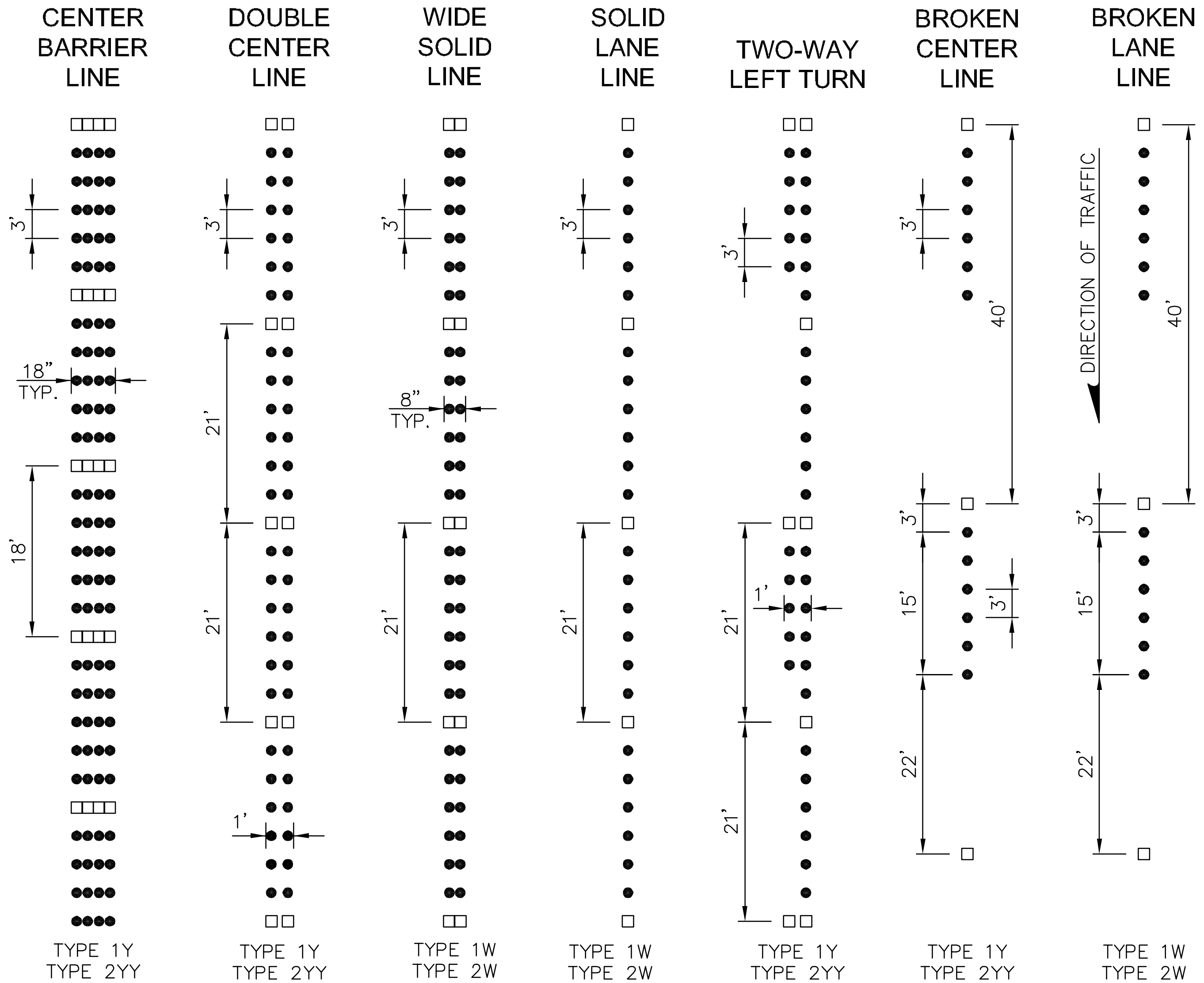
TRANSPORTATION DESIGN MANUAL

CH Drawings

Channelization

CITY OF BELLEVUE

WASHINGTON



NOTES:

1. A SINGLE LINE OF TYPE 2 RAISED PAVEMENT MARKERS MAY BE APPROPRIATE FOR CENTER LINE ON LOWER VOLUME STREETS, AS APPROVED BY THE ENGINEER.
2. FOR RAISED PAVEMENT MARKER DETAIL, SEE STD. DWG. CH–120–1.
3. SEE STD. DWG. CH–300–1 FOR MATERIAL SPECIFICATIONS.

● TYPE 1 RAISED PAVEMENT MARKER
□ TYPE 2 RAISED PAVEMENT MARKER

SEE DWG. CH–120–1

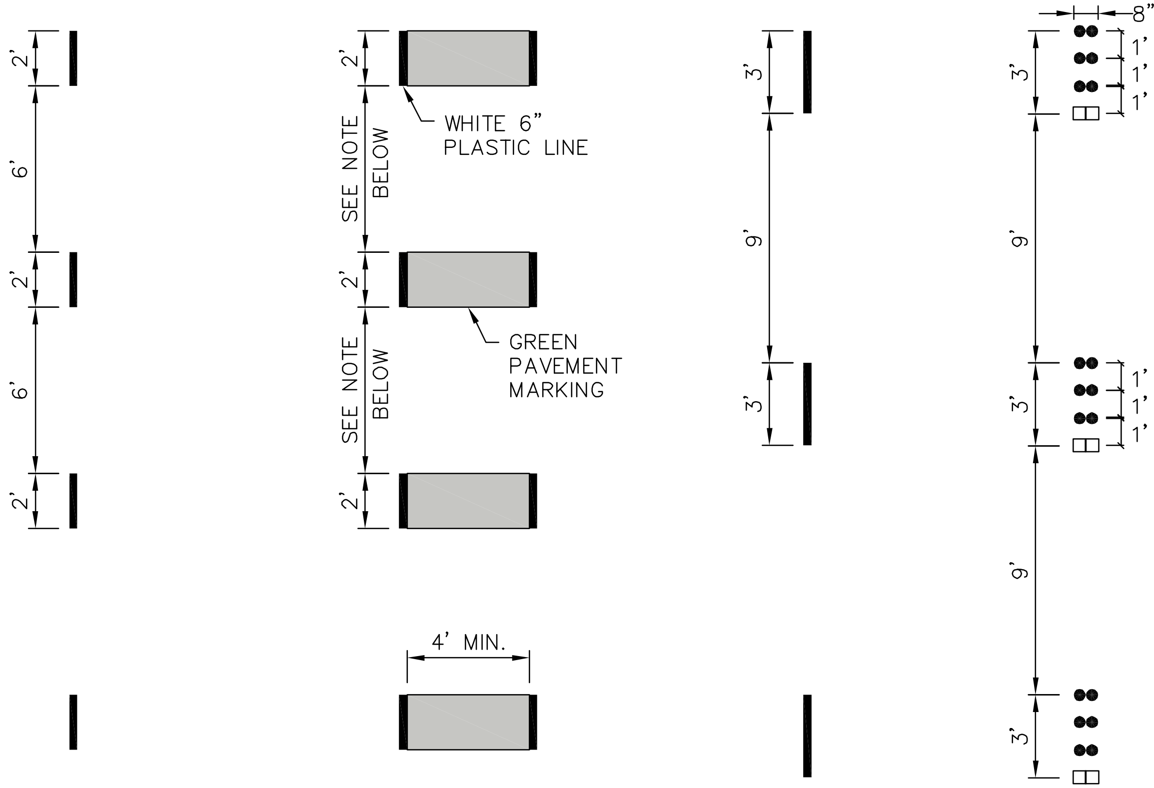
TYPE 2 RPM RAISED FACE COLORS	
TYPE 2YY	YELLOW AND YELLOW
TYPE 2W	WHITE–ONE SIDE ONLY
TYPE 2Y	YELLOW–ONE SIDE ONLY
TYPE 1 RPM COLORS	
TYPE 1W	WHITE
TYPE 1Y	YELLOW

City of Bellevue

CHANNELIZATION LINES – A

DRAWING NUMBER	CH–100–1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS

DASHED LINE (THROUGH INTERSECTION) | BICYCLE CROSSING MARKING (THROUGH INTERSECTION) | DASHED LINE (DROP LANE) | DASHED LINE - RPM'S (DROP LANE)



NOTE:
BICYCLE CROSSING MARKINGS SHALL ALIGN WITH CONTINENTAL CROSSWALK BARS IF PRESENT. IF NO CROSSWALK BARS EXIST, BICYCLE CROSSING MARKINGS SHALL BE PLACED AT LANE LINES AND ½ LANE WIDTH TO AVOID WHEEL PATHS OR AT 6' SPACING IF NO LANE LINES ARE PRESENT.

NOTES:

1. MATERIAL SHALL BE THERMOPLASTIC UNLESS OTHERWISE NOTED OR APPROVED BY THE ENGINEER.
2. FOR RAISED PAVEMENT MARKER DETAIL, SEE STD. DWG. CH-120-1.
3. SEE STD. DWG. CH-300-1 FOR MATERIAL SPECIFICATIONS.

● TYPE 1 RAISED PAVEMENT MARKER
□ TYPE 2 RAISED PAVEMENT MARKER

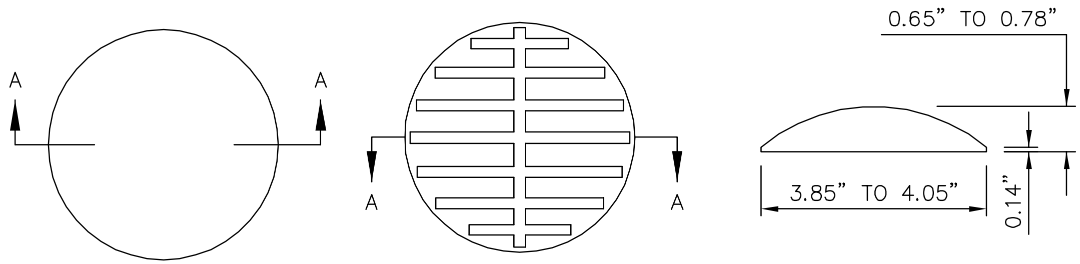
SEE DWG. CH-120-1

TYPE 2 RPM RAISED FACE COLORS	
TYPE 2YY	YELLOW AND YELLOW
TYPE 2W	WHITE-ONE SIDE ONLY
TYPE 2Y	YELLOW-ONE SIDE ONLY
TYPE 1 RPM COLORS	
TYPE 1W	WHITE
TYPE 1Y	YELLOW

City of Bellevue

CHANNELIZATION LINES – B

DRAWING NUMBER	CH-110-1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS

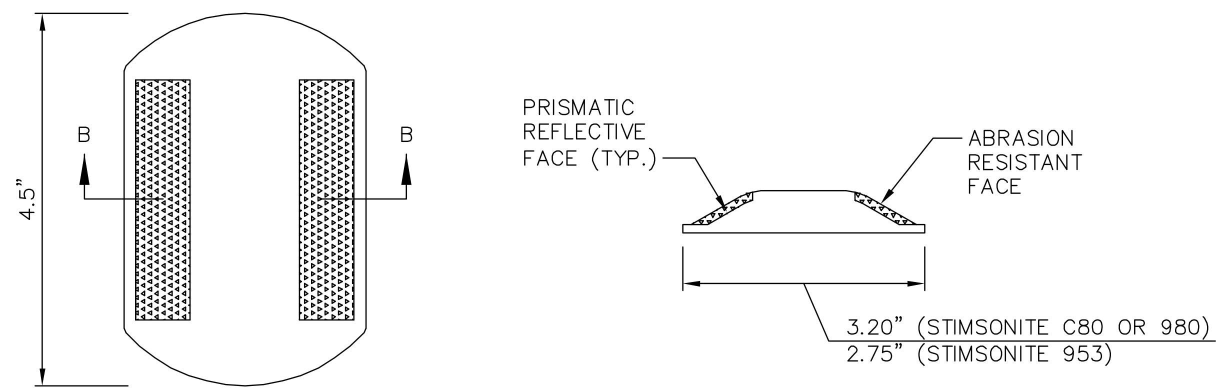


TOP VIEW

BOTTOM VIEW EXAMPLE
(SEE NOTE 2)

SECTION A-A

TYPE 1



PLAN

SECTION B-B

DIRECTION OF TRAFFIC

TYPE 2

NOTES:

1. RAISED PAVEMENT MARKER TYPE 1 SHALL BE ALPINE PRODUCTS MODEL ANR–Y1 OR ANR–W1, STIMSONITE MODEL B10 OR APPROVED EQUAL. MARKERS SHALL BE MOLDED OF A HIGH IMPACT, RECYCLED ACRYLONITRILE BUTADIENE STYRENE (ABS), CONFORMING TO ASTM SPEC DI 78868.
2. TYPE 1 MARKER BOTTOM SHALL ALLOW UPWARD FLOW OF ADHESIVE AND VENTING TO PREVENT AIR ENTRAPMENT.
3. RAISED PAVEMENT MARKER TYPE 2 SHALL BE ENNIS FLINT STIMSONITE MODEL C80, 980, OR 953.
4. SUBSTITUTE PAVEMENT MARKERS SHALL NOT BE ACCEPTED WITHOUT WRITTEN APPROVAL BY THE ENGINEER, PRIOR TO INSTALLATION.
5. ALL MARKERS INSTALLED ON CEMENT CONCRETE PAVEMENT SHALL BE INSTALLED WITH AN EAS–60 TWO PART EPOXY. SEE STD. DWG. CH–300–1.
6. ALL MARKERS INSTALLED ON HMA PAVEMENTS SHALL BE INSTALLED WITH BITUMINOUS ADHESIVE, CRAFCO STANDARD PAVEMENT MARKER ADHESIVE. SEE STD. DWG. CH–300–1.

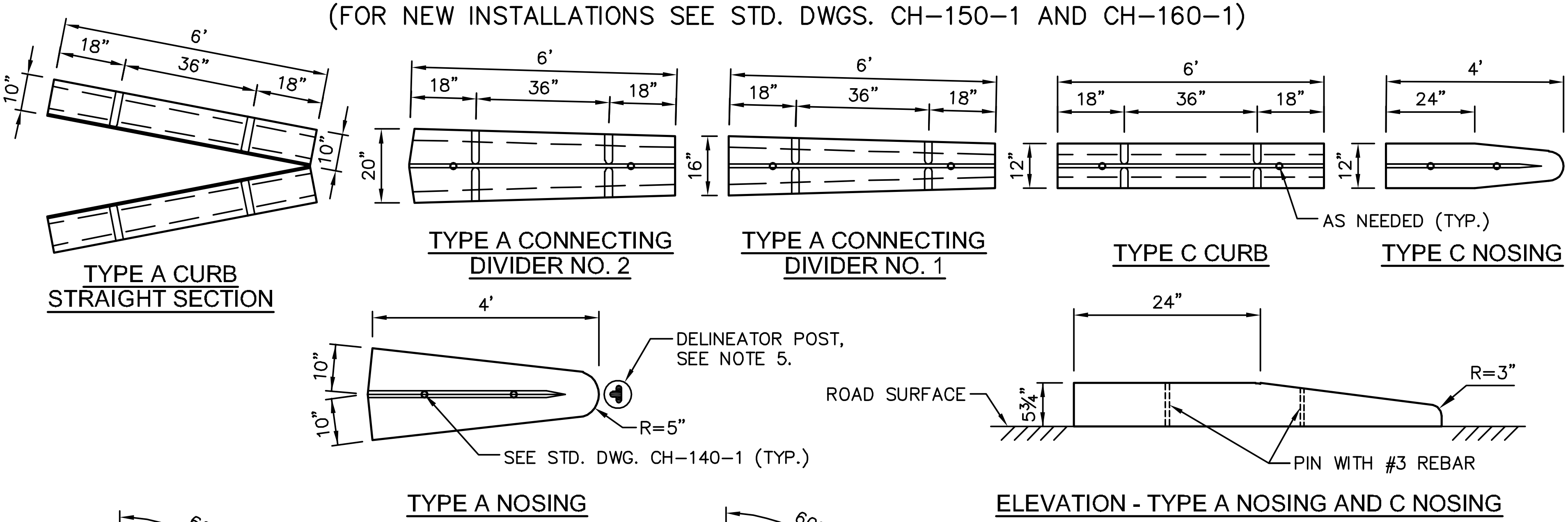
City of Bellevue

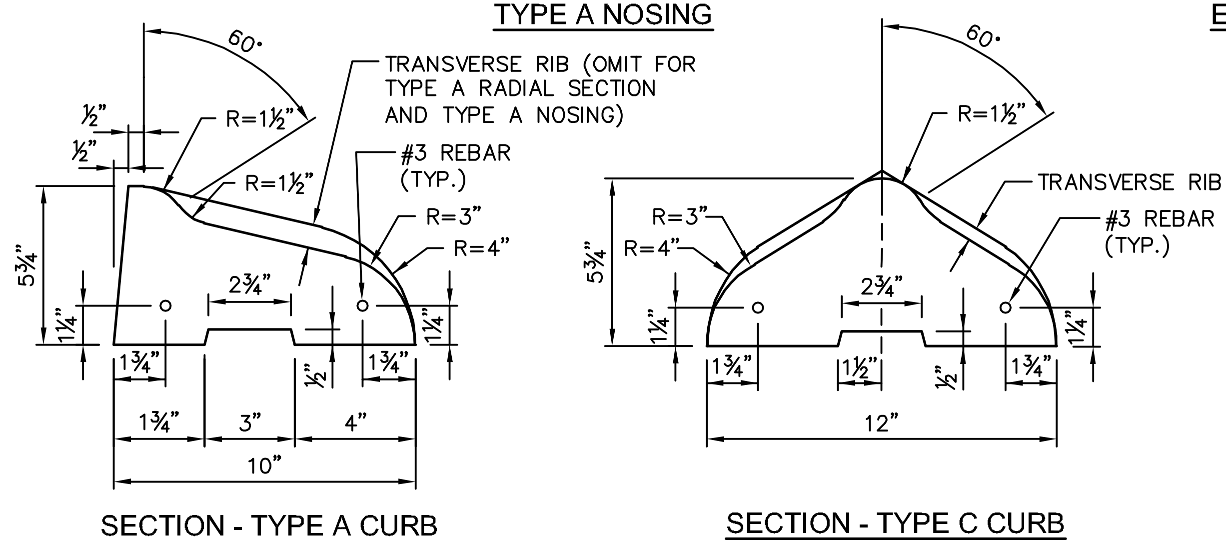
RAISED PAVEMENT MARKER DETAILS

DRAWING NUMBER	CH–120–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

FOR MAINTENANCE OR EXTENSION OF EXISTING CURB ONLY. NOT FOR NEW INSTALLATIONS.

(FOR NEW INSTALLATIONS SEE STD. DWGS. CH–150–1 AND CH–160–1)





NOTES:

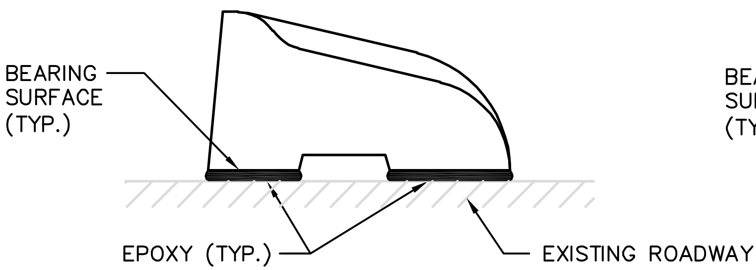
1. ONLY 6' SECTIONS OF TYPE C AND TYPE A CURB SHALL BE USED ON ALL INSTALLATIONS, EXCEPT FOR NOTE 2.
2. THE USE OF 1' BLOCK SECTIONS OF TYPE C AND TYPE A CURB SHALL ONLY BE USED TO FORM SMALL RADIUS CURVES OR ADJUSTMENTS IN FINAL LENGTH, AS APPROVED BY THE ENGINEER.
3. PRECAST TRAFFIC CURB SHALL BE INSTALLED WITH AN EAS–06 OR EAS–08 TWO PART EPOXY. SEE STD. DWG. CH–300–1.
4. PRECAST CURB NOSINGS AND NEXT TWO SECTIONS OF CURB SHALL BE BOTH PINNED AND EPOXIED TO THE ROAD SURFACE. SEE STD. DWG. CH–140–1.
5. DELINEATOR POST MAY BE REQUIRED AT CURB NOSE.

City of Bellevue

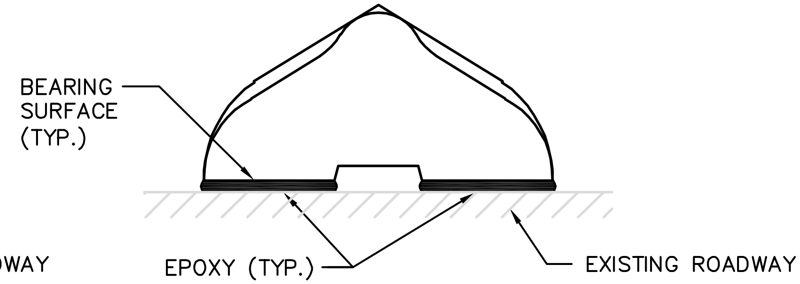
PRECAST TRAFFIC CURBS
FOR MAINTENANCE OF EXISTING CURB

DRAWING NUMBER	CH–130–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

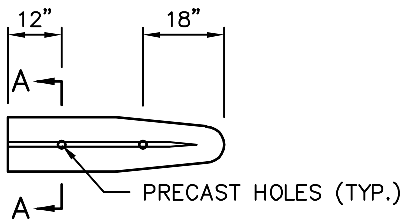
FOR MAINTENANCE OR EXTENSION OF EXISTING CURB ONLY. NOT FOR NEW INSTALLATIONS.
(FOR NEW INSTALLATIONS SEE STD. DWGS. CH–150–1 AND CH–160–1)



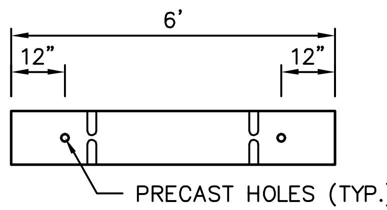
SECTION - TYPE A CURB



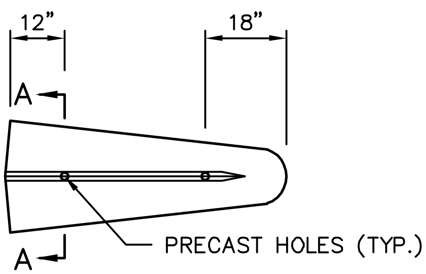
SECTION - TYPE C CURB



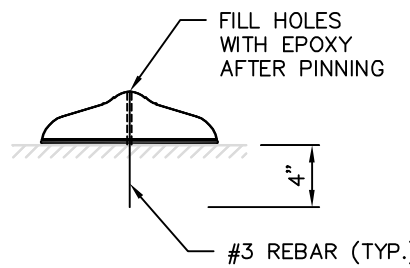
TYPE C NOSING



TYPE C OR TYPE A CONNECTING DIVIDER



TYPE A NOSING



SECTION A-A

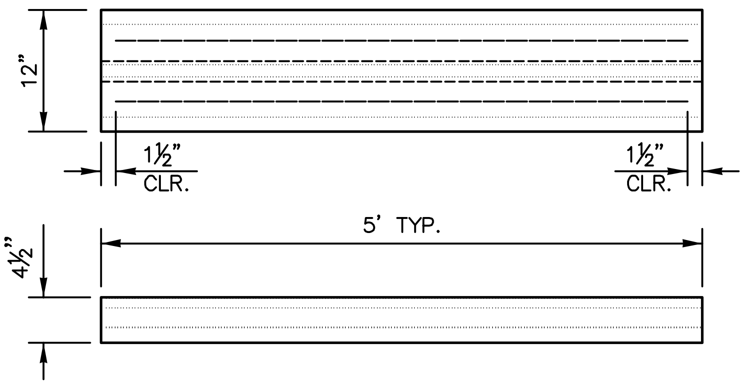
NOTES:

1. NOSING AND NEXT TWO SECTIONS OF CURB SHALL HAVE HOLES PRECAST AS SHOWN.
2. PRECAST TRAFFIC CURB SHALL BE INSTALLED WITH AN EAS–06 OR EAS–08 TWO PART EPOXY. SEE STD. DWG. CH–300–1.
3. EPOXY SHALL BE PLACED UNDER THE BEARING SURFACE OF THE PRECAST TRAFFIC CURB.
4. SUFFICIENT EPOXY SHALL BE APPLIED TO ENSURE SQUEEZE–OUT OF 50% PER EACH SIDE OF EACH CURB SECTION.

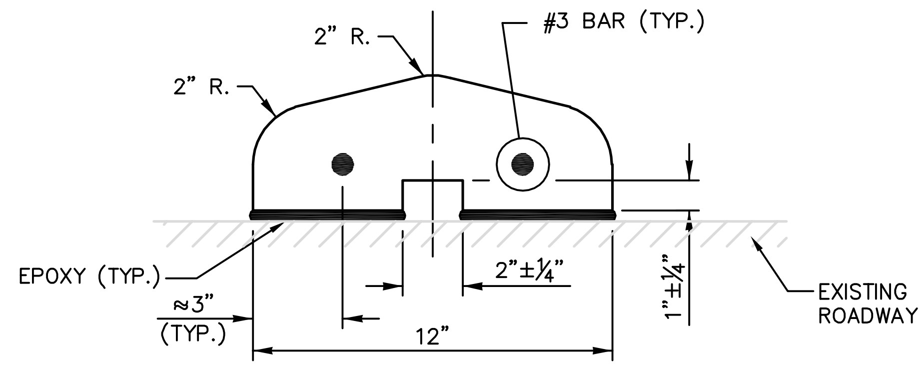
City of Bellevue

PRECAST TRAFFIC CURB INSTALLATION
FOR MAINTENANCE OF EXISTING CURB

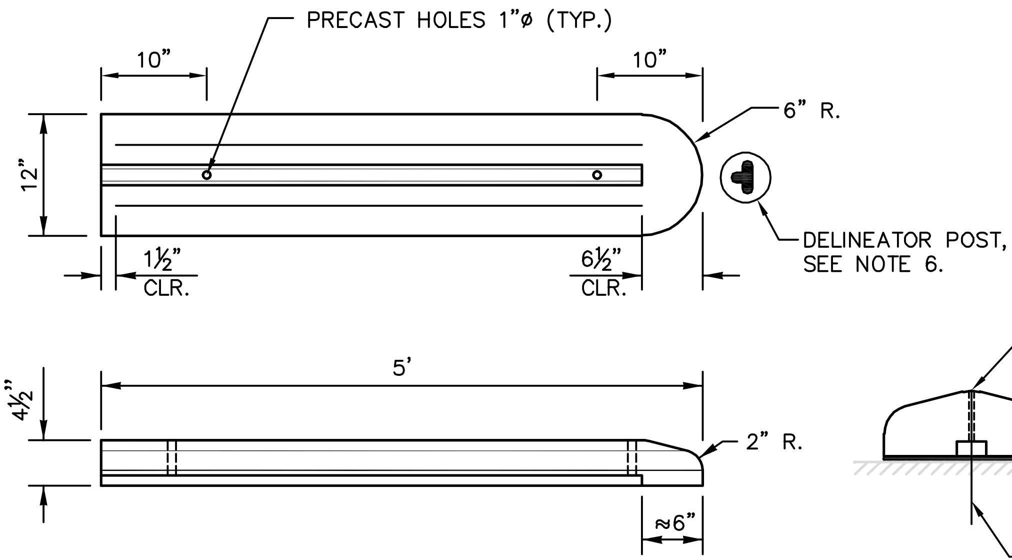
DRAWING NUMBER	CH–140–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



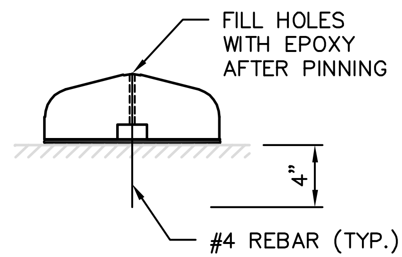
DUAL SLOPED BLOCK



SECTION



NOSING BLOCK



PINNING SECTION

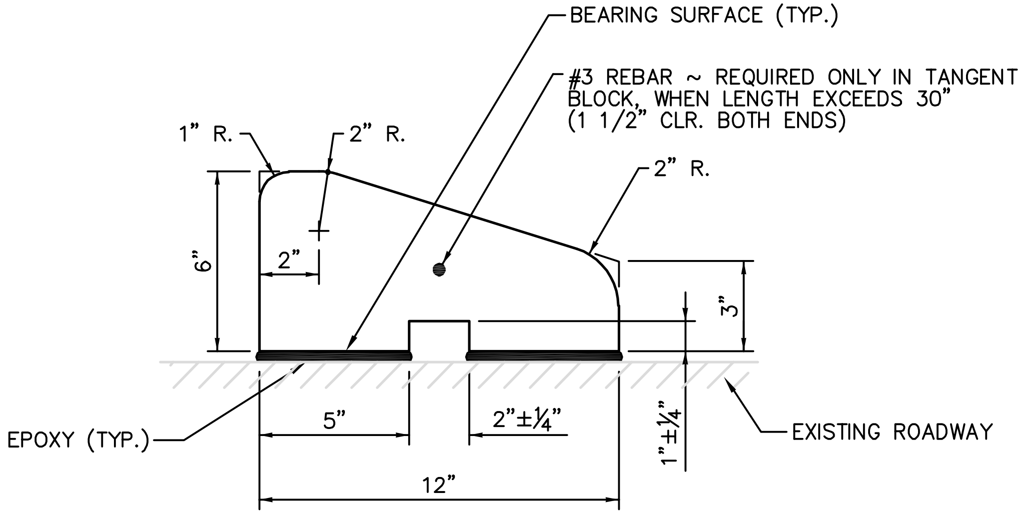
NOTES:

1. 5' LONG STANDARD SECTIONS SHALL BE USED EXCLUSIVELY, EXCEPT TO ADJUST FOR FINAL LENGTH. NOSING BLOCK SHALL BE 5' LONG, NO EXCEPTIONS.
2. NOSING SHALL HAVE HOLES PRECAST AS SHOWN.
3. PRECAST TRAFFIC CURB SHALL BE INSTALLED WITH AN EAS-06 OR EAS-08 TWO PART EPOXY. SEE STD. DWG. CH-300-1.
4. EPOXY SHALL BE PLACED UNDER THE BEARING SURFACE OF THE PRECAST TRAFFIC CURB.
5. SUFFICIENT AMOUNT OF EPOXY SHALL BE APPLIED TO ENSURE UNIFORM COVERAGE OF APPROXIMATELY ¼" ACROSS THE BEARING SURFACE. THE EPOXY SHALL SQUEEZE-OUT ALONG ALL EDGES.
6. DELINEATOR POST MAY BE REQUIRED AT CURB NOSE.

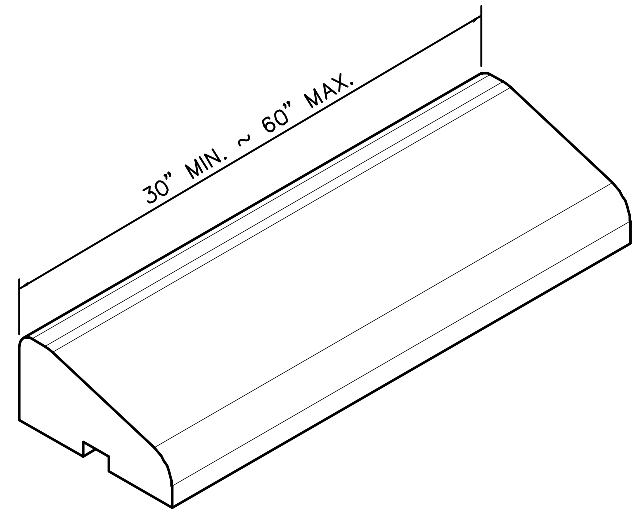
City of Bellevue

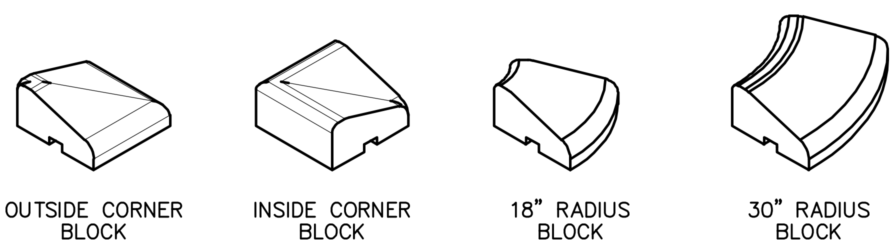
PRECAST CONCRETE DUAL FACED SLOPED MOUNTABLE CURB

DRAWING NUMBER	CH-150-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



SLOPED MOUNTABLE CURB





CORNER SEGMENTS

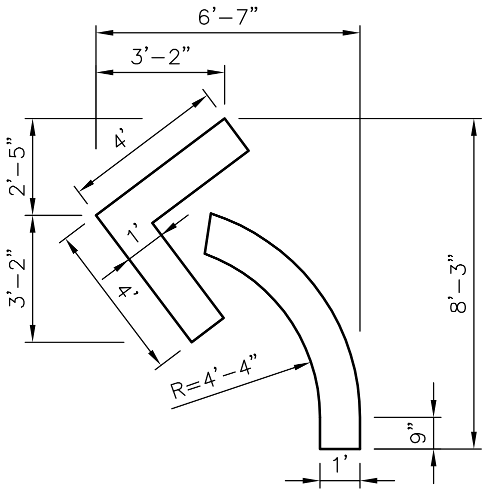
NOTES:

1. PRECAST TRAFFIC CURB SHALL BE INSTALLED WITH AN EAS–06 OR EAS–08 TWO PART EPOXY. SEE STD. DWG. CH–300–1.
2. EPOXY SHALL BE PLACED UNDER THE BEARING SURFACE OF THE PRECAST TRAFFIC CURB.
3. APPLY SUFFICIENT AMOUNT OF EPOXY TO ENSURE UNIFORM COVERAGE OF APPROXIMATELY ¼" ACROSS THE BEARING SURFACE. THE EPOXY SHALL SQUEEZE–OUT ALONG ALL EDGES.

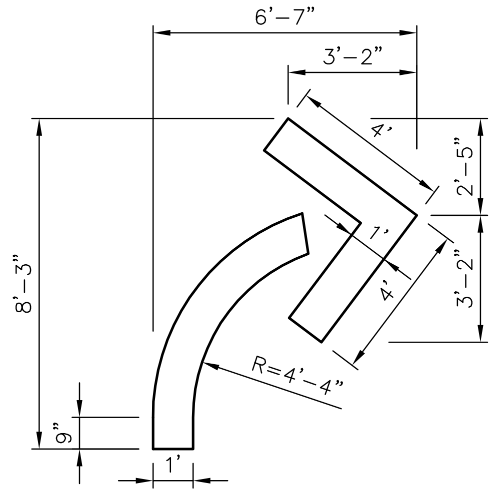
City of Bellevue

PRECAST CONCRETE SLOPED MOUNTABLE CURB

DRAWING NUMBER	CH–160–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



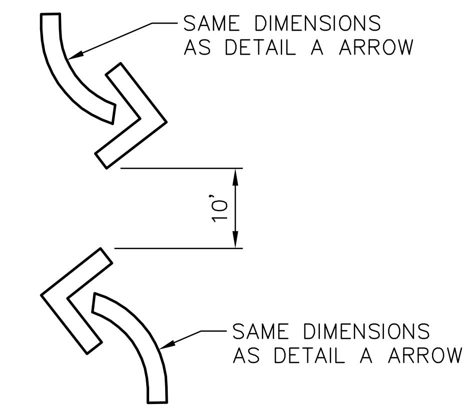
DETAIL A - LEFT



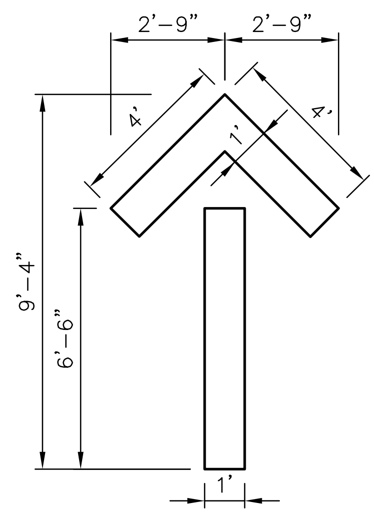
DETAIL B - RIGHT

NOTES:

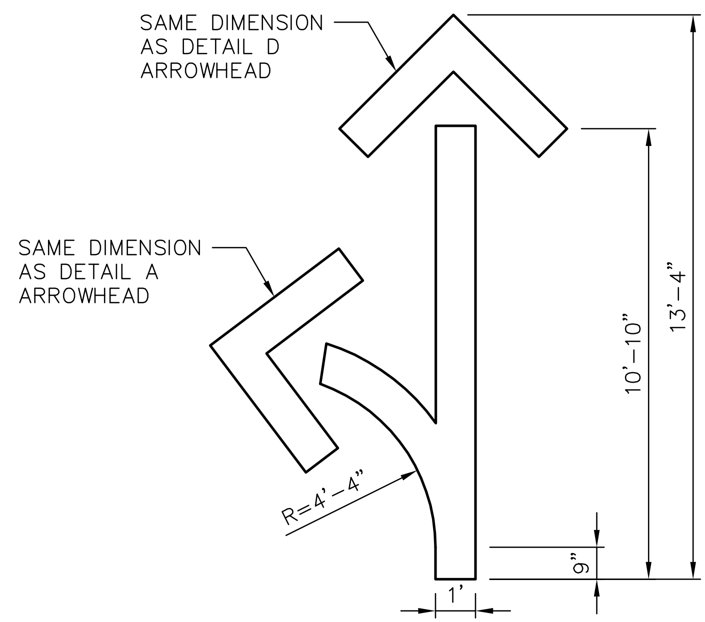
1. MATERIAL SHALL BE THERMOPLASTIC UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. SEE STD. DWG. CH–300–1 FOR MATERIAL SPECIFICATIONS.



DETAIL C - TWO WAY LEFT TURN

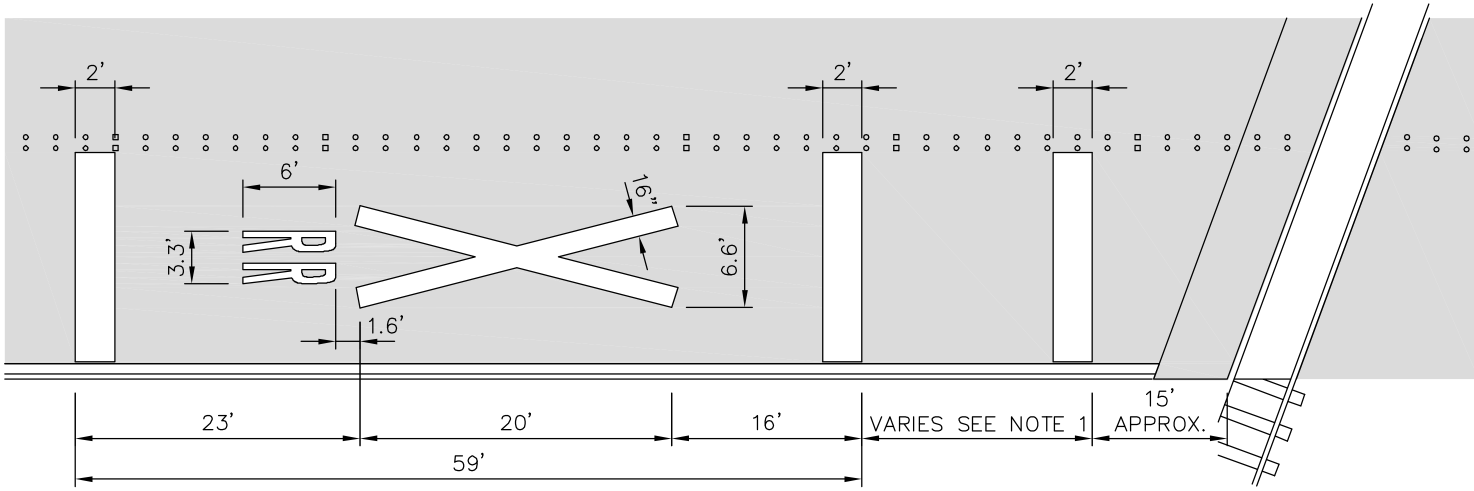


DETAIL D - STRAIGHT

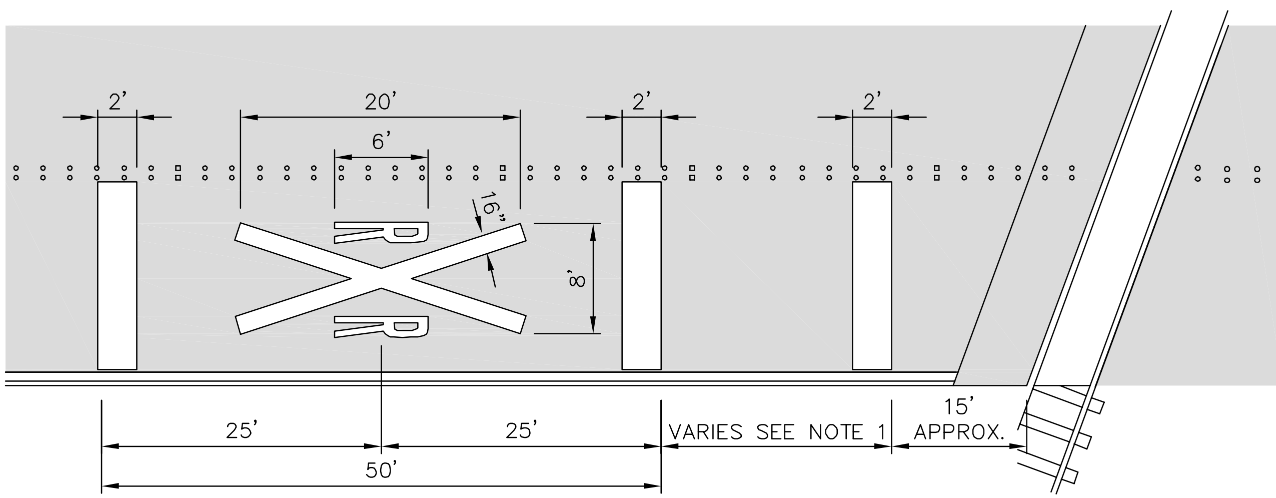


DETAIL E - STRAIGHT/LEFT

City of Bellevue	PAVEMENT ARROW MARKINGS	DRAWING NUMBER	CH–170–1
		SCALE	NONE
		REVISION DATE	1/18
		DEPARTMENT	TRANS



HIGHWAY-RAIL GRADE CROSSING
PAVEMENT MARKINGS



ALTERNATE "WIDE" PAVEMENT
MARKINGS

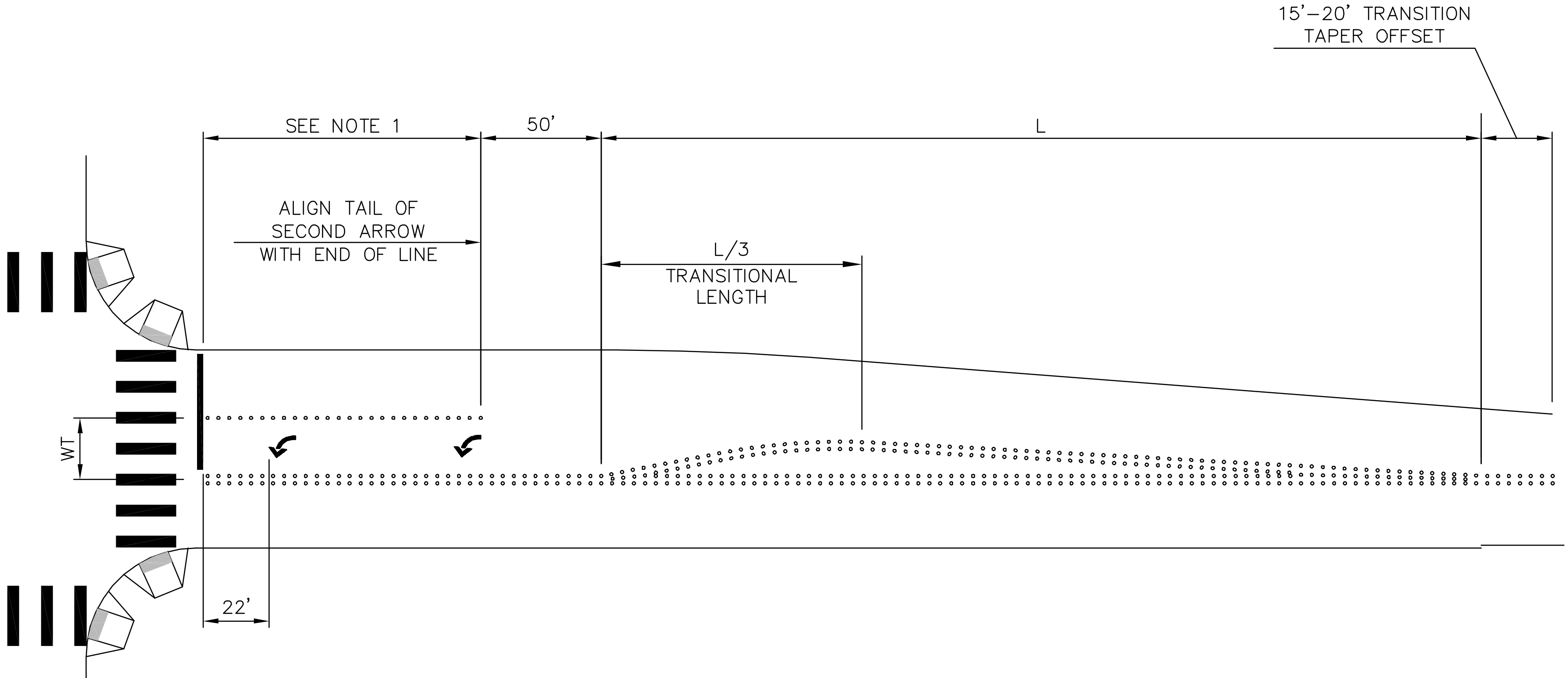
NOTES:

1. FOR DISTANCE, SEE CHAPTER 2C, TABLE 2C-4 OF THE MUTCD.
2. MATERIAL SHALL BE THERMOPLASTIC UNLESS OTHERWISE APPROVED BY THE ENGINEER.
3. USE ALTERNATE "WIDE" MARKINGS ONLY WHEN APPROVED BY THE ENGINEER.

City of Bellevue

HIGHWAY – RAIL GRADE CROSSING
PAVEMENT MARKINGS

DRAWING NUMBER	CH-180-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



WT = WIDTH OF TURN LANE ADDED

L = LENGTH OF TAPER

NOTES:

1. SEE ENGINEER FOR POCKET LENGTH.
2. SEE SECTION 3.2.3.2 FOR MINIMUM TAPER LENGTH.

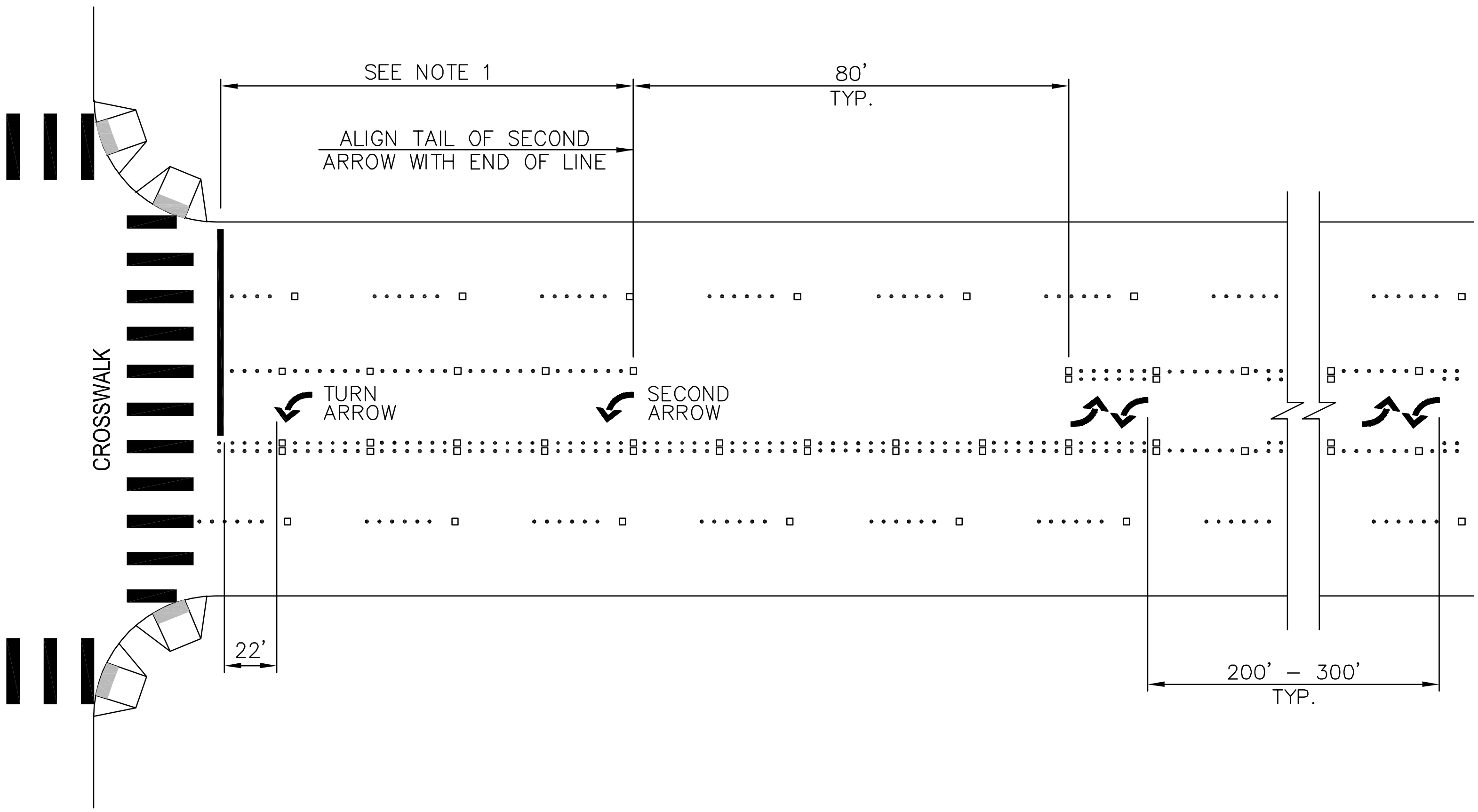
City of Bellevue

NONCONTINUOUS LEFT TURN LANE

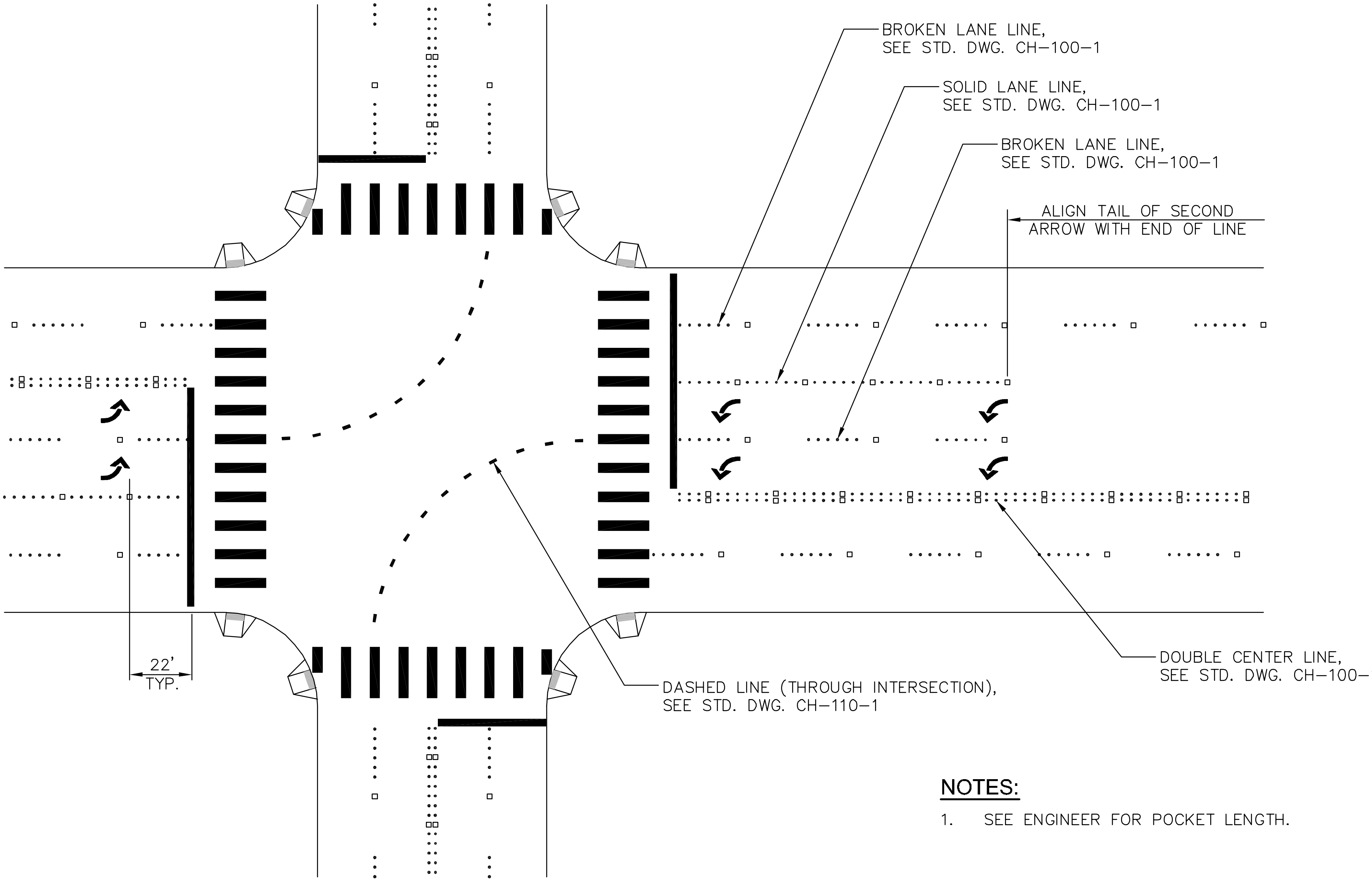
DRAWING NUMBER	CH–190–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

NOTES:

1. SEE ENGINEER FOR POCKET LENGTH.
2. DIMENSIONS SHOWN MAY BE MODIFIED TO ACCOMMODATE DRIVEWAYS.



City of Bellevue	
LEFT TURN AND TWO WAY LEFT TURN LANE	
DRAWING NUMBER	CH–200–1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS



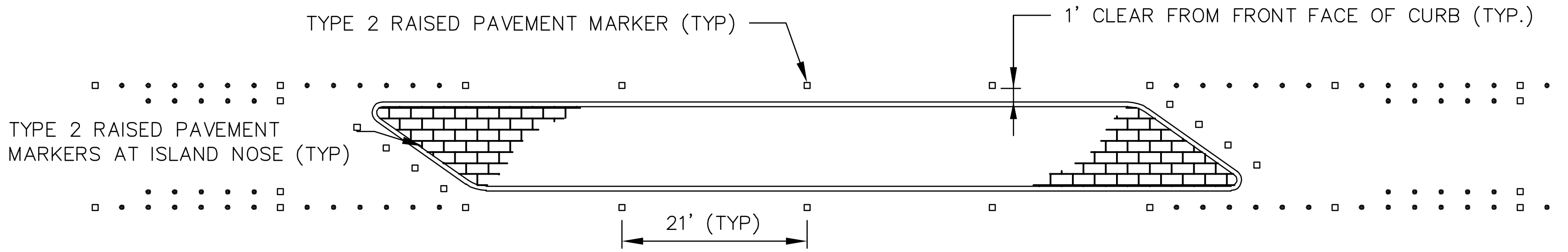
NOTES:

1. SEE ENGINEER FOR POCKET LENGTH.

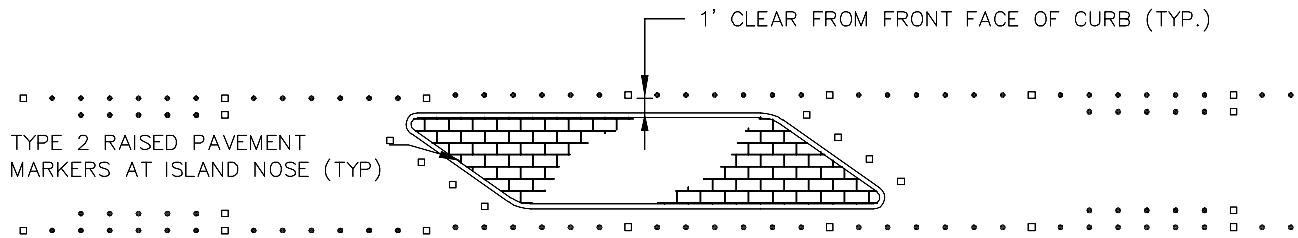
City of Bellevue

DUAL LEFT TURN AT INTERSECTION

DRAWING NUMBER	CH–210–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



TYPICAL CHANNELIZATION (MEDIAN LENGTH >50')
NOT TO SCALE



TYPICAL CHANNELIZATION (MEDIAN LENGTH <50')
NOT TO SCALE

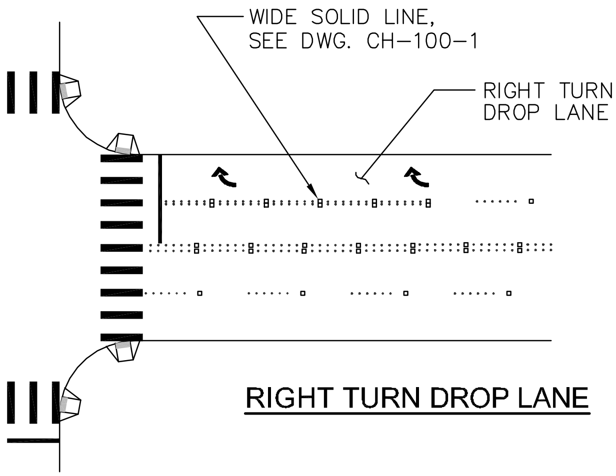
NOTES:

1. FOR CURB NOSE DIMENSIONS, SEE STD. DWG. RC–121–1
2. FOR MEDIANS WITH CROSSWALKS, SEE STD. DWG. CW–110–1.
3. RPMs SHALL NOT BE INSTALLED ON CEMENT CONCRETE CURB OR GUTTER.

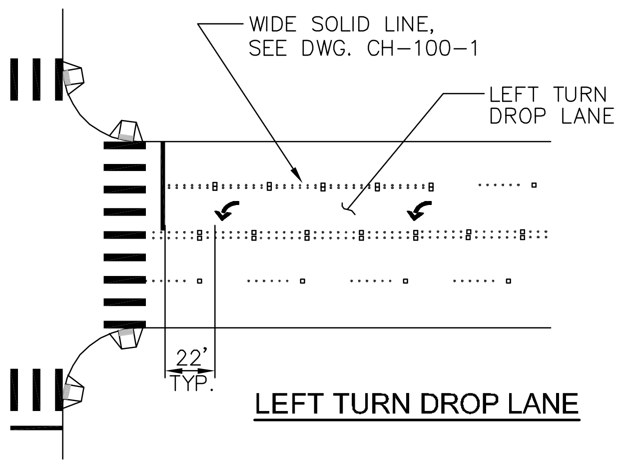
City of Bellevue

TYPICAL CHANNELIZATION AT MEDIAN ISLANDS

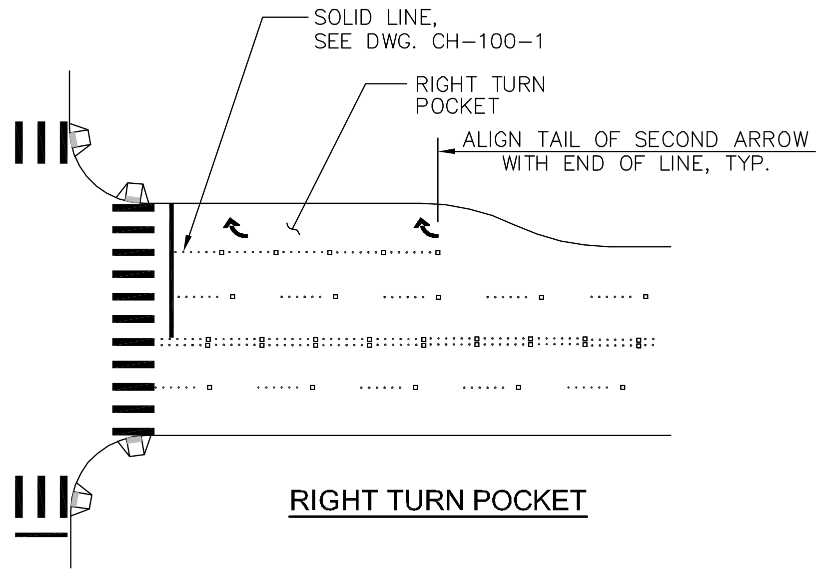
DRAWING NUMBER	CH–220–1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS



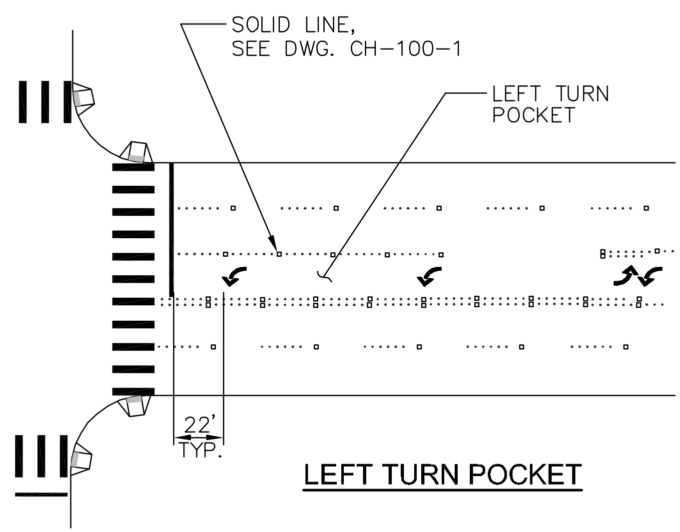
RIGHT TURN DROP LANE



LEFT TURN DROP LANE



RIGHT TURN POCKET



LEFT TURN POCKET

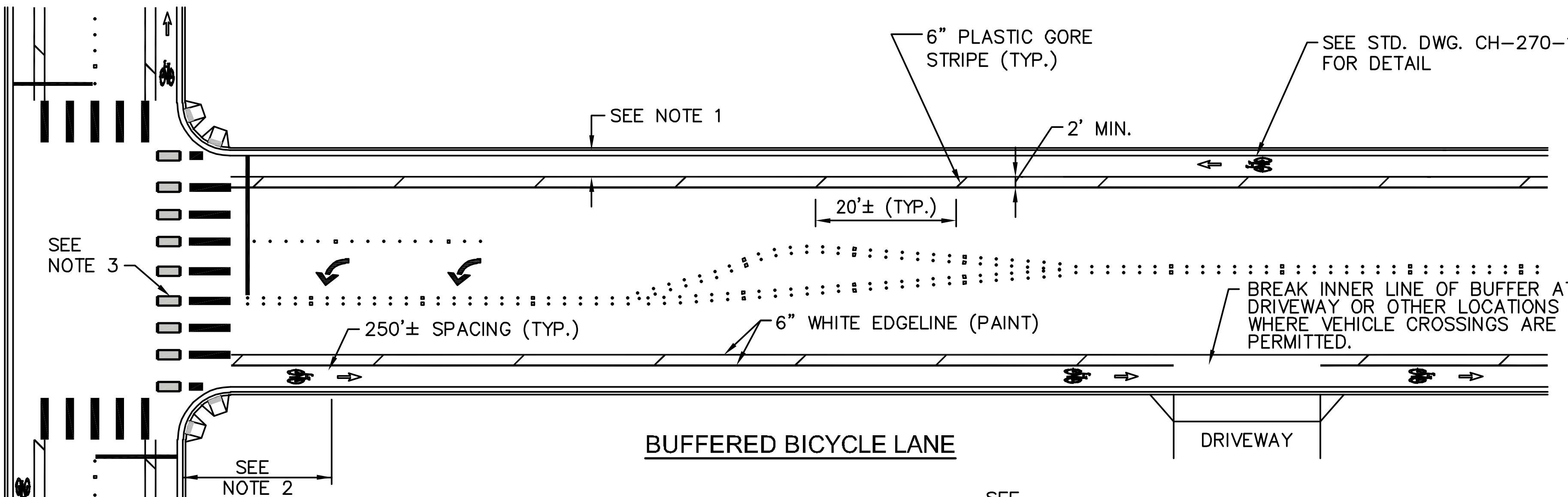
NOTES:

1. RIGHT AND LEFT TURN DROP LANES SHOULD ALSO BE SUPPLEMENTED WITH R3–7 (GROUND MOUNT) AND/OR R3–5 (OVERHEAD MOUNT) MANDATORY MOVEMENT LANE CONTROL SIGNS.

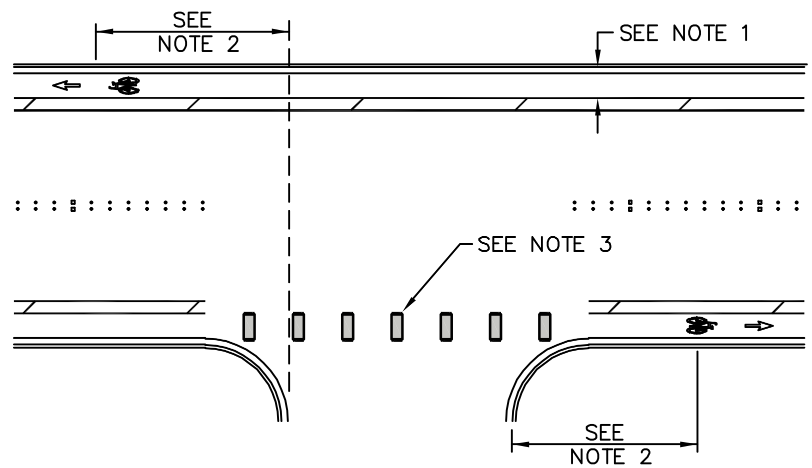
City of Bellevue

DROP LANES AND POCKETS

DRAWING NUMBER	CH–230–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



BUFFERED BICYCLE LANE



SIDE STREET TREATMENT

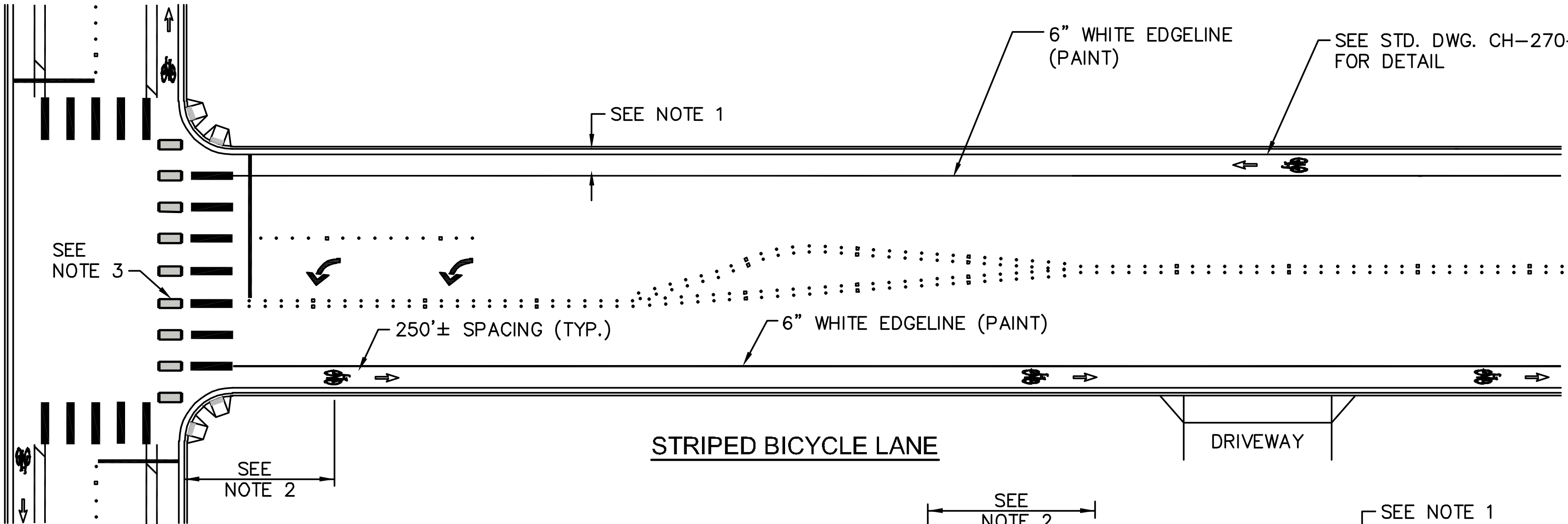
NOTES:

1. MINIMUM BIKE LANE WIDTH IS 5 FEET, NOT INCLUDING GUTTER.
2. 40' TYPICAL (ADJUST AS NECESSARY FOR VEHICLE TRACKING).
3. SEE STD. DWG. CH-110-1 FOR BICYCLE CROSSING MARKINGS.
4. CONSIDER THE USE OF TWO-STAGE TURN BOXES AT MULTI-LANE OR HIGHER SPEED SIGNALIZED INTERSECTIONS. CONTACT THE REVIEW ENGINEER FOR SITE SPECIFIC REQUIREMENTS. INTERSECTION OPERATION ANALYSIS REQUIRED.

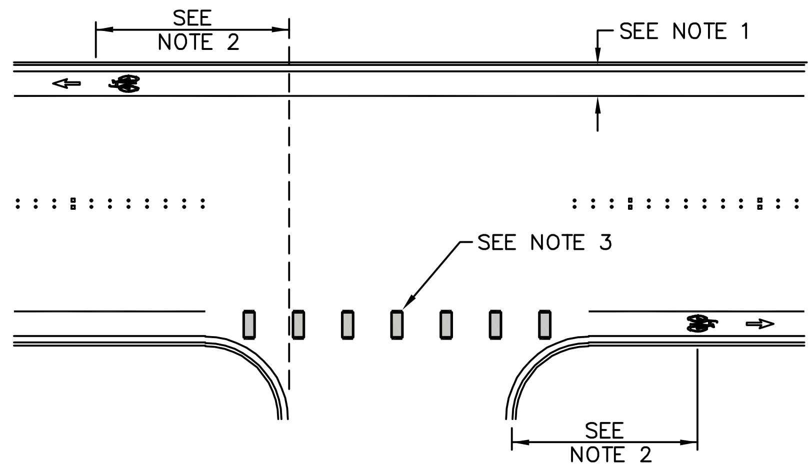
City of Bellevue

BUFFERED BICYCLE LANE CHANNELIZATION

DRAWING NUMBER	CH-240-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



STRIPED BICYCLE LANE



SIDE STREET TREATMENT

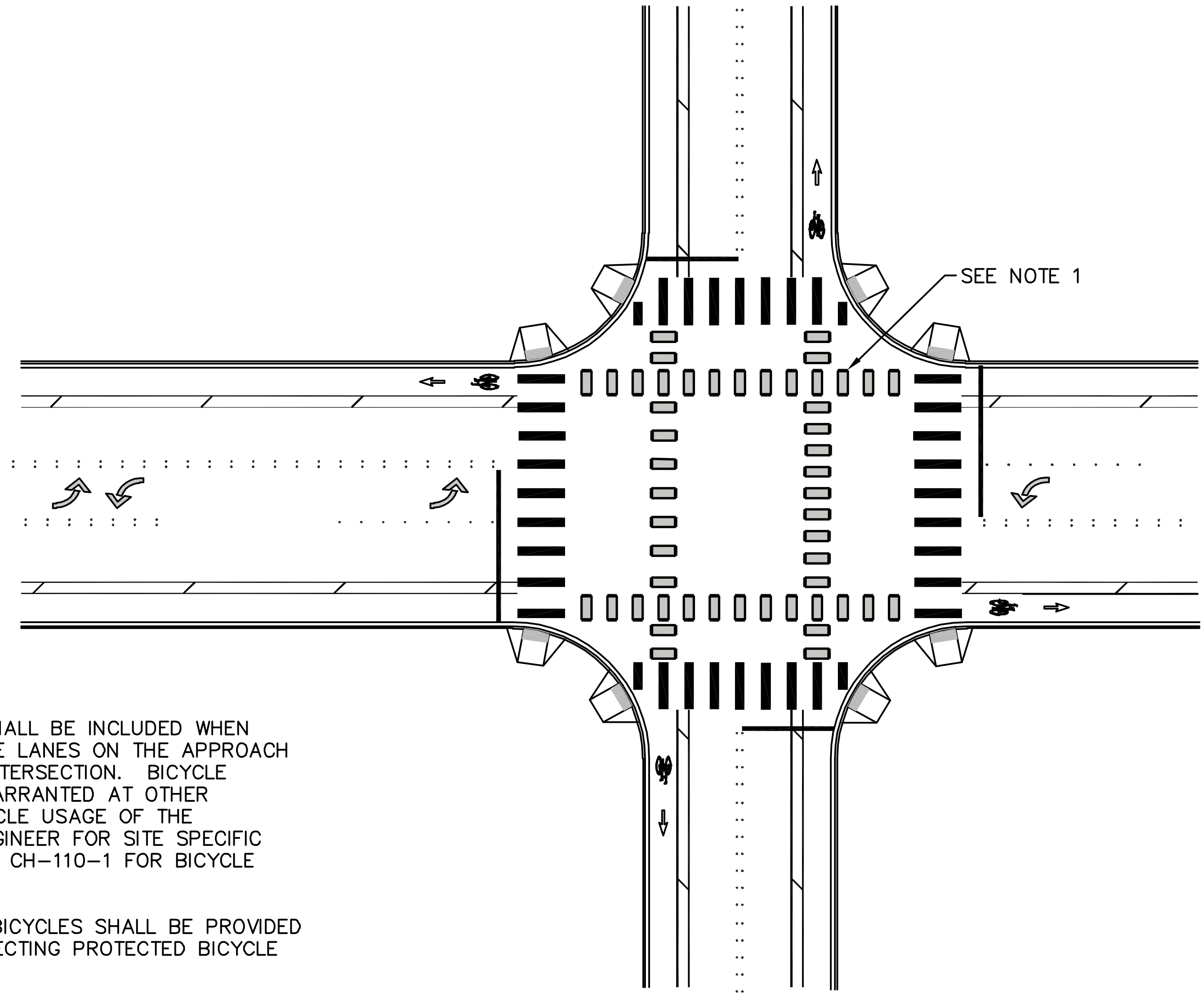
NOTES:

1. MINIMUM BIKE LANE WIDTH IS 5 FEET, NOT INCLUDING GUTTER.
2. 40' TYPICAL (ADJUST AS NECESSARY FOR VEHICLE TRACKING.)
3. SEE STD. DWG. CH-110-1 FOR BICYCLE CROSSING MARKINGS.
4. CONSIDER THE USE OF TWO-STAGE TURN BOXES AT MULTI-LANE OR HIGHER SPEED SIGNALIZED INTERSECTIONS. CONTACT THE REVIEW ENGINEER FOR SITE SPECIFIC REQUIREMENTS. INTERSECTION OPERATION ANALYSIS REQUIRED.
5. BUFFERED BIKE LANE SHALL BE EVALUATED AND IMPLEMENTED WHERE SPACE IS AVAILABLE.

City of Bellevue

STRIPED BICYCLE LANE CHANNELIZATION

DRAWING NUMBER	CH-241-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



NOTES:

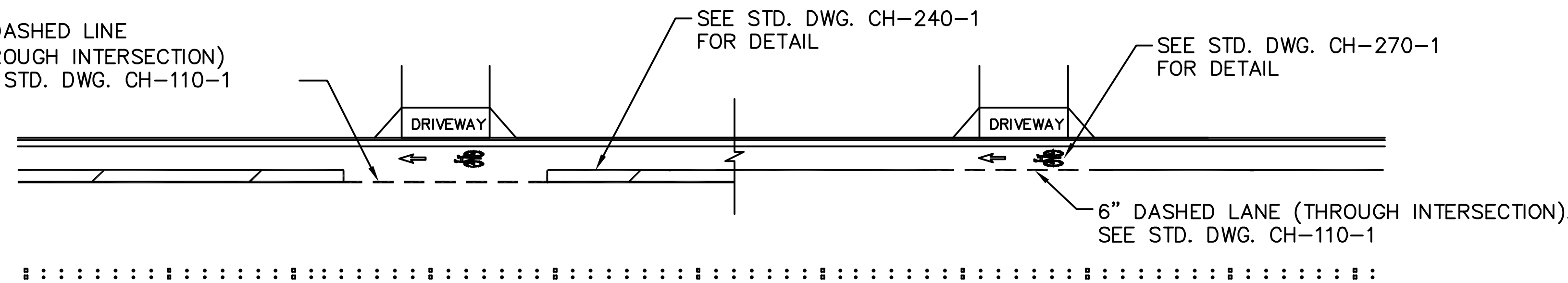
1. BICYCLE THROUGH MARKINGS SHALL BE INCLUDED WHEN THERE ARE DESIGNATED BICYCLE LANES ON THE APPROACH AND RECEIVING LEGS OF THE INTERSECTION. BICYCLE THROUGH MARKINGS MAY BE WARRANTED AT OTHER LOCATIONS DEPENDING ON BICYCLE USAGE OF THE INTERSECTION. SEE REVIEW ENGINEER FOR SITE SPECIFIC REQUIREMENTS. SEE STD. DWG. CH-110-1 FOR BICYCLE CROSSING MARKINGS.

2. TWO-STAGE TURN BOXES FOR BICYCLES SHALL BE PROVIDED AT INTERSECTIONS WITH INTERSECTING PROTECTED BICYCLE LANES WHERE POSSIBLE.

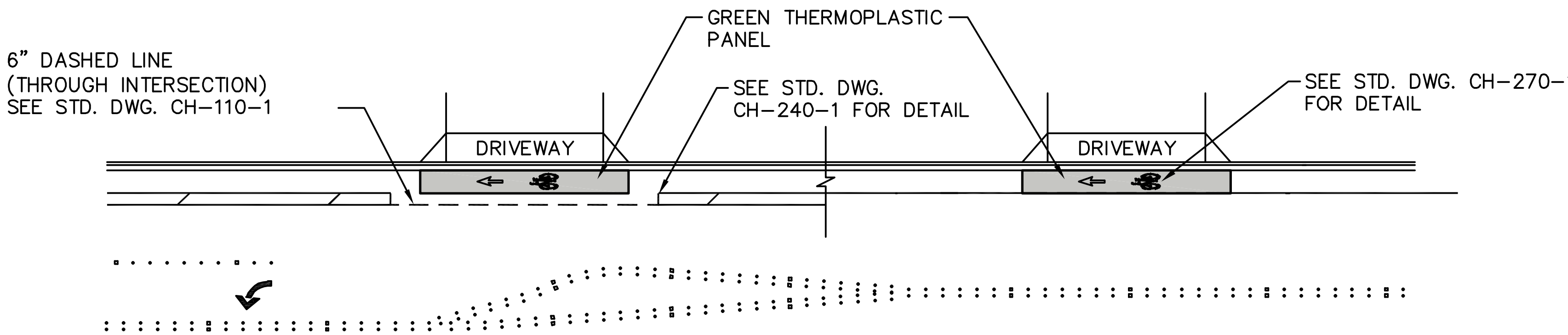
City of Bellevue

BICYCLE LANES AT INTERSECTIONS

DRAWING NUMBER	CH-250-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



BICYCLE LANE TREATMENT AT SINGLE FAMILY DRIVEWAY



BICYCLE LANE TREATMENT AT COMMERCIAL OR MULTI-FAMILY DRIVEWAY

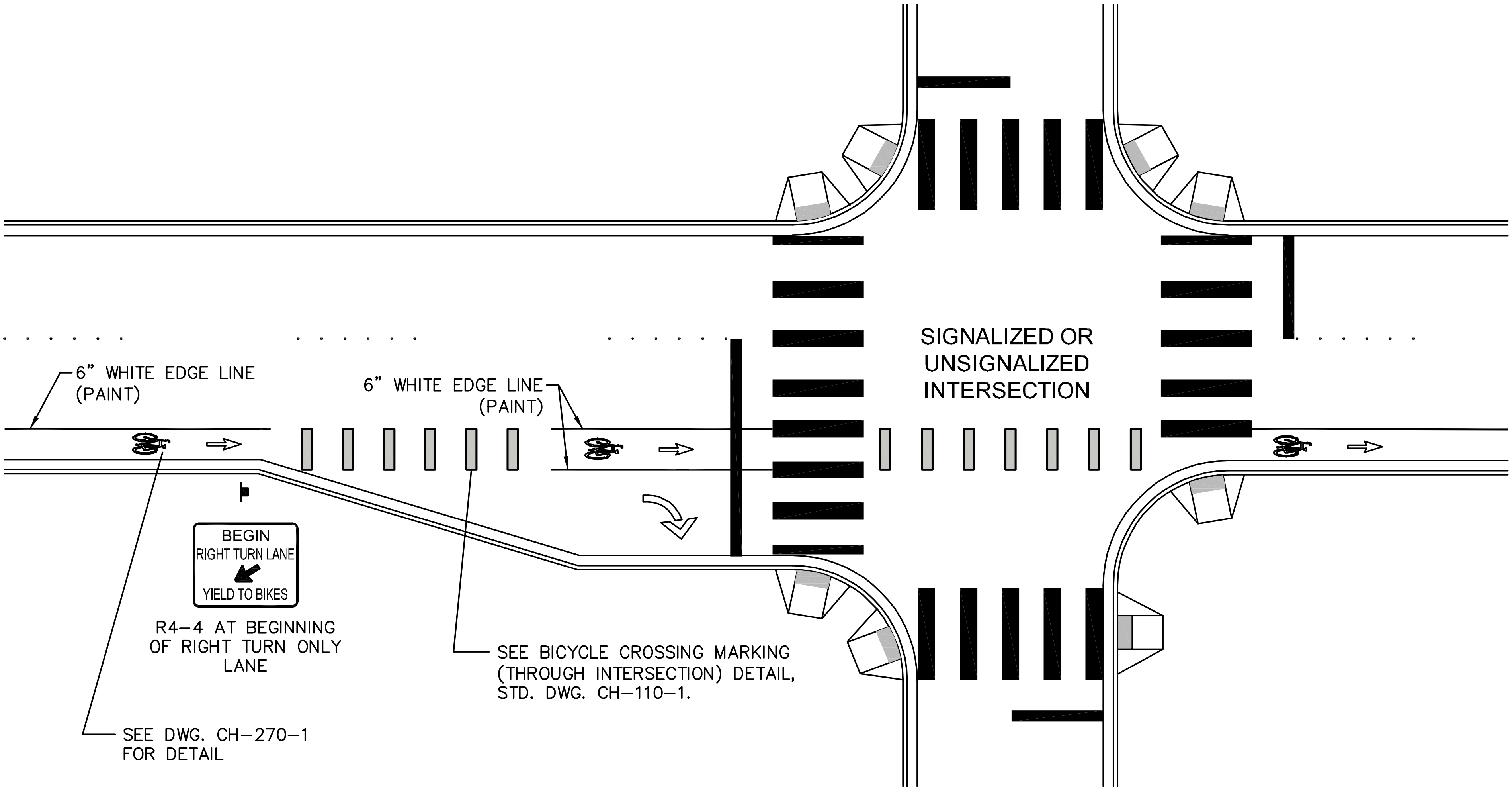
NOTES:

1. MULTI-FAMILY IS DEFINED AS A BUILDING, HOUSING DEVELOPMENT, OR TOWNHOMES WITH 5 OR MORE HOUSING UNITS.

City of Bellevue

DRIVEWAY BICYCLE TREATMENT CHANNELIZATION

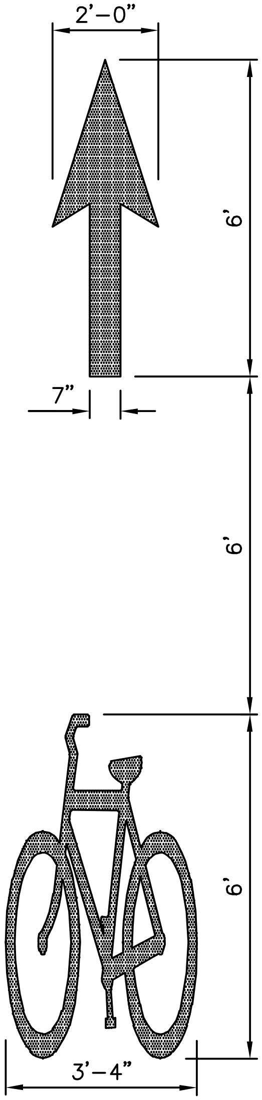
DRAWING NUMBER	CH-251-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



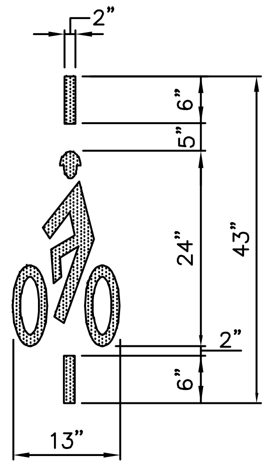
City of Bellevue

BIKE LANE TREATMENT AT
RIGHT TURN POCKET

DRAWING NUMBER	CH–260–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



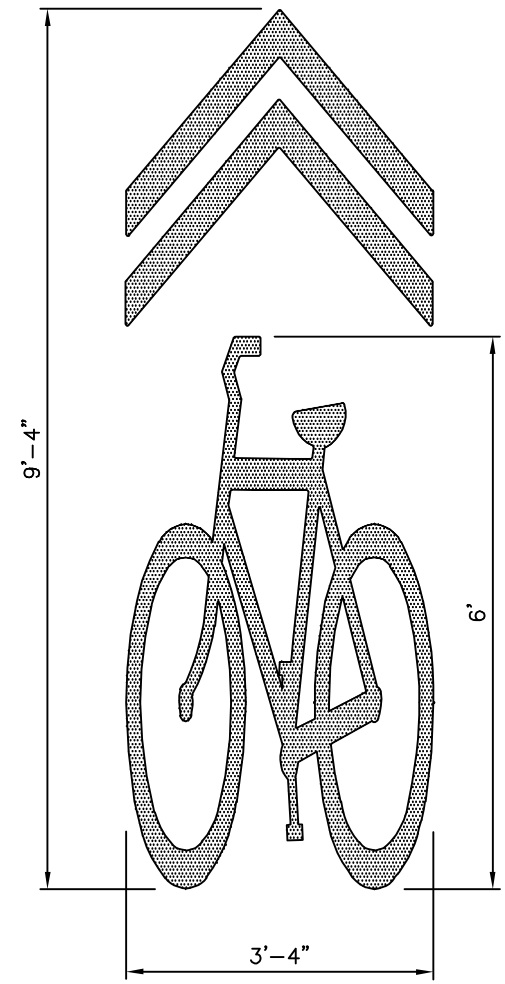
BICYCLE LANE SYMBOL



BICYCLE DETECTOR MARKING

NOTES:

1. BICYCLE LANE SYMBOL, SHARED LANE SYMBOL, AND BICYCLE DETECTOR MARKING SHALL BE LOW PROFILE, NON–SKID, PREFORMED THERMOPLASTIC, 90 MIL.
2. BICYCLE MARKINGS SHALL ALWAYS FACE LEFT.
3. SHARED LANE SYMBOL SHALL BE CENTERED IN THE TRAVEL LANE UNLESS APPROVED IN ADVANCE BY THE ENGINEER.
4. ANY ADJUSTMENTS TO DIMENSIONS SHALL BE APPROVED IN ADVANCE BY THE ENGINEER.

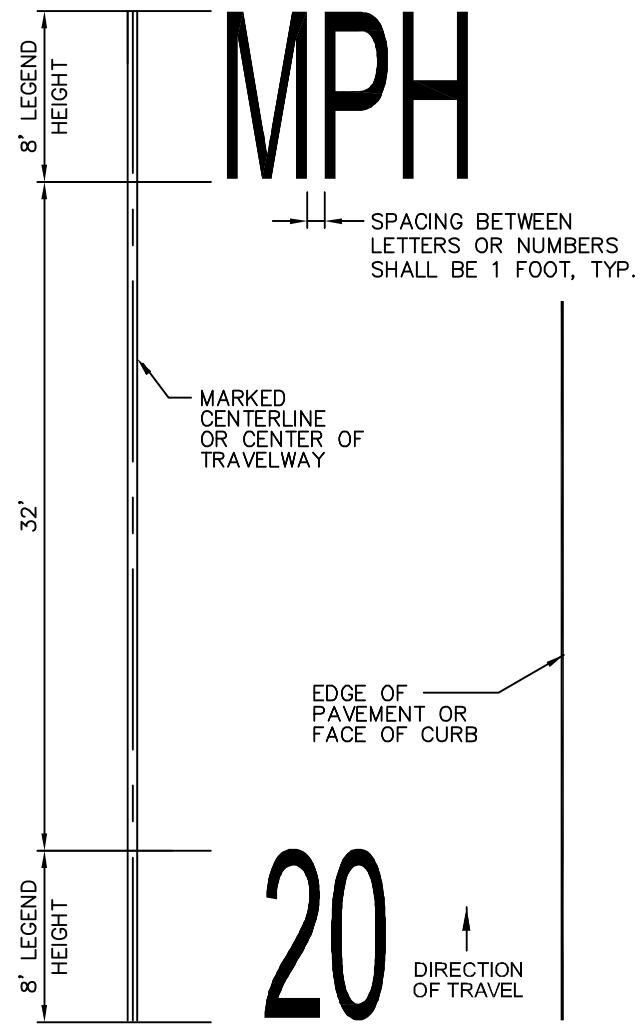


SHARED LANE SYMBOL

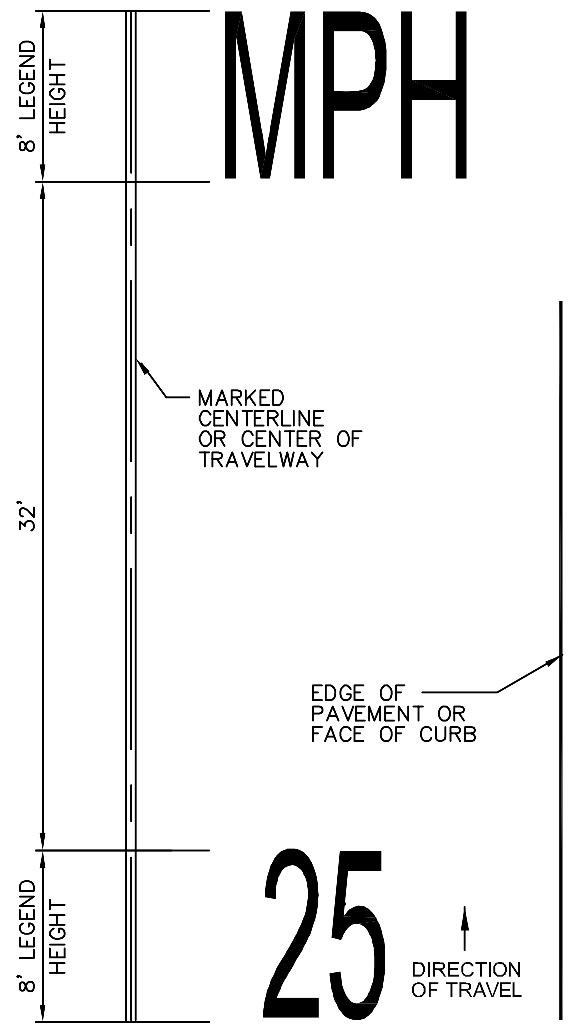
City of Bellevue

BICYCLE FACILITY MARKINGS

DRAWING NUMBER	CH–270–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



20 MPH LEGEND

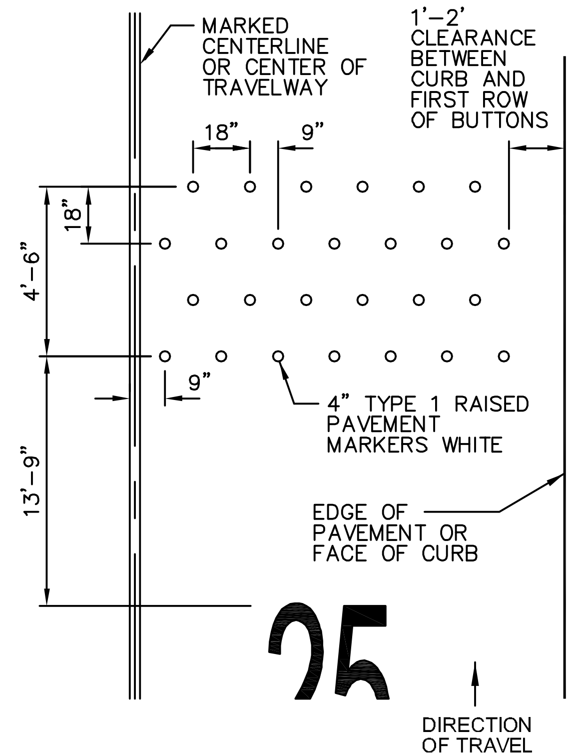


25 MPH LEGEND

NOTES:

1. RUMBLE STRIP SHALL BE PLACED ACROSS ENTIRE ROADWAY WIDTH IF NO CENTERLINE EXISTS.

2. LEGEND MATERIAL USED SHALL BE PREFORMED THERMOPLASTIC (125 MIL. MIN.), UNLESS OTHERWISE APPROVED BY THE ENGINEER.



RUMBLE STRIP

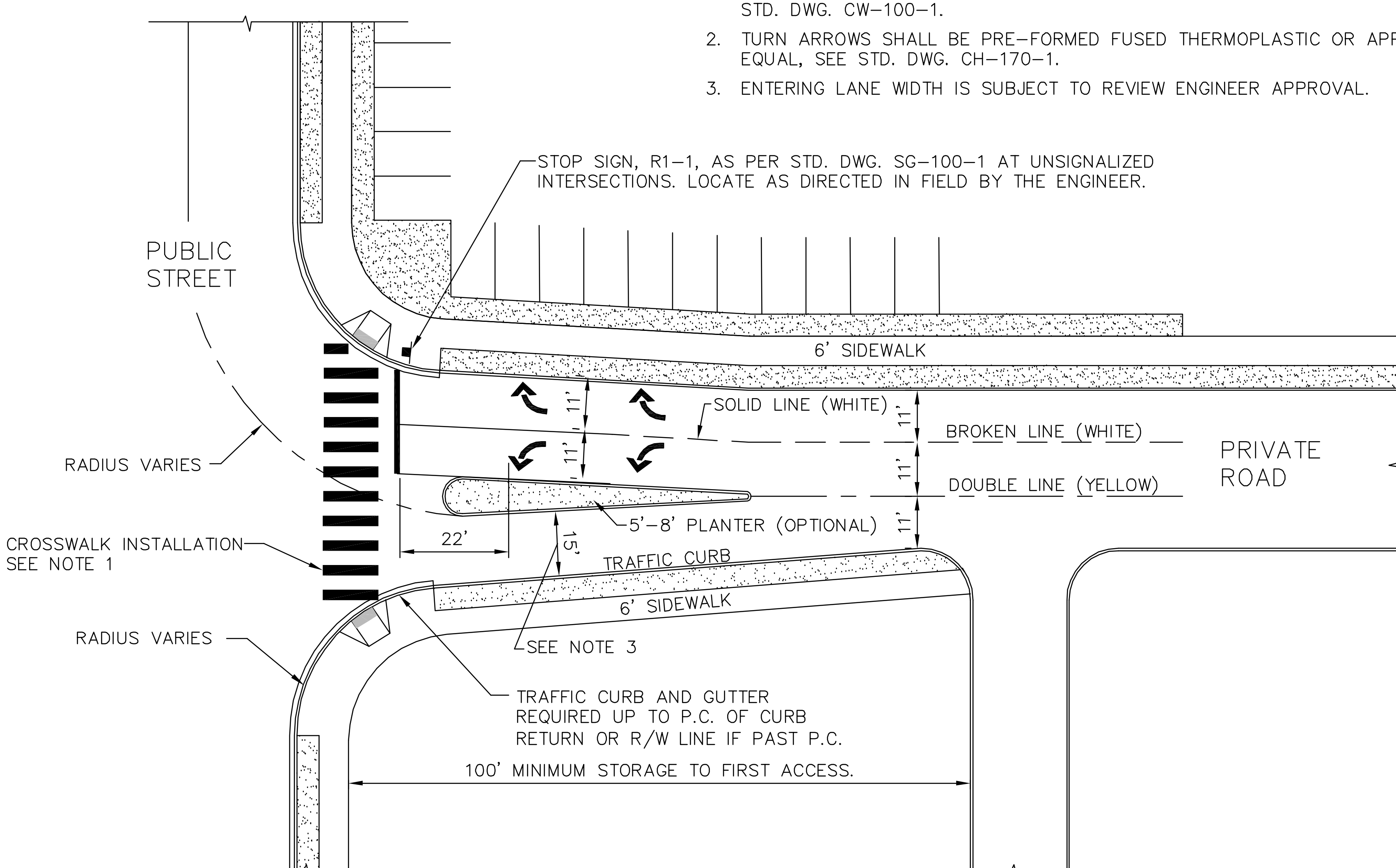
City of Bellevue

SPEED LIMIT PAVEMENT LEGEND AND RUMBLE STRIP

DRAWING NUMBER	CH–280–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

NOTES:

1. CROSSWALK SHALL BE HOT APPLIED THERMOPLASTIC OR APPROVED EQUAL, SEE STD. DWG. CW–100–1.
2. TURN ARROWS SHALL BE PRE–FORMED FUSED THERMOPLASTIC OR APPROVED EQUAL, SEE STD. DWG. CH–170–1.
3. ENTERING LANE WIDTH IS SUBJECT TO REVIEW ENGINEER APPROVAL.



City of Bellevue

PRIVATE COMMERCIAL ROAD/PUBLIC STREET INTERSECTION

DRAWING NUMBER	CH–290–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

CHANNELIZATION MATERIALS

THERMOPLASTIC:

1. TYPE A PLASTIC PAVEMENT MARKINGS SHALL BE HYDROCARBON BASED PLASTIC ONLY. NO ALKYD BASED TYPE A PLASTIC PAVEMENT MARKING MATERIAL WILL BE ALLOWED ON PROJECTS IN THE CITY. REFER TO SECTION 9–34.3 OF THE WSDOT STANDARD SPECIFICATIONS FOR ADDITIONAL INFORMATION. TYPE A PLASTIC PAVEMENT MARKINGS SHALL BE PAVEMARK HYDROCARBON BC2000 HIGH PERFORMANCE EXTRUDE THERMOPLASTIC, MANUFACTURED BY ENNIS–FLINT.
2. TYPE B PLASTIC PAVEMENT MARKINGS SHALL BE ALKYD BASED PLASTIC ONLY. NO HYDROCARBON BASED TYPE B PLASTIC PAVEMENT MARKING MATERIAL WILL BE ALLOWED ON PROJECTS IN THE CITY. REFER TO SECTION 9–34.3 OF THE WSDOT STANDARD SPECIFICATIONS FOR ADDITIONAL INFORMATION. TYPE B PLASTIC PAVEMENT MARKINGS SHALL BE PREMARK, MANUFACTURED BY ENNIS–FLINT OR OPTAMARK BY GEVEKO MARKINGS, INC.
3. TYPE B PLASTIC PAVEMENT MARKINGS SPECIFIED ON THE PLANS TO BE APPLIED ON PORTLAND CEMENT CONCRETE SHALL BE INSTALLED ON CLEAN, DRY CONCRETE IN CONJUNCTION WITH PREMARK LOW–VOC SEALER IN ACCORDANCE WITH THE MANUFACTURER'S APPLICATION INSTRUCTIONS FOR PORTLAND CEMENT CONCRETE. NEW CONCRETE SHALL BE ALLOWED TO CURE A MINIMUM OF 45 DAYS BEFORE APPLICATION.
4. TYPE D PLASTIC PAVEMENT MARKINGS SHALL BE HPS–6 DURASET MMA, MANUFACTURED BY ENNIS–FLINT.
5. PLASTIC PAVEMENT MARKINGS ON PORTLAND CEMENT CONCRETE PAVEMENT SHALL BE TYPE D, EXCEPT FOR WORD AND SYMBOL MARKINGS SPECIFIED IN THE PLANS TO BE TYPE B.

PAINT:

1. ALL PAINT SHALL BE LOW VOC SOLVENT BASED PAINT. WATERBORNE PAINT WILL NOT BE PERMITTED FOR USE.

RAISED PAVEMENT MARKERS:

1. TYPE 1 RAISED PAVEMENT MARKERS SHALL BE ALPINE PRODUCTS MODEL ANR–Y1 OR ANR–W1, STIMSONITE MODEL B10 OR APPROVED EQUAL.
2. TYPE 2 RAISED PAVEMENT MARKERS SHALL BE ENNIS FLINT STIMSONITE MODEL C80, 980, OR 953, OR APPROVED EQUAL.

DELINEATOR POSTS:

1. DELINEATOR POSTS AT PRECAST CURB NOSES SHALL BE FG–300–UR, 24" URETHANE MANUFACTURED BY PEXCO. WHITE POSTS SHALL HAVE (2) 3" REFL. HIP WHITE WRAPS AND A WHITE BASE; YELLOW POSTS SHALL HAVE (2) 3" REFL. HIP YELLOW WRAPS AND A YELLOW BASE.

ADHESIVES:

1. ALL RAISED PAVEMENT MARKERS INSTALLED ON HMA PAVEMENTS SHALL BE INSTALLED WITH A BITUMINOUS ADHESIVE, HOT APPLIED FLEXIBLE MARKER ADHESIVE, PART NUMBER 34270, MANUFACTURED BY CRAFCO, INC.; HE184 FLEXIBLE DOT STICK BITUMINOUS MARKER ADHESIVE MANUFACTURED BY HENRY COMPANY; OR APPROVED EQUAL. INSTALLATION SHALL BE ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
2. ALL RAISED PAVEMENT MARKERS INSTALLED ON PORTLAND CEMENT CONCRETE PAVEMENTS SHALL BE INSTALLED WITH EAS–06 FIRMMARKER TWO–PART EPOXY, MANUFACTURED BY FORREST TECHNICAL COATINGS, OR APPROVED EQUAL. INSTALLATION SHALL BE ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
3. PRECAST TRAFFIC CURB SHALL BE INSTALLED WITH EPOXY ADHESIVE. EPOXY SHALL BE TWO–PART EPOXY, EAS–06 FIRMMARKER OR CURB EPOXY ADHESIVE EAS–08 GRADE 4, MANUFACTURED BY FORREST TECHNICAL COATINGS, OR APPROVED EQUAL. INSTALLATION SHALL BE ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

City of Bellevue

MATERIAL SPECIFICATION FOR CHANNELIZATION

DRAWING NUMBER	CH–300–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

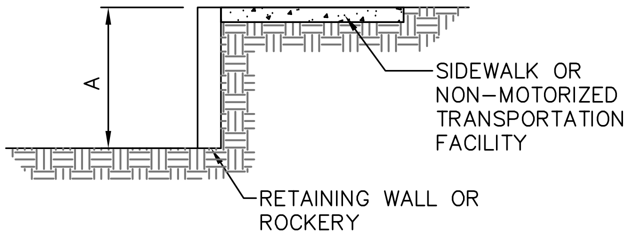
CITY OF BELLEVUE
WASHINGTON

TRANSPORTATION DESIGN MANUAL

RS Drawings

Roadside Safety

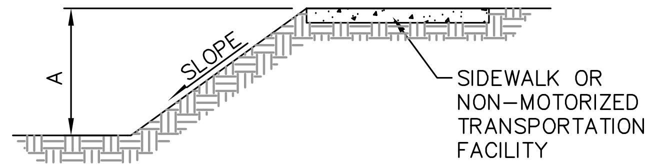
CITY OF BELLEVUE
WASHINGTON



SAFETY RAILING WARRANTED WHEN: DIMENSION "A" ≥ 1 FT

WARRANT 1

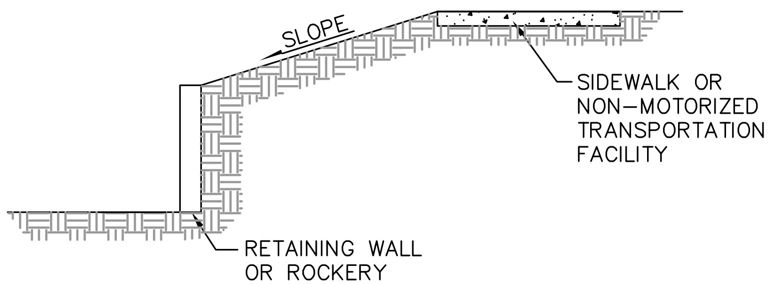
FOR DROP OFF AT BACK OF SIDEWALK



SAFETY RAILING WARRANTED WHEN: SLOPE IS STEEPER THAN 2H:1V AND DIMENSION "A" IS ≥ 1 FOOT

WARRANT 2

FOR SLOPE AT BACK OF SIDEWALK



SAFETY RAILING WARRANT TO BE DETERMINED BY THE ENGINEER

WARRANT 3

FOR SLOPE AND WALL DROP OFF
AT BACK OF SIDEWALK

City of Bellevue

SAFETY RAILING INSTALLATION WARRANTS

DRAWING NUMBER	RS–100–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS

METAL SAFETY RAILING NOTES:

MATERIAL REQUIREMENTS:

1. GALVANIZED STEEL RAILING SHALL BE USED. ALUMINUM MAY BE USED IN DOWNTOWN BELLEVUE.

GENERAL REQUIREMENTS:

1. SHOP DRAWINGS OF RAILING SHALL BE SUBMITTED FOR APPROVAL SHOWING COMPLETE DIMENSIONS AND DETAILS OF FABRICATION AND INCLUDING AN ERECTION DIAGRAM. MATERIALS BEING USED SHALL BE SPECIFIED IN THE SHOP DRAWINGS.
2. PIPE RAILING, PIPE BALUSTERS AND PIPE RAILING SPLICES SHALL BE ADEQUATELY WRAPPED TO ENSURE SURFACE PROTECTION DURING HANDLING AND TRANSPORTATION TO THE JOB SITE.
3. CUTTING SHALL BE DONE BY SAWING OR MILLING AND ALL CUTS SHALL BE TRUE AND SMOOTH. FLAME CUTTING WILL NOT BE PERMITTED.
4. TOP AND BOTTOM RAILS SHALL BE PARALLEL TO GRADE AND ALL POSTS AND BALUSTERS SHALL BE VERTICAL (NOTE: NOT ALWAYS PERPENDICULAR TO TOP AND BOTTOM RAILS).
5. PLACE EXPANSION GAP AT EVERY OTHER PANEL.
6. ONLY USE PANEL HEIGHT OF 36 INCHES AFTER APPROVAL OF THE TRAFFIC ENGINEER.
7. SLEEVES SHALL BE 6" SCHEDULE 40 PVC PIPE. IF RAILING IS TO BE INSTALLED IN EXISTING SIDEWALK, HOLES SHALL BE CORE DRILLED 2 INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE POST, AND NO LESS THAN 6" FROM THE EDGE OF CONCRETE.
8. AVOID PLACING SAFETY RAIL IN SIGHT LINES. SEE STD. DWGS. RL–100–1, RL–110–1, AND RL–120–1.
9. SEE SECTION 3.4.1.2 OF THE DESIGN MANUAL FOR ADDITIONAL INFORMATION.

STEEL RAILING REQUIREMENTS:

1. POST AND RAIL MATERIAL SHALL BE SCHEDULE 40 STEEL PIPE CONFORMING TO ASTM A 53, GRADE B. BALUSTERS SHALL BE SOLID STEEL BARS CONFORMING TO AASHTO M 183.
2. SPOT WELDING IS NOT ALLOWED. ALL WELDS SHALL ENCOMPASS THE ENTIRE JOINT.
3. SAFETY RAILING WILL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
4. ANY FIELD CUTTING OR WELDING AREAS SHALL BE GROUND SMOOTH AND COATED WITH AT LEAST 2 COATS OF COLD GALVANIZED PAINT

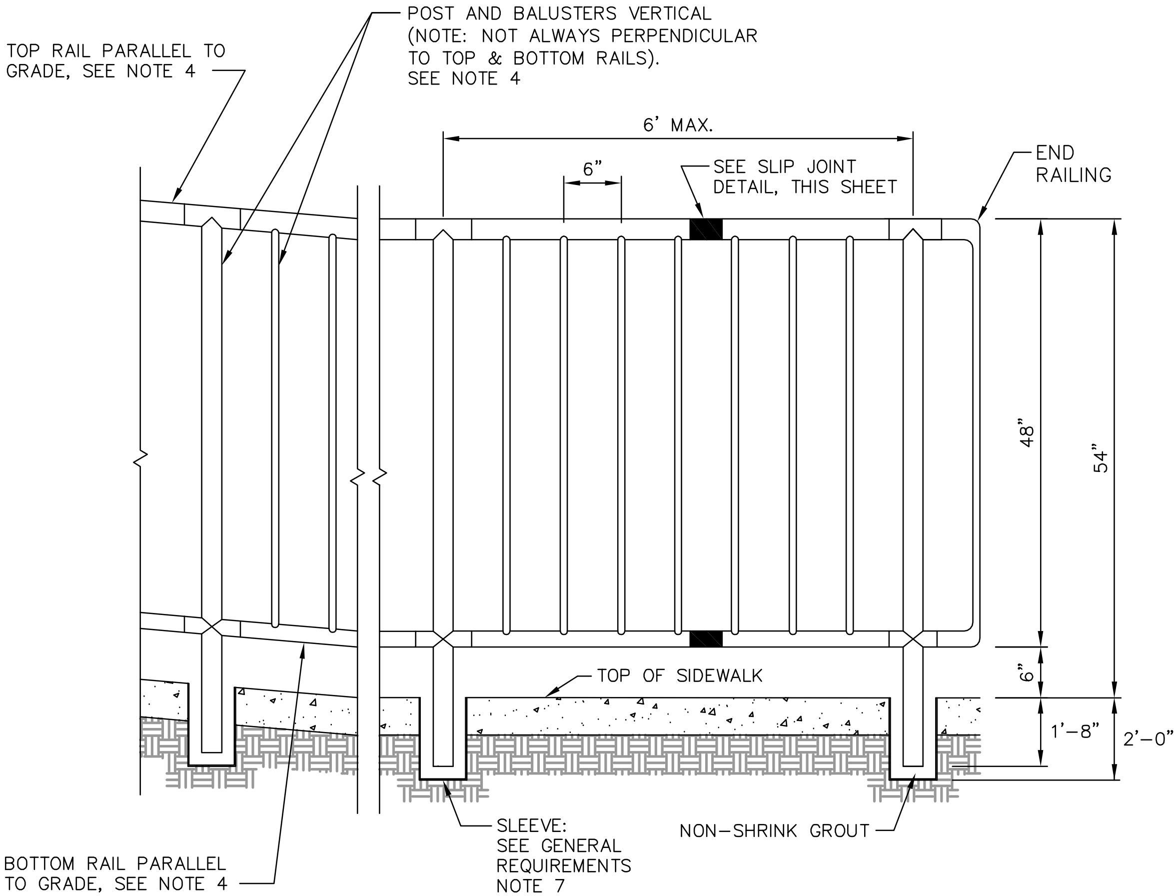
ALUMINUM RAILING REQUIREMENTS:

1. RAILING SHALL BE CV PIPE RAIL OR APPROVED EQUIVALENT. INSTALLATION PER MANUFACTURER'S RECOMMENDATIONS. BALUSTERS SHALL BE SOLID ALUMINUM FULL WELDED IN PLACE.
2. ALL ALUMINUM PARTS SHALL BE GIVEN A CLEAR ANODIC COATING AT LEAST 0.0006 INCH THICK AND BE HOT WATER SEALED AND SHALL HAVE A UNIFORM FINISH.
3. PIPE RAILING AND PIPE RAILING SPLICES MAY BE HEATED TO NOT MORE THAN 400°F FOR A PERIOD NOT TO EXCEED 30 MINUTES TO FACILITATE FORMING OR BENDING.
4. WELDING OF ALUMINUM SHALL BE IN ACCORDANCE WITH THE LATEST AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.
5. RAILS, POSTS AND FORMED ELBOWS SHALL BE A.S.T.M. B–241 OR B–429 ALLOW 6063–T6 SCHEDULE 40 (STD PIPE). BRACKETS, END CAPS AND OTHER FITTINGS SHALL BE A.S.T.M. 6063–T5. SPLICES AND REINFORCING SLEEVES SHALL BE DRAWN ALUMINUM TUBING 6063–T832. SLEEVE I.D. SHALL BE 1" GREATER THAN POST O.D.

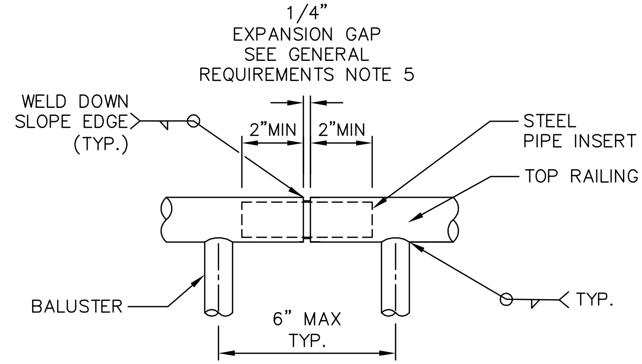
City of Bellevue

NOTES FOR METAL SAFETY RAILING

DRAWING NUMBER	RS–110–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



METAL SAFETY RAILING DETAIL



SLIP JOINT DETAIL

MATERIAL DIMENSIONS

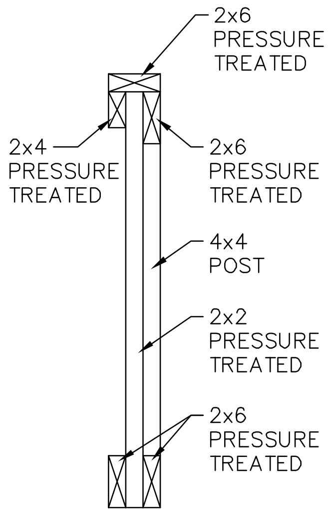
PANEL HEIGHT	48"
TOP RAIL/POST	2½" NOM.
BOTTOM RAIL	2" NOM.
BALUSTER	⅞"ø BAR

NOTES REFERENCED ON THIS SHEET ARE LOCATED ON STD. DWG. RS-110-1

City of Bellevue

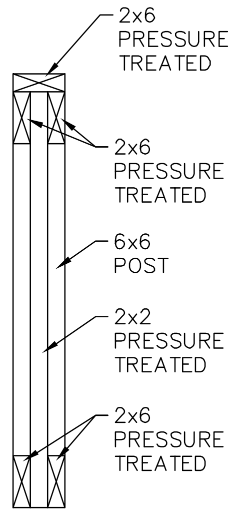
METAL SAFETY RAILING DETAILS

DRAWING NUMBER	RS-120-1
SCALE	NONE
REVISION DATE	2/18
DEPARTMENT	TRANS

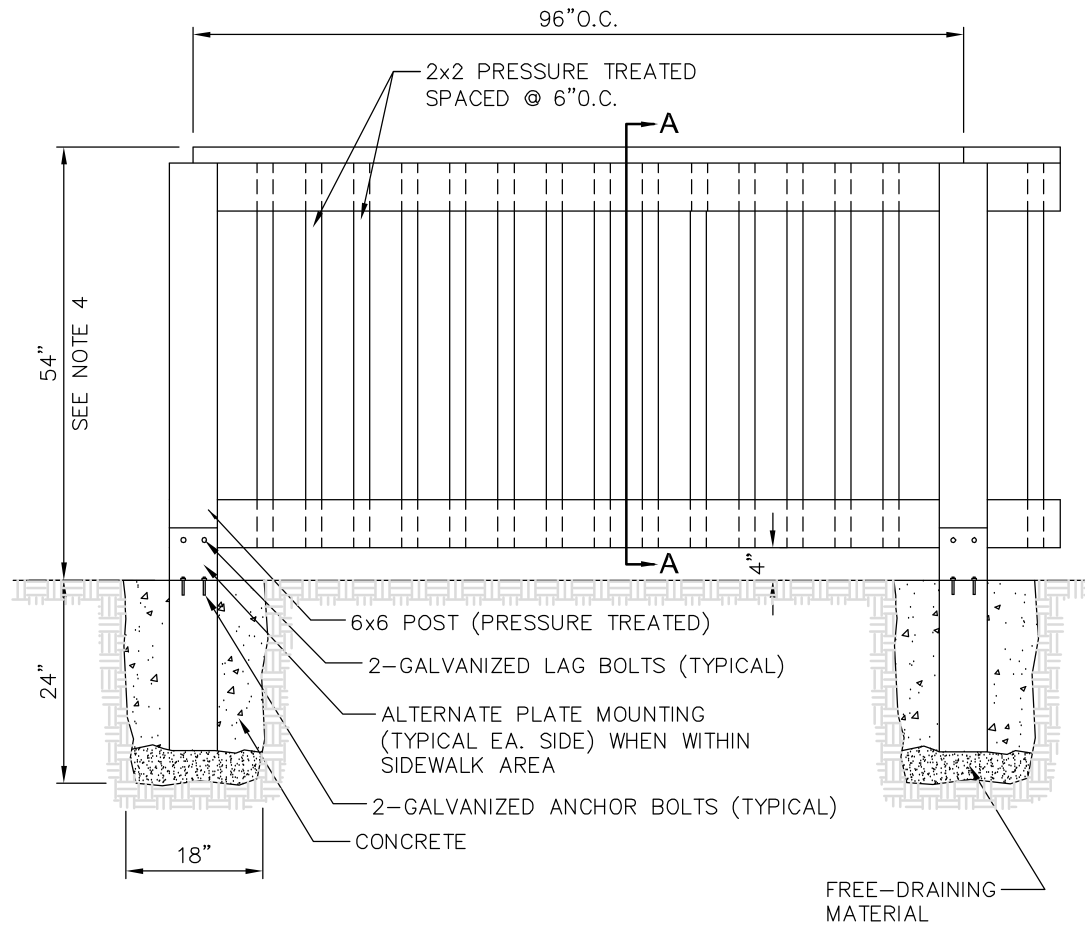


REDUCED SECTION A-A

(SEE NOTE 5)



SECTION A-A



ELEVATION VIEW

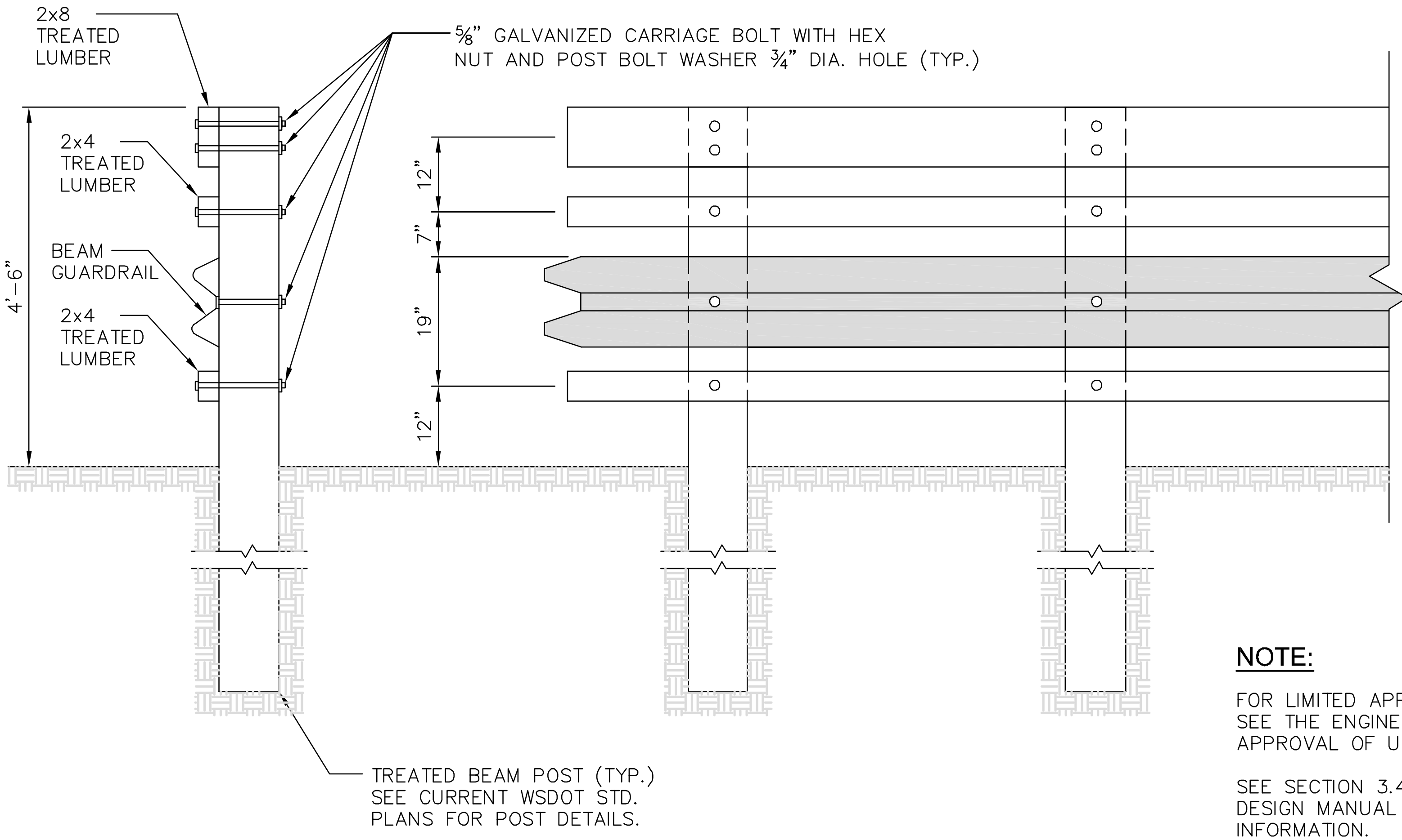
NOTES:

1. USE ON TRAILS OR TO UPGRADE EXISTING WOOD RAILING.
2. FOR NEW INSTALLATIONS IN SIDEWALK, METAL RAILING IS PREFERRED (SEE STD. DWG. RS-110-1 AND RS-120-1).
3. AVOID PLACING IN SIGHT LINES (SEE STD. DWGS. RL-100-1, RL-110-1, AND RL-120-1).
4. 42" HEIGHT MAY BE USED ONLY UPON APPROVAL OF THE ENGINEER.
5. USE REDUCED CROSS SECTION ONLY UPON APPROVAL OF THE ENGINEER.
6. NAILING - TWO NAILS PER JOINT MINIMUM, WITH PENETRATION TO ADEQUATELY SECURE THE JOINT. NAILS MUST BE GALVANIZED.
9. SEE SECTION 3.4.1.2 OF THE DESIGN MANUAL FOR ADDITIONAL INFORMATION.

City of Bellevue

WOOD SAFETY RAILING

DRAWING NUMBER	RS-130-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



NOTE:

FOR LIMITED APPLICATIONS.
SEE THE ENGINEER FOR
APPROVAL OF USE.

SEE SECTION 3.4.1.2 OF THE
DESIGN MANUAL FOR ADDITIONAL
INFORMATION.

City of Bellevue	COMBINATION GUARDRAIL & HANDRAIL	DRAWING NUMBER	RS-140-1
		SCALE	NONE
		REVISION DATE	2/24
		DEPARTMENT	TRANS

CITY OF BELLEVUE
WASHINGTON

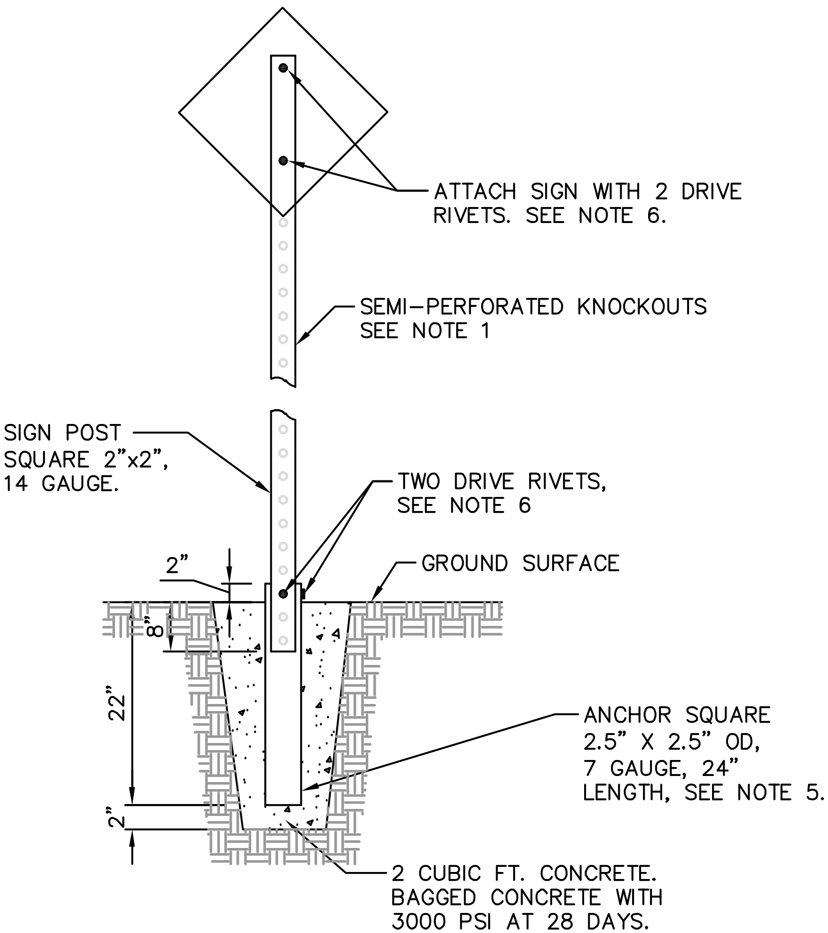
TRANSPORTATION DESIGN MANUAL

SG Drawings

Signing

CITY OF BELLEVUE

WASHINGTON



SQUARE METAL POST

SIGN POST NOTES

1. SIGN POST SHALL BE 2"x2" SQUARE STEEL POSTS, MINIMUM 14 GAUGE, WITH 7⁄16" SEMI-PERFORATED KNOCKOUTS ON 1" CENTERS FULL LENGTH FOUR SIDES..
2. STOP AND YIELD SIGN POSTS SHALL HAVE REFLECTOR ATTACHMENT FOR ALTERNATING 1' BANDS OF RED AND WHITE, SEE STD. DWG. SG-110-1.
3. FOR IN-SIDEWALK INSTALLATIONS, CORE 4" DIAM. HOLE. ANCHOR LENGTH MAY BE DECREASED TO 12".
4. POST SHALL BE ROLLED CARBON SHEET STEEL AND SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A653, G90, STRUCTURAL QUALITY GRADE 50.
5. ANCHOR SHALL HAVE FOUR 7⁄16" DIAM. HOLES, ONE EACH SIDE, 1" FROM TOP END. ANCHOR SHALL MEET THE REQUIREMENTS OF ASTM A500 GRADE B AND SHALL BE HOT DIPPED GALVANIZED.
6. INSTALL TWO DRIVE RIVETS AT 90 DEGREES TO EACH OTHER. DRIVE RIVETS TO BE 3/8" DIA., ZUMAR TL3806 OR SIMIFAST VCR221.

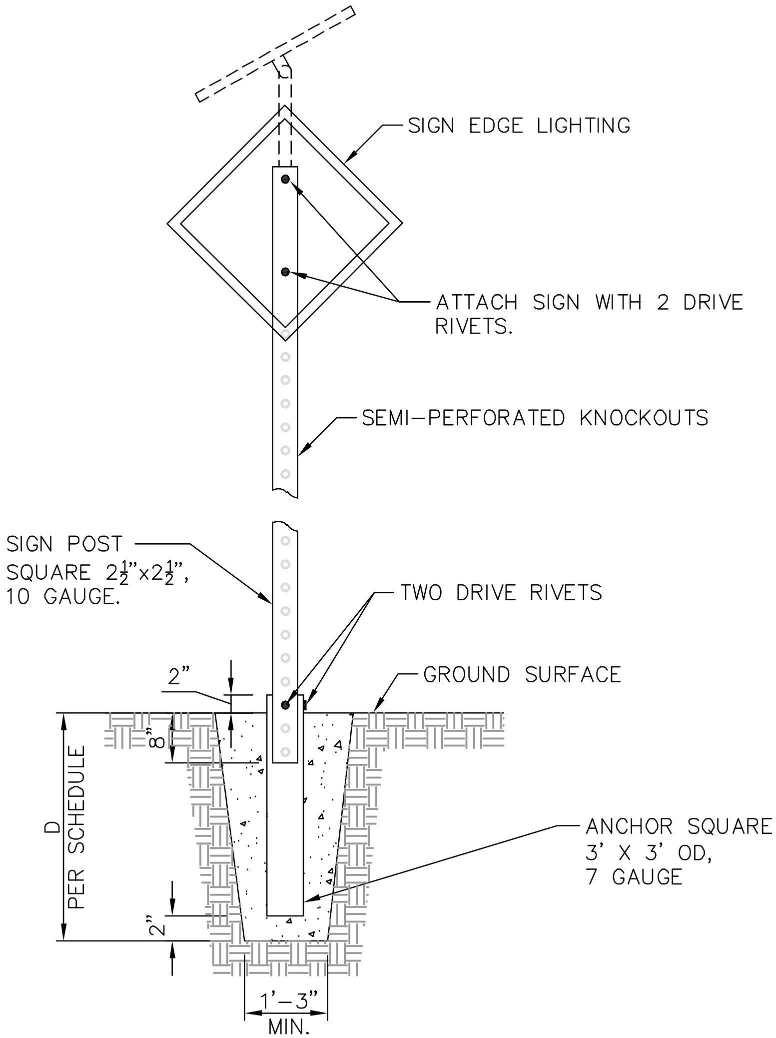
SIGN INSTALLATION NOTES

1. SIGN SHEETING REQUIREMENTS:
STOP, YIELD, KEEP RT, TURN RESTRICTION, LARGE ARROW, CHEVRON, CURVE/TURN WARNING, PED & ADV PED CROSSING, SCHOOL AND ADV SCHOOL CROSSING, STOP/YIELD/SIGNAL AHEAD, OBJECT MARKERS, END OF ROAD MARKER, ALL STREET NAME SIGNS AND ALL MAST ARM OR OVERHEAD MOUNTED SIGNS SHALL BE 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL OTHER SIGNS SHALL BE 3M HIGH INTENSITY PRISMATIC SHEETING, OR APPROVED EQUAL.
2. SIGN HEIGHT SHALL BE 7' FROM BOTTOM OF SIGN TO STREET OR SIDEWALK OR 6.5' FROM BOTTOM OF LOWER SIGN FOR MULTIPLE SIGNS ON ONE POST. EXCEPTIONS ONLY AS SPECIFICALLY STATED ON PLANS OR APPROVED BY THE ENGINEER.

City of Bellevue

SIGN INSTALLATION DETAILS

DRAWING NUMBER	SG-100-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



SQUARE METAL POST

FOUNDATION SCHEDULE		
LOADING AT BASE M	GROUND CONDITION (SEE NOTES)	FOUNDATION DEPTH D
< 3500 FT-LB	FLAT	4'-0"
	SLOPED	5'-0"

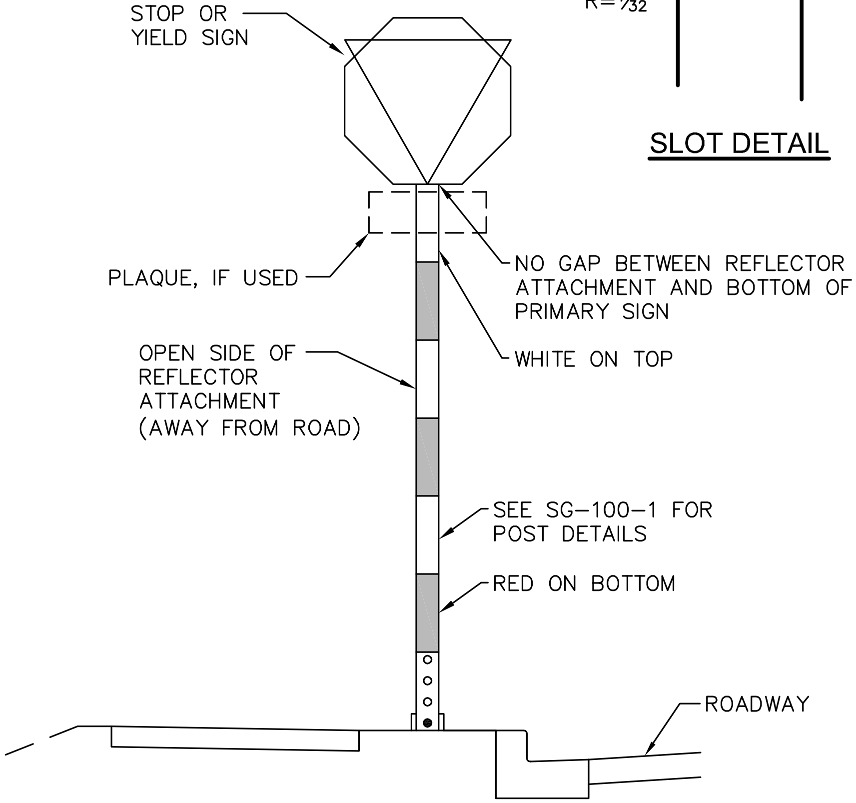
NOTES:

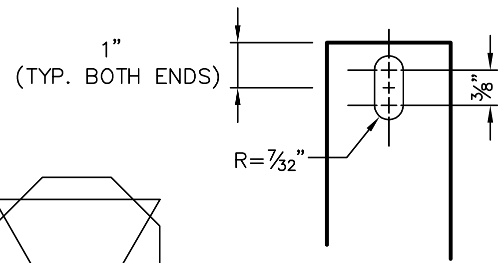
1. THIS EDGE-LIT SIGN DETAIL SHALL ONLY BE USED FOR SOLAR POWERED SIGNS. AC-POWERED EDGE-LIT SIGNS SHALL USE 4" PIPE, PEDESTAL, AND FOUNDATION DETAILED IN STD. DWGS. SL-140-2 AND SL-141-1.
2. REFER TO CITY OF BELLEVUE STANDARD DRAWING SG-100-1 FOR SIGN INFORMATION NOT SHOWN HERE.
3. IF SIGN BASE MOMENT EXCEEDS 3500 FT-LB THEN USE PIPE, PEDESTAL, AND FOUNDATION DETAILS IN STD. DWGS. SL-140-2 AND SL-141-1.
4. FLAT GROUND CONDITION SHOULD BE USED IF SLOPE IS 4H:1V OR LESS.
5. SLOPED GROUND CONDITION SHOULD BE USED IF SLOPE IS GREATER THAN 4H:1V BUT LESS THAN 2H:1V.
6. FOUNDATION DEPTHS PROVIDED ASSUME SOIL CAN BE CLASSIFIED AS SAND. FOR PREDOMINATELY CLAY SOILS A PROJECT SPECIFIC DESIGN WILL BE REQUIRED.

City of Bellevue

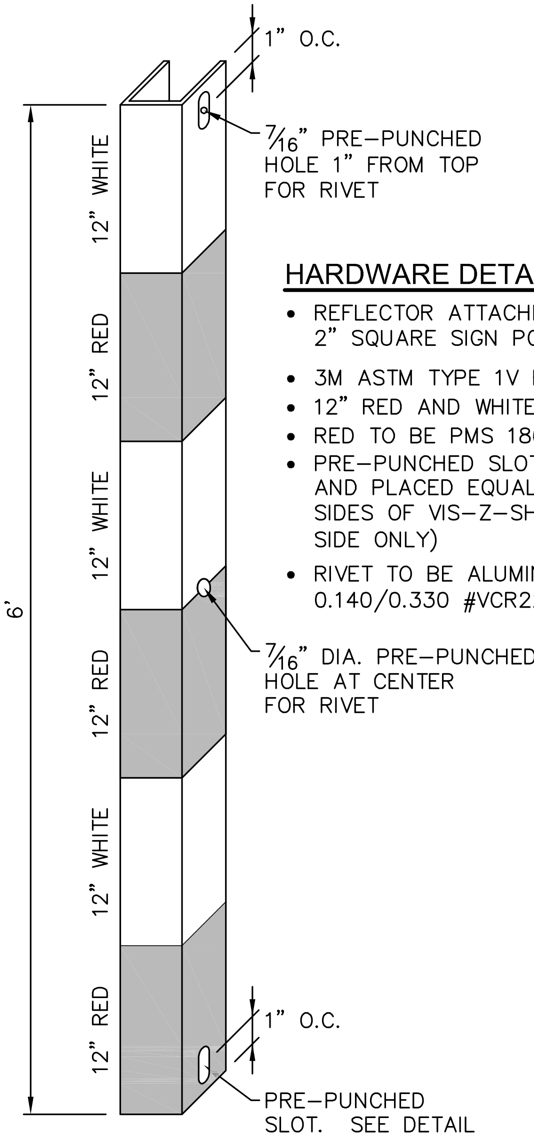
SOLAR POWERED EDGE-LIT SIGN FOUNDATION

DRAWING NUMBER	SG-101-1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS





SLOT DETAIL



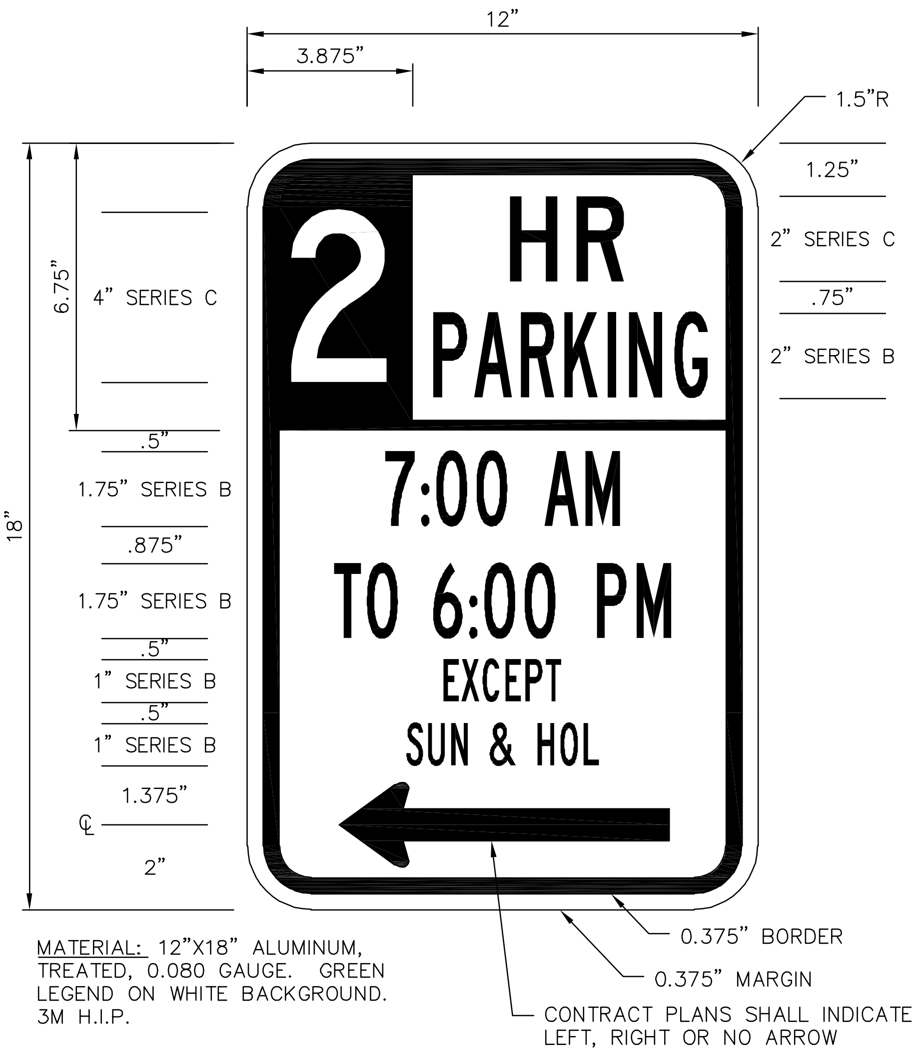
HARDWARE DETAIL NOTES

- REFLECTOR ATTACHMENT TO BE VIS–Z–SHIELD® FOR 2" SQUARE SIGN POST, OR APPROVED EQUAL.
- 3M ASTM TYPE 1V REFLECTIVE SHEETING.
- 12" RED AND WHITE ALTERNATING REFLECTIVE BANDS.
- RED TO BE PMS 186 TRANSPARENT INK.
- PRE–PUNCHED SLOTS AND HOLES ARE MEASURED AND PLACED EQUALLY ON BOTH LEFT AND RIGHT SIDES OF VIS–Z–SHIELD® (DRAWING SHOWS ONE SIDE ONLY)
- RIVET TO BE ALUMINUM DRIVE PIN RIVETS 3/8" GP 0.140/0.330 #VCR221, OR APPROVED EQUAL.

City of Bellevue

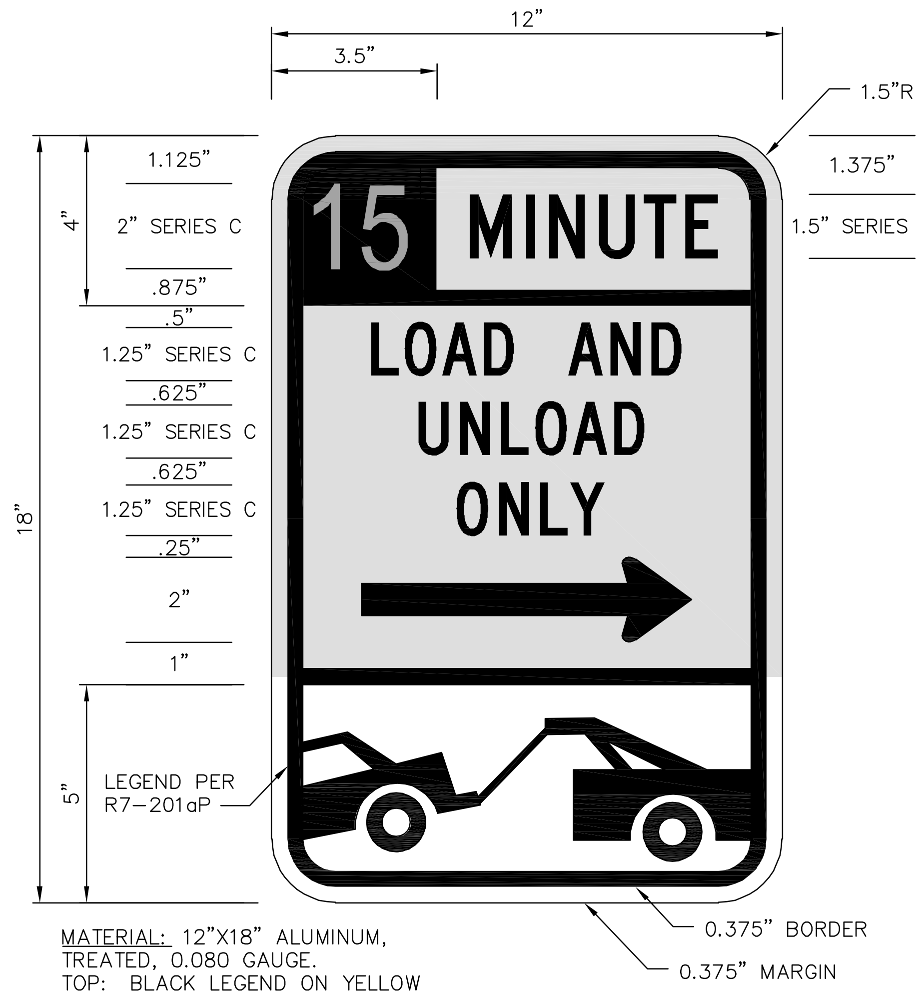
STOP AND YIELD SIGN POST REFLECTOR ATTACHMENT

DRAWING NUMBER	SG–110–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS



MATERIAL: 12"X18" ALUMINUM, TREATED, 0.080 GAUGE. GREEN LEGEND ON WHITE BACKGROUND. 3M H.I.P.

2-HR PARKING



MATERIAL: 12"X18" ALUMINUM, TREATED, 0.080 GAUGE.
TOP: BLACK LEGEND ON YELLOW BACKGROUND.
BOTTOM: RED LEGEND ON WHITE BACKGROUND.
3M H.I.P.

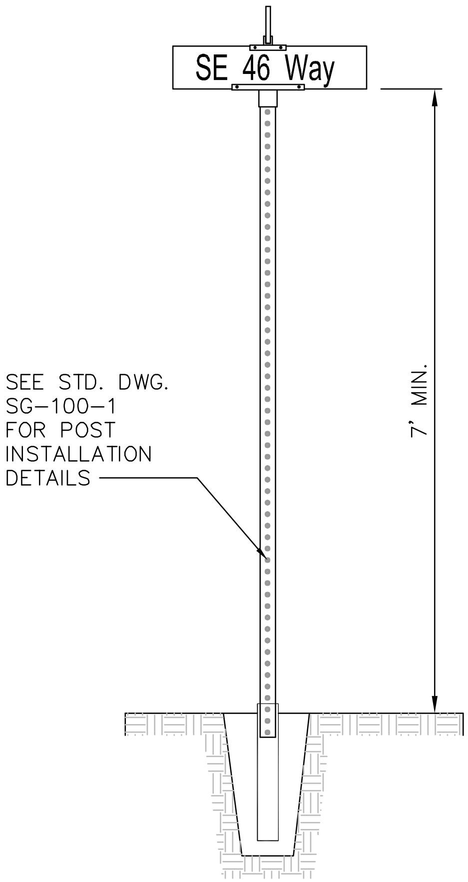
15-MINUTE LOAD ZONE

NOTE: FOR OTHER SIGNS, CONTACT THE REVIEW ENGINEER

City of Bellevue

TIME RESTRICTED PARKING

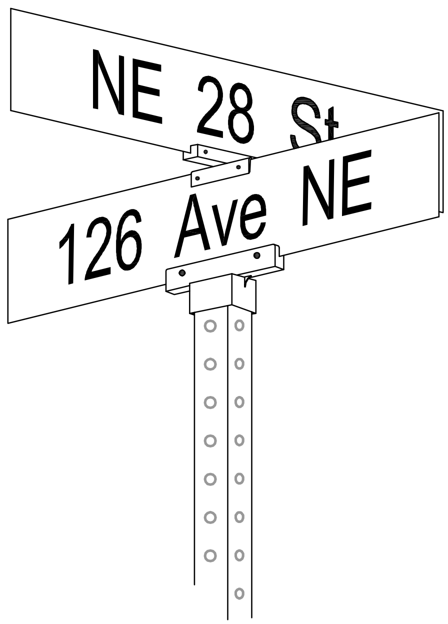
DRAWING NUMBER	SG-120-1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS

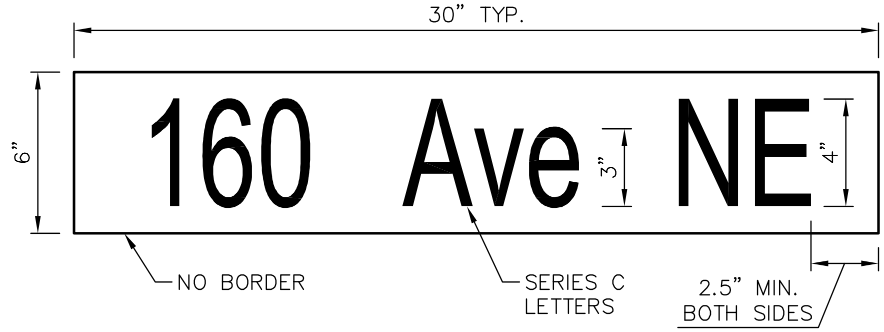


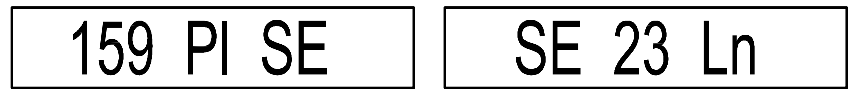
TYPICAL INSTALLATION

ABBREVIATIONS:

STREET =	St
AVENUE =	Ave
PLACE =	Pl
WAY =	Way OR Wy
BOULEVARD =	Blvd
PARKWAY =	Pkwy
LANE =	Ln
COURT =	Ct
DRIVE =	Dr
ROAD =	Rd
KEY =	Key
CONNECTOR =	Conn
CIRCLE =	Cir
TERRACE =	Ter







NOTES:

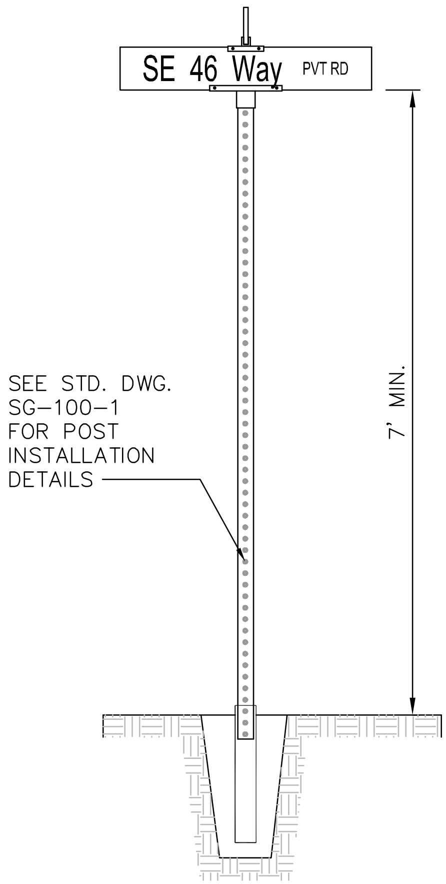
1. SIGNING MATERIAL AND FABRICATION SHALL BE IN ACCORDANCE WITH SECTION 9-28 OF THE WSDOT STANDARD SPECIFICATIONS, CURRENT EDITION.
2. TYPE 1 SIGNS SHALL BE WHITE LETTERING ON GREEN BACKGROUND, NO BORDER, DOUBLE-SIDED.
3. SIGN BLADE SHALL BE 6" EXTRUDED ALUMINUM, TREATED, EXCEPT 9" BLADE SHALL BE USED FOR STREET NAMES CONTAINING LOWER CASE LETTERS WITH DESCENDING STEMS OR TAILS (E.G., "g", "p", "y").
4. SIGN SHEETING SHALL BE 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING SERIES 4000.
5. LETTERING SHALL BE FORMED USING 3M ELECTROCUT (EC) FILM SERIES 1170.
6. FONT SHALL BE HIGHWAY GOTHIC SERIES C, 4" UPPER AND LOWER CASE.
7. POSTS SHALL BE 2"x2" SQUARE STEEL POSTS AS PER STD DWG SG-100-1.
8. MOUNTING HARDWARE SHALL BE ZUMAR Z12RDSQ200EX CAP AND ZUMAR 812EX90X CROSSPIECE, OR APPROVED EQUAL.
9. LAYOUT OF NON-NUMBERED STREET NAME LETTERING (E.G., Newport Key, Vineyard Crest) WILL BE PROVIDED BY THE ENGINEER.

City of Bellevue

CITY OF BELLEVUE WASHINGTON

STREET NAME SIGN – TYPE 1
NON-ARTERIAL STREET

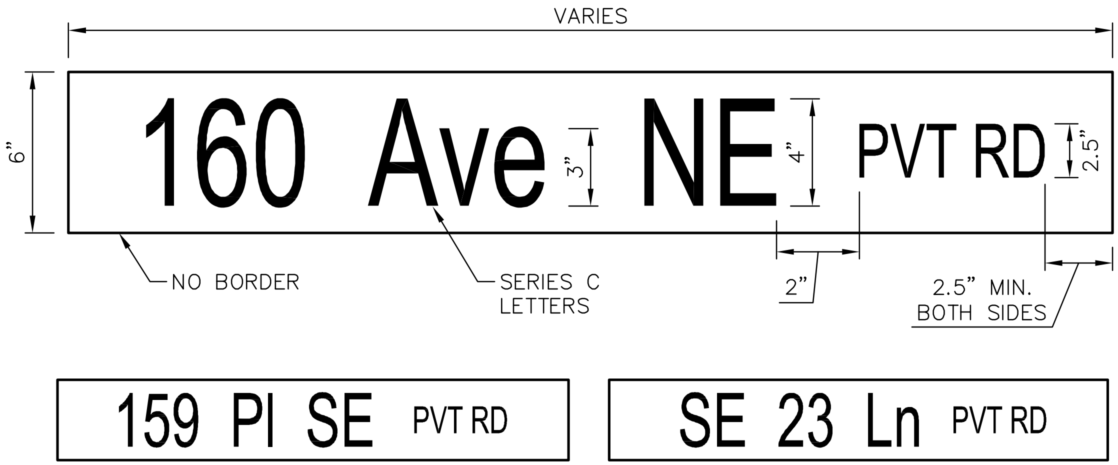
DRAWING NUMBER	SG-130-1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS

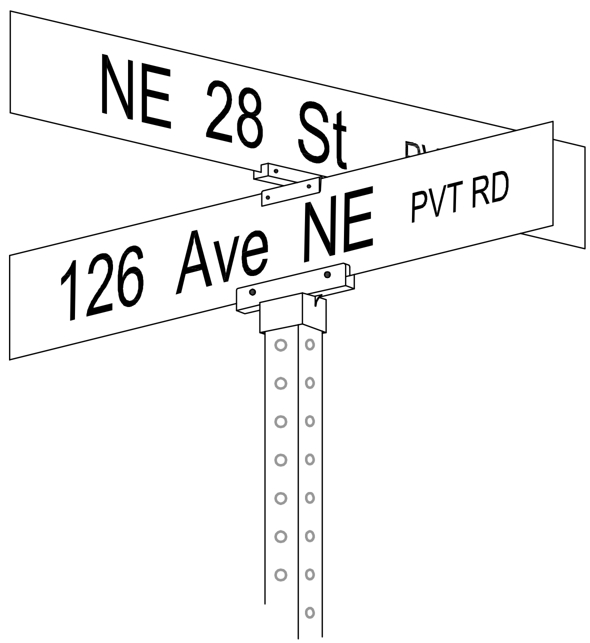


TYPICAL INSTALLATION

ABBREVIATIONS:

STREET =	St
AVENUE =	Ave
PLACE =	Pl
WAY =	Way OR Wy
BOULEVARD =	Blvd
PARKWAY =	Pkwy
LANE =	Ln
COURT =	Ct
DRIVE =	Dr
ROAD =	Rd
KEY =	Key
CONNECTOR =	Conn
CIRCLE =	Cir
TERRACE =	Ter





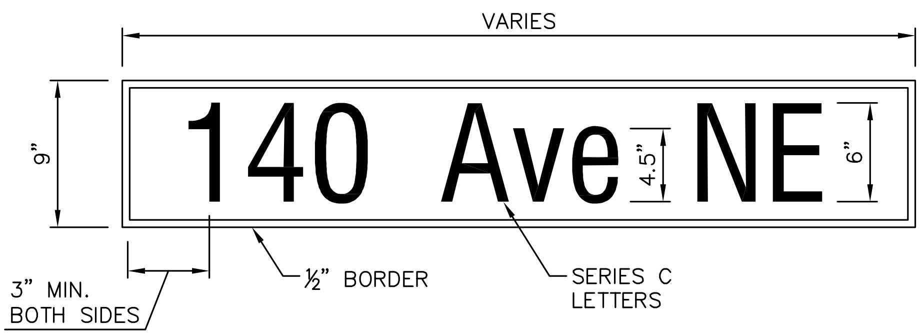
NOTES:

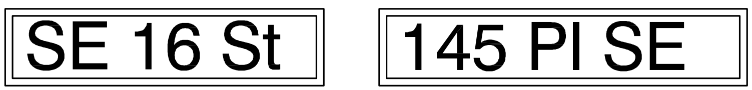
1. SIGNING MATERIAL AND FABRICATION SHALL BE IN ACCORDANCE WITH SECTION 9–28 OF THE WSDOT STANDARD SPECIFICATIONS, CURRENT EDITION.
2. TYPE 1 SIGNS SHALL BE WHITE LETTERING ON GREEN BACKGROUND, NO BORDER, DOUBLE-SIDED.
3. SIGN BLADE SHALL BE 6" EXTRUDED ALUMINUM, TREATED.
4. SIGN SHEETING SHALL BE 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING SERIES 4000.
5. LETTERING SHALL BE FORMED USING 3M ELECTROCUT (EC) FILM SERIES 1170.
6. FONT SHALL BE HIGHWAY GOTHIC SERIES C, 4" UPPER AND LOWER CASE.
7. POSTS SHALL BE 2"x2" SQUARE STEEL POSTS AS PER STD DWG SG-100-1.
8. MOUNTING HARDWARE SHALL BE ZUMAR Z12RDSQ200EX CAP AND ZUMAR 812EX90X CROSSPIECE, OR APPROVED EQUAL.

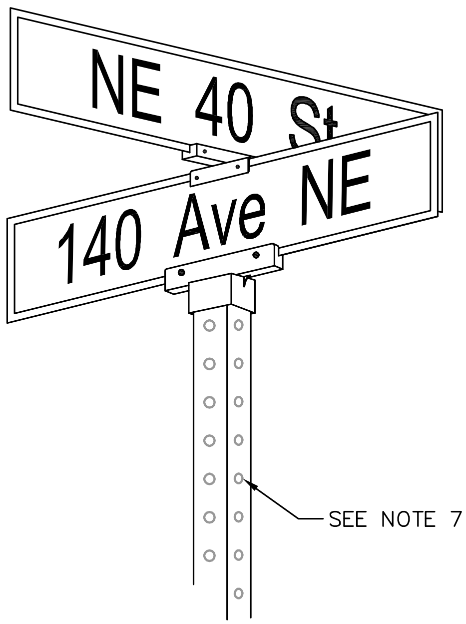
City of Bellevue

STREET NAME SIGN (PRIVATE ROAD) – TYPE 1
NON-ARTERIAL STREET

DRAWING NUMBER	SG-140-1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS







ABBREVIATIONS:

STREET =	St
AVENUE =	Ave
PLACE =	Pl
WAY =	Way OR Wy
BOULEVARD =	Blvd
PARKWAY =	Pkwy
LANE =	Ln
COURT =	Ct
DRIVE =	Dr
ROAD =	Rd
KEY =	Key
CONNECTOR =	Conn
CIRCLE =	Cir
TERRACE =	Ter

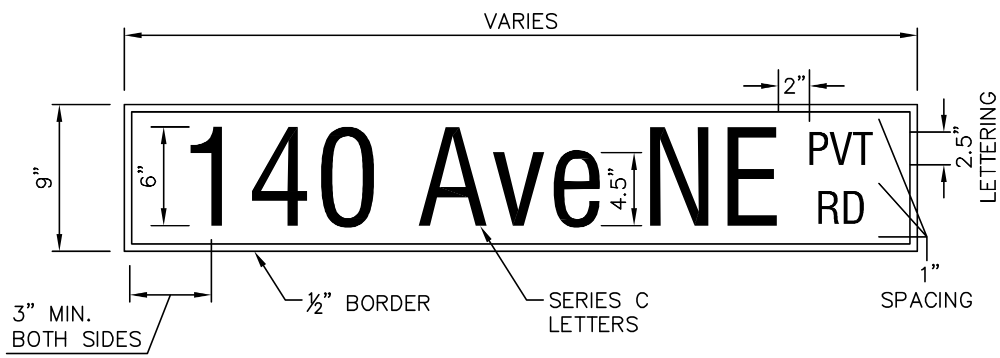
NOTES:

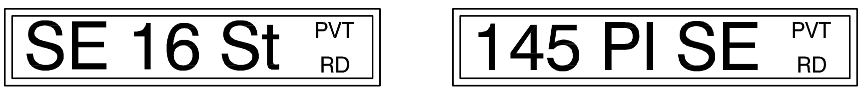
1. SIGNING MATERIAL AND FABRICATION SHALL BE IN ACCORDANCE WITH SECTION 9–28 OF THE WSDOT STANDARD SPECIFICATIONS, CURRENT EDITION.
2. TYPE 2 SIGNS SHALL BE WHITE LETTERING ON GREEN BACKGROUND, ½" WHITE BORDER, NO MARGIN, DOUBLE–SIDED.
3. SIGN BLADE SHALL BE 9" EXTRUDED ALUMINUM, TREATED, EXCEPT 12" BLADE SHALL BE USED FOR STREET NAMES CONTAINING LOWER CASE LETTERS WITH DESCENDING STEMS OR TAILS (E.G., "g", "p", "y").
4. SIGN SHEETING SHALL BE 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING SERIES 4000.
5. LETTERING SHALL BE FORMED USING 3M ELECTROCUT (EC) FILM SERIES 1170.
6. FONT SHALL BE HIGHWAY GOTHIC SERIES C, 6" UPPER AND LOWER CASE.
7. POSTS SHALL BE 2"x2" SQUARE STEEL POSTS AS PER STD DWG SG–100–1.
8. MOUNTING HARDWARE SHALL BE ZUMAR Z12RDSQ200EX CAP AND ZUMAR 812EX90X CROSSPIECE, OR APPROVED EQUAL.
9. LAYOUT OF NON–NUMBERED STREET NAME LETTERING (E.G., Bellevue Way SE, Coal Creek Pkwy SE) WILL BE PROVIDED BY THE ENGINEER.

City of Bellevue

STREET NAME SIGN – TYPE 2
ARTERIAL STREET

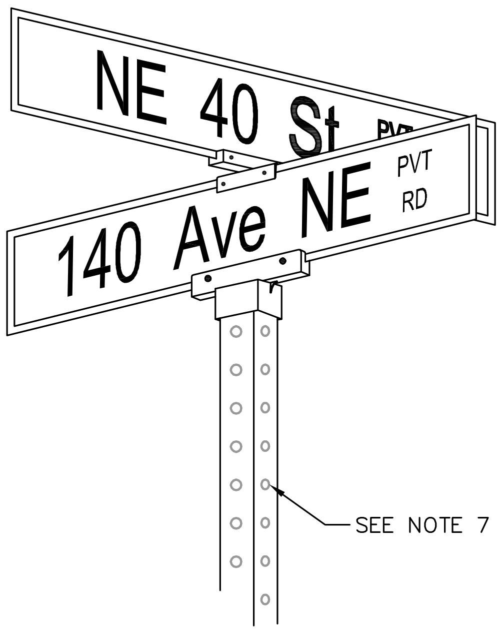
DRAWING NUMBER	SG–150–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS





NOTES:

1. SIGNING MATERIAL AND FABRICATION SHALL BE IN ACCORDANCE WITH SECTION 9–28 OF THE WSDOT STANDARD SPECIFICATIONS, CURRENT EDITION.
2. TYPE 2 SIGNS SHALL BE WHITE LETTERING ON GREEN BACKGROUND, ½" WHITE BORDER, NO MARGIN, DOUBLE–SIDED.
3. SIGN BLADE SHALL BE 9" EXTRUDED ALUMINUM, TREATED.
4. SIGN SHEETING SHALL BE 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING SERIES 4000.
5. LETTERING SHALL BE FORMED USING 3M ELECTROCUT (EC) FILM SERIES 1170.
6. FONT SHALL BE HIGHWAY GOTHIC SERIES C, 6" UPPER AND LOWER CASE.
7. POSTS SHALL BE 2"x2" SQUARE STEEL POSTS AS PER STD DWG SG–100–1.
8. MOUNTING HARDWARE SHALL BE ZUMAR Z12RDSQ200EX CAP AND ZUMAR 812EX90X CROSSPIECE, OR APPROVED EQUAL.



ABBREVIATIONS:

STREET =	St
AVENUE =	Ave
PLACE =	Pl
WAY =	Way OR Wy
BOULEVARD =	Blvd
PARKWAY =	Pkwy
LANE =	Ln
COURT =	Ct
DRIVE =	Dr
ROAD =	Rd
KEY =	Key
CONNECTOR =	Conn
CIRCLE =	Cir
TERRACE =	Ter

City of Bellevue

STREET NAME SIGN (PRIVATE ROAD) – TYPE 2
ARTERIAL STREET

DRAWING NUMBER	SG–160–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS

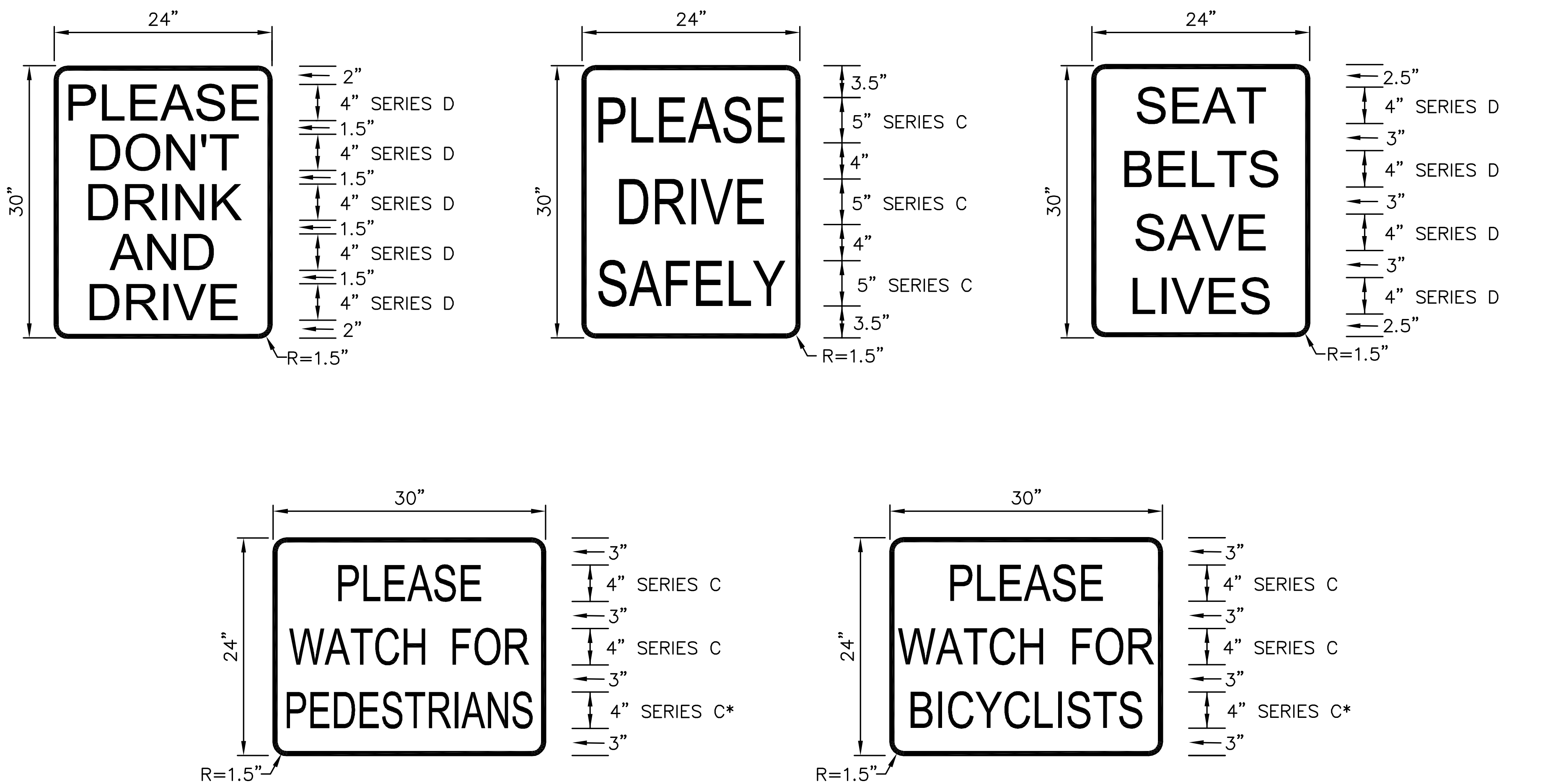
NOTES:

1. SIGNING MATERIAL AND FABRICATION SHALL BE IN ACCORDANCE WITH SECTION 9–28 OF THE WSDOT STANDARD SPECIFICATIONS, CURRENT EDITION.
2. ALL TYPE 3 SIGNS SHALL BE WHITE LETTERING ON GREEN BACKGROUND, ¾" WHITE BORDER, NO MARGIN, SINGLE–SIDED.
3. SIGN BLADE SHALL BE ALUMINUM, TREATED, 0.125 GAUGE.
4. SIGN SHEETING SHALL BE 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING SERIES 4000.
5. LETTERING SHALL BE FORMED USING 3M ELECTROCUT (EC) FILM SERIES 1170.
6. FONT SHALL BE HIGHWAY GOTHIC SERIES C.
7. TYPE 3A SIGN SHALL HAVE 12" UPPER AND LOWER CASE EXCEPT NUMERICAL SUFFIX (E.G., th, st) SHALL BE 10" LOWER CASE.
8. TYPE 3B SIGN SHALL HAVE 12" UPPER AND LOWER CASE. SIGN BLADE SHALL BE 18" TALL, EXCEPT 22" BLADE SHALL BE USED FOR STREET NAMES CONTAINING LOWER CASE LETTERS WITH DESCENDING STEMS OR TAILS (E.G., "g", "p", "y").
9. TYPE 3C SIGN SHALL HAVE 10" UPPER AND LOWER CASE EXCEPT NUMERICAL SUFFIX (E.G., th, st) SHALL BE 8" LOWER CASE.
10. ALL SIGNS SHALL BE INSTALLED USING EITHER BANDING (TO HORIZONTAL SECTION OF MASTARM) OR PELCO ASTRO SIGN–BRAC, TALLON CABLE MOUNT (TO CURVED SECTION OF MASTARM OR VERTICAL SECTION OF POLE).

City of Bellevue

STREET NAME SIGN – TYPES 3A, 3B, & 3C; MAST ARM

DRAWING NUMBER	SG–170–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS



*WIDTH FACTOR = 0.5

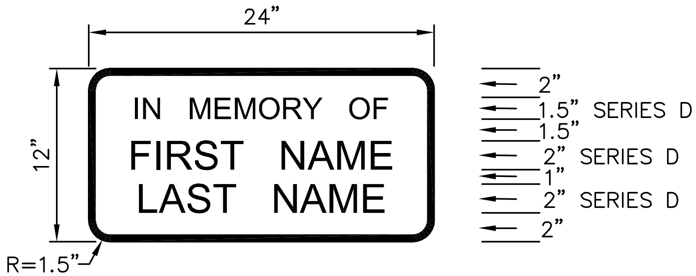
NOTES:

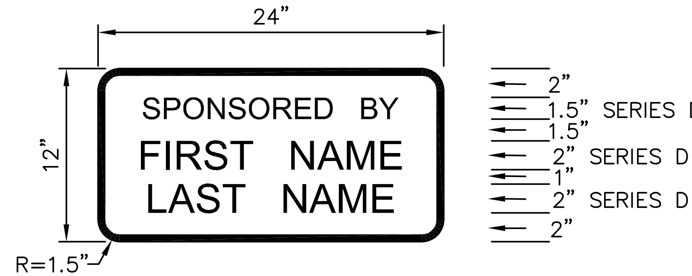
1. USE ½” WHITE BORDER WITH NO MARGIN.
2. USE WHITE LEGEND ON BLUE BACKGROUND.

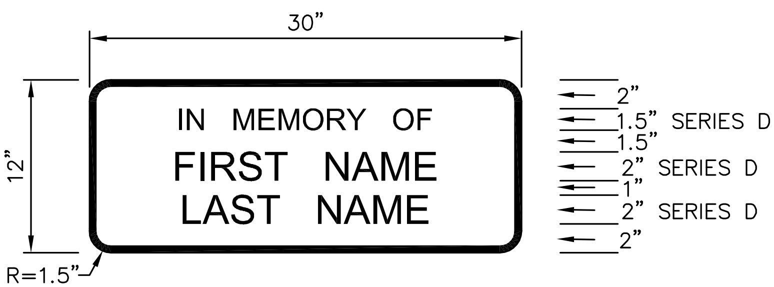
City of Bellevue

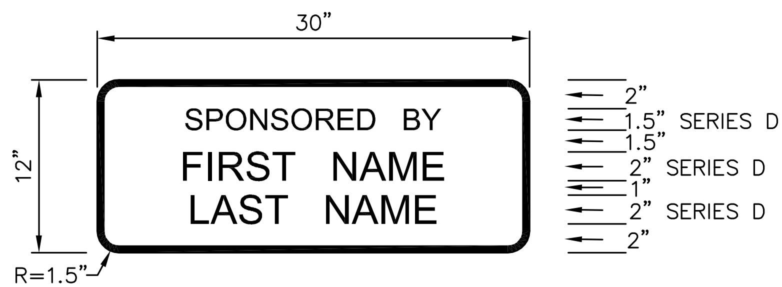
MEMORIAL SIGN LAYOUTS – A

DRAWING NUMBER	SG–180–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS









NOTES:

1. USE ½” WHITE BORDER WITH NO MARGIN.
2. USE WHITE LEGEND ON BLUE BACKGROUND.

City of Bellevue

MEMORIAL SIGN LAYOUTS – B

DRAWING NUMBER	SG–190–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS

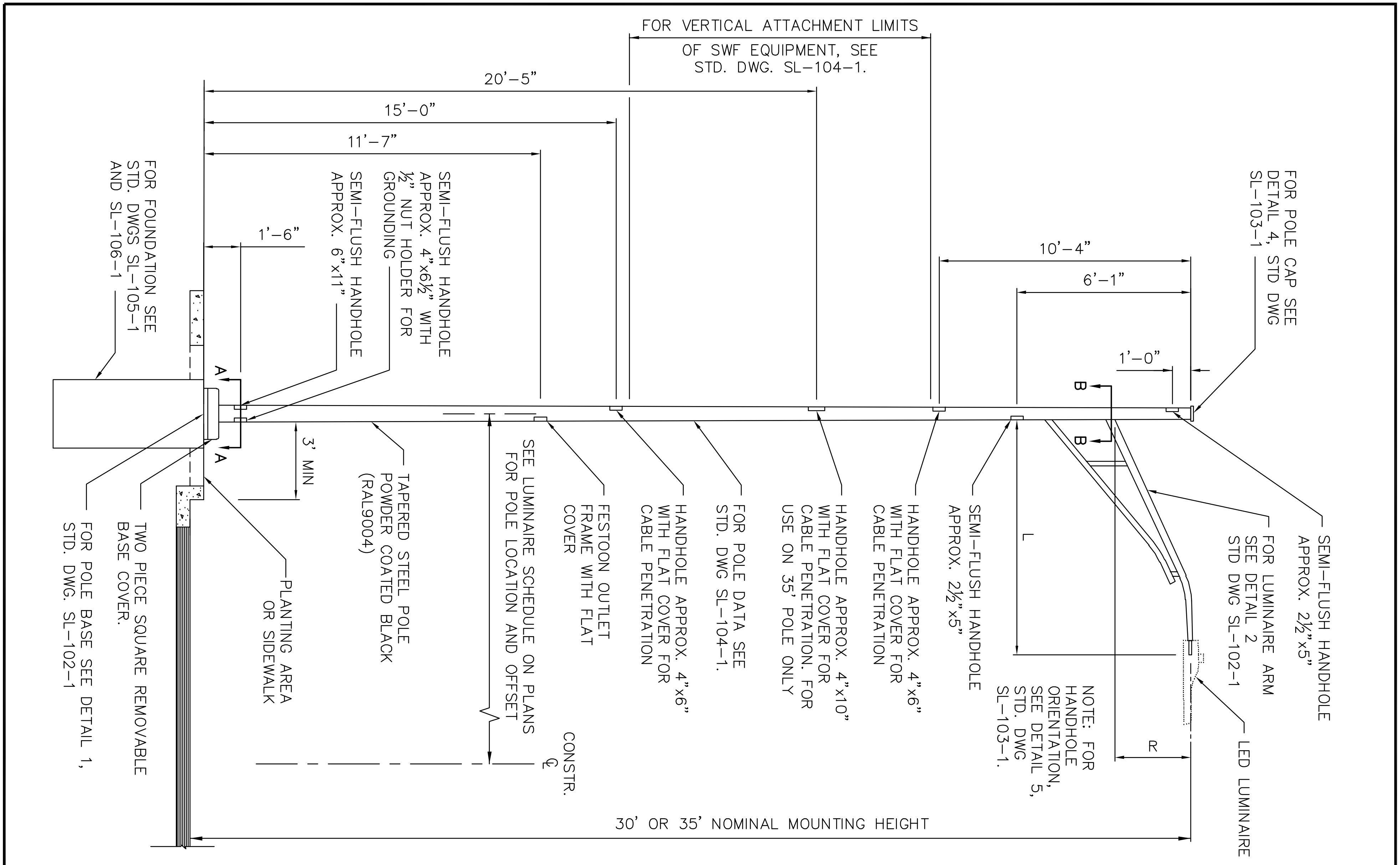
CITY OF BELLEVUE
WASHINGTON

TRANSPORTATION DESIGN MANUAL

SL Drawings

Traffic Signals & Street Lighting

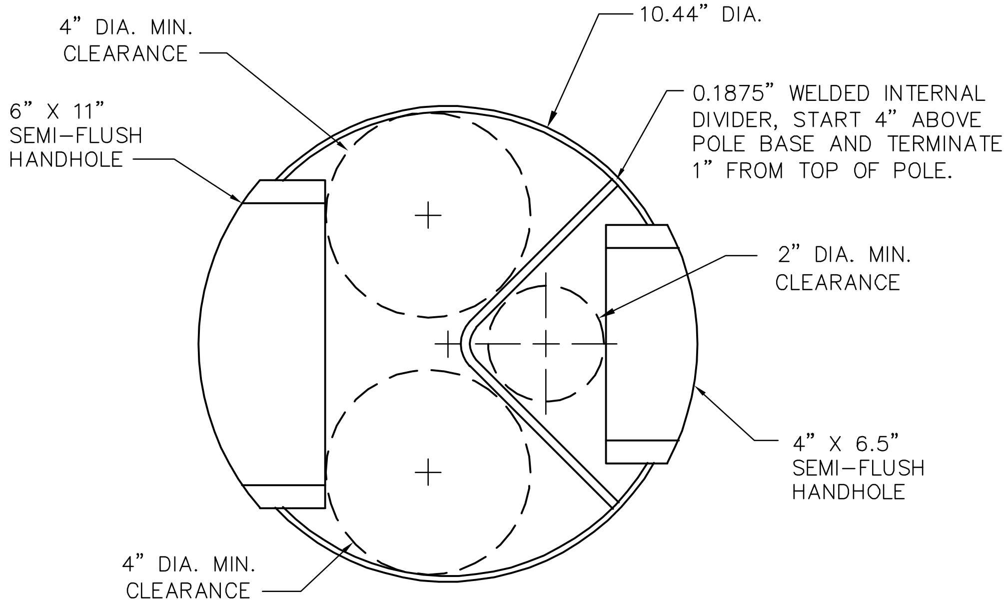
CITY OF BELLEVUE
WASHINGTON



City of Bellevue

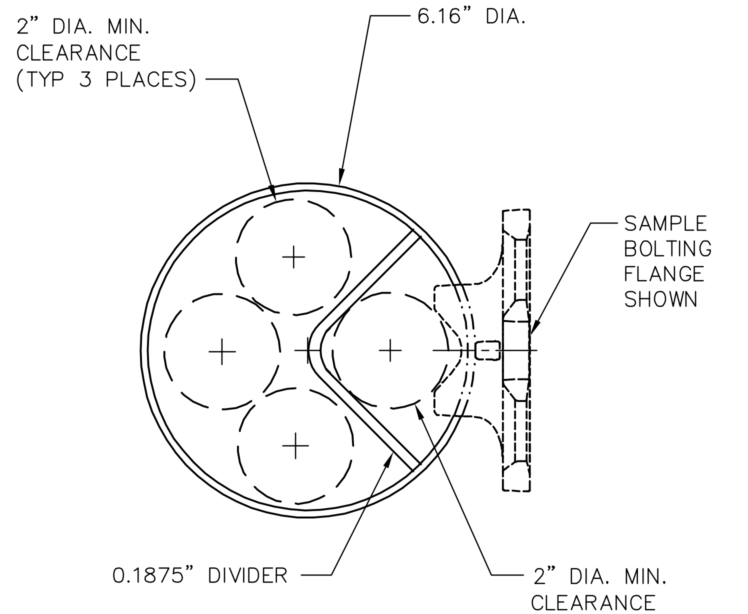
STEEL ROADWAY LIGHTING POLE (SMALL WIRELESS FACILITY COMPATIBLE)

DRAWING NUMBER	SL-100-2
SCALE	NONE
REVISION DATE	6/22
DEPARTMENT	TRANS



CLEARANCE FOR WIRE AT 1'-6" ELEVATION

SECTION A-A
<u>LOWER SECTION CLEARANCE</u>



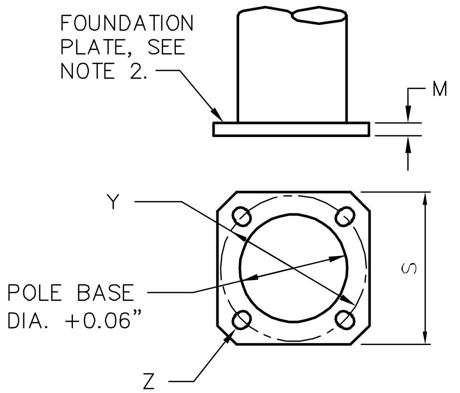
CLEARANCE FOR WIRE AT LUMINAIRE ARM UPPER CONNECTION

SECTION B-B
<u>UPPER SECTION CLEARANCE</u>

City of Bellevue

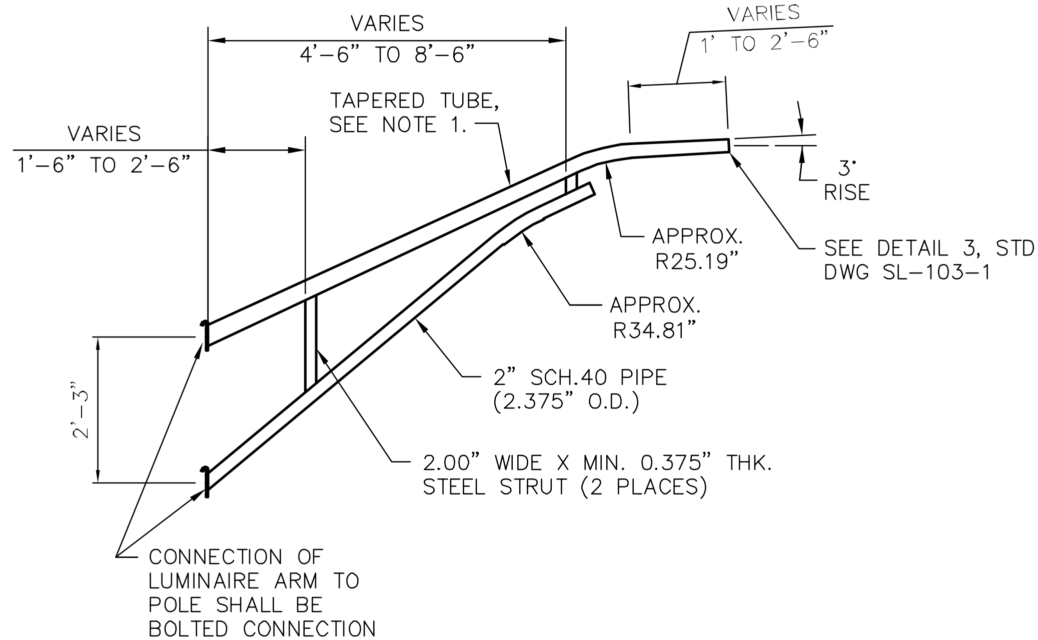
STEEL ROADWAY LIGHTING POLE DETAILS
(SMALL WIRELESS FACILITY COMPATIBLE)

DRAWING NUMBER	SL-101-1
SCALE	NONE
REVISION DATE	6/21
DEPARTMENT	TRANS

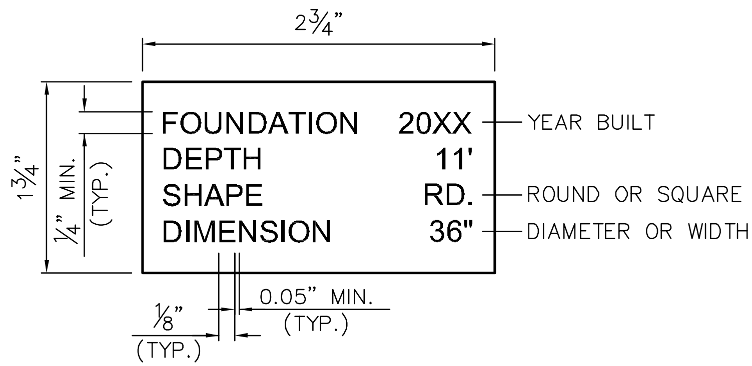


SEE STD DWG SL-104-1 FOR ASSOCIATED DIMENSIONS

DETAIL 1 – POLE BASE



DETAIL 2 – LUMINAIRE ARM



DETAIL 3 – FOUNDATION PLATE DETAIL

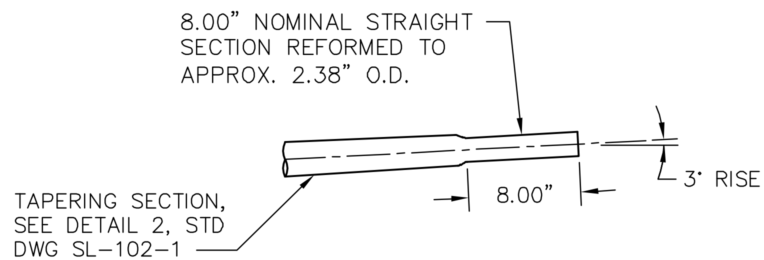
NOTES:

1. TAPERED TUBE HAS CROSS-SECTION OF 4.00"x2.75" (LONGER DIMENSION VERTICAL) AT CONNECTION TO POLE AND TAPERS TO A 2.75" O.D. CROSS-SECTION, THEN CONTINUES TO TAPER TO AN O.D. OF APPROX. 2.40". SEE DETAIL 3, STD DWG SL-103-1 FOR ARM END DIMENSIONS.
2. FOUNDATION PLATE MATERIAL MAY BE METAL OR PLASTIC AND SHALL BE ATTACHED TO THE POLE BASE WITH A PERMANENT WEATHERPROOF ADHESIVE.

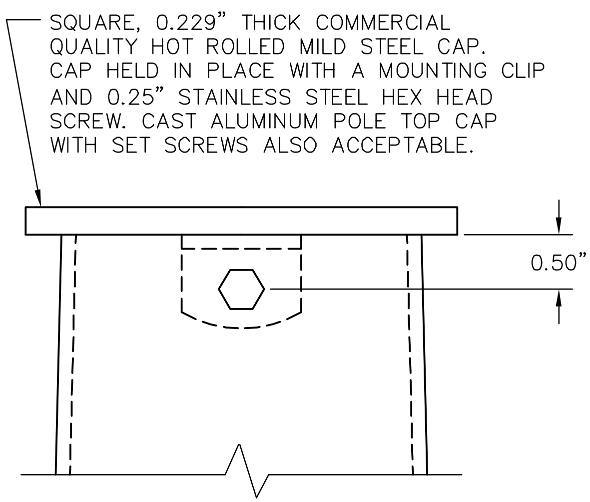
City of Bellevue

STEEL ROADWAY LIGHTING POLE DETAILS
(SMALL WIRELESS FACILITY COMPATIBLE)

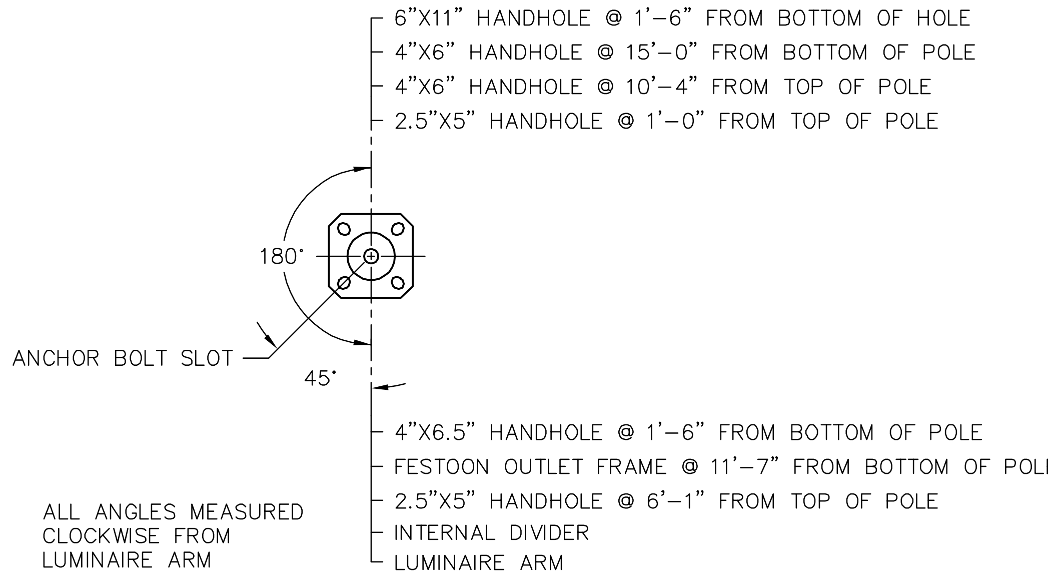
DRAWING NUMBER	SL-102-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



DETAIL 3 – ARM END



DETAIL 4 – POLE CAP PLATE



DETAIL 5 – RADIAL INDEX

City of Bellevue

STEEL ROADWAY LIGHTING POLE DETAILS
(SMALL WIRELESS FACILITY COMPATIBLE)

DRAWING NUMBER	SL-103-1
SCALE	NONE
REVISION DATE	6/21
DEPARTMENT	TRANS

FINISH DATA

BASE COAT: HOT-DIP GALVANIZED TO ASTM A123

PRIME COAT: HIGH BUILD EPOXY POWDER

FINISH COAT: TGIC POWDER

COLOR: BLACK (RAL 9004)

NOTES:

1. LIGHTING STRUCTURES HAVE BEEN DESIGNED AND SHALL BE FABRICATED IN ACCORDANCE WITH THE LOADING AND THE NOMINAL STRENGTH REQUIREMENTS OF THE 2015 AASHTO "LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, FIRST EDITION", SLTS-1. THE WIND LOADS WERE CALCULATED FROM AN ULTIMATE WIND VELOCITY OF 120 MPH WITH A MEAN RECURRENCE INTERVAL OF 1700 YEARS.
2. SEE COB DESIGN MANUAL APPENDIX A, SECTION IV.A FOR POLE DESIGN LOAD INFORMATION FOR FUTURE SMALL WIRELESS FACILITY INSTALLATIONS.

SMALL WIRELESS FACILITY (SWF) VERTICAL ATTACHMENT LIMITS

POLE HEIGHT	SWF DISCONNECT/SURGE DEVICE	SWF ENCLOSURE, PANEL ANTENNA ZONE
30'	BOTTOM ≥ 15'-7" AFG	BOTTOM ≥ 18'-6" AFG TOP ≤ 23' AFG
35'	BOTTOM ≥ 15'-7" AFG	BOTTOM ≥ 20' AFG TOP ≤ 28' AFG

AFG = ABOVE FINISHED GRADE AT SIDEWALK

MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
TAPERED TUBES	A595 GR.A	55
BASE PLATE	A36	36
PIPE	A513 OR EQUIV	36
ANCHOR BOLTS(BY OTHERS)	F1554 GR.55	55
GALVANIZE-HARDWARE	HOT DIP ZINC	

POLE DATA

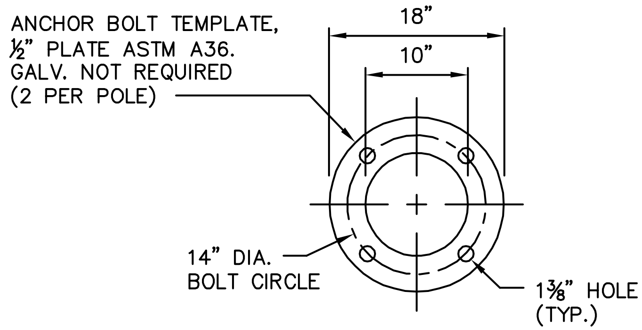
POLE TUBE				POLE BASE				ANCHOR BOLT					LUMINAIRE ARM		
BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	MIN. THICKNESS (GAUGE)	SQUARE S (IN)	BOLT CIRCLE Y (IN)	THK. M (IN)	SLOT Z (IN)	DIA. K (IN)	LENGTH J (IN)	HOOK H (IN)	UPPER THREAD LENGTH U1 (IN)	LOWER THREAD LENGTH U2 (IN)	SPAN LENGTH L (FT)	RISE R (FT)	MIN. THICKNESS (GAUGE)
10.65	5.75	35.00	10	14.50	14.00	1.25	1.38 X 1.79	1.25	38.00*	NA	14.00*	6.00	(1)	3.00	11
10.65	6.5	30.00	10	14.50	14.00	1.25	1.38 X 1.79	1.25	38.00*	NA	14.00*	6.00	(1)	3.00	11

NOTES:
1. LUMINAIRE ARMS CAN BE 6', 8' 10' OR 12'
2. DIMENSIONS MAY VARY BY MANUFACTURER
3. * IF FOUNDATION IS INSTALLED IN THE SIDEWALK PER SL-105-1, ANCHOR BOLT LENGTH J SHALL BE 43" AND UPPER THREAD LENGTH U1 SHALL BE 19".

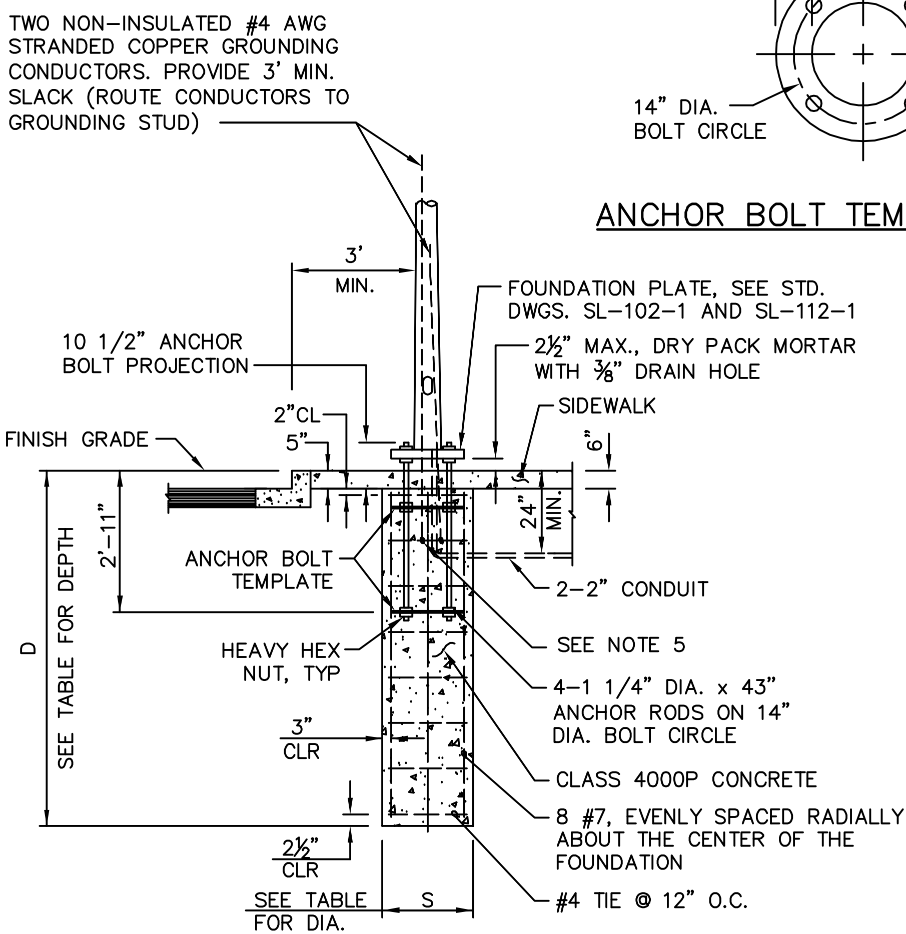
City of Bellevue

STEEL ROADWAY LIGHTING POLE DETAILS (SMALL WIRELESS FACILITY COMPATIBLE)

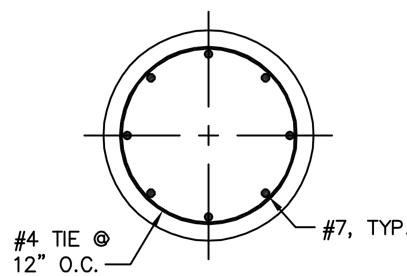
DRAWING NUMBER	SL-104-1
SCALE	NONE
REVISION DATE	1/24
DEPARTMENT	TRANS



ANCHOR BOLT TEMPLATE DETAIL



FOUNDATION – SIDEWALK CONDITION



FOUNDATION SECTION

NOTES:

1. THE FOUNDATION HAS BEEN DESIGNED ACCORDING TO THE AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, FIRST EDITION, 2015. ULTIMATE WIND SPEED IS 120 MPH.
2. THE FOUNDATION HAS BEEN DESIGNED FOR THE FOLLOWING POLE BASE FORCES:

BENDING MOMENT:	41,816 FT-LB
TORSION:	2,330 FT-LB
SHEAR FORCE:	1,814 LB
AXIAL FORCE:	1,798 LB

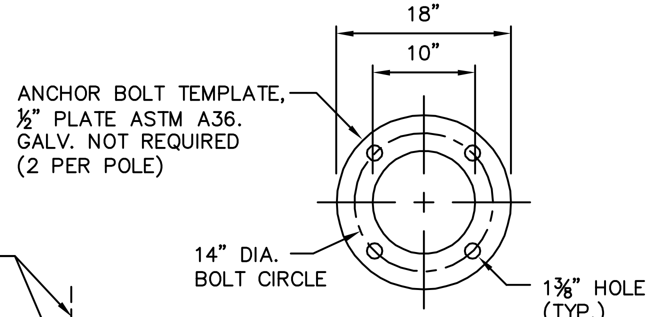
3. FOUNDATIONS FOR POLES WITH FORCES GREATER THAN ONE OR MORE OF THE FORCES LISTED ABOVE SHALL REQUIRE SPECIAL DESIGN.
4. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE HOT DIPPED GALVANIZED FULL LENGTH PER ASTM A153 OR F2329. ANCHOR BOLTS SHALL CONFORM TO ASTM F1554, GRADE 55, WITH 19" OF THREADS AT TOP AND 6" OF THREADS AT BOTTOM. HEAVY HEX NUTS SHALL CONFORM TO ASTM A563, GRADE A. WASHERS SHALL CONFORM TO ASTM F436.
5. CLAMP CONDUCTORS TO STEEL REINFORCING WITH LISTED CONNECTOR SUITABLE FOR USE EMBEDDED IN CONCRETE.
6. REINFORCING STEEL SHALL CONFORM TO ASTM A706, GRADE 60.

FOUNDATION DEPTH D		
ALLOWABLE LATERAL BEARING PRESSURE	SHAFT DIA. S	GROUND SLOPE: SIDEWALK
1000 TO 1500 PSF	30"	11'-0"
	36"	10'-0"
GREATER THAN 1500 PSF	30"	8'-0"
	36"	7'-6"

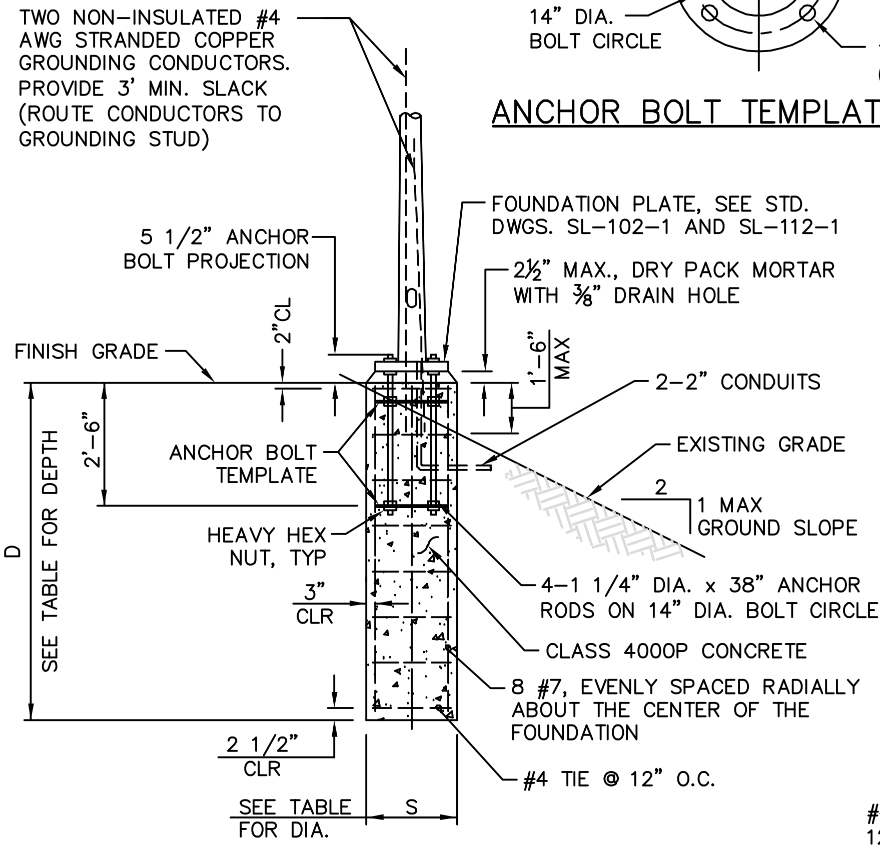
City of Bellevue

ROADWAY LIGHTING POLE FOUNDATION AT SIDEWALK (SMALL WIRELESS FACILITY COMPATIBLE)

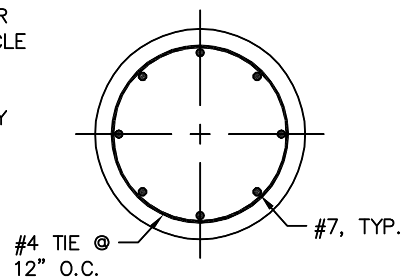
DRAWING NUMBER	SL-105-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



ANCHOR BOLT TEMPLATE DETAIL



FOUNDATION – SLOPED GROUND CONDITION



FOUNDATION SECTION

NOTES:

1. THE FOUNDATION HAS BEEN DESIGNED ACCORDING TO THE AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, FIRST EDITION, 2015. ULTIMATE WIND SPEED IS 120 MPH.
2. THE FOUNDATION HAS BEEN DESIGNED FOR THE FOLLOWING POLE BASE FORCES:

BENDING MOMENT:	41,816 FT-LB
TORSION:	2,330 FT-LB
SHEAR FORCE:	1,814 LB
AXIAL FORCE:	1,798 LB

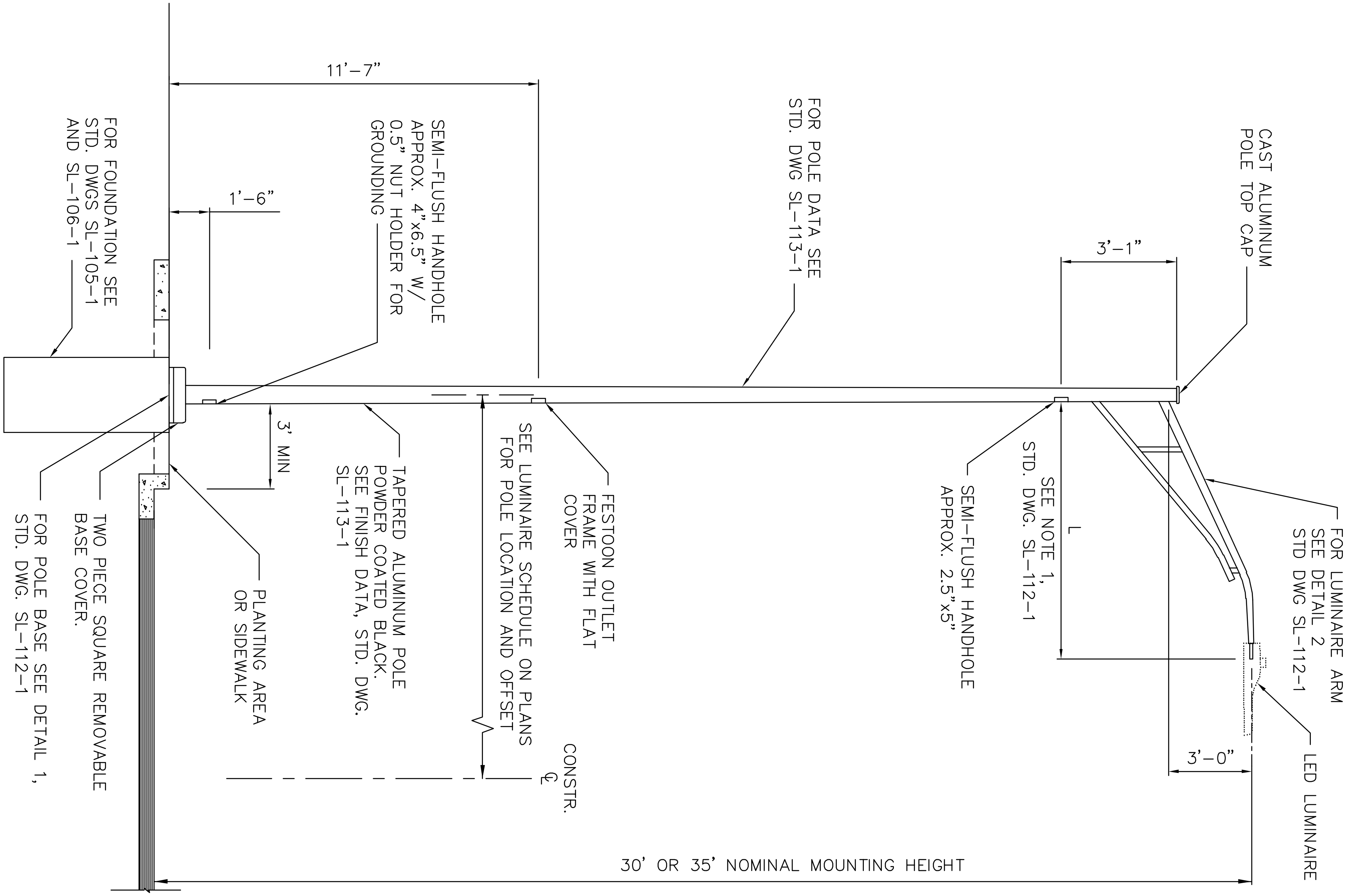
3. FOUNDATIONS FOR POLES WITH FORCES GREATER THAN ONE OR MORE OF THE FORCES LISTED ABOVE SHALL REQUIRE SPECIAL DESIGN.
4. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE HOT DIPPED GALVANIZED FULL LENGTH PER ASTM A153 OR F2329. ANCHOR BOLTS SHALL CONFORM TO ASTM F1554, GRADE 55, WITH 14" OF THREADS AT TOP AND 6" OF THREADS AT BOTTOM. HEAVY HEX NUTS SHALL CONFORM TO ASTM A563, GRADE A. WASHERS SHALL CONFORM TO ASTM F436.
5. CLAMP CONDUCTORS TO STEEL REINFORCING WITH LISTED CONNECTOR SUITABLE FOR USE EMBEDDED IN CONCRETE.
6. REINFORCING STEEL SHALL CONFORM TO ASTM A706, GRADE 60.
7. GROUND BAR MOUNTED AT BASE OF POLE. PROVIDE #2 BARE SOLID TINNED COPPER CONDUCTOR FINAL LEAD TO EXOTHERMIC WELD OR OTHER APPROVED METHOD CONNECTION TO REBAR CAGE THEN TO JUNCTION BOX. ATTACH TO GROUND ROD IN LIGHTING JUNCTION BOX.
8. GROUND RODS SHALL BE STAINLESS STEEL OR COPPER CLAD STEEL, ⅝" DIA. 10-FT LONG, AND SHALL BE DRIVEN VERTICALLY WITH THEIR TOPS 6" BELOW FINAL GRADE FOR MAXIMUM DEPTH.

FOUNDATION DEPTH "D"			
ALLOWABLE LATERAL BEARING PRESSURE	SHAFT DIA. S	GROUND SLOPE	
		SLOPE 4H:1V OR FLATTER	SLOPE BTWN 4H:1V & 2H:1V
1000 TO 1500 PSF	30"	11'	SPECIAL DESIGN REQ'D
	36"	10'	SPECIAL DESIGN REQ'D
GREATER THAN 1500 PSF	30"	8'	10'
	36"	7'-6"	9'

City of Bellevue

ROADWAY LIGHTING POLE FOUNDATION WITHIN UNPAVED AREA (SMALL WIRELESS FACILITY COMPATIBLE)

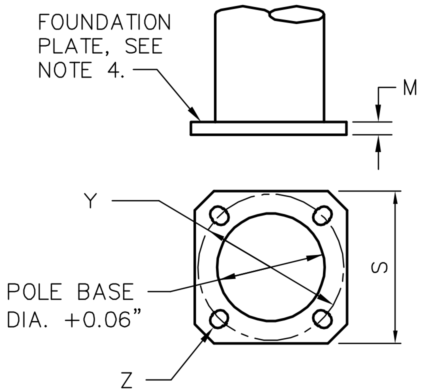
DRAWING NUMBER	SL-106-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



City of Bellevue

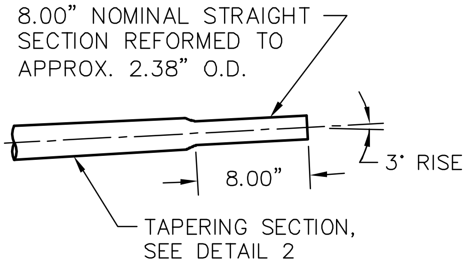
ALUMINUM ROADWAY LIGHTING POLE

DRAWING NUMBER	SL-111-1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS

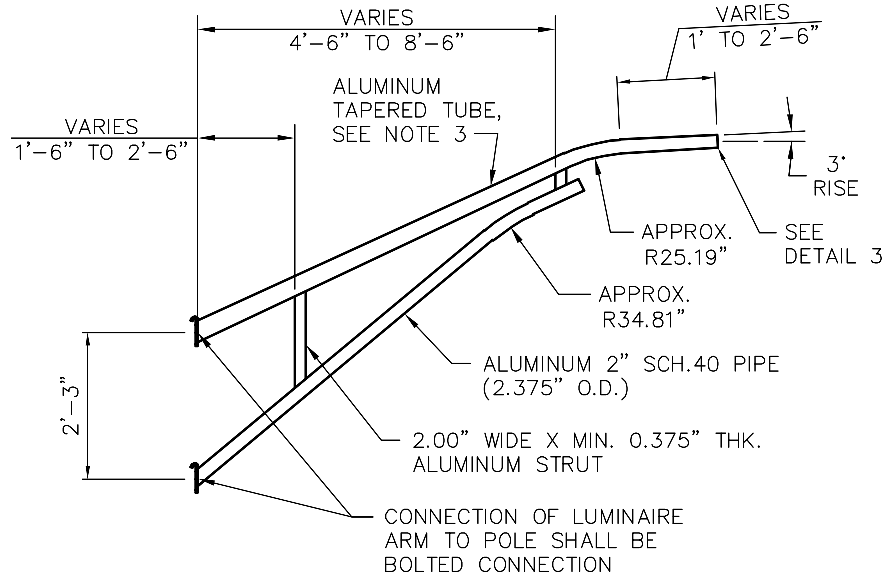


SEE STD DWG SL-113-1 FOR ASSOCIATED DIMENSIONS

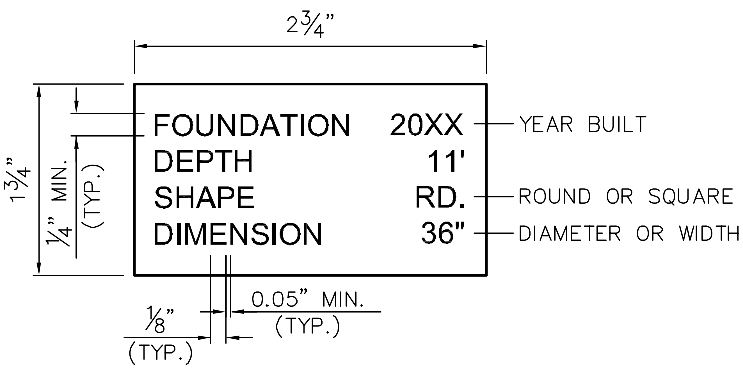
DETAIL 1 – POLE BASE



DETAIL 3 – ARM END



DETAIL 2 – LUMINAIRE ARM



DETAIL 4 – FOUNDATION PLATE DETAIL

NOTES:

1. LUMINAIRE ARM LENGTH L=6', 8', 10', OR 12'.
2. DIMENSIONS MAY VARY BY MANUFACTURER.
3. ALUMINUM TAPERED TUBE HAS CROSS–SECTION OF 4.00"X2.75" (LONGER DIMENSION VERTICAL) AT CONNECTION TO POLE AND TAPERS TO A 2.75" O.D. CROSS–SECTION, THEN CONTINUES TO TAPER TO AN O.D. OF APPROX. 2.40". SEE DETAIL 3, THIS SHEET, FOR ARM END DIMENSIONS.
4. FOUNDATION PLATE MATERIAL MAY BE METAL OR PLASTIC AND SHALL BE ATTACHED TO THE POLE BASE WITH A PERMANENT WEATHERPROOF ADHESIVE.

City of Bellevue

ALUMINUM ROADWAY LIGHTING POLE DETAILS

DRAWING NUMBER	SL–112–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

FINISH DATA

PRIME COAT: HIGH BUILD EPOXY POWDER

FINISH COAT: TGIC POWDER

COLOR: BLACK (RAL 9004)

NOTES:

1. LIGHTING STRUCTURES HAVE BEEN DESIGNED AND SHALL BE FABRICATED IN ACCORDANCE WITH THE LOADING AND THE NOMINAL STRENGTH REQUIREMENTS OF THE 2015 AASHTO "LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, FIRST EDITION", SLTS-1. THE WIND LOADS WERE CALCULATED FROM AN ULTIMATE WIND VELOCITY OF 120 MPH WITH A MEAN RECURRENCE INTERVAL OF 1700 YEARS.

COMPONENT	MATERIAL	ASTM DESIGNATION
POLE SHAFT	6063-T6 AL. ALLOY	B221
TAPERED TUBES	6063-T6 AL. ALLOY	B221
SCH 40 PIPE	6063-T6 AL. ALLOY	B221
STRUT	6063-T6 AL. ALLOY	B221
BASE PLATE	356-T6 AL. ALLOY	B26 OR B108
GALVANIZE-HARDWARE	HOT DIP ZINC	

POLE DATA

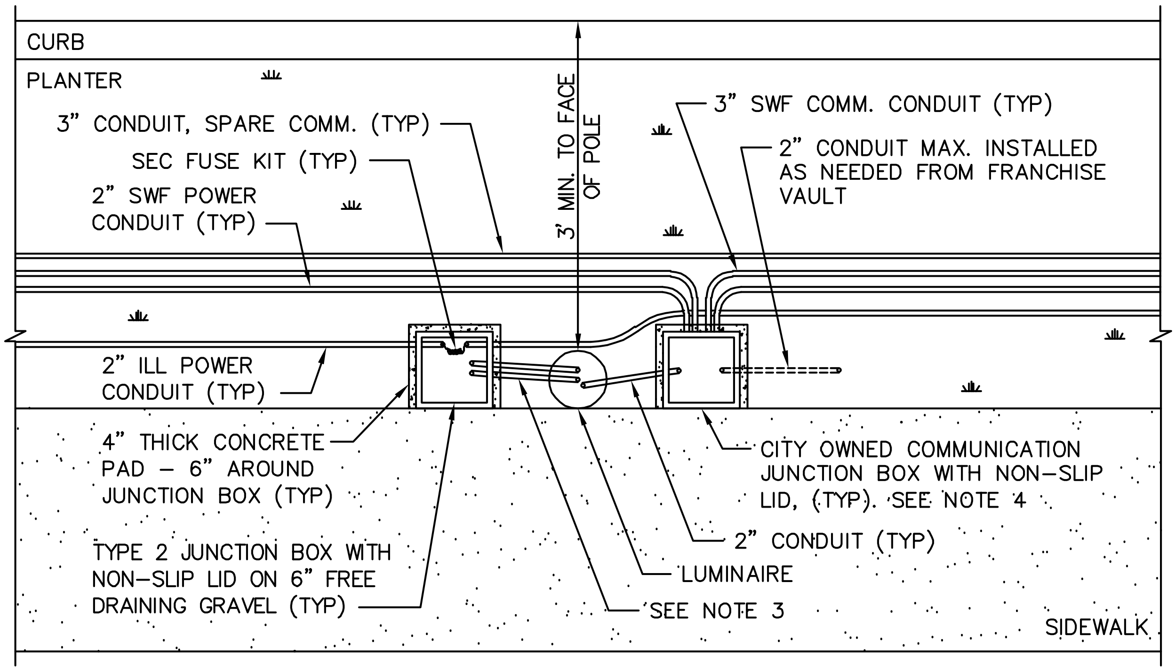
POLE TUBE				POLE BASE				ANCHOR BOLT				
BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	MIN. THICKNESS (IN)	SQUARE S (IN)	BOLT CIRCLE Y (IN)	THK. M (IN)	SLOT Z (IN)	DIA. K (IN)	LENGTH J (IN)	HOOK H (IN)	UPPER THREAD LENGTH U1 (IN)	LOWER THREAD LENGTH U2 (IN)
10.65	5.75	35.00	0.25	14.50	14.00	1.25	1.38 X 1.79	1.25	38.00*	NA	14.00*	6.00
10.65	6.5	30.00	0.25	14.50	14.00	1.25	1.38 X 1.79	1.25	38.00*	NA	14.00*	6.00

NOTE:
1. DIMENSIONS MAY VARY BY MANUFACTURER
2. * IF FOUNDATION IS INSTALLED IN THE SIDEWALK PER SL-105-1, ANCHOR BOLT LENGTH J SHALL BE 43" AND UPPER THREAD LENGTH U1 SHALL BE 19".

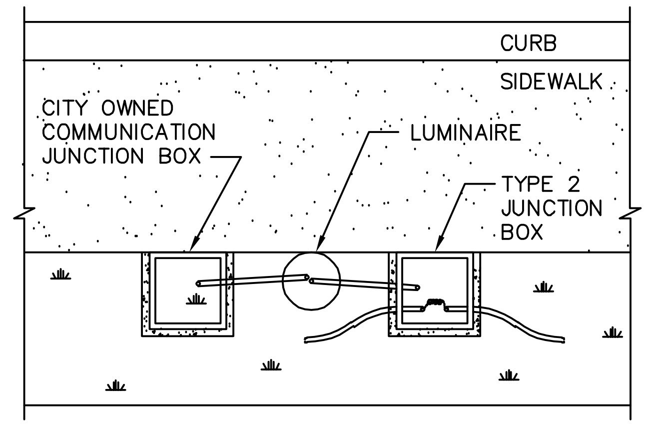
City of Bellevue

ALUMINUM ROADWAY LIGHTING POLE DETAILS

DRAWING NUMBER	SL-113-1
SCALE	NONE
REVISION DATE	1/24
DEPARTMENT	TRANS



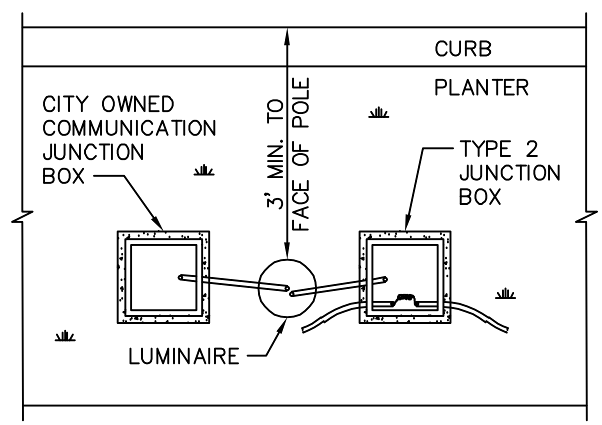
SIDEWALK WITH PLANTER STRIP



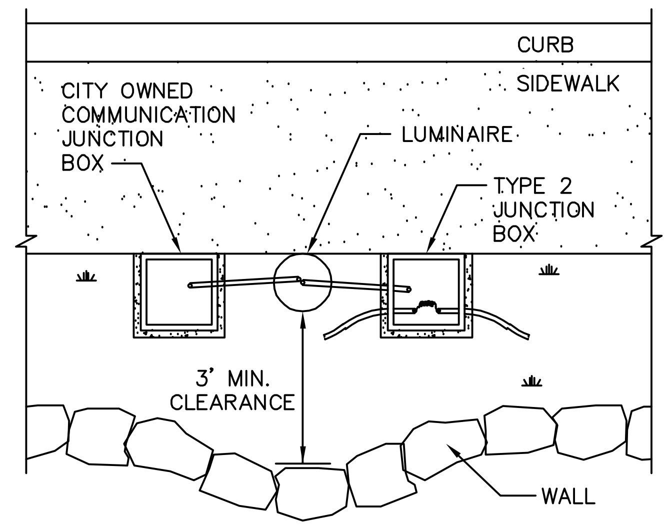
SIDEWALK WITH PLANTER BEHIND

NOTES:

1. MUST MAINTAIN 3' MINIMUM CLEARANCE FROM POLE HANDHOLE TO ANY OBSTRUCTION.
2. ALL CONDUIT AT COMMUNICATION JUNCTION BOX SHOWN IN "SIDEWALK WITH PLANTER STRIP" DETAIL TYPICAL FOR ALL DETAILS THIS SHEET.
3. 2–2" CONDUITS SHALL BE INSTALLED WHEN POWER IS OBTAINED FROM A SHARED ILLUMINATION CIRCUIT OR WHEN 2" SWF POWER CONDUIT AND 3" SWF COMM CONDUIT IS NOT PRESENT.
4. CITY OWNED COMMUNICATION JUNCTION BOX WITH NON-SLIP LID PER STD DWG SL–180–1. IF CONNECTING TO FIBER MEET-ME VAULT VIA 2" CONDUIT, JUNCTION BOX SHALL BE INSTALLED PER STD DWG SL–181–1.
5. TYPE 2 JUNCTION BOX SHALL CONFORM TO WSDOT STD. PLAN J–40.10–04.



NO SIDEWALK

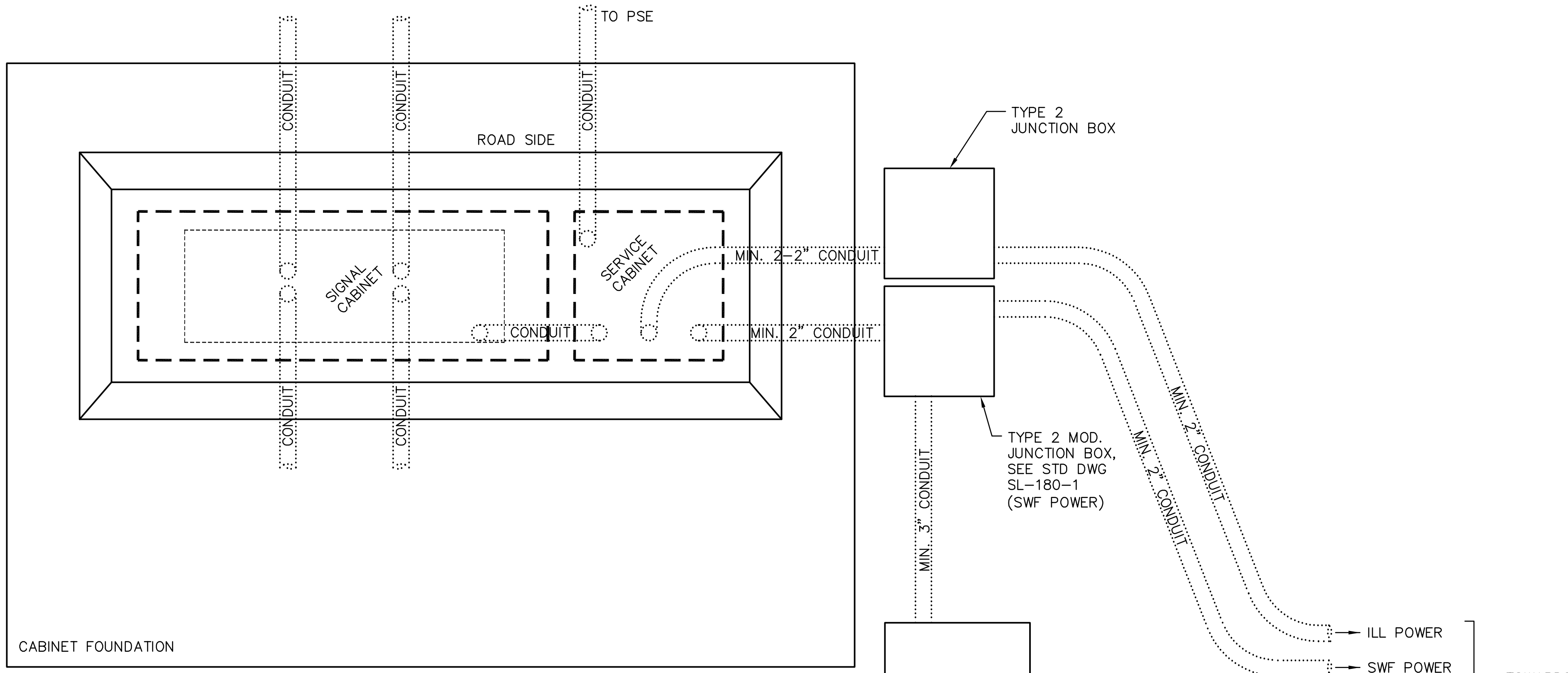


SIDEWALK WITH VERTICAL WALL

City of Bellevue

TYPICAL LUMINAIRE LOCATIONS AND SMALL WIRELESS FACILITY CONDUIT LAYOUT

DRAWING NUMBER	SL–120–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



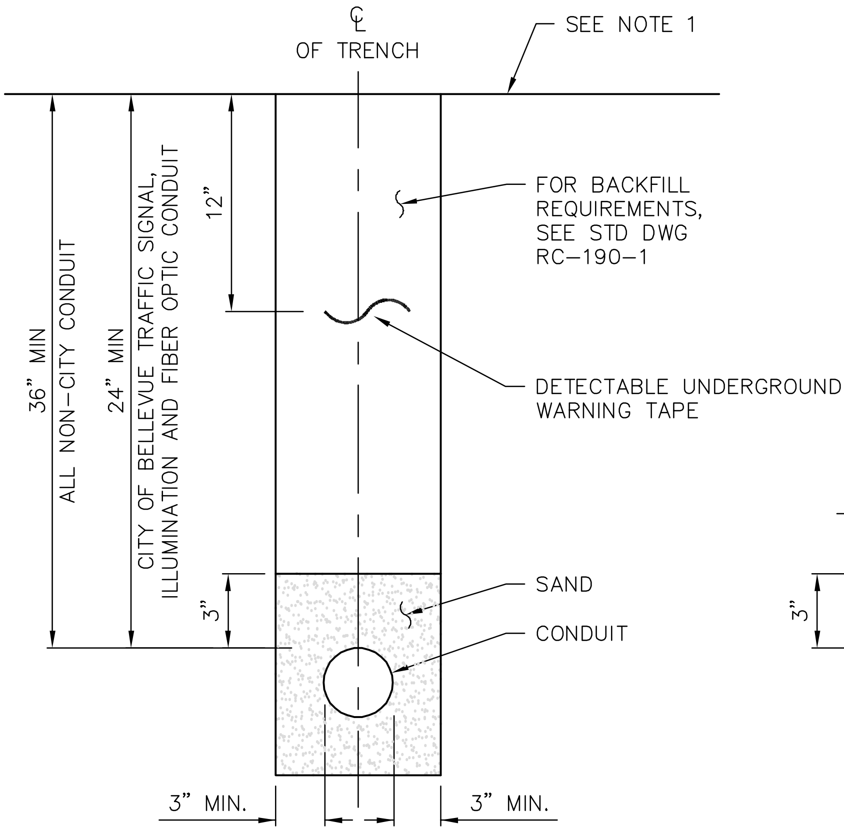
NOTES:

1. THIS DRAWING INDICATES MINIMUM CONDUIT SIZES, WHERE SPECIFIED. CONDUIT DIAMETER ARE TO BE SIZED IN ACCORDANCE WITH CONDUIT FILL REQUIREMENTS.
2. THIS DRAWING INDICATES MINIMUM JUNCTION BOX SIZES, WHERE SPECIFIED. LARGER JUNCTION BOXES ARE REQUIRED WHERE JUNCTION BOX FILL CALCULATIONS DEEM NECESSARY.
3. THIS STD DWG PROVIDES DETAILS FOR CONDUITS ASSOCIATED WITH SMALL WIRELESS FACILITY POWER AND COMMUNICATIONS ONLY. ADDITIONAL TRAFFIC SIGNAL AND ILLUMINATION CONDUITS AND JUNCTION BOX DETAILS ARE NOT SHOWN.
4. SEE STD DWG SL–210–1 FOR SIGNAL AND SERVICE CABINET FOUNDATION DETAILS.
5. SEE STD DWG SL–120–1 FOR JUNCTION BOX AND CONDUIT DETAILS AT SWF LUMINAIRE LOCATIONS.
6. FINAL CONDUIT LAYOUT SHALL BE APPROVED BY REVIEW ENGINEER.
7. COMMUNICATION CONDUIT AND LARGE COMMUNICATION JUNCTION BOX ARE REQUIRED WHEN THERE IS AN EXECUTED AGREEMENT WITH DATA/TELECOMMUNICATION CARRIERS OPERATING UNDER A ROW AGREEMENT OR FRANCHISE OR WHEN A PROJECT REQUIRES FRONTAGE IMPROVEMENTS.

City of Bellevue

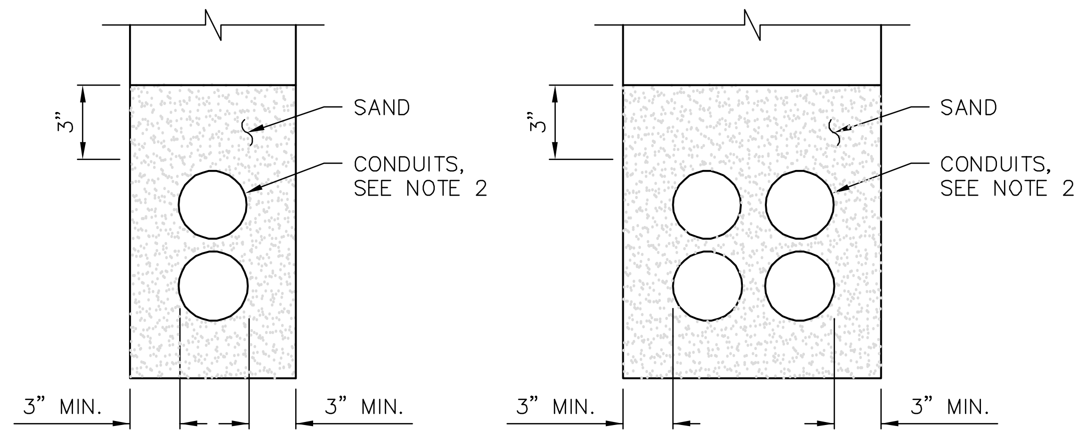
SMALL WIRELESS FACILITY COB–PROVIDED POWER CONDUIT AND JUNCTION BOX LAYOUT

DRAWING NUMBER	SL–121–1
SCALE	NONE
REVISION DATE	5/21
DEPARTMENT	TRANS



NOTES:

1. MINIMUM DEPTH TO TOP OF CONDUIT SHALL BE MEASURED:
   - FROM TOP OF FINISH GRADE AT SIDEWALKS, DRIVEWAY APPROACHES, AND UNPAVED AREAS.
   - FROM BOTTOM OF PAVEMENT (HMA OR PCC) AT ROADWAY.
2. MULTIPLE CONDUIT CONFIGURATION MAY VARY (1x2, 2x2, 2x3, ETC). HOWEVER, MINIMUM DEPTH AND UTILITY CLEARANCES SHALL BE MAINTAINED.
3. ADDITIONAL REQUIREMENTS MAY APPLY FOR JOINT TRENCHES.



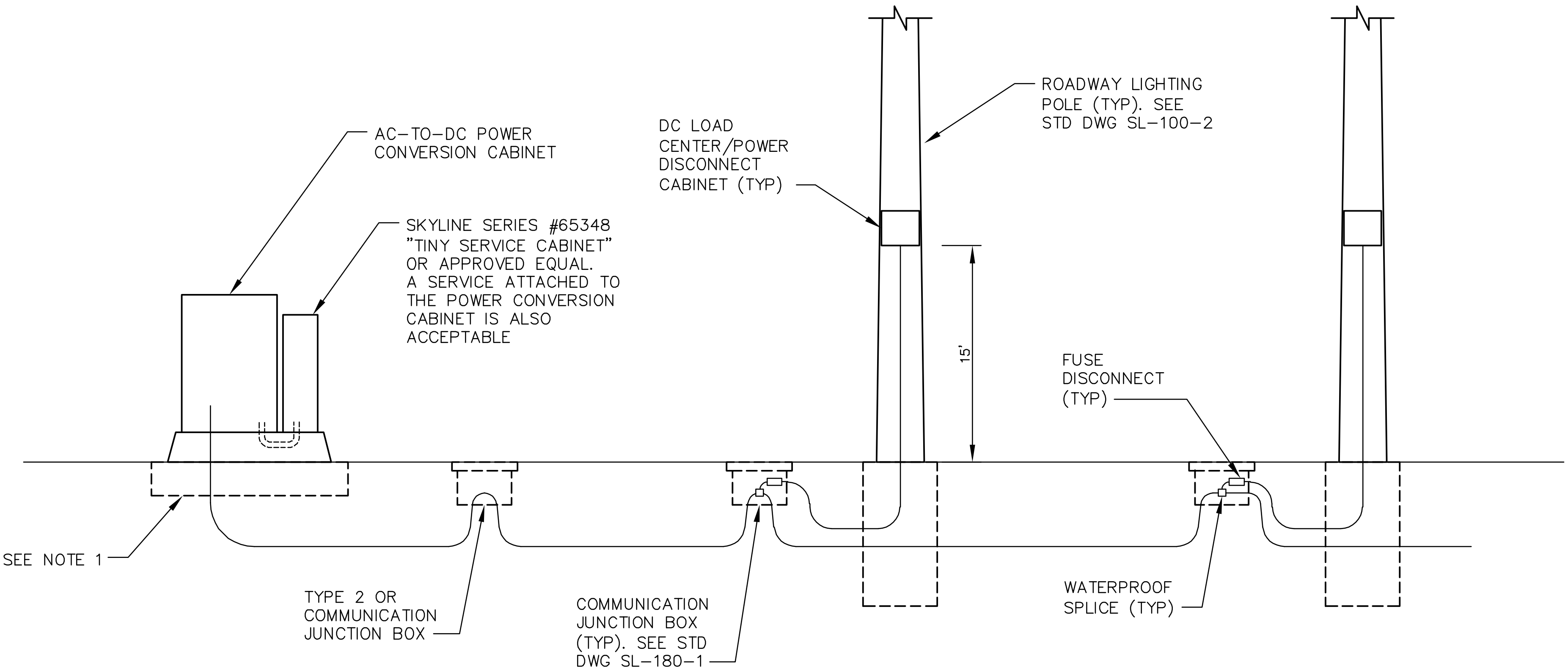
CONDUIT TRENCH DETAIL

ALTERNATE CONDUIT CONFIGURATION EXAMPLES

City of Bellevue

CONDUIT TRENCH DETAIL

DRAWING NUMBER	SL-122-1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS



NOTES:

1. FOUNDATION SHALL BE CONSTRUCTED PER STD DWG SL–210–1. WIDTH AND HORIZONTAL DEPTH SHALL BE SCALED TO THE DIMENSIONS OF THE CABINET SELECTED. CONDUIT QUANTITY AND LAYOUT TO BE DETERMINED BY THE CARRIER. A CONDUIT WELL IS OPTIONAL.

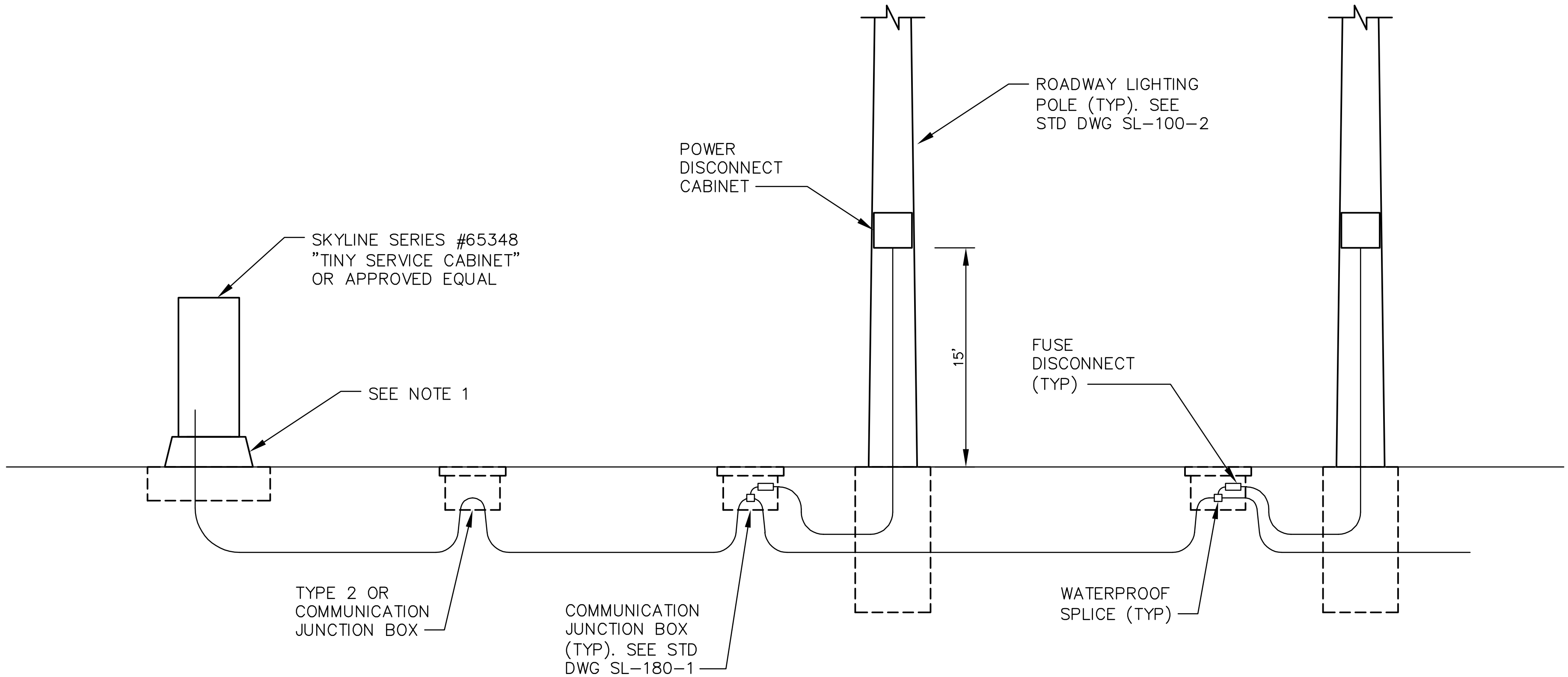
2. CABINET PAD SHALL BE LOCATED IN THE LANDSCAPE STRIP/SIDEWALK AMENITY ZONE OR BEHIND THE SIDEWALK. THE EDGE OF THE CABINET PAD MUST BE A MINIMUM OF 3' FROM THE FACE OF CURB AND SHALL NOT EXTEND INTO THE PRIMARY WALKING PATH. SEE COB DESIGN MANUAL SECTION 15 FOR ADDITIONAL INFORMATION REGARDING LOCATING FIXED OBJECTS.

3. COB MUST HAVE ACCESS TO THE BREAKER DOOR ON THE SERVICE CABINET. A COMMON KEY, UNIQUE TO EACH CARRIER, SHALL BE PROVIDED.

City of Bellevue

SMALL WIRELESS FACILITY DC POWER LAYOUT

DRAWING NUMBER	SL–123–1
SCALE	NONE
REVISION DATE	5/21
DEPARTMENT	TRANS



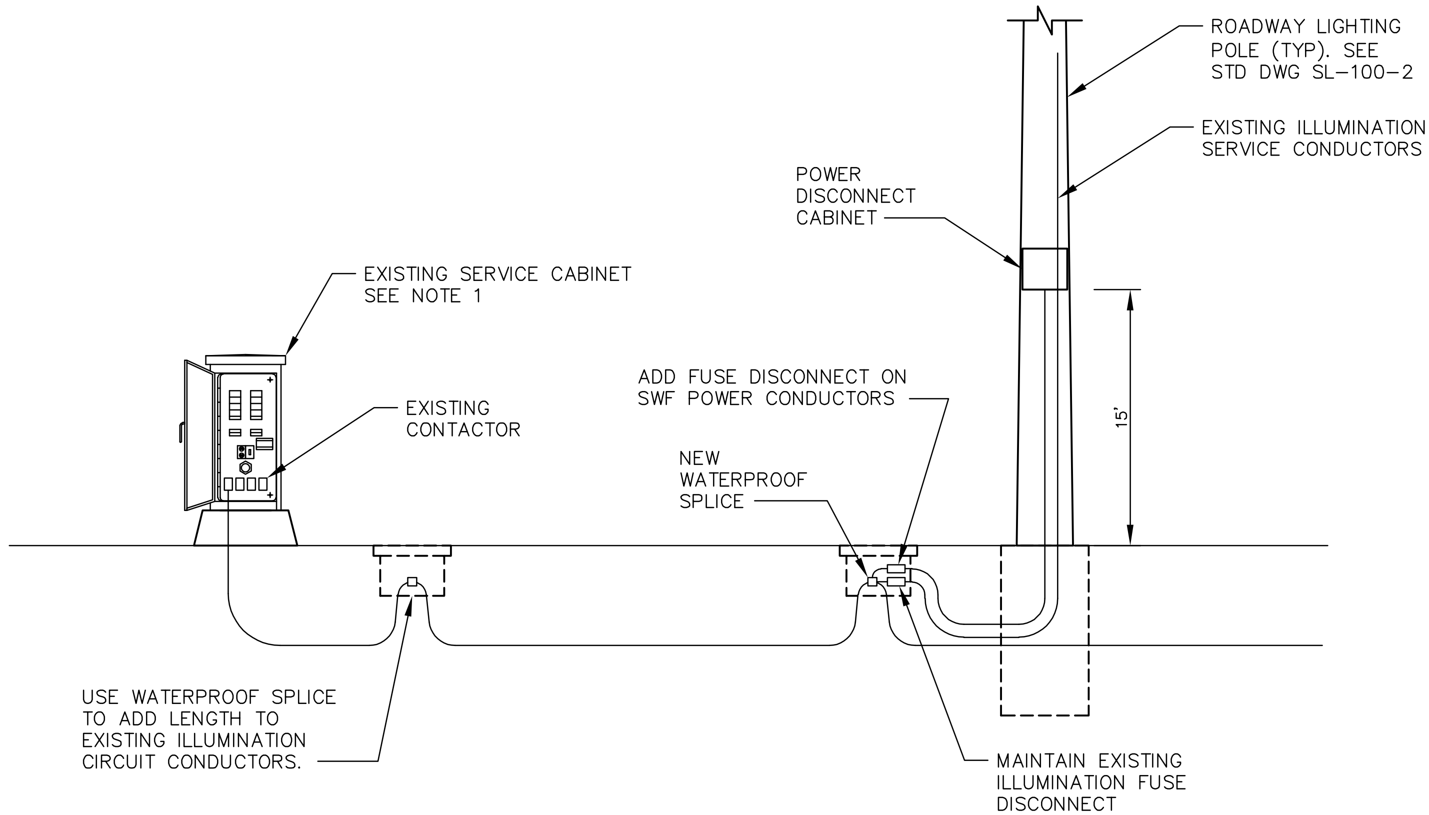
NOTES:

1. FOUNDATION SHALL BE CONSTRUCTED PER STD DWG SL–211–1. WIDTH AND HORIZONTAL DEPTH SHALL BE SCALED TO THE DIMENSIONS OF THE CABINET SELECTED. CONDUIT QUANTITY AND LAYOUT TO BE DETERMINED BY THE CARRIER.
2. CABINET PAD SHALL BE LOCATED IN THE LANDSCAPE STRIP/SIDEWALK AMENITY ZONE OR BEHIND THE SIDEWALK. THE EDGE OF THE CABINET PAD MUST BE A MINIMUM OF 3' FROM THE FACE OF CURB AND SHALL NOT EXTEND INTO THE PRIMARY WALKING PATH. SEE COB DESIGN MANUAL SECTION 15 FOR ADDITIONAL INFORMATION REGARDING LOCATING FIXED OBJECTS.
3. COB MUST HAVE ACCESS TO THE BREAKER DOOR ON THE SERVICE CABINET. A COMMON KEY, UNIQUE TO EACH CARRIER, SHALL BE PROVIDED.

City of Bellevue

SMALL WIRELESS FACILITY PSE–PROVIDED SERVICE LAYOUT

DRAWING NUMBER	SL–124–1
SCALE	NONE
REVISION DATE	5/21
DEPARTMENT	TRANS



NOTES:

1. TO POWER SWF EQUIPMENT OFF AN EXISTING ILLUMINATION CIRCUIT, THE EXISTING ILLUMINATION CONDUCTORS SHALL BE DISCONNECTED FROM THE ASSOCIATED CONTACTOR AND ROUTED DIRECT TO THE ASSOCIATED BREAKER. PULL EXISTING CONDUCTORS BACK TO CLOSEST JUNCTION BOX TO SPLICE ADDITIONAL LENGTH AS NEEDED.
2. ALL STREETLIGHT POLES ON THE SAME CIRCUIT AS THE SWF POLE SHALL HAVE PHOTOCELLS INSTALLED. STREETLIGHT FIXTURES THAT ARE NOT COMPATIBLE WITH A 3-PIN TWIST-LOCK PHOTOCELL SHALL BE REPLACED.

City of Bellevue

SMALL WIRELESS FACILITY SHARED ILLUMINATION CIRCUIT

DRAWING NUMBER	SL-125-1
SCALE	NONE
REVISION DATE	5/21
DEPARTMENT	TRANS

LUMINAIRE SCHEDULE FOR CONTACTOR CABINET @ ________ STA. CABINET #__________

COB POLE NO.*	LUM. NO. ⬡	CIRCUIT NO.	STATION (OFFSET)	LIGHT SPECIFICATION	POLE HEIGHT	POLE TYPE	COMMENTS
NE 8@100-01	1	1	12+73 (38 LT)	LED COBRAHEAD TYPE XX-XX WATTS	35'	ROADWAY LIGHTING POLE	
EGATE@139-06	2	2	14+05 (30 RT)	LED COBRAHEAD TYPE XX-XX WATTS	35'	ROADWAY LIGHTING POLE	
	3						
	4						
	5						

* ASSIGNED BY C.O.B. SIGNAL & LIGHTING ENGINEER.

ILLUMINATION WIRE SCHEDULE

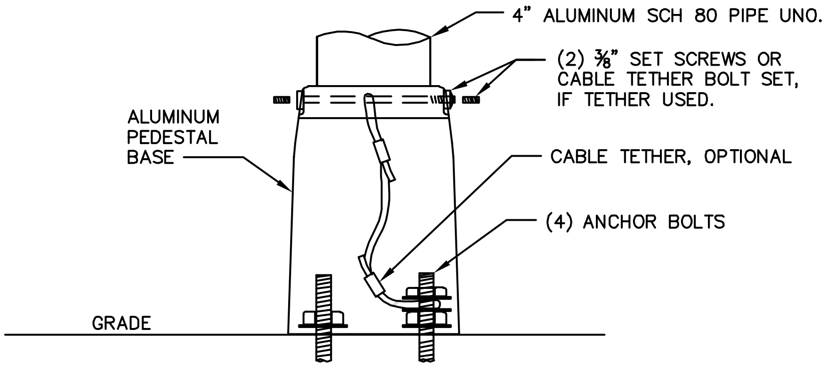
RUN NO. △	CONDUCTORS	CONDUIT
1	2#8 (ILL.), 2#8 (REC.), 1#8 (GROUND)	2"
2	4#8 (ILL.), 2#8 (REC.), 1#8 (GROUND)	2"
3		
4		
5		

ILL. = ILLUMINATION
REC. = RECEPTACLES

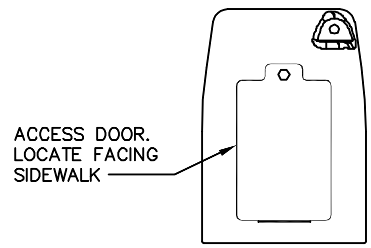
City of Bellevue

LUMINAIRE SCHEDULE AND ILLUMINATION WIRE SCHEDULE

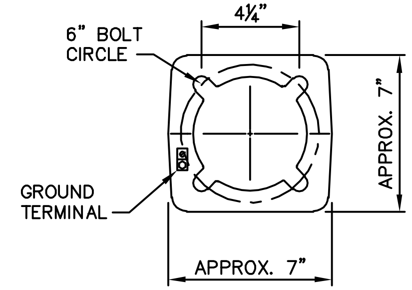
DRAWING NUMBER	SL-130-1
SCALE	NONE
REVISION DATE	11/19
DEPARTMENT	TRANS



BASE MOUNTING DETAIL

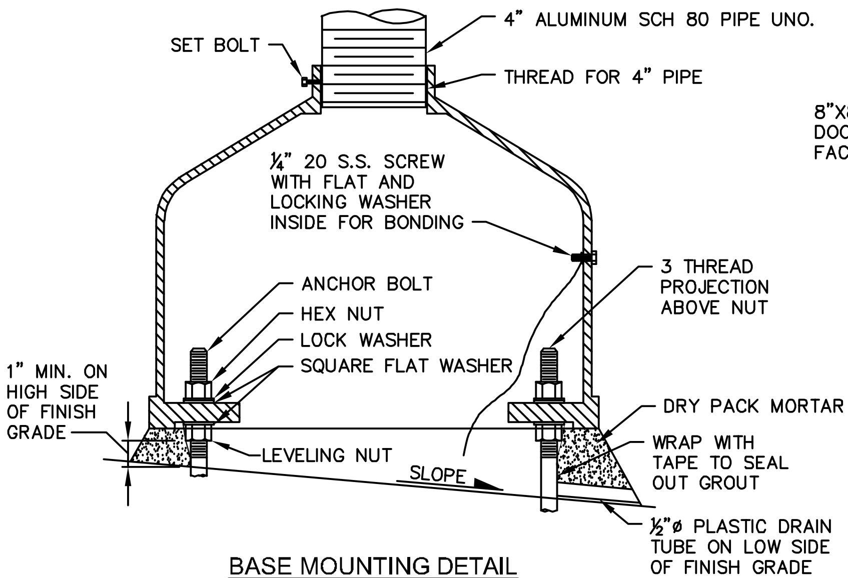


BASE ELEVATION

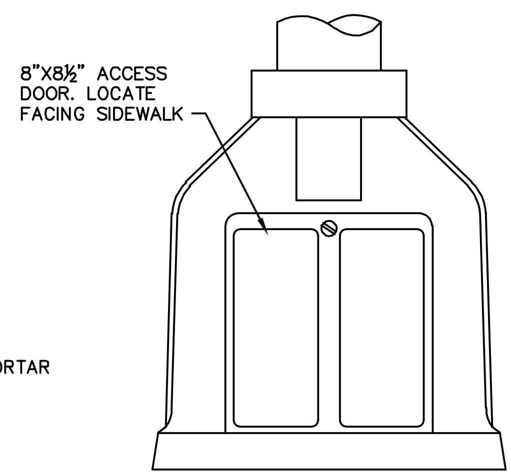


BOTTOM VIEW

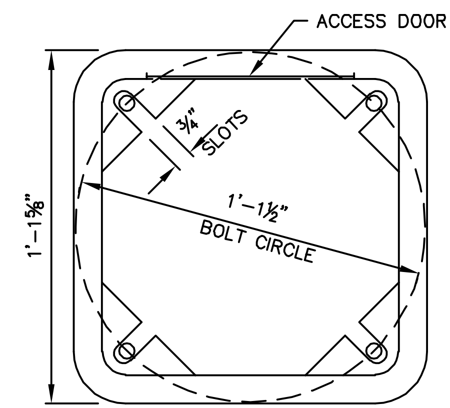
PEDESTAL BASE WITH 6" BOLT CIRCLE



BASE MOUNTING DETAIL



BASE ELEVATION



NOTE: BASE SHALL MEET AASHTO BREAKAWAY REQUIREMENTS

BOTTOM VIEW

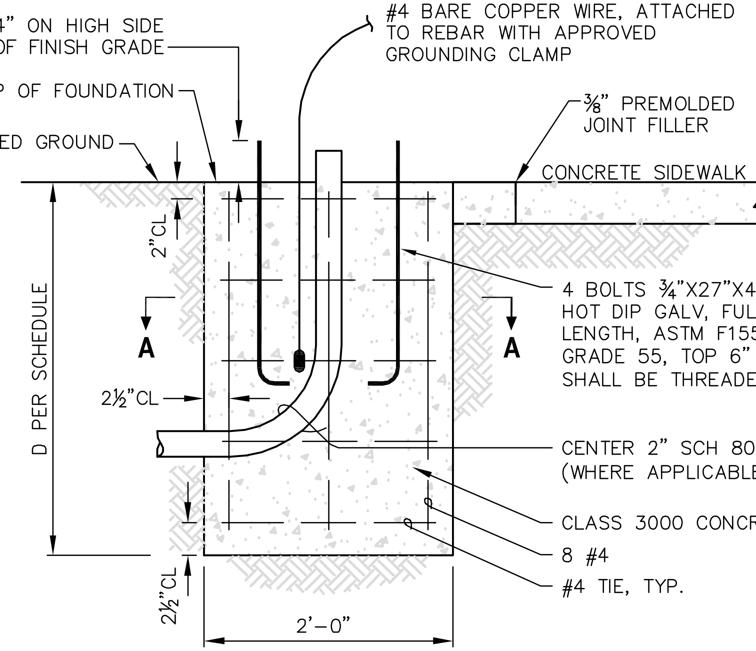
PEDESTAL BASE WITH 1'-1½" BOLT CIRCLE

City of Bellevue

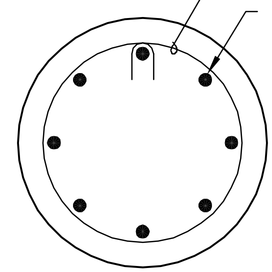
PEDESTAL BASE FOR 4" ALUMINUM POLE

DRAWING NUMBER	SL-140-2
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

FOUNDATION SCHEDULE		
LOADING AT BASE M	GROUND CONDITION (SEE NOTES)	FOUNDATION DEPTH D
M < 8500 FT–LB	FLAT SLOPED	4'–0" 5'–0"
8500 FT–LB < M < 12,000 FT–LB	FLAT SLOPED	5'–0" 6'–0"



PEDESTAL FOUNDATION



FOUNDATION SECTION (A-A)

NOTES:

1. THIS FOUNDATION HAS BEEN DESIGNED ACCORDING TO THE AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, FIRST EDITION, 2015. ULTIMATE WIND SPEED IS 100 MPH.
2. IF THE LOADING AT THE BASE OF THE POLE IS GREATER THAN 12,000 FT–LB. A PROJECT–SPECIFIC DESIGN WILL BE REQUIRED.
3. FLAT GROUND CONDITION SHALL BE USED IF SLOPE IS 4H:1V OR LESS.
4. SLOPED GROUND CONDITION SHALL BE USED IF SLOPE IS GREATER THAN 4H:1V BUT LESS THAN 2H:1V.
5. FOUNDATION DEPTHS PROVIDED ASSUME SOIL CAN BE CLASSIFIED AS SAND. FOR PREDOMINATELY CLAY SOILS A PROJECT–SPECIFIC DESIGN WILL BE REQUIRED.

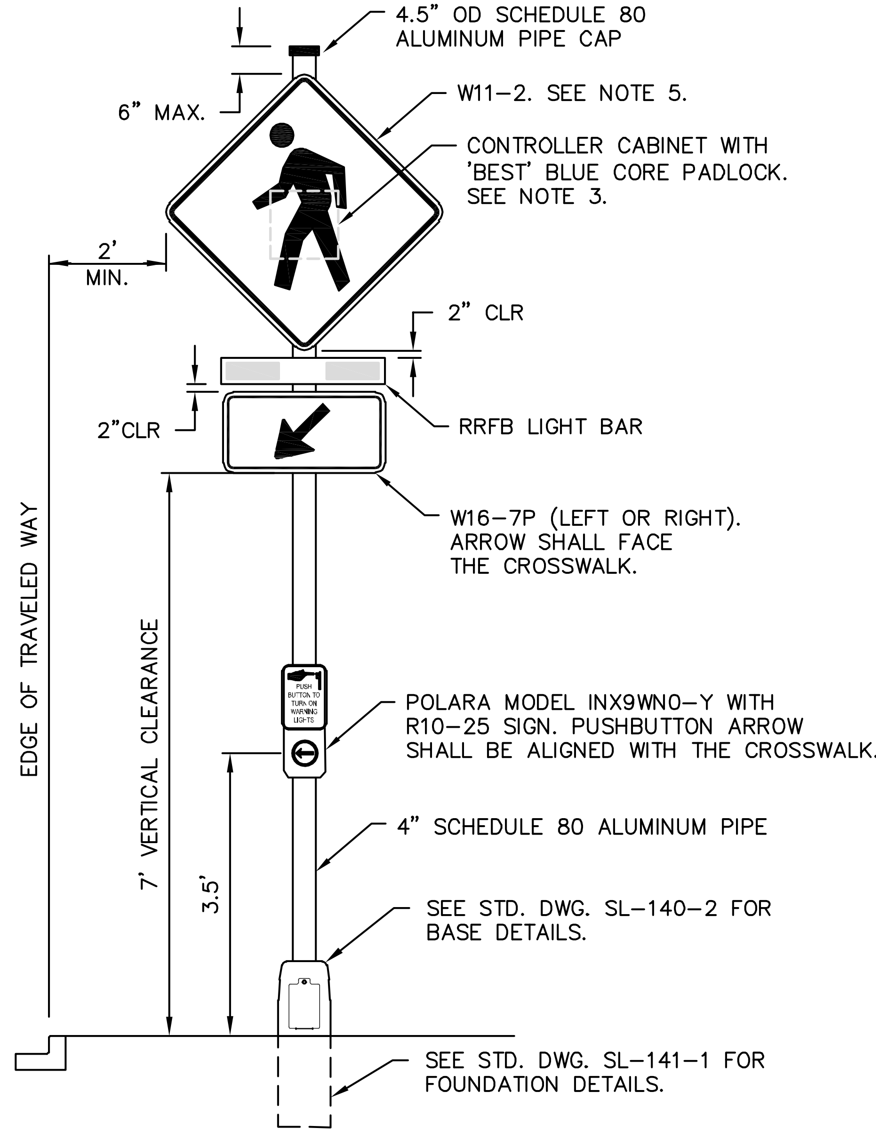
City of Bellevue

FOUNDATION FOR 4" ALUMINUM POLE AND PEDESTAL

DRAWING NUMBER	SL–141–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

NOTES:

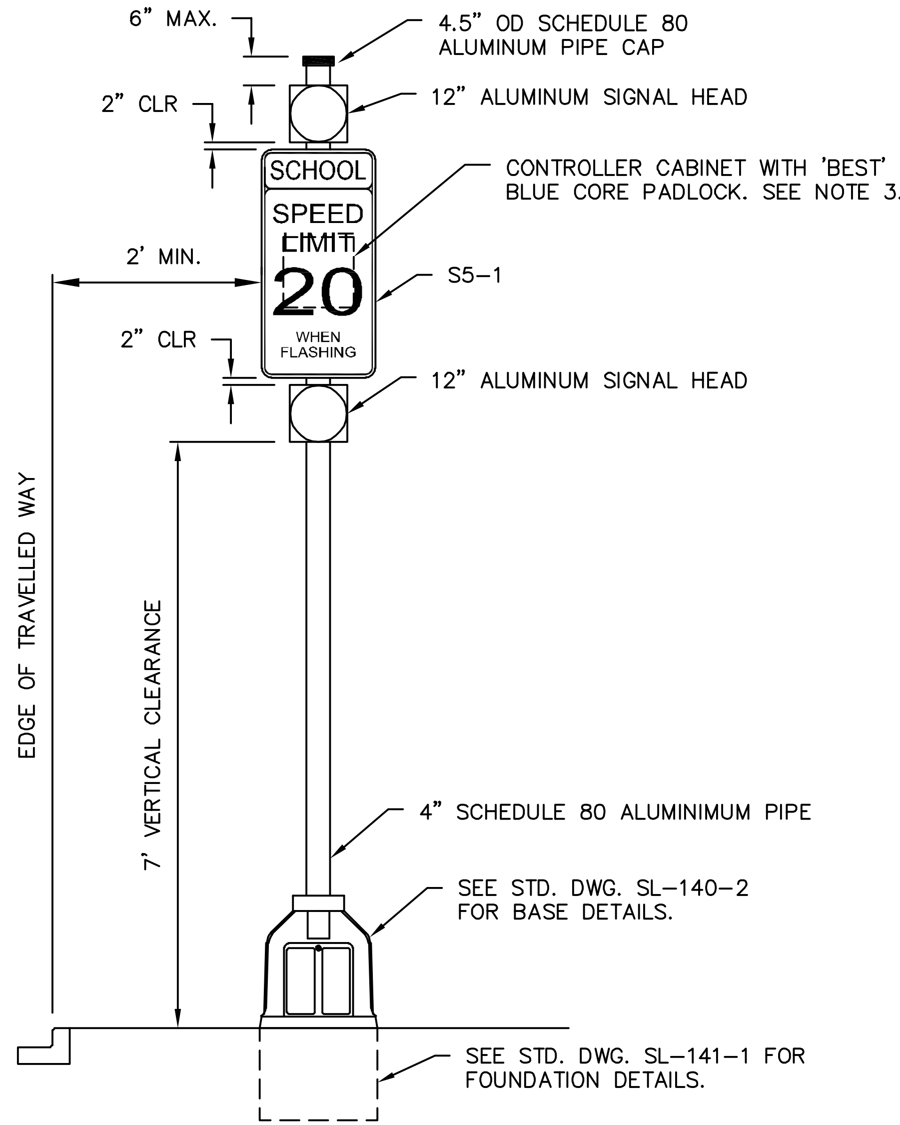
1. SEE CONTRACT PLANS AND SPECIFICATIONS FOR POLE HEIGHT, SIGN SIZES, SHEETING TYPE, AND OTHER DETAILS.
2. REFER TO THE CURRENT BELLEVUE SPECIAL PROVISIONS FOR APPROVED RRFB COMPONENTS.
3. THE PREFERRED PLACEMENT OF RRFB CONTROLLER CABINET HOUSING THE RRFB CONTROLLER IS BEHIND THE W11–2 SIGN. CONTACT THE CITY'S TRAFFIC ENGINEER FOR CONTROLLER PLACEMENT WHEN USING DUAL SIDED SIGN ASSEMBLIES.
4. POLE, POLE BASE, POLE CAP, SIGN BACKS, BANDING, AND CONTROLLER CABINET SHALL BE POWDER COATED BLACK (RAL 9004 OR P33) UNLESS OTHERWISE NOTED ON THE PLANS.
5. FOR SCHOOL CROSSINGS, A S1–1 SHALL BE USED.
6. THE RRFB BASE AND FOUNDATION SHALL BE LOCATED SO THAT 4' MINIMUM CLEARANCE IS MAINTAINED FOR THE PEDESTRIAN ACCESS ROUTE.
7. "TINY" SERVICE CABINET SHALL BE USED WITH RRFB ASSEMBLY UNLESS OTHERWISE REQUIRED BY REVIEW ENGINEER. SEE STD. DWG. SL–221–1.



City of Bellevue

TYPICAL RRFB ASSEMBLY

DRAWING NUMBER	SL–150–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



NOTES:

1. SEE CONTRACT PLANS AND SPECIFICATIONS FOR POLE HEIGHT, SIGN SIZES, SHEETING TYPE, AND OTHER DETAILS.
2. REFER TO THE CURRENT BELLEVUE SPECIAL PROVISIONS FOR APPROVED SCHOOL ZONE FLASHING BEACON COMPONENTS.
3. THE PREFERRED PLACEMENT OF THE CONTROLLER CABINET HOUSING THE SCHOOL ZONE FLASHING BEACON CONTROLLER IS BEHIND THE SCHOOL SPEED LIMIT SIGN (S5-1).
4. POLE, POLE BASE, POLE CAP, SIGN BACKS, BANDING, AND CONTROLLER CABINET SHALL BE POWDER COATED "BLACK" (RAL9004 OR P33) UNLESS OTHERWISE NOTED ON THE PLANS.
5. SUPPORTING SCHOOL ZONE SIGNAGE SHALL BE INSTALLED ALONG THE ROADWAY CORRIDOR INCLUDING SCHOOL ZONE SIGN (S1-1) WITH SCHOOL PLAQUE (S4-3P) AND END SCHOOL ZONE SIGN (S5-2), IN ACCORDANCE WITH THE MUTCD.
6. THE SCHOOL ZONE FLASHING BEACON SIGN BASE AND FOUNDATION SHALL BE LOCATED SO THAT 4' MINIMUM CLEARANCE IS MAINTAINED FOR THE PEDESTRIAN ACCESS ROUTE.

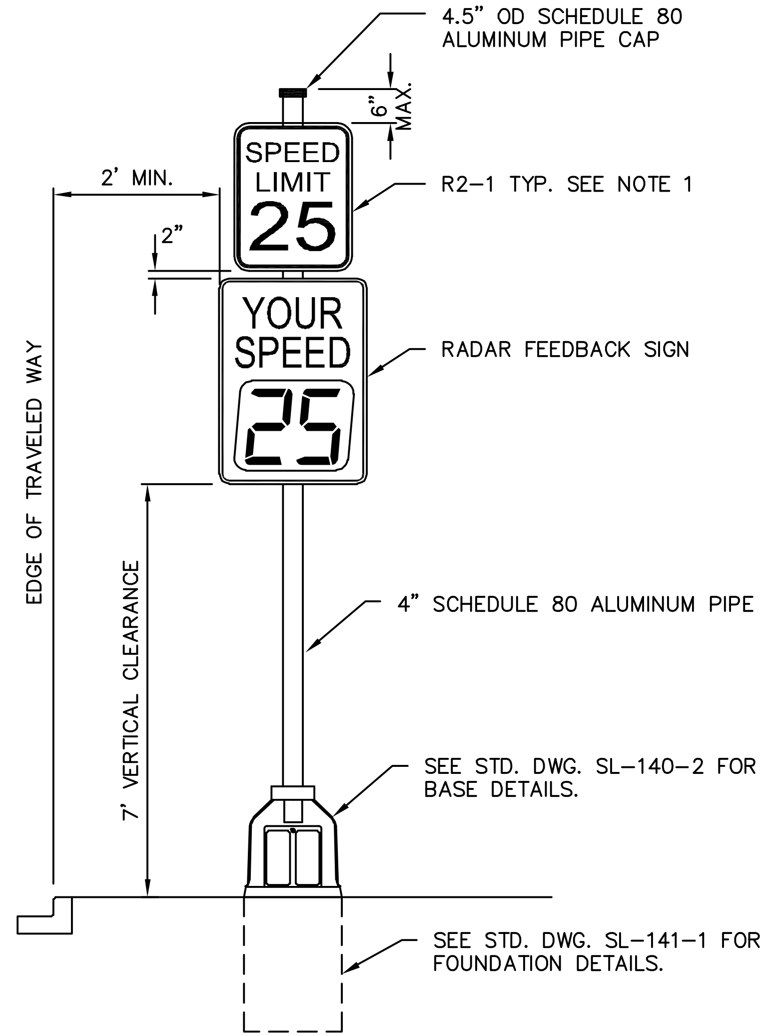
City of Bellevue

TYPICAL SCHOOL ZONE FLASHING BEACON ASSEMBLY

DRAWING NUMBER	SL-151-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

NOTES:

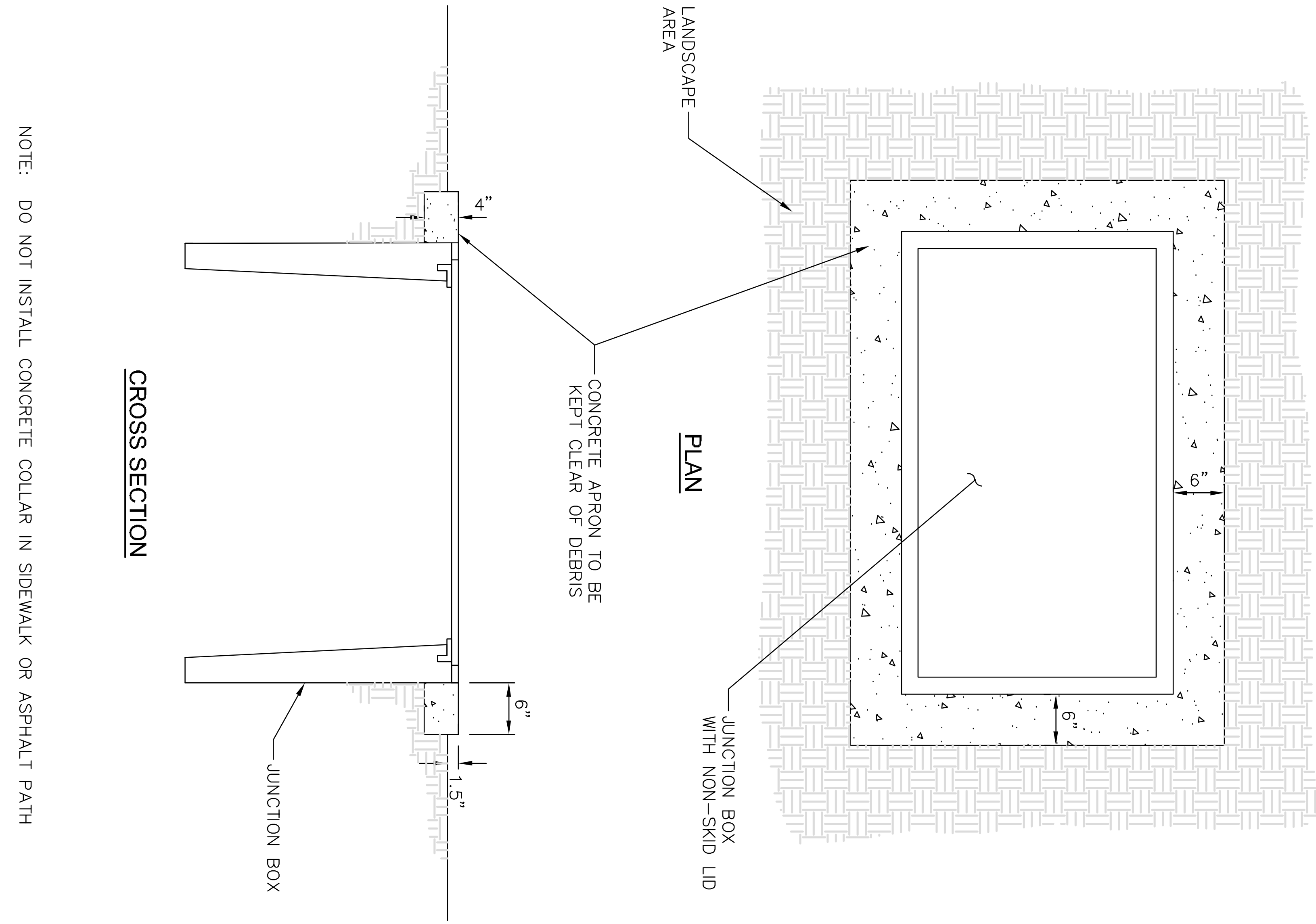
1. SEE CONTRACT PLANS AND SPECIFICATIONS FOR POLE HEIGHT, SIGN SIZES, SHEETING TYPE, SPEED LIMIT, AND OTHER DETAILS.
2. THE LEGEND "YOUR SPEED" SHALL BE A BLACK LEGEND ON A YELLOW RETROREFLECTIVE BACKGROUND.
3. THE CHANGEABLE LEGEND DISPLAYING THE SPEED OF THE APPROACHING VEHICLE SHALL BE A YELLOW LUMINOUS LEGEND ON A BLACK OPAQUE BACKGROUND. THE VEHICLE SPEED DISPLAYED ON THE CHANGEABLE PORTION OF THE SIGN SHALL BE DISPLAYED AS AN INTEGER.
4. REFER TO THE CURRENT BELLEVUE SPECIAL PROVISIONS FOR APPROVED RADAR FEEDBACK SIGN COMPONENTS.
5. POLE, POLE BASE, POLE CAP, SIGN BACKS, BANDING, AND CONTROLLER CABINET SHALL BE POWDER COATED "BLACK" (RAL9004 OR APPROVED EQUAL) UNLESS OTHERWISE NOTED ON THE PLANS.
6. THE RADAR FEEDBACK SIGN BASE AND FOUNDATION SHALL BE LOCATED SO THAT 4' MINIMUM CLEARANCE IS MAINTAINED FOR THE PEDESTRIAN ACCESS ROUTE.
7. WHEN USED TO SUPPLEMENT A HORIZONTAL ALIGNMENT WARNING SIGN ADVISORY SPEED, THE FEEDBACK SIGN SHALL BE AN INDEPENDENT INSTALLATION PLACED DOWNSTREAM OF THE WARNING SIGN NEAR THE POINT OF CURVATURE OF THE HORIZONTAL CURVE.



City of Bellevue

TYPICAL RADAR FEEDBACK SIGN ASSEMBLY

DRAWING NUMBER	SL-152-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS



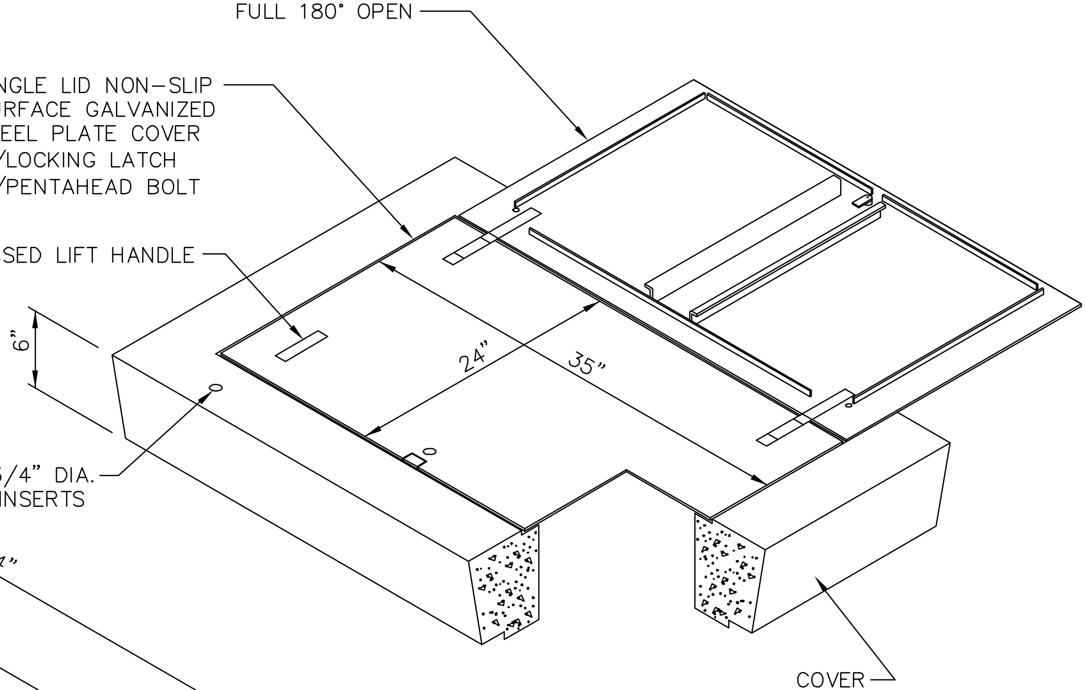
City of Bellevue

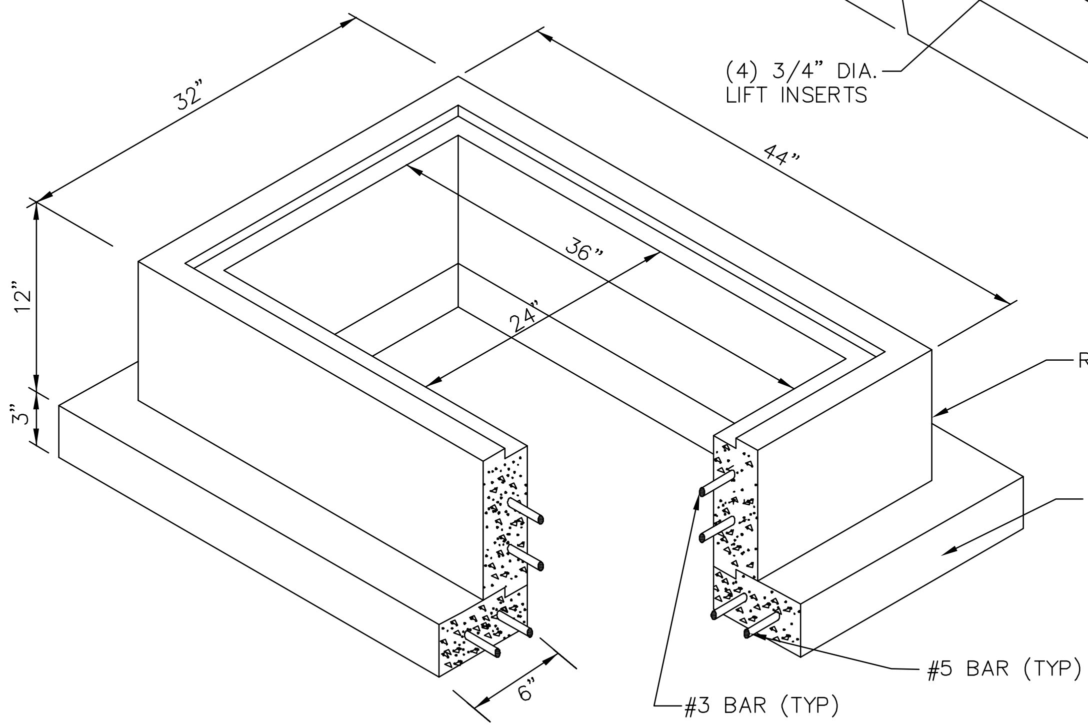
JUNCTION BOX IN LANDSCAPE AREAS

DRAWING NUMBER	SL–160–1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS

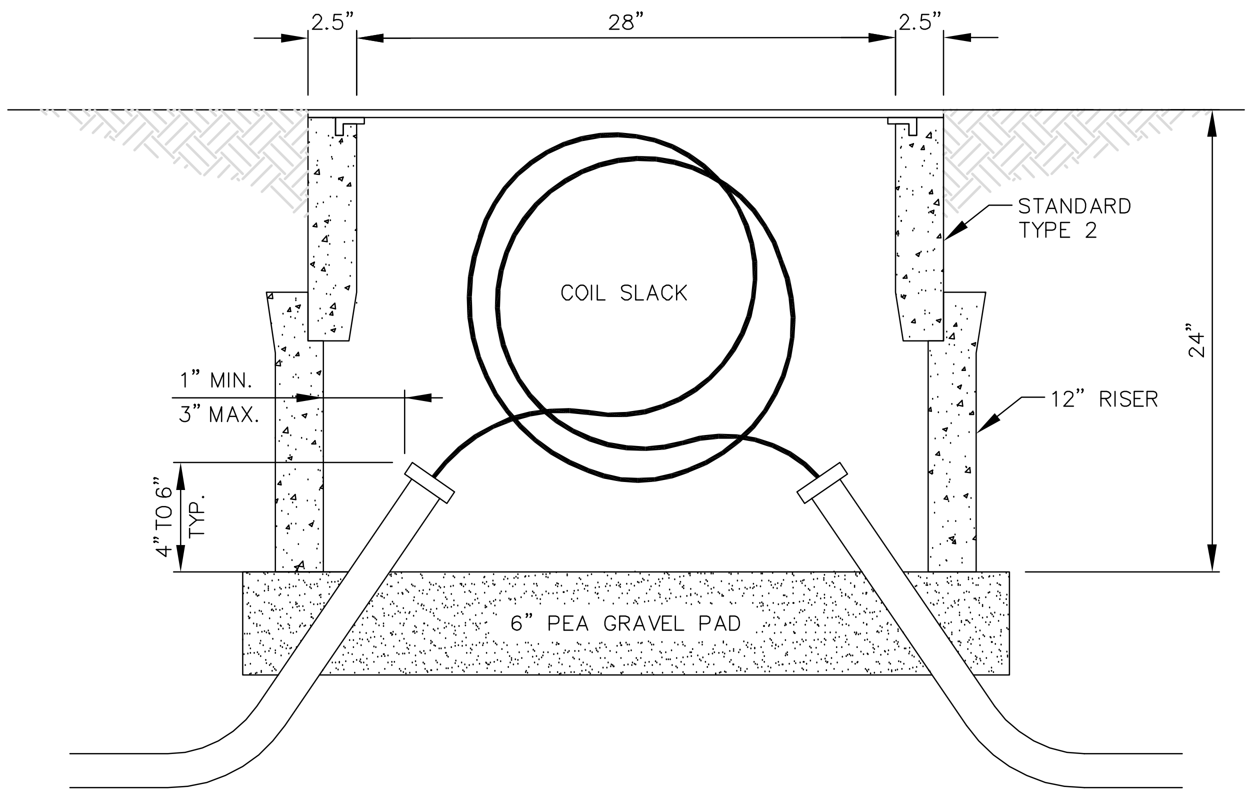
NOTES:

1. THE COVER SHALL HAVE 1/16" TO 1/8" CLEARANCE ON EACH EDGE WITHIN THE FRAME GALVANIZING
2. CONDUIT ELBOWS OR SWEEPS INTO JUNCTION BOX SHALL BE DETERMINED IN THE FIELD BY THE INSPECTOR.
3. DISTANCE BETWEEN THE TOP OF THE CONDUIT AND THE BOTTOM OF THE LID SHALL BE 10" MIN. TO 12" MAX.
4. JUNCTION BOX SHALL BE PLACED ON MINIMUM 6" THICK PEA GRAVEL PAD.





City of Bellevue	TYPE 8 MODIFIED JUNCTION BOX	DRAWING NUMBER	SL-170-1
		SCALE	NONE
		REVISION DATE	2/24
		DEPARTMENT	TRANS

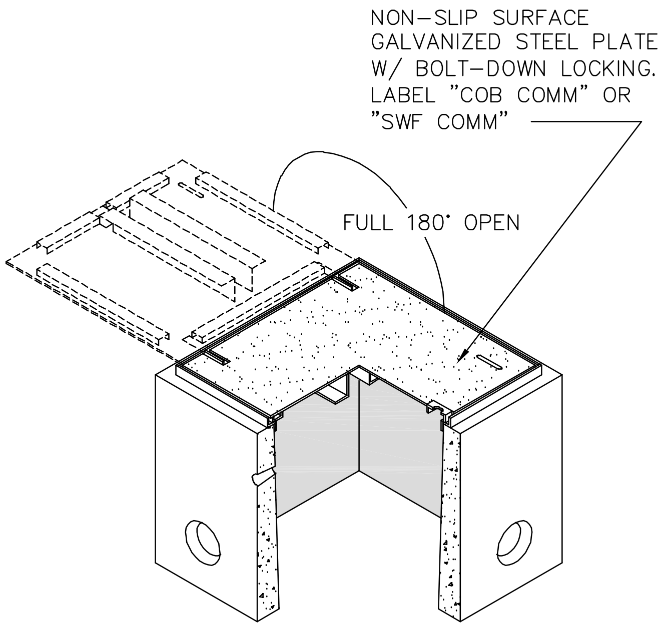


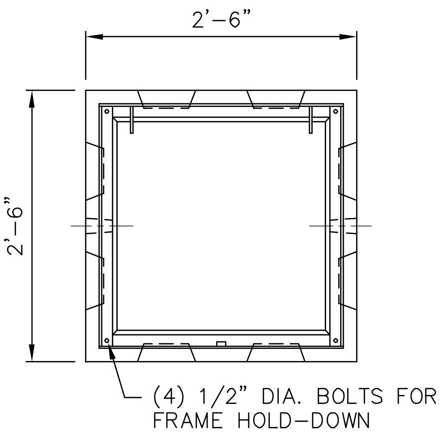
MODIFIED TYPE 2 JUNCTION BOX

City of Bellevue

COMMUNICATION JUNCTION BOX DETAIL

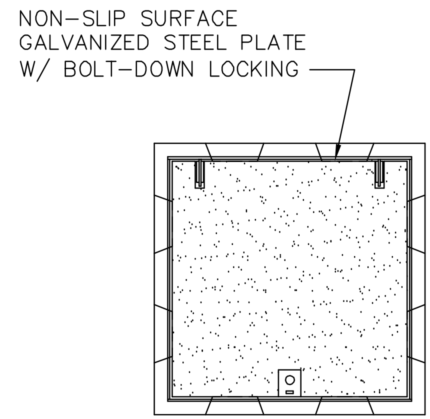
DRAWING NUMBER	SL-180-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS





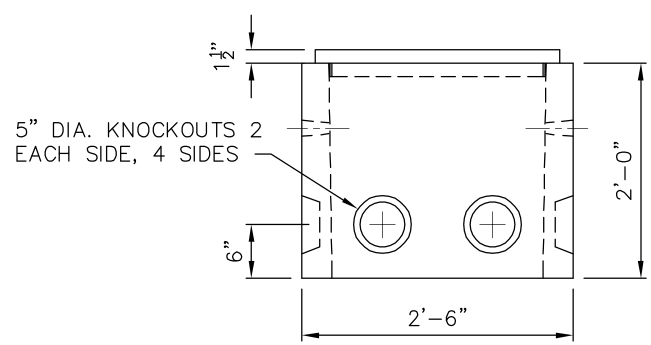
PLAN VIEW

COVER NOT SHOWN

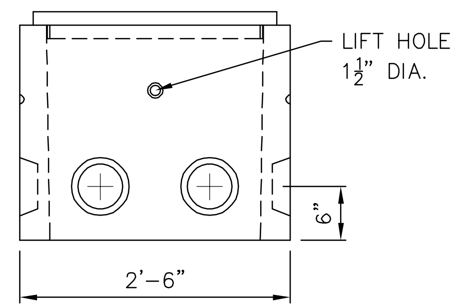


PLAN VIEW

SHOWN WITH COVER



FRONT VIEW

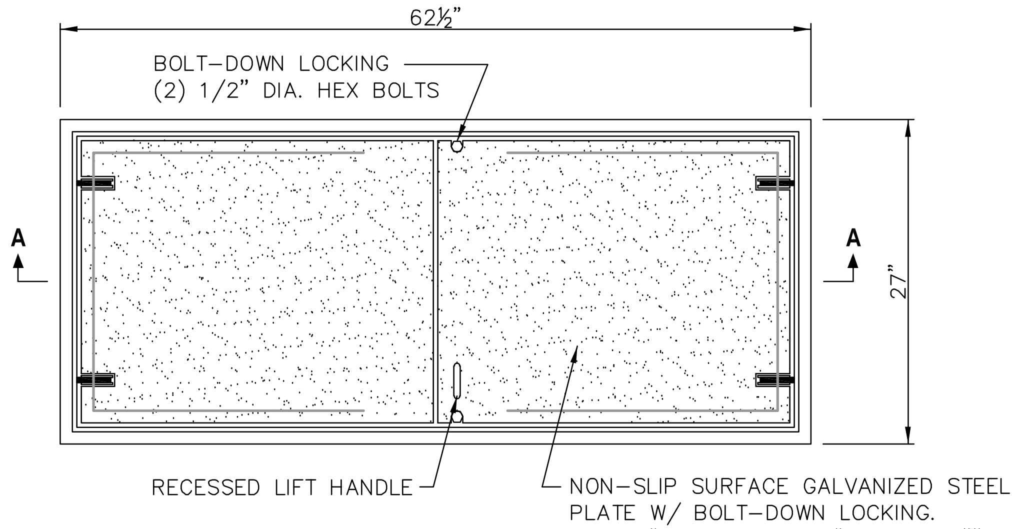


SIDE VIEW

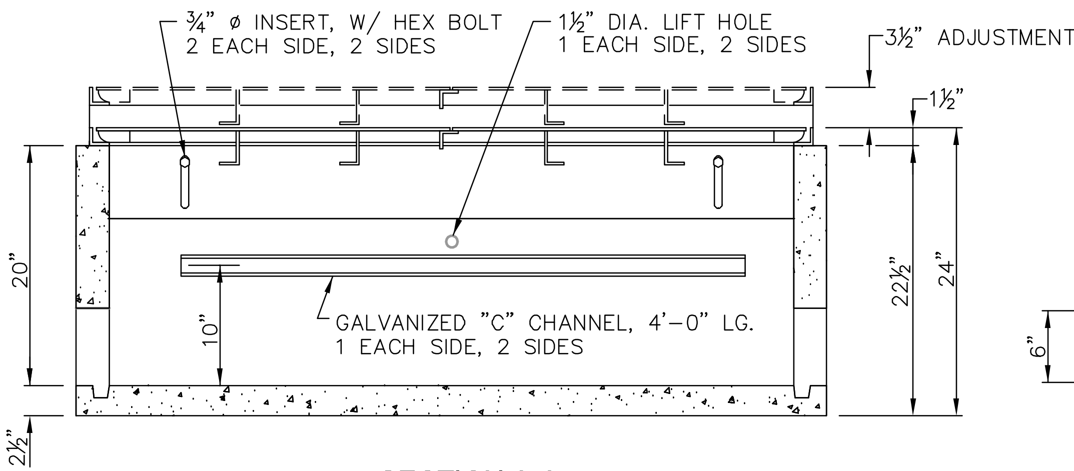
City of Bellevue

LARGE COMMUNICATION JUNCTION BOX DETAIL

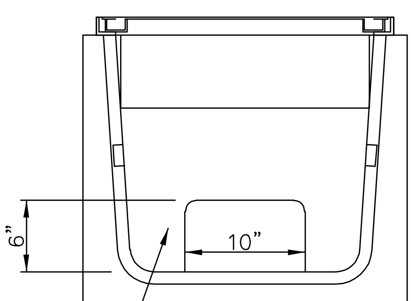
DRAWING NUMBER	SL-181-1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS



PLAN VIEW



SECTION A-A

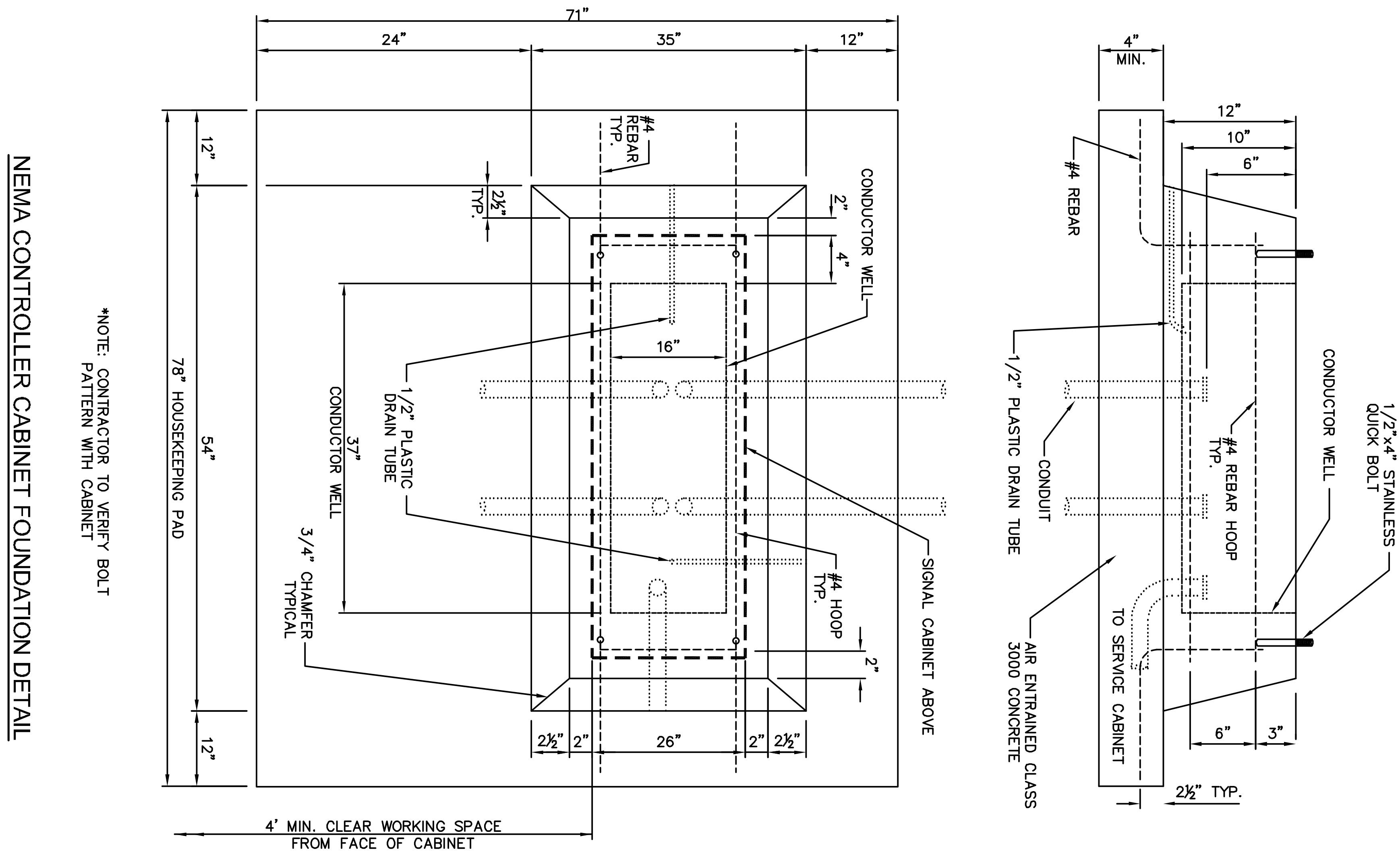


END VIEW

City of Bellevue

FIBER OPTIC VAULT

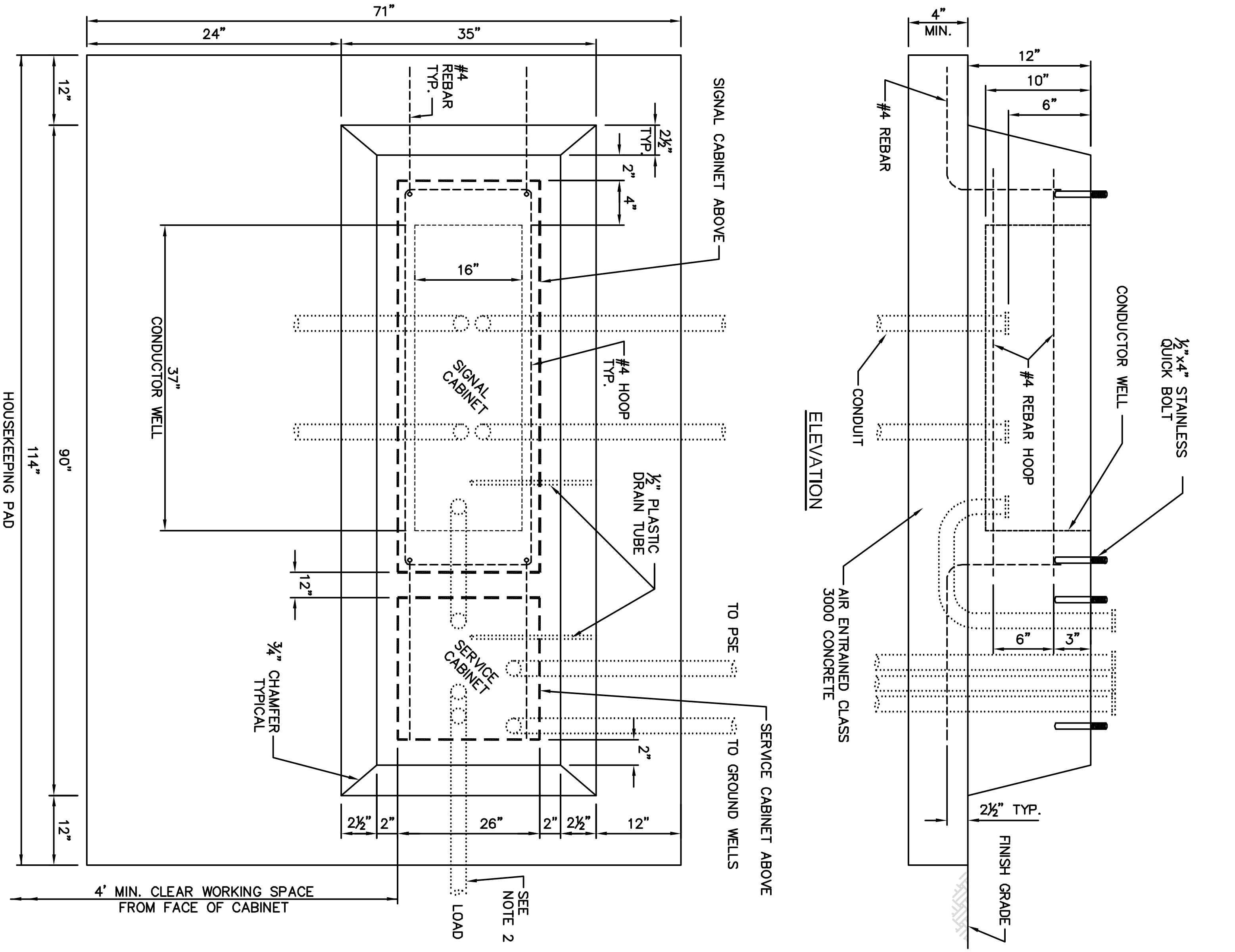
DRAWING NUMBER	SL-190-1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS



City of Bellevue	SIGNAL CABINET FOUNDATION DETAIL	DRAWING NUMBER	SL–200–1
		SCALE	NONE
		REVISION DATE	1/25
		DEPARTMENT	TRANS

NOTES:
1. CONTRACTOR TO VERIFY BOLT PATTERN WITH CABINETS.
2. MINIMUM 2-2" CONDUITS. FOR CONDUIT LOCATION SEE SERVICE CABINET DETAIL, STD DWG SL-220-1.
3. INSTALL GROUND RODS PER SERVICE CABINET GROUNDING DETAIL, STD. DWG. SL-213-1.

NEMA CONTROLLER CABINET AND SERVICE CABINET FOUNDATION DETAIL



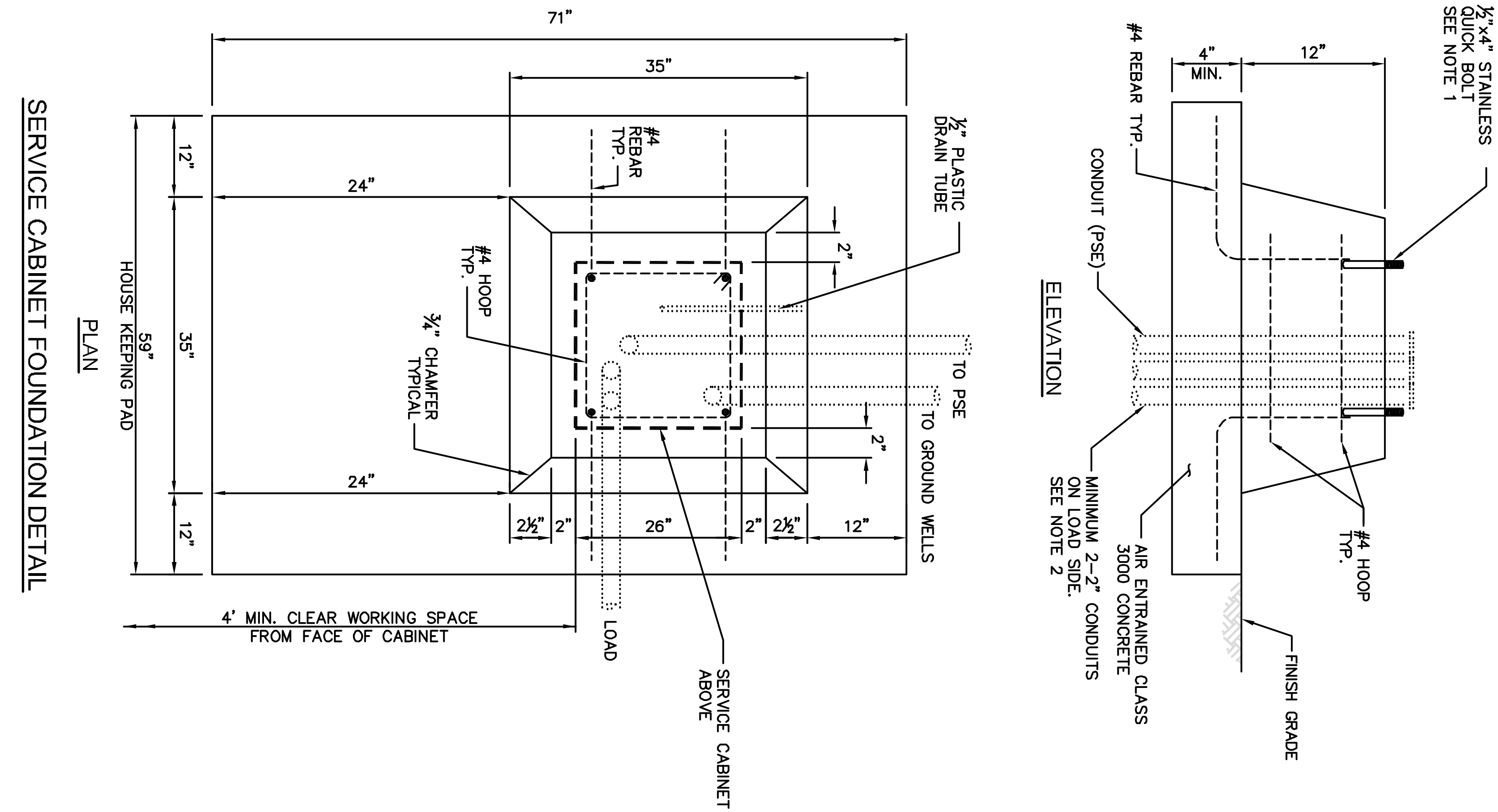
City of Bellevue

SIGNAL AND SERVICE CABINET FOUNDATION DETAIL

DRAWING NUMBER	SL-210-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

NOTES:

1. CONTRACTOR TO VERIFY BOLT PATTERN WITH CABINETS.
2. FOR CONDUIT LOCATION SEE SERVICE CABINET DETAIL, STD DWG SL-220-1.
3. INSTALL GROUND RODS PER CABINET GROUNDING DETAIL, STD. DWG. SL-213-1.



City of Bellevue

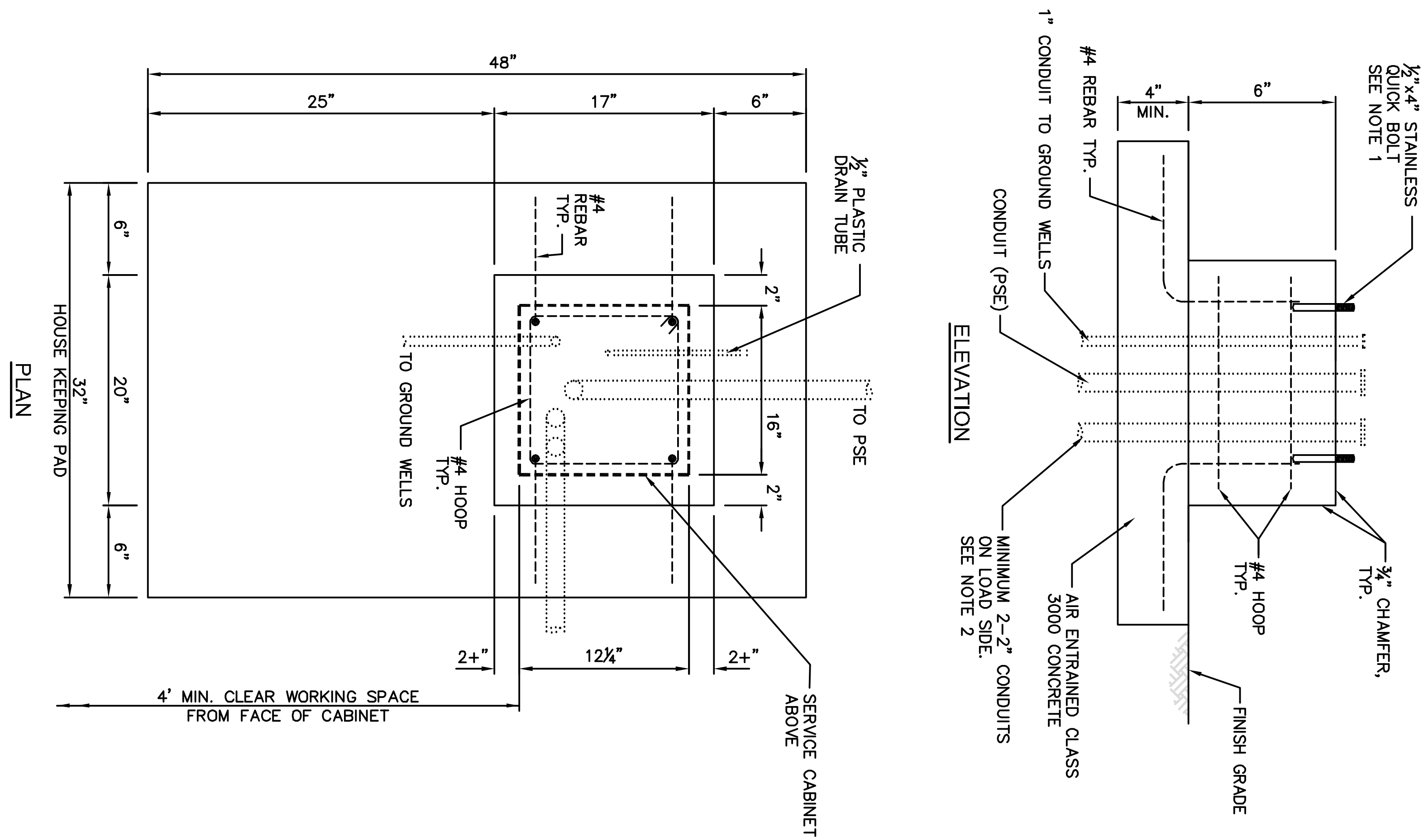
SERVICE CABINET FOUNDATION DETAIL

DRAWING NUMBER	SL-211-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

"TINY" SERVICE CABINET FOUNDATION DETAIL

NOTES:

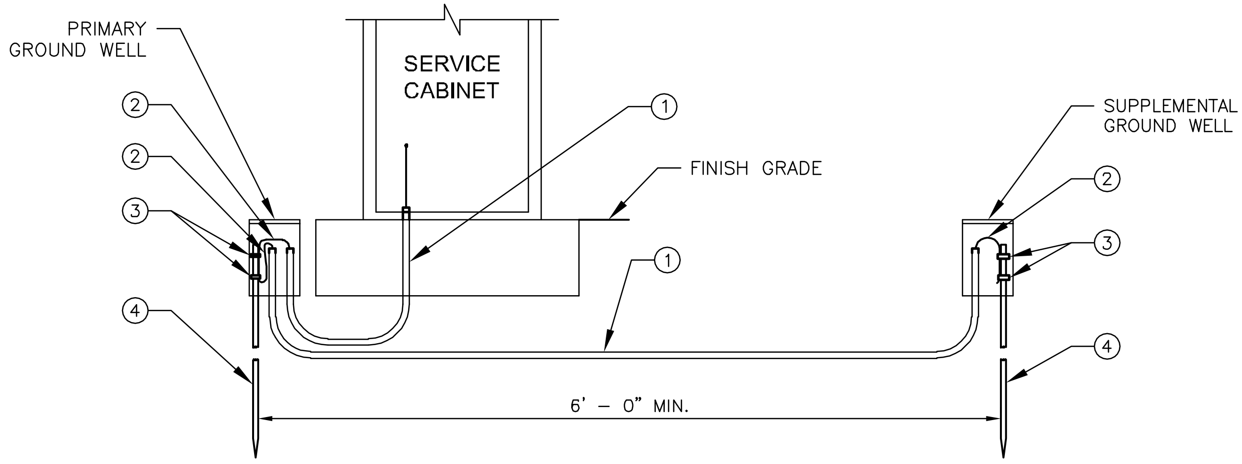
1. CONTRACTOR TO VERIFY BOLT PATTERN WITH CABINETS.
2. FOR CONDUIT LOCATION SEE SERVICE CABINET DETAIL, STD DWG SL–220–1.
3. INSTALL GROUND RODS PER CABINET GROUNDING DETAIL, STD. DWG. SL–213–1.



City of Bellevue

"TINY" SERVICE CABINET FOUNDATION DETAIL

DRAWING NUMBER	SL–212–1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

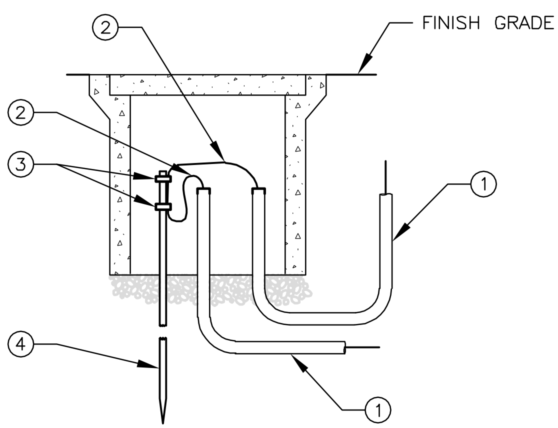


CABINET GROUND DETAIL

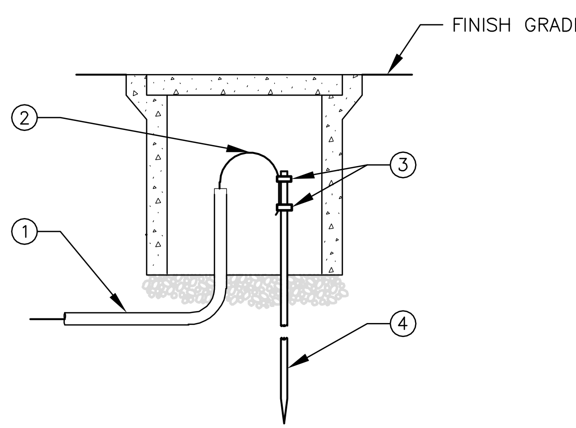
SCHEDULE	
1	1 INCH PVC CONDUIT
2	#4 COPPER GROUNDING CONDUCTOR
3	GROUNDING CONNECTORS
4	GROUND ROD A MINIMUM OF 8 FOOT LONG AND A MINIMUM ⅝" INCH DIAMETER

NOTE:

FOR RETROFIT APPLICATION, GROUND RODS MUST BE INSTALLED UNTIL THE RESISTANCE READING OF THE TOTAL CONNECTED GROUND ROD SYSTEM IS 25 OHMS OR LESS.
GROUND WELLS CAN BE INSTALLED IN EARTH OR CONCRETE.



PRIMARY GROUND WELL

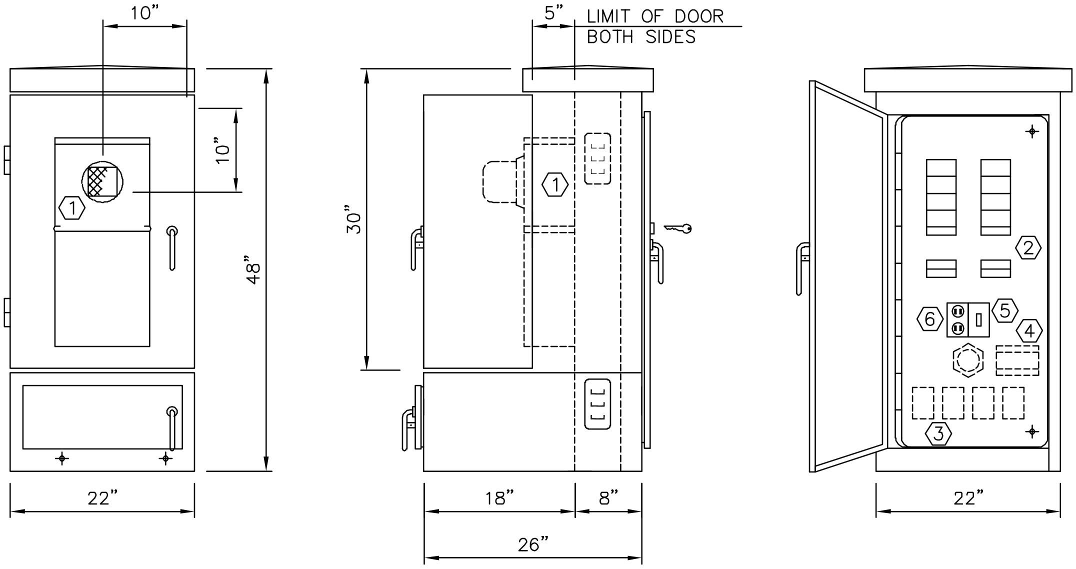


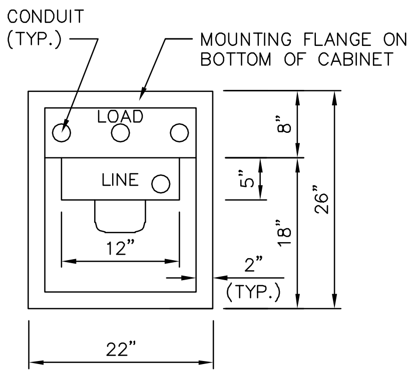
SUPPLEMENTAL GROUND WELL

City of Bellevue

SERVICE CABINET GROUNDING DETAIL

DRAWING NUMBER	SL–213–1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS





TYPICAL CONDUIT LAYOUT

CITY OF BELLEVUE

SERVICE CABINET FOR STREET AND TRAFFIC SIGNAL

COMPONENT SCHEDULE

1. METERBASE: 200 AMP SAFETY SOCKET, 5th JAW INSTALLED AT 9:00 POSITION
2. PANELBOARD: 120/240 VAC, 225 AMP COPPER BUS, 1 PHASE, 3 WIRE, SPLIT BUS, COPPER BUS, 22 KAIC BREAKERS
   SIGNAL SECTION: MLO, 4CKT, 1–30/1 SIGNAL BRANCH
   ILLUMINATION SECTION: MAIN BREAKER, 150 AMP, 2 POLE
   - 4–30/2 STREET ILLUMINATION BRANCH
   - 1–15/1 CONTROL CKT BRANCH
   - 1–20/1 GROUND FAULT RECEPTACLE BRANCH
   - 2–20/1 SMALL WIRELESS FACILITY
   - 2–20/1 DUPLEX RECEPTACLES
3. CONTACTORS: LIGHTING RATED, 120 VAC COIL, 4–REQUIRED FOR STREET LIGHTING AT 30 AMP, 4 POLE
4. TERMINAL BLOCK TO REMOTE PHOTO CELL (FOR CONTROL OF STREET LIGHTING), INCLUDES 5" UNUSED DIN RAIL SPACE FOR FUTURE ENERGY METER.
5. PHOTO–CELL BYPASS SWITCH, SPDT, 15 AMP, UP TO 277 VAC
6. GROUND FAULT RECEPTACLE: 20 AMP, 125 VAC, DUPLEX

CABINET: NEMA 3R, PADMOUNT, 2 SCREENED, AND GASKETED VENTS

DOORS: HEAVY DUTY STAINLESS STEEL HINGES (LIFT–OFF TYPE), 3 POINT LATCHES, STAINLESS STEEL VAULT HANDLES, "BEST" LOCK ON DISTRIBUTION DOOR, PADLOCKABLE METER DOOR WITH POLISHED WIRE GLASS WINDOW CLOSED CELL NEOPRENE GASKET, CARD HOLDER.

FINISH: POLYESTER POWDER COAT, ZINC PRIME, ASA 61 GRAY INSIDE AND OUT. DEADFRONT AND WIREWAY COVERS WHITE.

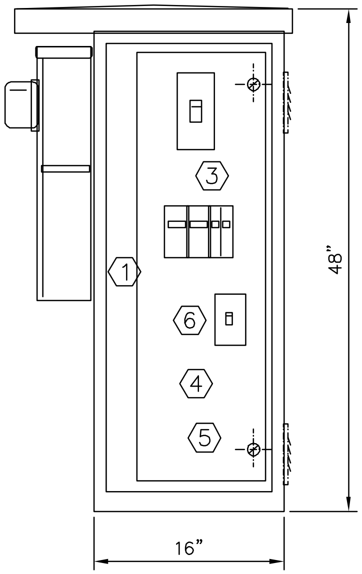
NOTES:

1. CABINET SHALL MEET CURRENT ELECTRIC UTILITY SERVICE EQUIPMENT COMMITTEE (EUSERC) STD. 308.
2. ANCHOR BOLTS AND DATA FOR SPACING TO BE SUPPLIED BY CABINET MANUFACTURER.
3. FOR SERVICE CABINET FOUNDATION, SEE STD. DWG. SL–210–1 AND SL–211–1.
4. METER DOOR SHALL BE REMOVABLE. STANDARD HINGING ON LEFT, HINGING ON RIGHT SHALL BE AVAILABLE IF REQUIRED.
5. WHERE SMALL WIRELESS FACILITIES ARE POWERED FROM A CITY SERVICE, AN ETHERNET–READY ENERGY METER SHALL BE PROVIDED. THE DEVICE SHALL BE DIN–RAIL MOUNTED. AN ETHERNET CABLE SHALL BE INSTALLED FROM THE DEVICE TO THE TRAFFIC SIGNAL CONTROLLER CABINET IF THE SERVICE IS LOCATED WITHIN 300' OF A TRAFFIC SIGNAL CABINET.

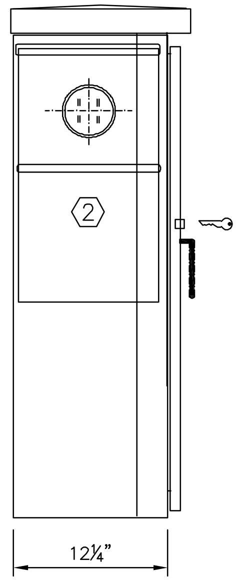
City of Bellevue

SERVICE CABINET DETAIL

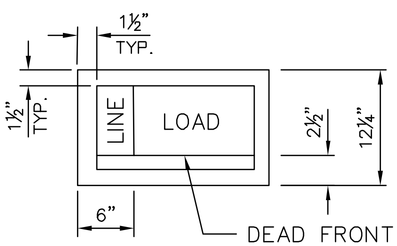
DRAWING NUMBER	SL–220–1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS



FRONT ELEVATION
(DOOR NOT SHOWN)



SIDE ELEVATION



FOOTPRINT

CABINET DESIGNATION

CITY OF BELLEVUE "TINY" CABINET

SKYLINE SERIES #65348

1 REQUIRED

CABINET:

CONSTRUCTION:
NEMA TYPE 3R, OUTDOOR PADMOUNT, ⅛" 5052–H32 ALUMINUM CONSTRUCTION, 2 SCREENED AND GASKETED VENTS, REMOVABLE EQUIPMENT MOUNTING PAN, CABINET GROUND WITH MINIMUM BONDING WIRE TO NEUTRAL.

DOORS:
HEAVY–DUTY CONCEALED HINGES (LIFT–OFF TYPE), STAINLESS STEEL VAULT HANDLE WITH ROLLER RODS THAT PROVIDE 3–POINT COMPRESSION ON CLOSED CELL NEOPRENE GASKET, "BEST" LOCK AND PADLOCK TABS ON DOOR

DEADFRONT:
HINGED AND SECURED WITH QUARTER–TURN FASTENERS

FINISH:
MILL FINISH ALUMINUM, DEADFRONT AND WIREWAY COVER WHITE

COMPONENT SCHEDULE:

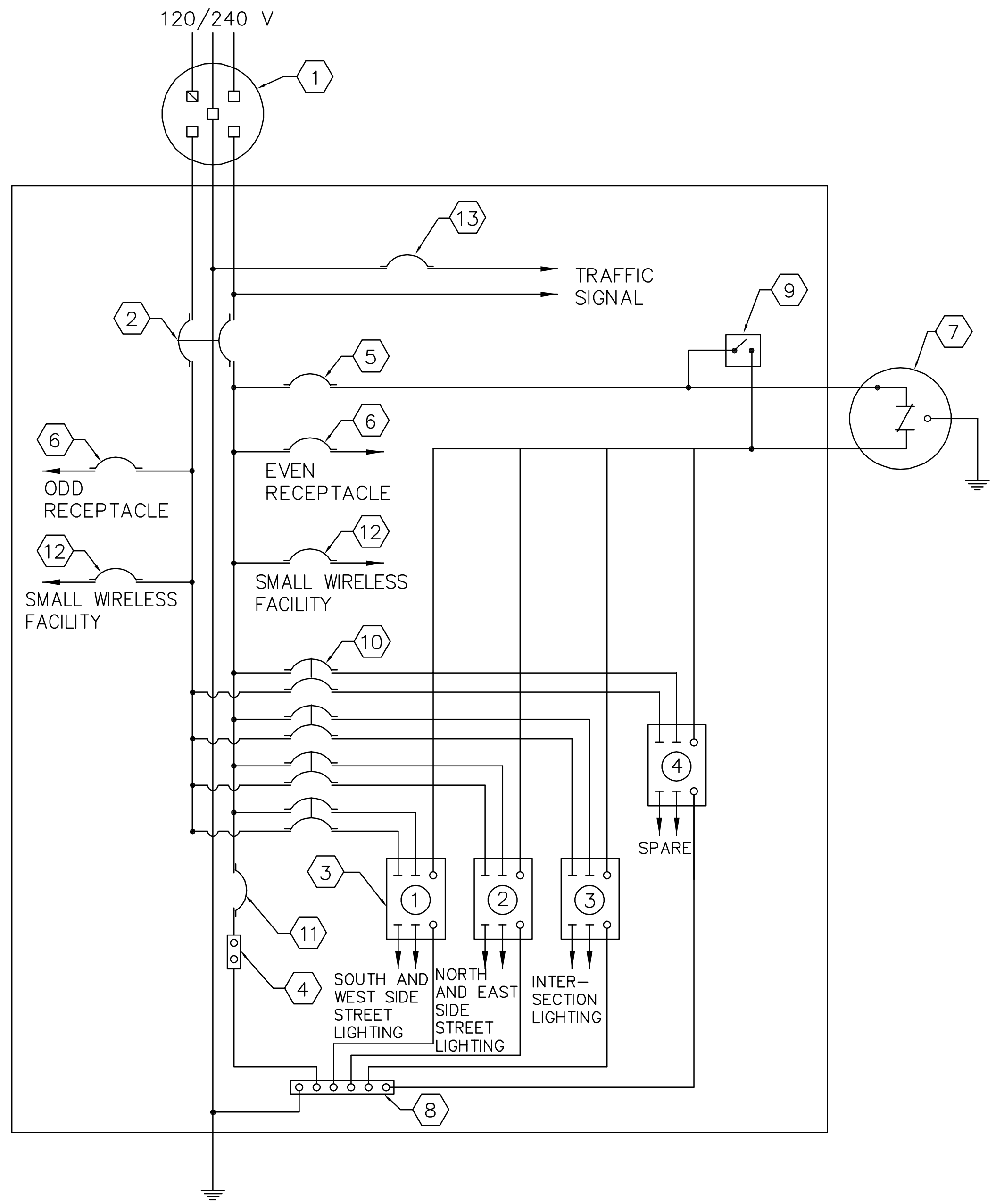
1. SERVICE WIREWAY
2. METER BASE: 200A, 4 JAW, MANUAL BYPASS, B–LINE U264, W/ 5TH JAW
3. PANELBOARD: 120/240 VAC, 125 AMP COPPER BUS, 1 PHASE, 3 WIRE, 6 CKT, FULLY RATED AT 10K AIC, WITH ENGRAVED NAME PLATES
   MAIN BREAKER: 100AMP, 2 POLE, EATON QC2100
   BRANCH BREAKERS, BOLT ON, EATON TYPE BAB:
   2–20/2 LIGHTING 1, 2
   1–20/1 RRFB
   1–15/1 CONTROL
4. CONTACTOR: LIGHTING RATED, 30A, 4 POLE, 120V COIL, SQD 8910DPA34V02U1
5. TERMINAL BLOCK FOR FIELD WIRE CONNECTION TO REMOTE PHOTO CELL
6. PHOTO–CELL BYPASS SWITCH

UL LISTED PER STANDARD #508A
SUITABLE FOR USE AS SERVICE ENTRANCE

City of Bellevue

"TINY" SERVICE CABINET DETAIL

DRAWING NUMBER	SL–221–1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS



SERVICE CABINET WIRING

ELECTRICAL SERVICE LEGEND:

1. METER
2. MAIN BREAKER (150 AMP.)
3. CONTACTORS (30 AMP.)
4. 120 V GFCI RECEPTACLE
5. CONTROL BREAKER (15 AMP.)
6. RECEPTACLE BREAKER – (20 AMP.)
7. PHOTOCELL
8. NEUTRAL BUS
9. TEST SWITCH (15 AMP.)
10. SERVICE BREAKER (30 AMP.)
11. GFCI BREAKER (20 AMP.)
12. SMALL WIRELESS FACILITY BREAKER (20 AMP.)
13. SIGNAL BREAKER (30 AMP.)

City of Bellevue

SERVICE CABINET WIRING DETAIL

DRAWING NUMBER	SL–230–1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS

SOUTH AND WEST SIDE LIGHTING ARE ODD # LIGHTS & CONNECTED TO CONTACTOR #1
NORTH AND EAST SIDE LIGHTING ARE EVEN # LIGHTS & CONNECTED TO CONTACTOR #2

PANEL SCHEDULE

NO. S	LOCATION: PEDESTAL PANEL SERVING: STREET LIGHTS, ETC.	120/240 VOLTS 1 PHASE 3 WIRE 150 AMP with MAIN BREAKER

CKT NO.	LOAD DESCRIPTION	KVA	TRIP AMPS	TRIP AMPS	KVA	LOAD DESCRIPTION	CKT NO.
1	ODD # STREET LIGHTS		30	30		EVEN # STREET LIGHTS	2
5	INTERSECTION LIGHTS		30	30		SPARE/FUTURE	6
9	SMALL WIRELESS FACILITY		20	20		SMALL WIRELESS FACILITY	10
13	DUPLEX RECEPTACLE ODD # SL		20	20		DUPLEX RECEPTACLE EVEN # SL	14
15	GFCI		20	15		LIGHTING CONTROL	16

REMARKS:	CONNECTED LOAD: KVA AMPS DEMAND LOAD: KVA AMPS

PANEL SCHEDULE

NO. T	LOCATION: PEDESTAL PANEL SERVING: TRAFFIC SIGNAL CONTROL	120/240 VOLTS 1 PHASE 3 WIRE 50 AMP with MAIN LUGS ONLY

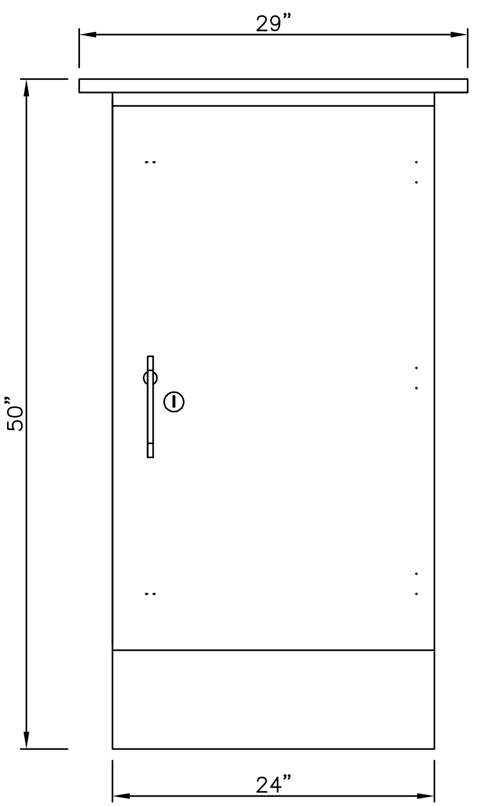
CKT NO.	LOAD DESCRIPTION	KVA	TRIP AMPS	TRIP AMPS	KVA	LOAD DESCRIPTION	CKT NO.
1	SPARE/FUTURE			30		TRAFFIC SIGNAL CONTROL	2
3	SPACE					SPACE	4

REMARKS:	CONNECTED LOAD: KVA AMPS DEMAND LOAD: KVA AMPS

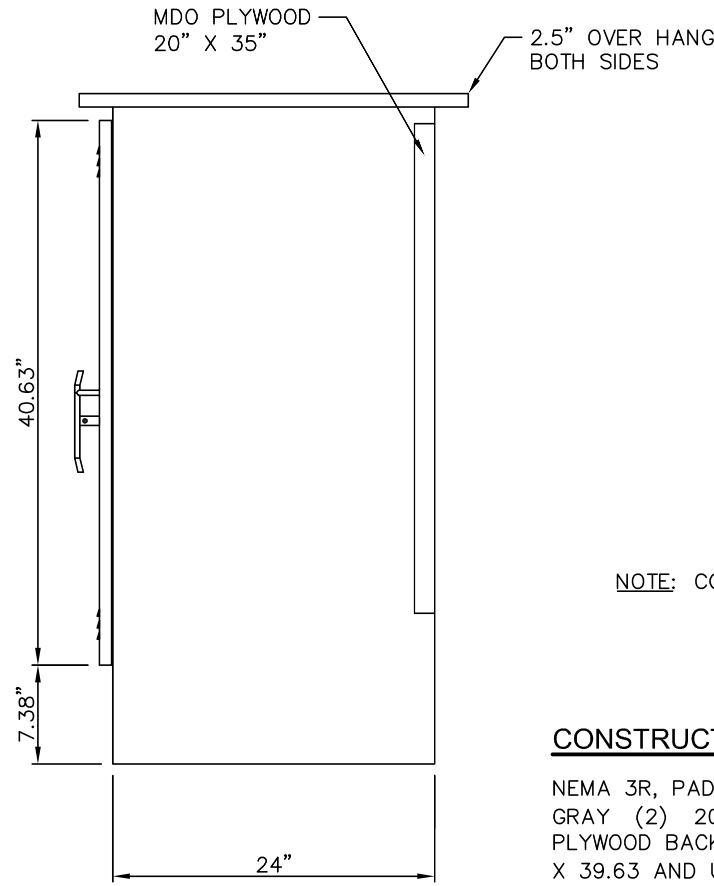
City of Bellevue

PANEL SCHEDULE

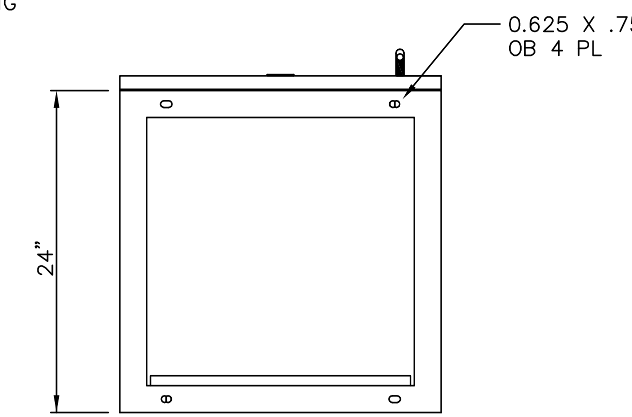
DRAWING NUMBER	SL-240-1
SCALE	NONE
REVISION DATE	5/21
DEPARTMENT	TRANS



FRONT VIEW



SIDE VIEW



TOP VIEW

NOTE: CONTRACTOR TO VERIFY BOLT PATTERN WITH CABINET.

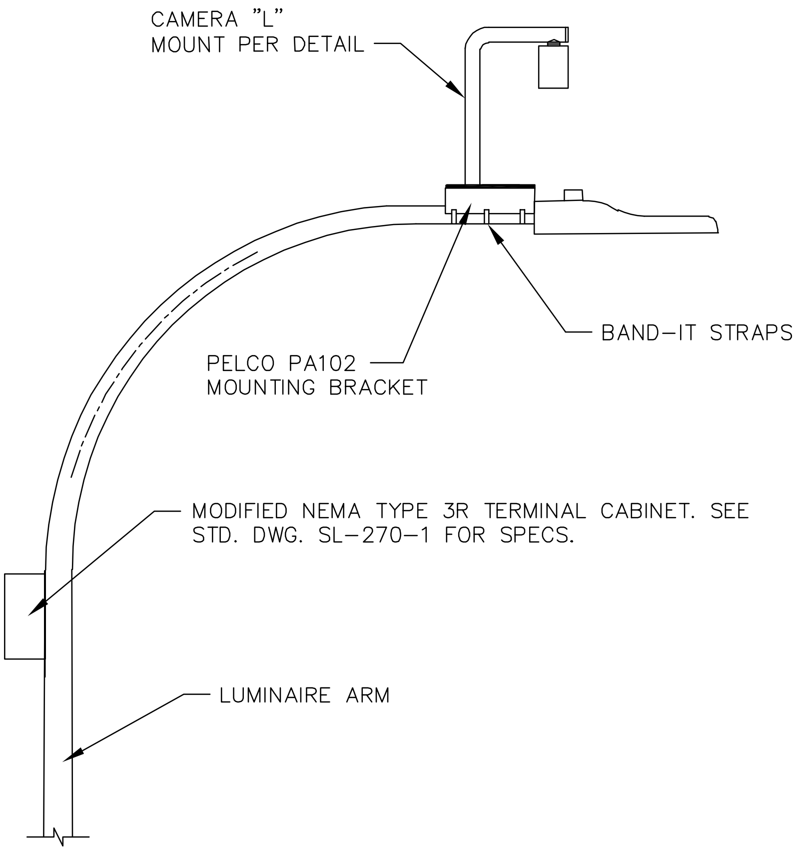
CONSTRUCTION NOTES:

NEMA 3R, PAD MOUNT, 1/8" ALUMINUM, POWDERCOATED ASA 61 GRAY (2) 20 X 35 X 1/2" MDO (MEDIUM DENSITY OVERLAID) PLYWOOD BACK BOARD. DOOR HAS AN APPROXIMATE OPENING OF 21 X 39.63 AND USES LIFT OFF CONCEALED HINGES WITH "BEST" LOCK ON DOOR AND 3 POINT LATCH SYSTEM, SEALED BY A CLOSED CELL NEOPRENE GASKET.

City of Bellevue

FIBER OPTIC CABINET

DRAWING NUMBER	SL–250–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS



TYPICAL LUMINAIRE ARM MOUNT

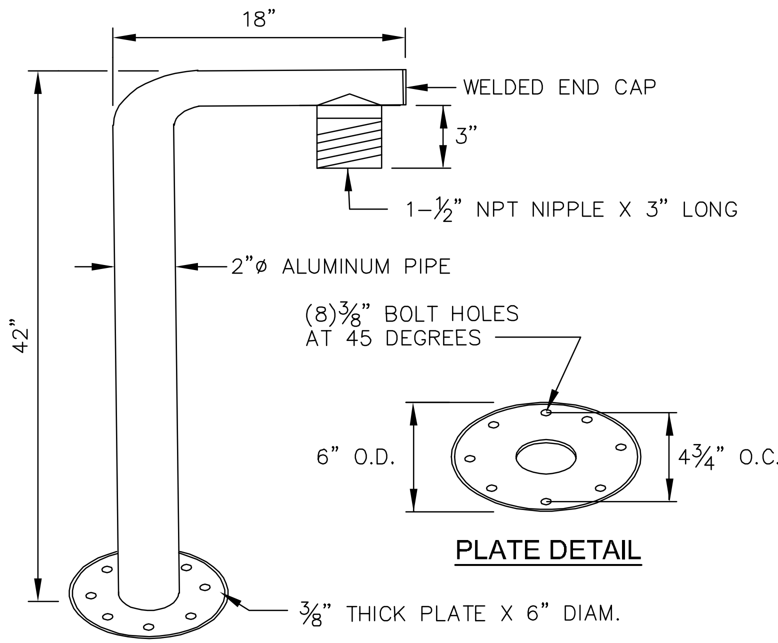
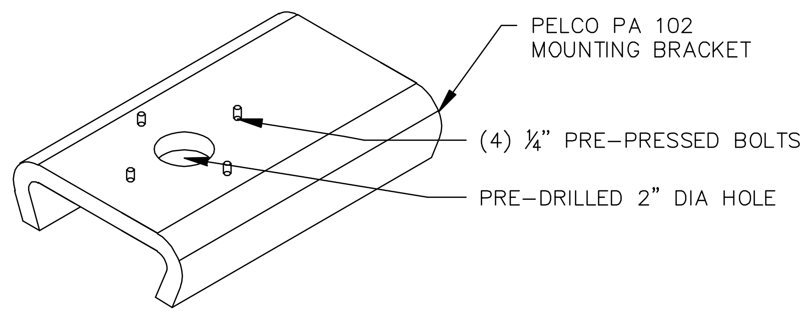


PLATE DETAIL

CAMERA "L" MOUNT DETAIL

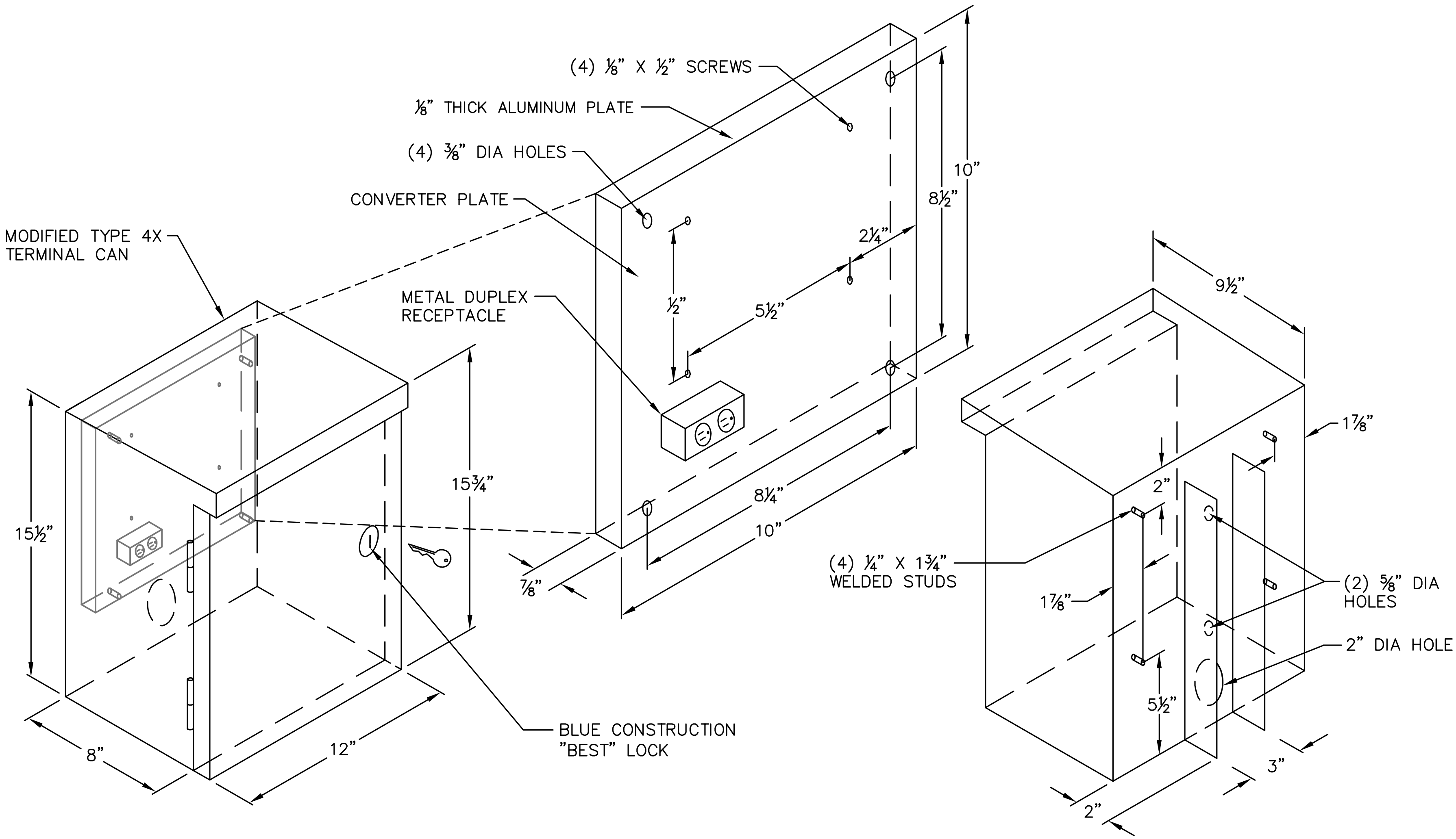


MOUNTING BRACKET DETAIL

City of Bellevue

VIDEO CAMERA MOUNT – LUMINAIRE ARM DETAIL

DRAWING NUMBER	SL-260-1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS



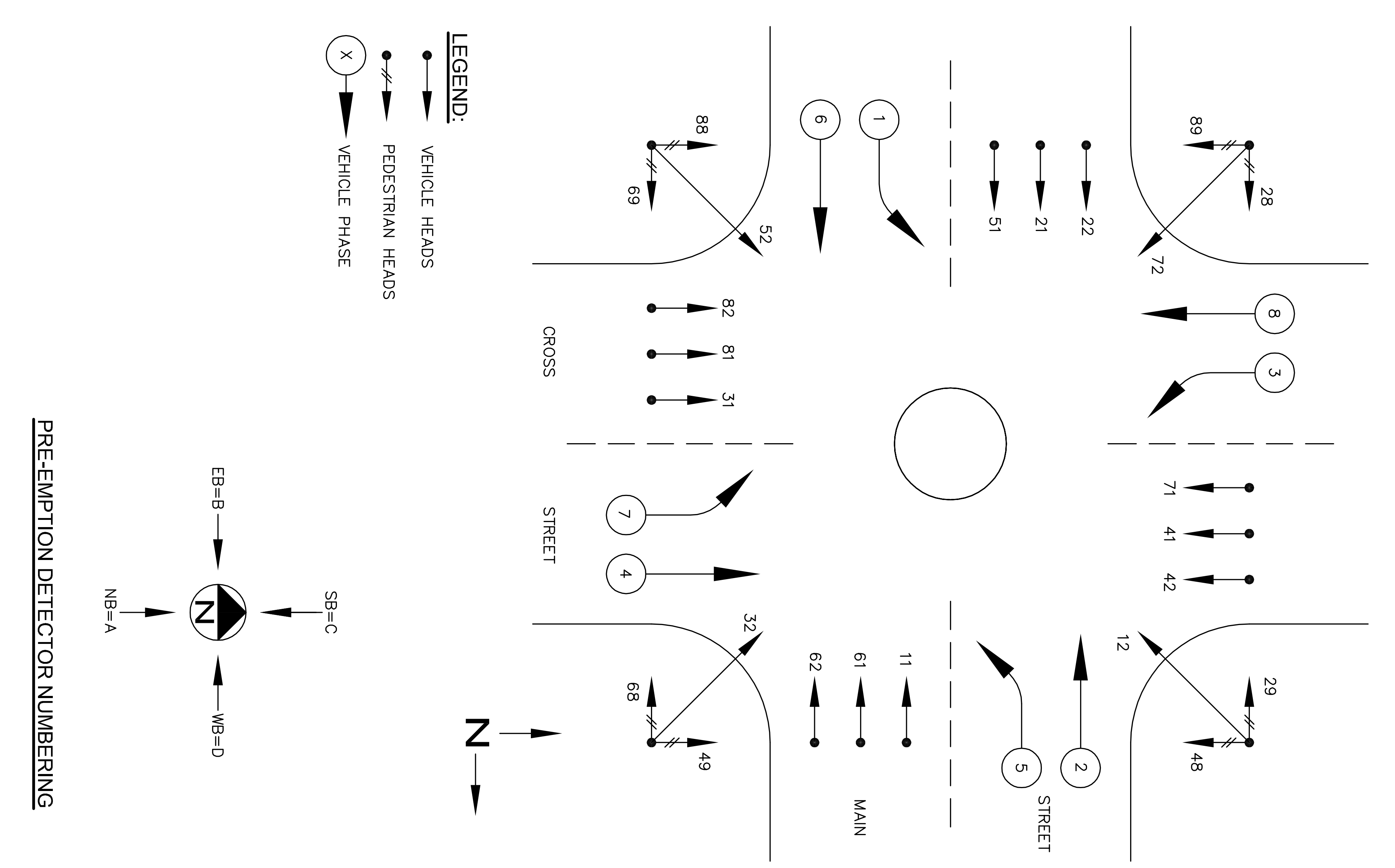
FRONT VIEW

BACK VIEW

City of Bellevue

VIDEO CONVERTER CABINET DETAIL

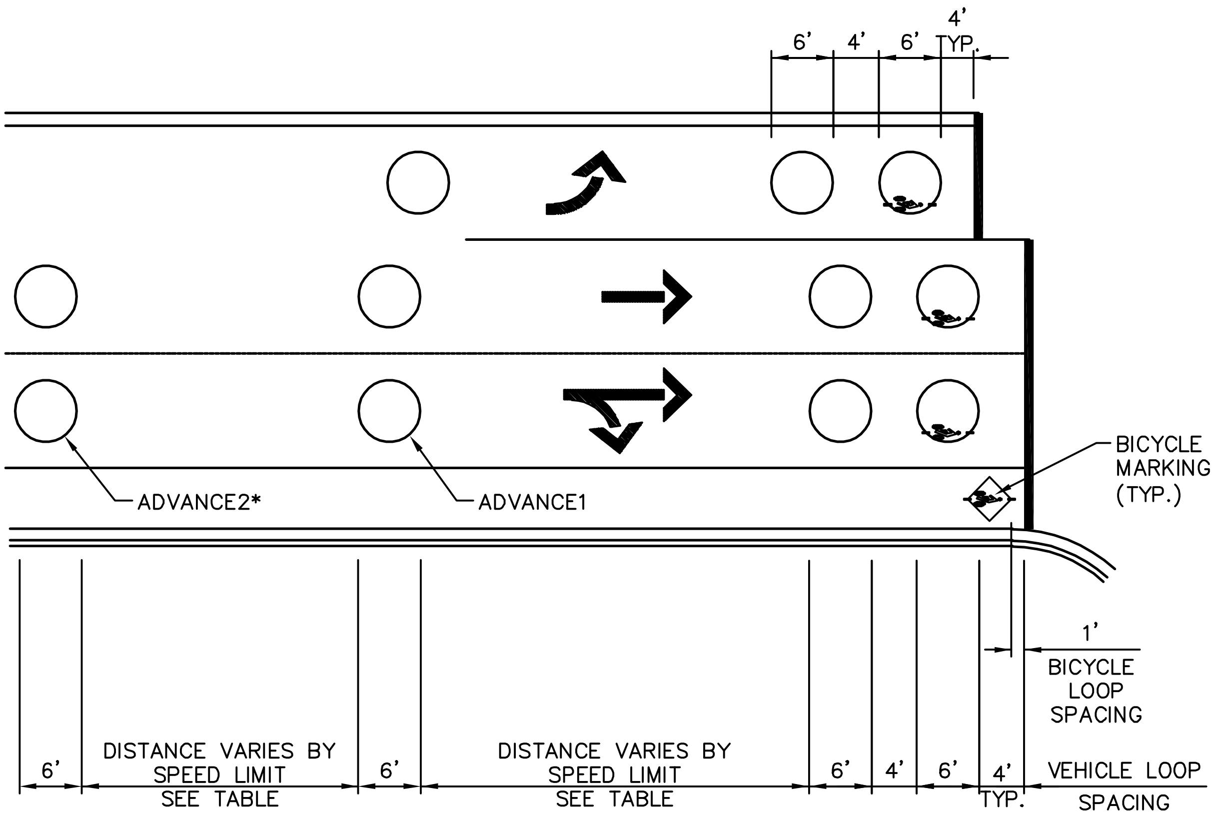
DRAWING NUMBER	SL-270-1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS



City of Bellevue

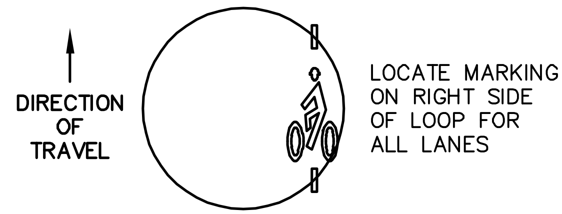
STANDARD INTERSECTION MOVEMENTS AND HEAD NUMBERS

DRAWING NUMBER	SL–280–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS



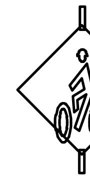
TYPICAL LOOP AND MARKING LAYOUT

*USE ADVANCE2 ON HIGHER VOLUME STREETS.
SEE TRAFFIC ENGINEER FOR DIRECTION.



ROUND LOOP

(ALWAYS RIGHT SIDE)



BIKE LOOP

(ALWAYS CENTERED)

BICYCLE MARKING LOCATION

POSTED SPEED LIMIT	DISTANCE
25 MPH	73 FEET
30 MPH	88 FEET
35 MPH	103 FEET
40 MPH	120 FEET

LOOP DISTANCE TABLE

City of Bellevue

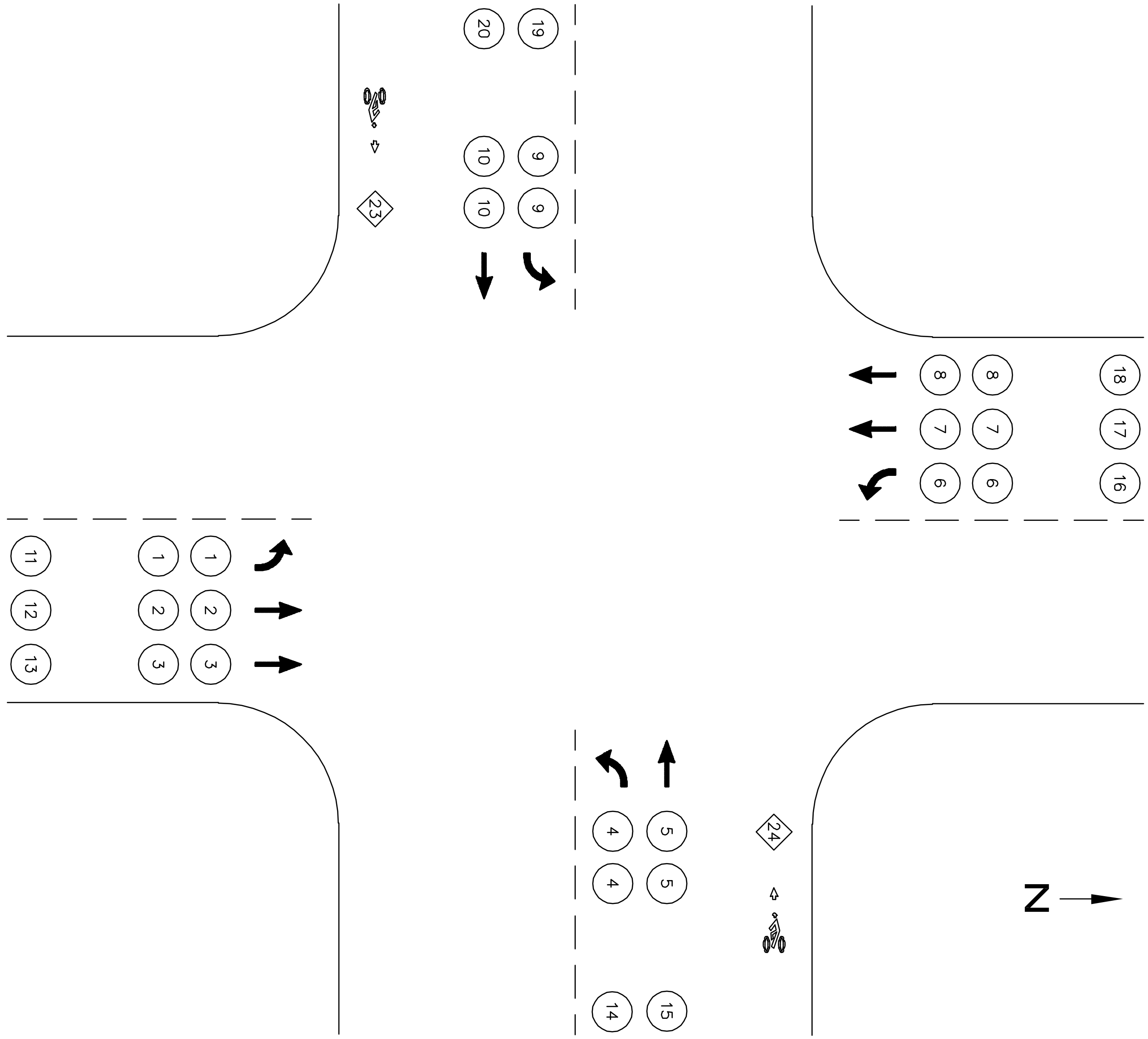
LOOP DETECTOR LAYOUT AND BICYCLE MARKING

DRAWING NUMBER	SL-290-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

LOOP NUMBERING SCHEME

LOOP NUMBER 1 (TWO LOOPS) WILL BE THE STOP BAR LOOP ON THE INNER-MOST NORTHBOUND LANE STOP BAR. STOP BAR LOOPS ARE THEN NUMBERED COUNTER-CLOCKWISE AROUND THE INTERSECTIONS. THE NUMBERING CONTINUES WITH ADVANCED LOOPS, COUNTER-CLOCKWISE AROUND THE INTERSECTION.

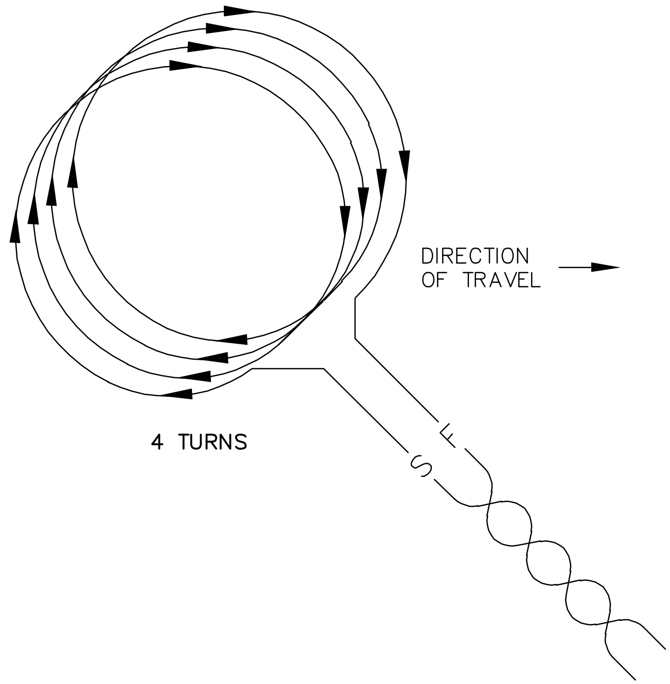
BIKE LOOPS START WITH NUMBER 24 AT THE NORTHBOUND POSITION AND THEN DECREASE IN NUMBER (I.E., 23, 22, 21) IN THE COUNTER-CLOCKWISE DIRECTION. IF NO NORTHBOUND BIKE LOOP IS PRESENT, CONTINUE IN THE COUNTER-CLOCKWISE DIRECTION UNTIL A BIKE LOOP IS PRESENT AND USE NUMBER 24.



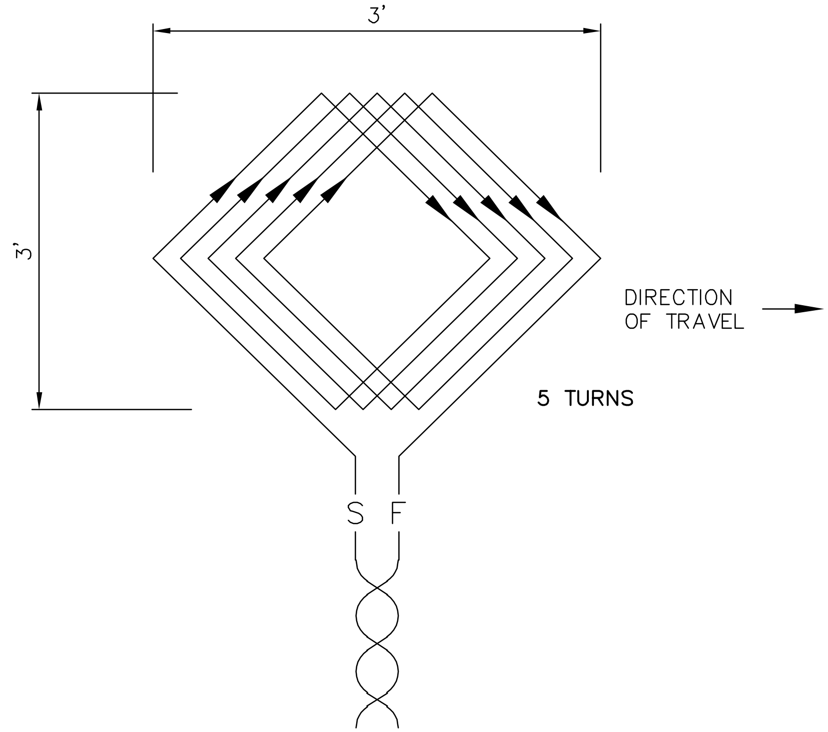
City of Bellevue

LOOP NUMBERING SCHEME

DRAWING NUMBER	SL–300–1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS



TYPICAL 6' ROUND VEHICLE LOOP WINDING



TYPICAL 3'x3' BICYCLE LOOP WINDING

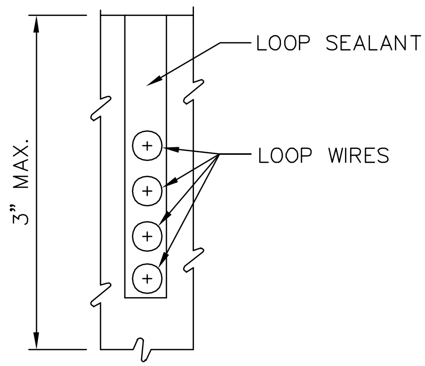
VEHICLE LOOP NOTE:

1. THE NUMBER OF TURNS SHALL BE AS SHOWN UNLESS NOTED OTHERWISE IN THE PLANS.

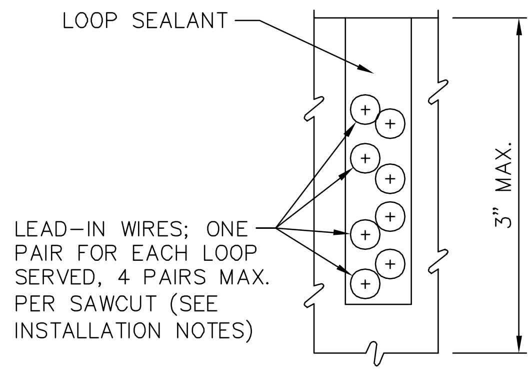
BICYCLE LOOP NOTES:

1. THE NUMBER OF TURNS SHALL BE AS SHOWN UNLESS NOTED OTHERWISE IN THE PLANS.
2. PLACE LOOP IN CENTER OF BIKE LANE. OUTSIDE LOOP EDGES SHALL BE 3" FROM GUTTER (IF PRESENT) AND 3" FROM EDGELINE.
3. FOR DEDICATED BICYCLE PHASE TRAFFIC SIGNAL OPERATIONS, THERMAL DETECTION SHALL BE USED FOR BICYCLE DETECTION. SEE SECTION 4.1.3.3 OF THE DESIGN MANUAL.

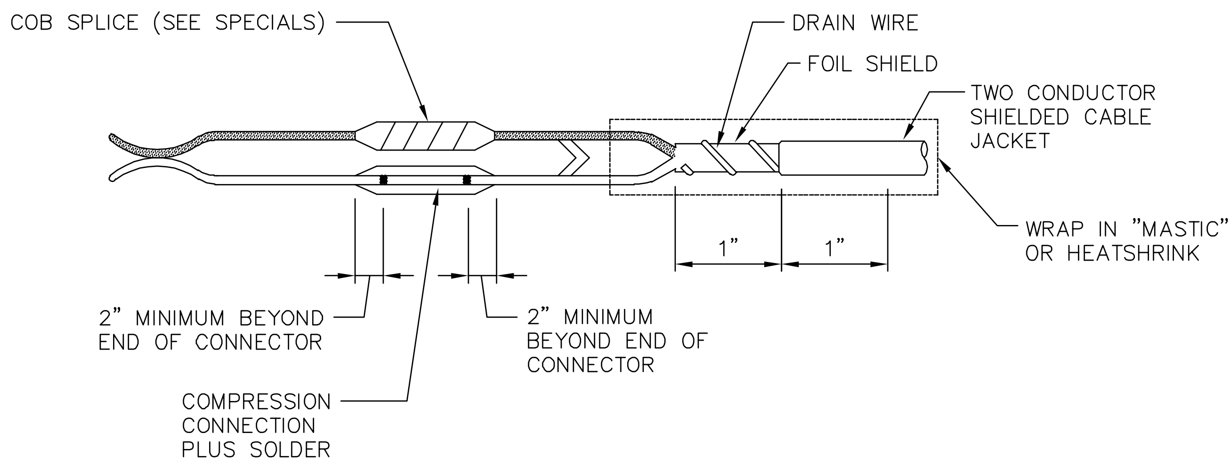
City of Bellevue	LOOP WINDING DETAILS	DRAWING NUMBER	SL-310-1
		SCALE	NONE
		REVISION DATE	2/24
		DEPARTMENT	TRANS



1/4" LOOP SAWCUT CROSS-SECTION



1/2" LEAD-IN SAWCUT CROSS-SECTION

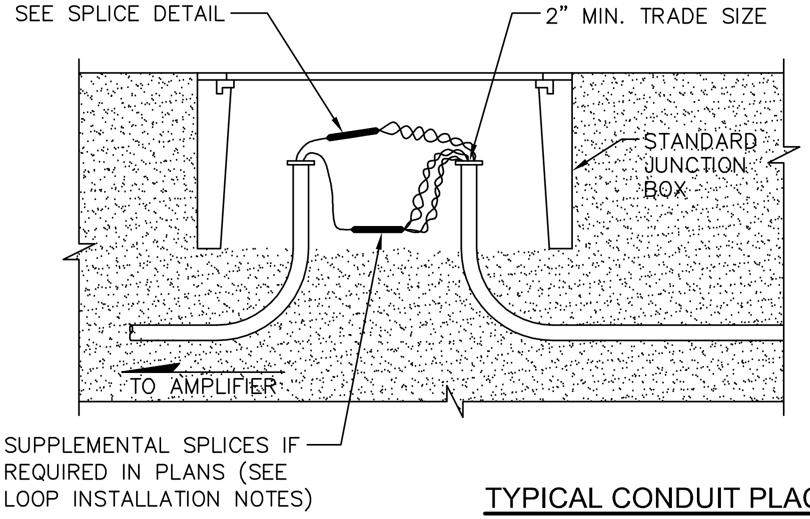


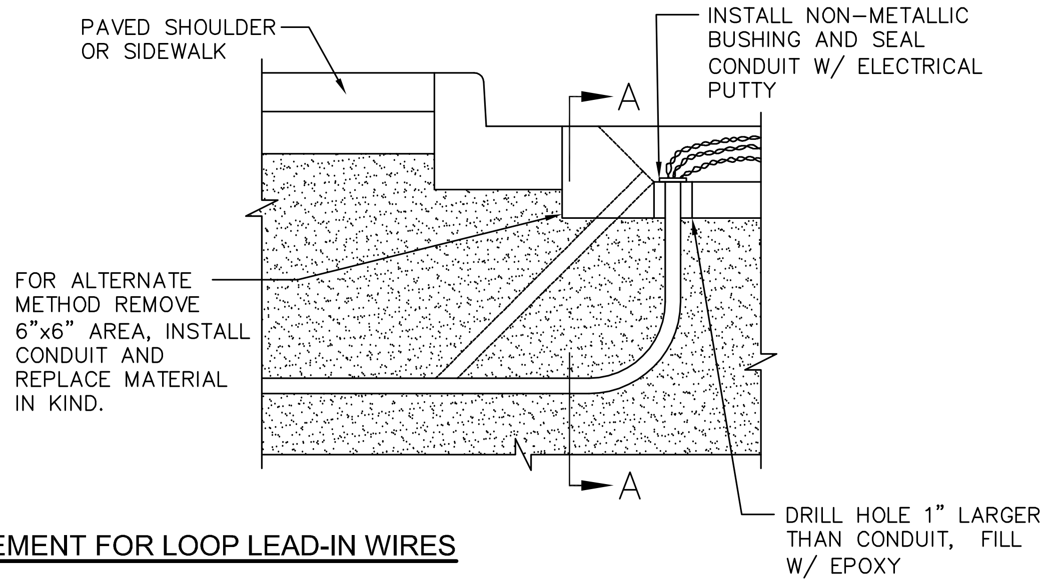
LOOP SPLICE

City of Bellevue

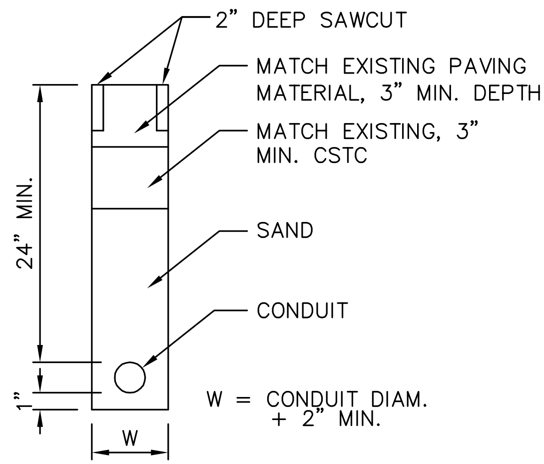
LOOP DETECTOR DETAIL

DRAWING NUMBER	SL–320–1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS

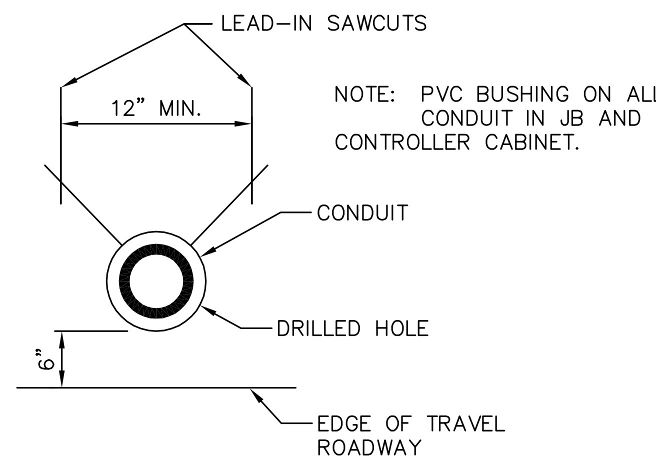




TYPICAL CONDUIT PLACEMENT FOR LOOP LEAD-IN WIRES



SECTION A-A



LEAD-IN SAWCUTS
AND CONDUIT PLACEMENT DETAIL

City of Bellevue

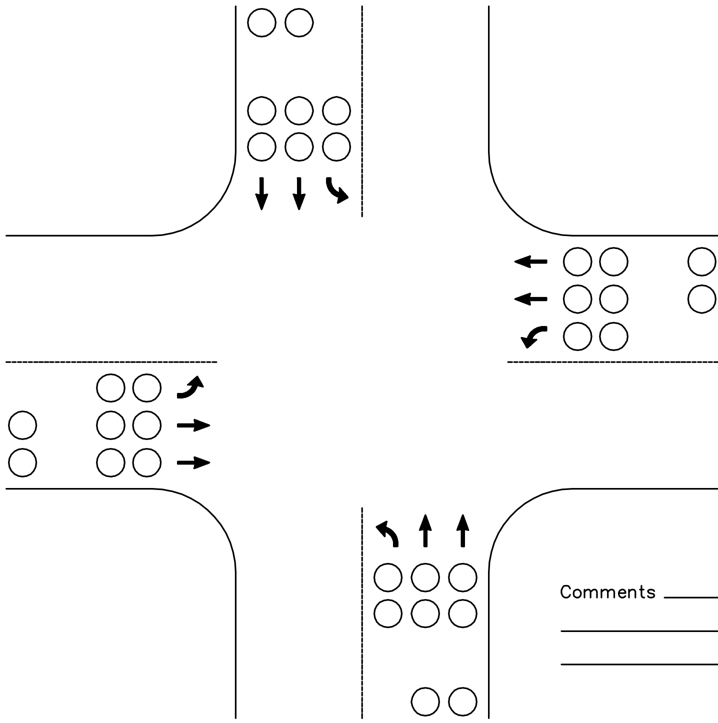
TYPICAL CONDUIT PLACEMENT FOR LOOP DETECTORS

DRAWING NUMBER	SL-330-1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS

INDUCTION LOOP TEST RESULTS

Location ______________________________ Date ______________

Tested By ______________________________ Verified By ______________



Comments ______________________________

TEST RESULTS						TEST RESULTS					
Loop #	Inductance	Meggar Reading	Loop #	Inductance	Meggar Reading	Loop #	Inductance	Meggar Reading	Loop #	Inductance	Meggar Reading

City of Bellevue

INDUCTION LOOP TEST

DRAWING NUMBER	SL–340–1
SCALE	NONE
REVISION DATE	12/16
DEPARTMENT	TRANS

3 SECTION SIGNAL HEADS - 5C

	Jacket Color		Phase Number 1	2	3	4	5	6	7	8	Overlap A	B	C	D
Red Indication	Red	R	611	621	631	641	651	661	671	681	6A1	6B1	6C1	6D1
Amber Indication	Orange	O	612	622	632	642	652	662	672	682	6A2	6B2	6C2	6D2
Green Indication	Green	G	613	623	633	643	653	663	673	683	6A3	6B3	6C3	6D3
AC—	White	W	614	624	634	644	654	664	674	684	6A4	6B4	6C4	6D4
Spare	Black	BLK	615	625	635	645	655	665	675	685	6A5	6B5	6C5	6D5

4 SECTION SIGNAL HEADS - 7C

Flashing Yellow Arrow	Bimodal 4 Section Head	Jacket Color		Phase Number 1	2	3	4	5	6	7	8
Red Indication	Red Indication	Red	R	611		631		651		671	
Amber Indication	Amber Indication	Orange	O	612		632		652		672	
Green Indication	Green Indication	Green	G	613		633		653		673	
AC—	AC—	White	W	614		634		654		674	
FYA	Yellow Arrow	Black	BLK	615		635		655		675	
Spare	Spare	White_black	WB	616		636		656		676	
Spare	Green Arrow	Blue	BL	617		637		657		677	

PEDESTRIAN HEADS AND DETECTIONS

	Jacket Color		Phase Number 2	4	6	8
Don't Walk	Red	R	721	741	761	781
Walk	Green	G	722	742	762	782
AC—	White	W	723	743	763	783
Detection	Black	BLK	724	744	764	784
Common—Detection	Clear	CLR	725	745	765	785

City of Bellevue

TRAFFIC SIGNAL HEAD WIRING CHART

DRAWING NUMBER	SL—350—2
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

SERVICE CONNECTION

AC+ Input	AC+
AC– Input	AC–
Equipment Ground	EQ GND

EMERGENCY PRE-EMPT

		Detector Number			
		1–NB	2–EB	3–SB	4–WB
Main Detection	(Orange)	511	521	531	541
	(Yellow)	512	522	532	542
	(Blue/Bare)	513	523	533	543
Advance Detection	(Orange)	511	521	531	541
	(Yellow)	A1	B1	C1	D1
	(Blue)	513	523	533	543
	(Orange)	511	521	531	541
	(Yellow)	A2	B2	C2	D2
	(Blue/Bare)	513	523	533	543

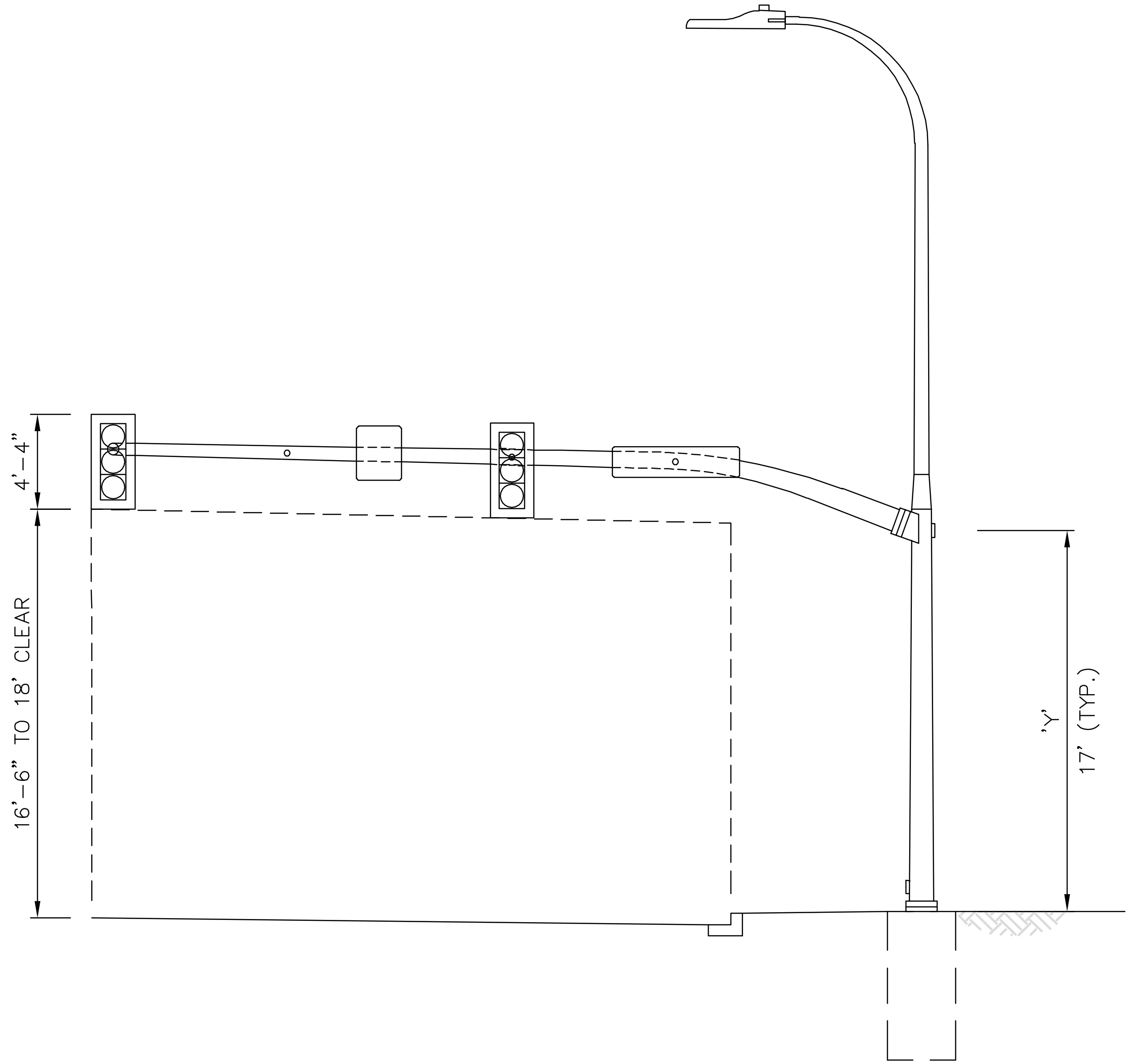
VEHICLE DETECTION

Loop Channel 1 (a)	B	01	05	09	13	17	21
Loop Channel 1 (b)	W	01	05	09	13	17	21
Loop Channel 2 (a)	B	02	06	10	14	18	22
Loop Channel 2 (b)	W	02	06	10	14	18	22
Loop Channel 3 (a)	B	03	07	11	15	19	23
Loop Channel 3 (b)	W	03	07	11	15	19	23
Loop Channel 4 (a)	B	04	08	12	16	20	24
Loop Channel 4 (b)	W	04	08	12	16	20	24

City of Bellevue

SIGNAL EQUIPMENT WIRING CHART

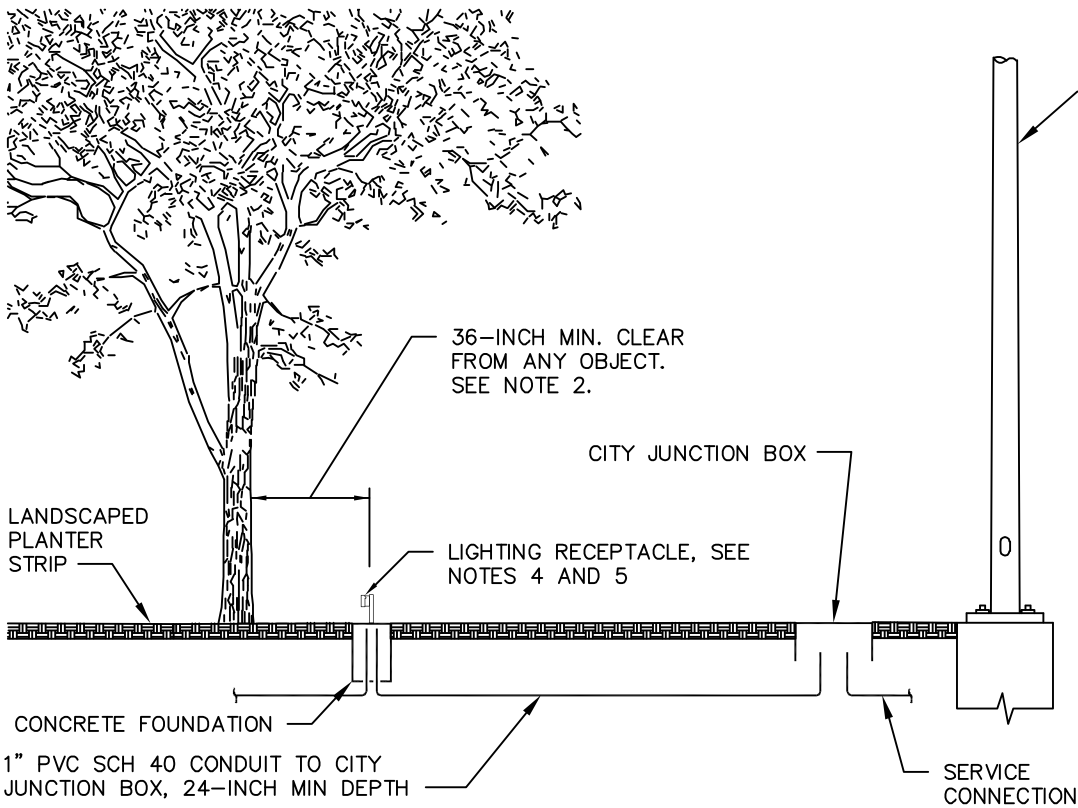
DRAWING NUMBER	SL–351–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



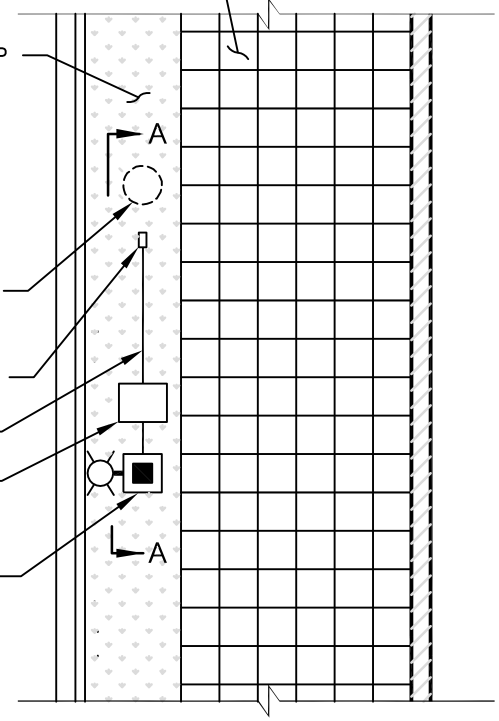
City of Bellevue

SIGNAL HEAD CLEARANCE DETAIL

DRAWING NUMBER	SL-360-1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS



SECTION A-A



NOTES:

1. LIGHTING RECEPTACLE SHALL HAVE 8-INCH MINIMUM VERTICAL CLEARANCE FROM FINISHED GRADE.
2. LIGHTING RECEPTACLE SHALL HAVE 36-INCH HORIZONTAL CLEARANCE FROM ANY OBJECT PER NEC 110.26(A)(1).
3. LIGHTING RECEPTACLE CLEAR WORKING SPACE SHALL HAVE A MINIMUM 30-INCH WIDTH PER NEC 110.26(A)2.
4. LIGHTING RECEPTACLE SHALL BE LISTED AND MARKED WITH THE MANUFACTURER'S NAME OR IDENTIFICATION AND VOLTAGE AND AMPERE RATINGS PER NEC 406.3.
5. LIGHTING RECEPTACLE SHALL HAVE A METALLIC, LOCKABLE INTERMATIC WP1010MXD COVER OR APPROVED EQUAL.
6. CONDUIT FOR OUTLET SHALL BE IN SAME TRENCH AS STREET LIGHTING CONDUIT.

City of Bellevue

HOLIDAY LIGHTING RECEPTACLE IN LANDSCAPED PLANTER STRIP

DRAWING NUMBER	SL-370-1
SCALE	NONE
REVISION DATE	1/25
DEPARTMENT	TRANS

TRANSPORTATION DESIGN MANUAL

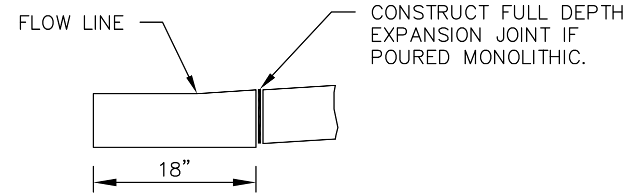
DT Drawings

Downtown

CITY OF BELLEVUE
WASHINGTON

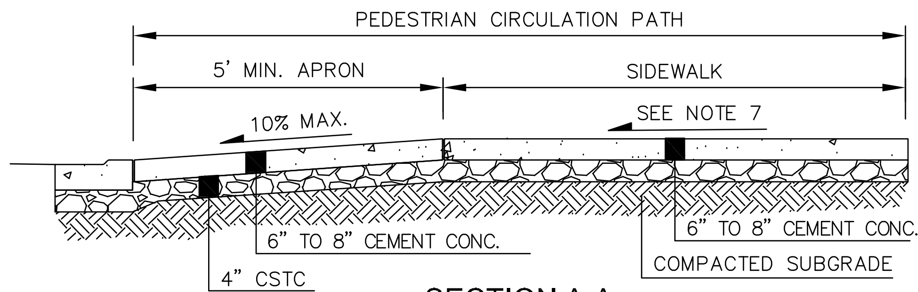
NOTES:

1. ALL JOINTS SHALL BE CLEANED AND EDGED.
2. CONCRETE SHALL BE A CLASS 4000 P.C.C. MIX WITH A COMPRESSIVE STRENGTH OF 3000 PSI WITHIN 3 DAYS (CURB, GUTTER, DRIVEWAY APPROACH, AND SIDE SLOPES.
3. CONCRETE PAVEMENT SHALL BE BRUSHED PERPENDICULAR TO THE CURB WITH A FIBER OR WIRE BRUSH OF A TYPE APPROVED BY THE ENGINEER.
4. ⅜" THRU EXPANSION JOINTS SHALL BE PLACED AT BACK, SIDES AND FRONT. MAXIMUM EXPANSION JOINT SPACING IS 14' CENTER TO CENTER.
5. SEE SECTION 3.5 OF THE DESIGN MANUAL FOR DRIVEWAY WIDTH AND DESIGN REQUIREMENTS. DRIVEWAY WIDTH DOES NOT INCLUDE WIDTH OF APPROACH SIDE SLOPES (WINGS).
6. SIDEWALK WIDTH SHOWN IS TYPICAL. REQUIRED SIDEWALK WIDTH WILL BE SPECIFIED BY THE ENGINEER.
7. CROSS SLOPE 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% UNLESS OTHERWISE APPROVED BY THE ENGINEER.

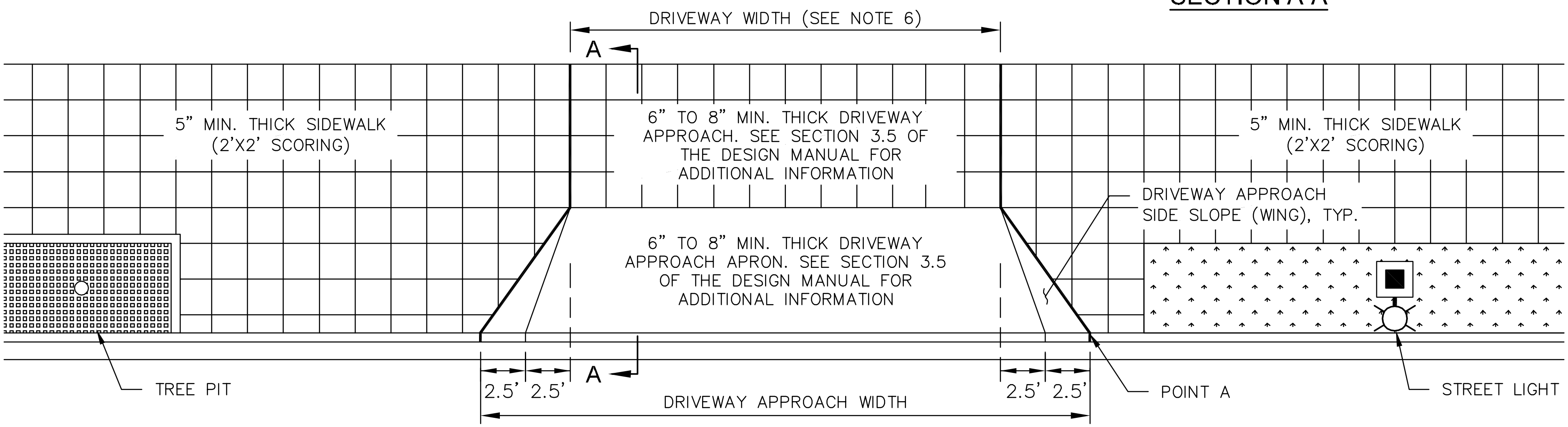


NOTE: DEPRESSED CURB AND GUTTER SHALL BE FLUSH WHEN DRIVEWAY IS USED FOR PEDESTRIAN ACCESS.

DEPRESSED CURB & GUTTER DETAIL



SECTION A-A

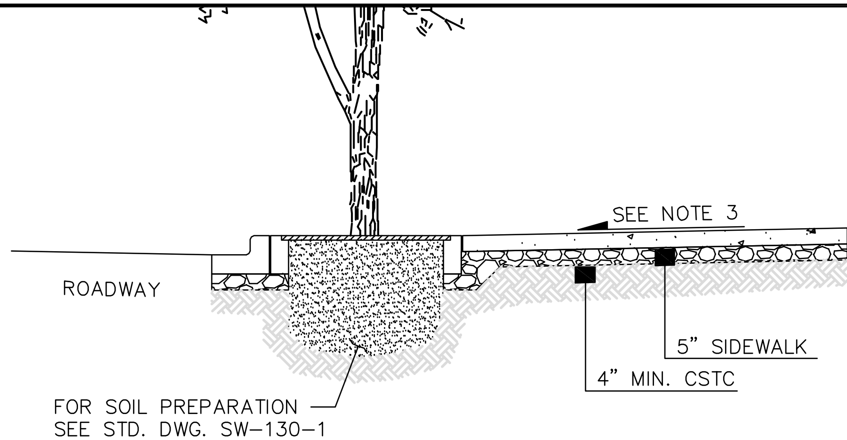


DOWNTOWN DRIVEWAY APPROACH PLAN

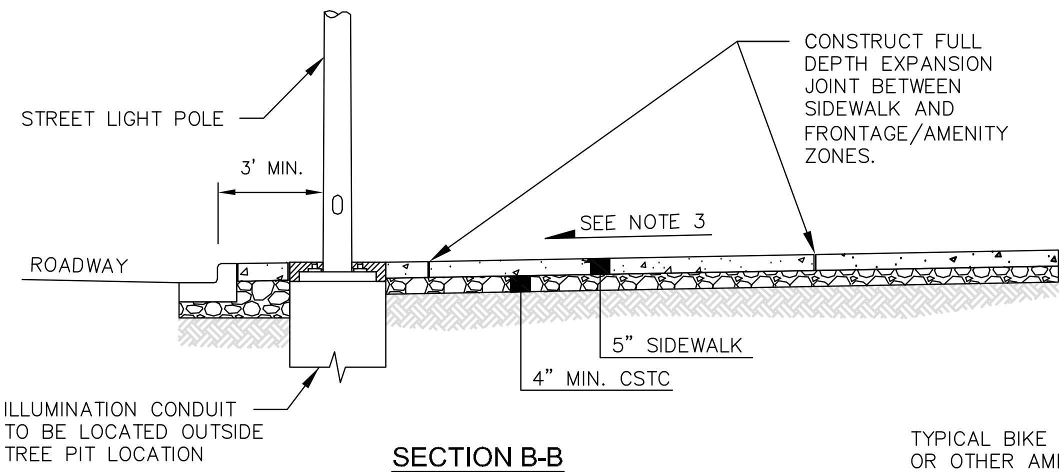
City of Bellevue

DOWNTOWN DRIVEWAY

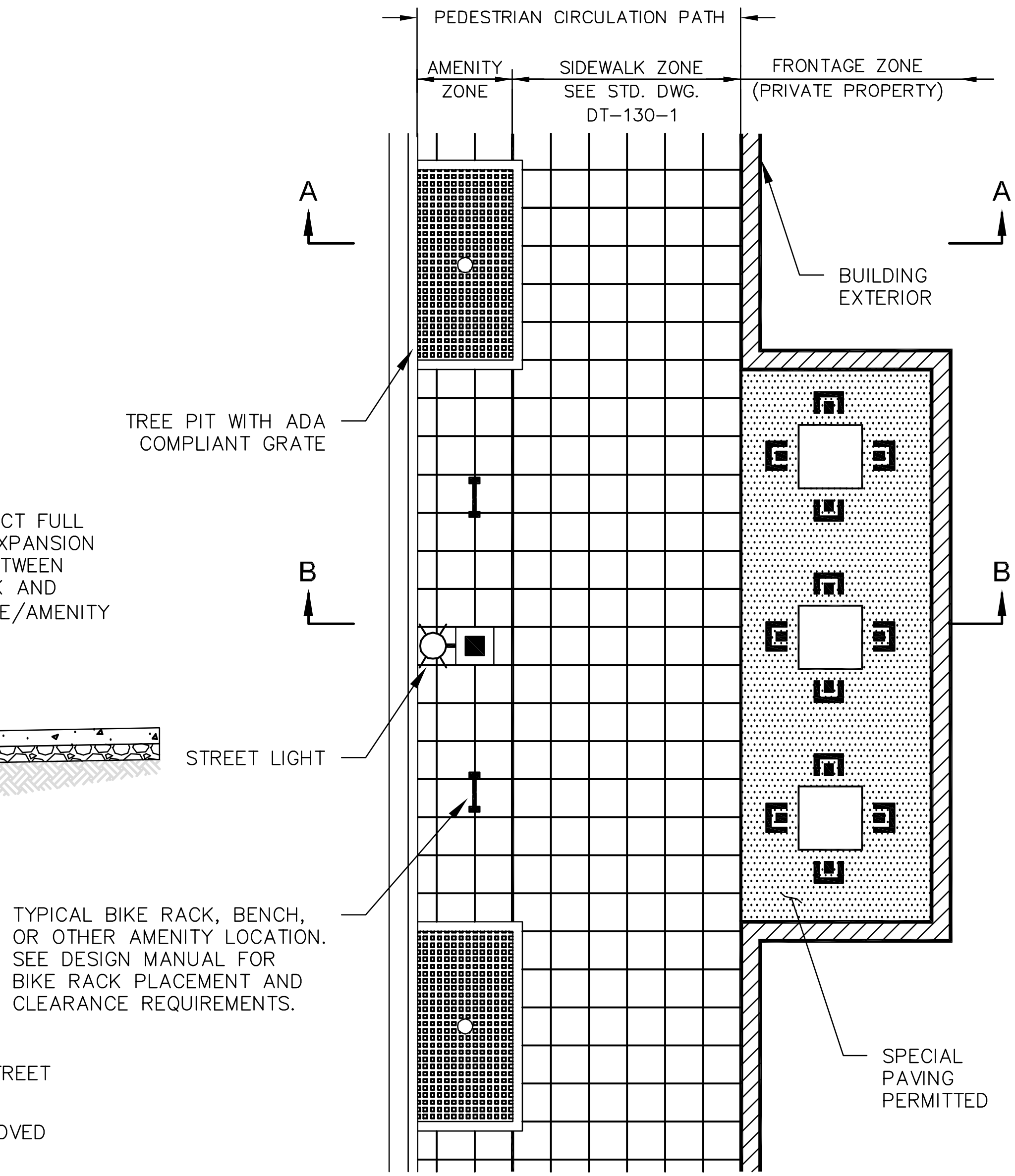
DRAWING NUMBER	DT–100–1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



SECTION A-A



SECTION B-B



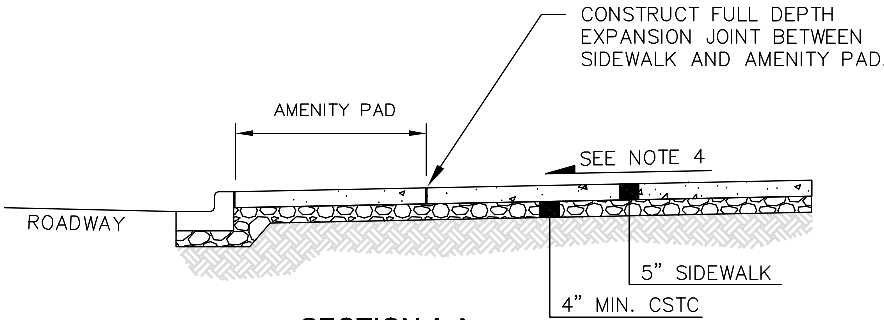
NOTES:

1. SEE STD. DWG. DT-130-1 FOR DOWNTOWN SIDEWALK CONSTRUCTION NOTES.
2. SEE SECTION 3.6.6 OF THE DESIGN MANUAL FOR MINIMUM SPACING BETWEEN STREET TREES AND STREET LIGHTS.
3. CROSS SLOPE 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% UNLESS OTHERWISE APPROVED BY THE ENGINEER.

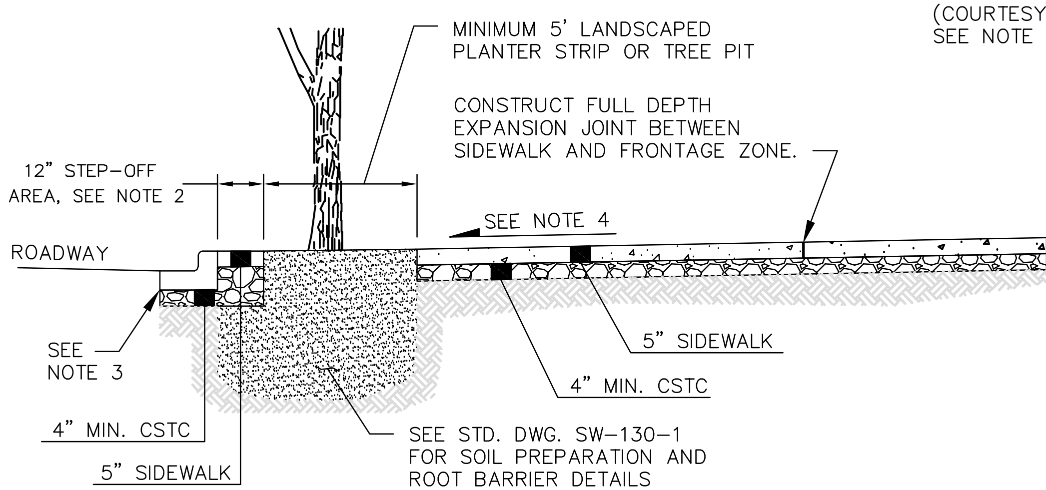
City of Bellevue

DOWNTOWN SIDEWALK WITH TREE PITS

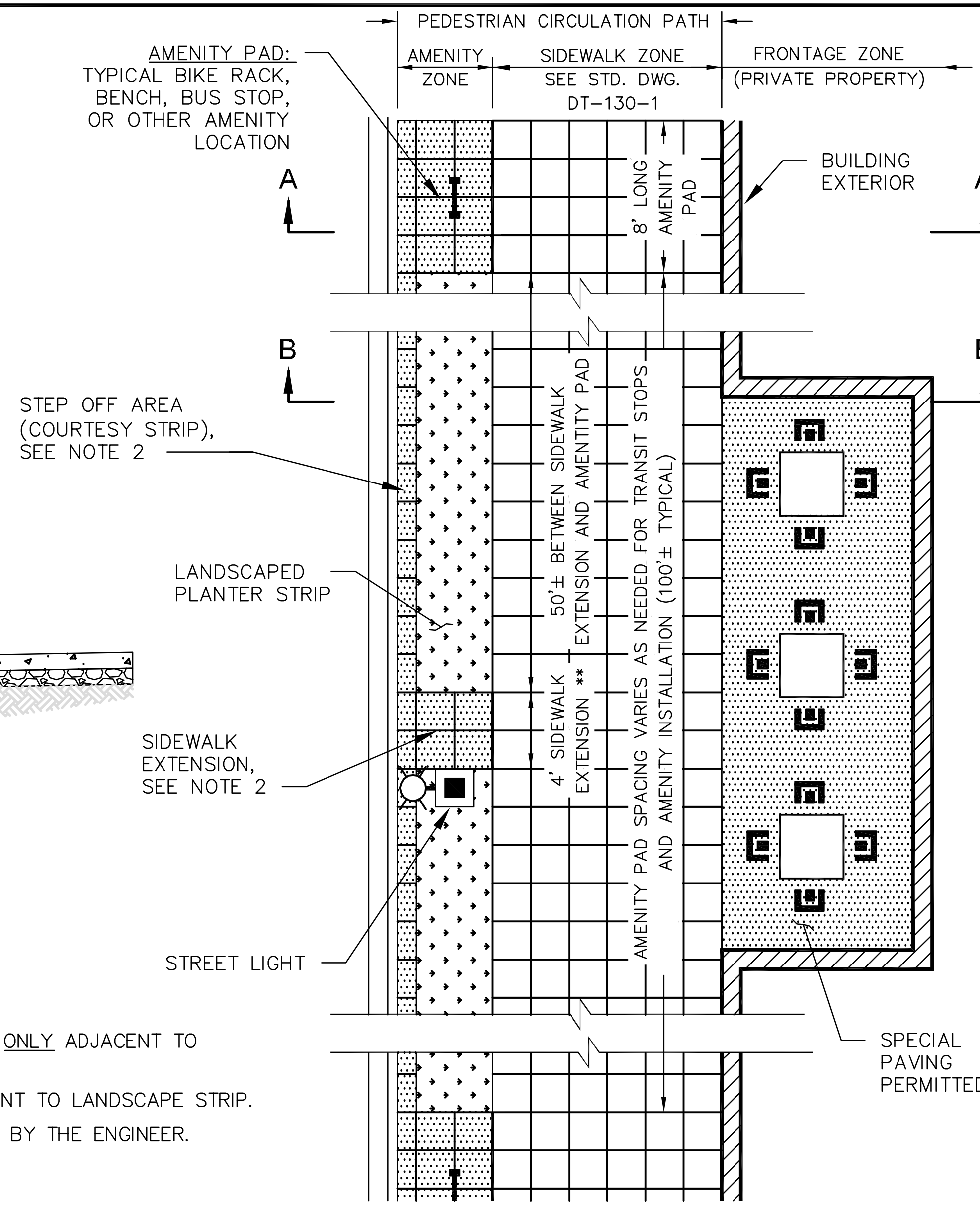
DRAWING NUMBER	DT-110-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



SECTION A-A



SECTION B-B



NOTES:

1. SEE STD. DWG. DT-130-1 FOR DOWNTOWN SIDEWALK CONSTRUCTION NOTES.
2. STEP-OFF AREA (COURTESY STRIP) AND SIDEWALK EXTENSIONS SHALL BE INSTALLED ONLY ADJACENT TO ON-STREET PARKING. OMIT WHERE NO ON-STREET PARKING IS PRESENT.
3. IF NO STEP-OFF AREA, SEE STD. DWG. RC-240-1 FOR CURB/GUTTER DETAIL ADJACENT TO LANDSCAPE STRIP.
4. CROSS-SLOPE 2% MAXIMUM, 0.5% MINIMUM. USE 1.5% UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. SEE SECTION 3.4.1.1 OF THE DESIGN MANUAL FOR SIDEWALK REQUIREMENTS.

City of Bellevue

DOWNTOWN SIDEWALK WITH LANDSCAPED PLANTER STRIP

DRAWING NUMBER	DT-120-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

DOWNTOWN SIDEWALK CONSTRUCTION NOTES

1. SIDEWALK SHALL BE CEMENT CONCRETE CLASS 3000, EXCEPT FOR SIDEWALK WITHIN THE DRIVEWAY APPROACH WHICH SHALL BE CLASS 4000, WITH 2'X2' SCORING PATTERN AND BROOM FINISH ONLY. SEE STANDARD DRAWING SW-110-1 FOR BROOM FINISH DETAILS.

2. THE SIDEWALK ZONE IS CONSIDERED THE PEDESTRIAN ACCESS ROUTE (PAR). THE ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY, FINAL RULE, SHALL APPLY.

3. THE FULL WIDTH OF THE SIDEWALK ZONE SHALL REMAIN CLEAR OF OBSTRUCTIONS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

4. SEE DOWNTOWN LAND USE CODE FOR SIDEWALK WIDTH, PLANTER STRIP WIDTH, STREET TREE, AND TREE GRATE REQUIREMENTS.

5. VERIFICATION OF UTILITIES BELOW GRADE IS REQUIRED PRIOR TO INSTALLATION OF ALL FIXED AND BREAKAWAY OBJECTS INCLUDING BUT NOT LIMITED TO: STREET TREES, STREET LIGHTS, SIGNAL EQUIPMENT, AND SIGNAGE. RELOCATE UTILITIES IN CONFLICT AS FEASIBLE.

6. STANDARD STREET TREE / STREET LIGHT SPACING IS 25-FEET ON CENTER. SPACING MAY BE AMENDED BY THE ENGINEER.

7. SEE SECTIONS 3.6.3 AND 3.6.4 OF THE DESIGN MANUAL FOR CLEAR DISTANCE REQUIREMENTS BETWEEN FIXED AND BREAKAWAY OBJECTS AND THE FACE OF CURB.

8. COVERS FOR JUNCTION BOXES AND UTILITY VAULTS SHOULD NOT BE INSTALLED WITHIN THE PEDESTRIAN ACCESS ROUTE AS FEASIBLE AND SHALL BE NON-SKID WITH FACTORY INSTALLED NON-SKID SURFACE AS SPECIFIED BY THE ENGINEER. SEE DESIGN MANUAL.

9. OPTIONAL ELECTRICAL CONNECTIONS SHALL COMPLY WITH ELECTRICAL CODES AND PASS ELECTRICAL INSPECTION.

DEFINITIONS:

AMENITY ZONE: THE AMENITY ZONE IS THE AREA LOCATED BETWEEN THE BACK OF CURB AND SIDEWALK ZONE. THIS AREA TYPICALLY CONSISTS OF LANDSCAPING AND SOME PAVED AREAS FOR STREET FURNITURE SUCH AS BENCHES, BICYCLE PARKING, LIGHTING, AND WAYFINDING KIOSKS/SIGNAGE. PAVED AREAS WITHIN THIS ZONE ARE CONSIDERED PART OF THE PEDESTRIAN CIRCULATION PATH. THIS AREA IS SOMETIMES ALSO REFERRED TO AS THE 'STREET FURNITURE ZONE' OR 'CURB ZONE'.

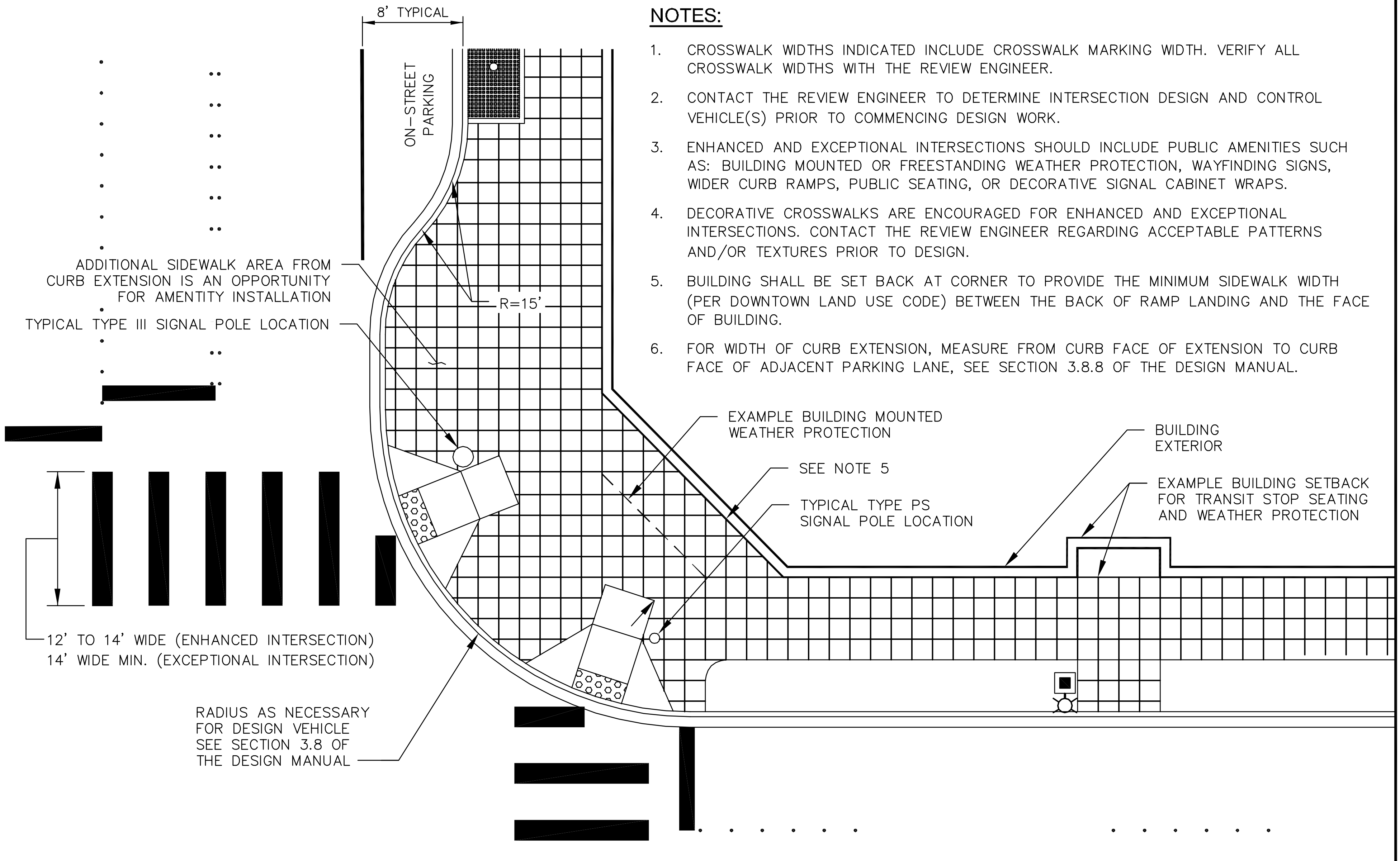
SIDEWALK ZONE: THE SIDEWALK ZONE IS THE AREA LOCATED BETWEEN THE AMENITY ZONE AND THE FRONTAGE ZONE. THE SIDEWALK ZONE IS THE PRIMARY PATHWAY OF PEDESTRIANS AND IS CONSIDERED THE PEDESTRIAN ACCESS ROUTE. THE FULL WIDTH OF THE SIDEWALK ZONE SHALL BE CLEAR OF ALL OBSTRUCTIONS ALLOWING FREE MOVEMENT OF PEDESTRIANS. THIS AREA IS SOMETIMES ALSO REFERRED TO AS THE 'PEDESTRIAN THROUGH ZONE'

FRONTAGE ZONE: THE FRONTAGE ZONE IS LOCATED BETWEEN THE SIDEWALK ZONE AND THE ADJACENT BUILDING STRUCTURE. THIS AREA SERVES AS AN EXTENSION OF THE BUILDING AND IS LOCATED OUTSIDE OF PUBLIC RIGHT-OF-WAY OR EASEMENTS. THE FRONTAGE ZONE MAY CONTAIN ITEMS SUCH AS SIDEWALK CAFES, ARTWORK, AND SANDWICH BOARDS. SPECIAL PAVING TREATMENTS ARE PERMITTED WITHIN THE FRONTAGE ZONE.

City of Bellevue

DOWNTOWN SIDEWALK CONSTRUCTION NOTES

DRAWING NUMBER	DT-130-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



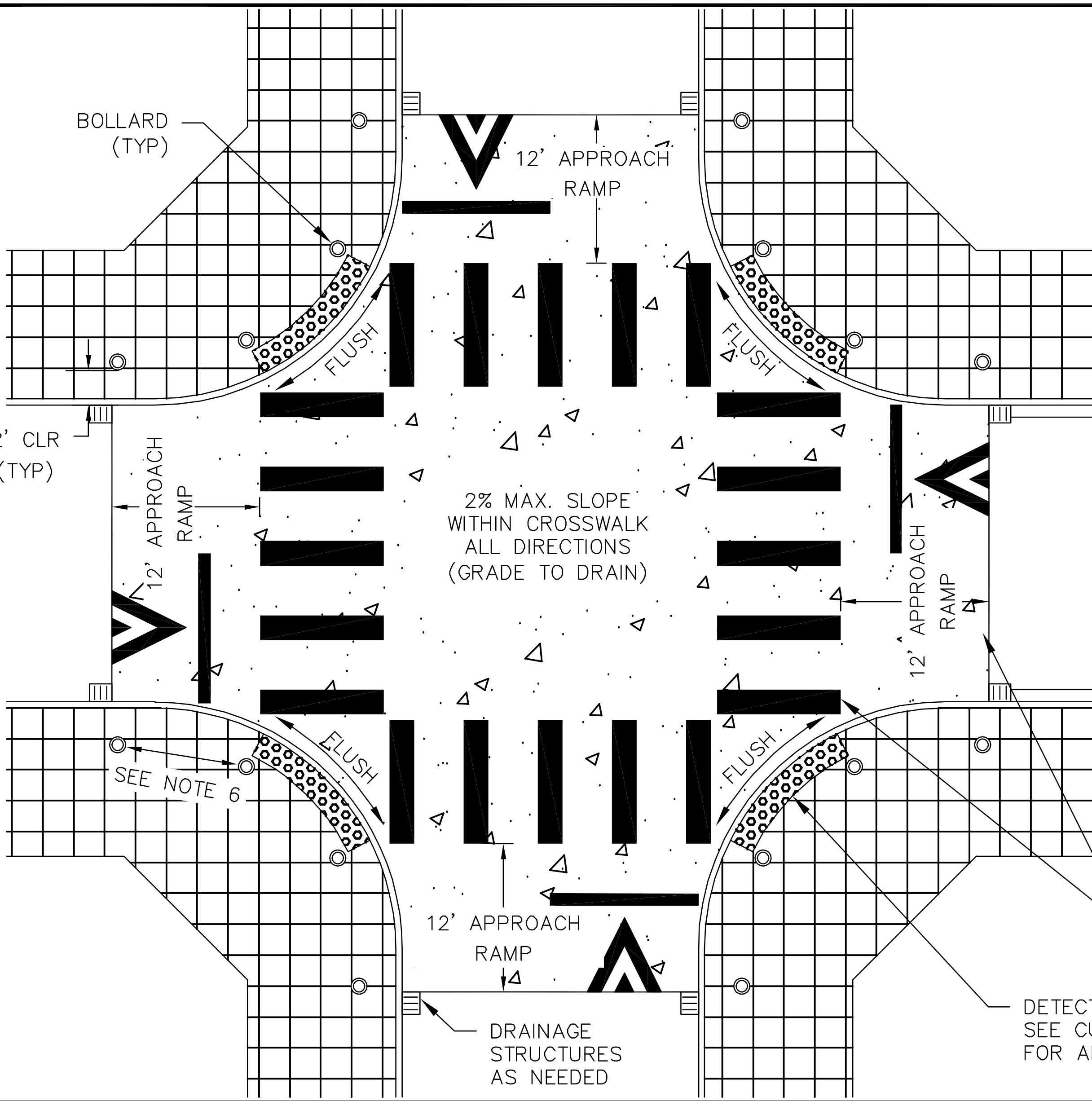
NOTES:

1. CROSSWALK WIDTHS INDICATED INCLUDE CROSSWALK MARKING WIDTH. VERIFY ALL CROSSWALK WIDTHS WITH THE REVIEW ENGINEER.
2. CONTACT THE REVIEW ENGINEER TO DETERMINE INTERSECTION DESIGN AND CONTROL VEHICLE(S) PRIOR TO COMMENCING DESIGN WORK.
3. ENHANCED AND EXCEPTIONAL INTERSECTIONS SHOULD INCLUDE PUBLIC AMENITIES SUCH AS: BUILDING MOUNTED OR FREESTANDING WEATHER PROTECTION, WAYFINDING SIGNS, WIDER CURB RAMPS, PUBLIC SEATING, OR DECORATIVE SIGNAL CABINET WRAPS.
4. DECORATIVE CROSSWALKS ARE ENCOURAGED FOR ENHANCED AND EXCEPTIONAL INTERSECTIONS. CONTACT THE REVIEW ENGINEER REGARDING ACCEPTABLE PATTERNS AND/OR TEXTURES PRIOR TO DESIGN.
5. BUILDING SHALL BE SET BACK AT CORNER TO PROVIDE THE MINIMUM SIDEWALK WIDTH (PER DOWNTOWN LAND USE CODE) BETWEEN THE BACK OF RAMP LANDING AND THE FACE OF BUILDING.
6. FOR WIDTH OF CURB EXTENSION, MEASURE FROM CURB FACE OF EXTENSION TO CURB FACE OF ADJACENT PARKING LANE, SEE SECTION 3.8.8 OF THE DESIGN MANUAL.

City of Bellevue

ENHANCED AND EXCEPTIONAL INTERSECTIONS

DRAWING NUMBER	DT-140-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS



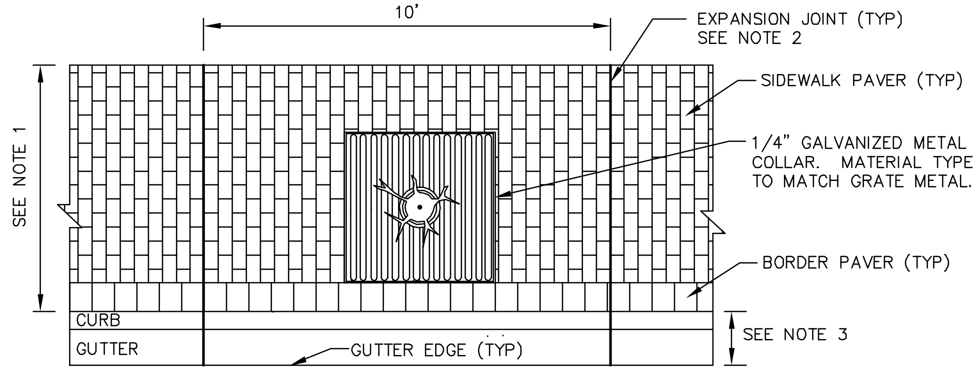
NOTES:

1. RAISED INTERSECTION AND APPROACH RAMPS SHALL BE CEMENT CONC. CONFORMING TO SPEC. SECTION 5-05. THICKNESS SHALL BE 10" THICK MINIMUM. ROADWAY SECTIONS SHALL BE INCLUDED IN THE DESIGN PLANS SHOWING THE PROPOSED INTERSECTION PAVEMENT SECTION.
2. CEMENT CONC. PAVEMENT JOINTS AND DOWELING SHALL BE PER WSDOT STD PLAN A-40.10-03. CONCRETE JOINT SPACING SHALL NOT EXCEED 15'. A JOINTING PLAN SHALL BE SUBMITTED FOR REVIEW BY THE PAVEMENT MANAGER.
3. CONCRETE JOINTS SHALL ALIGN WITH LANE LINE PROJECTIONS.
4. PAVEMENT COLOR OR TEXTURE MAY BE ACCEPTABLE WITH THE APPROVAL OF THE REVIEW ENGINEER. IF APPROVED, COLOR SHALL BE INTEGRAL TO THE CEMENT CONC. MIX AND TEXTURE SHALL COMPLY WITH ADA REQUIREMENTS.
5. INSIDE CROSSWALK MARKING MAY BE OMITTED WITH THE APPROVAL OF THE REVIEW ENGINEER.
6. BOLLARD SPACING VARIES DEPENDING ON SITE CONDITIONS AND BOLLARD USED. TYPICAL CLEARANCE BETWEEN BOLLARDS IS 10'-12'. CONTACT THE REVIEW ENGINEER FOR SITE SPECIFIC REQUIREMENTS.
7. A SPECIAL CONSTRUCTION INSPECTION WILL BE REQUIRED DURING CONSTRUCTION OF RAISED ALL-WAY STOP INTERSECTIONS.

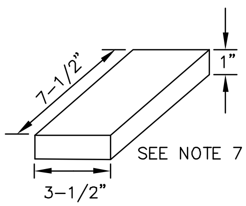
City of Bellevue

TYPICAL RAISED ALL-WAY STOP INTERSECTION

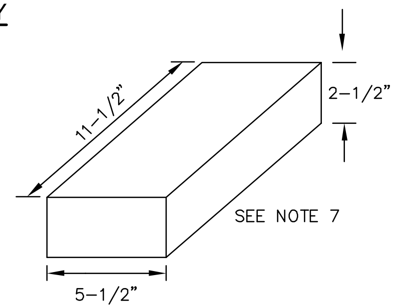
DRAWING NUMBER	DT-150-1
SCALE	NONE
REVISION DATE	12/22
DEPARTMENT	TRANS



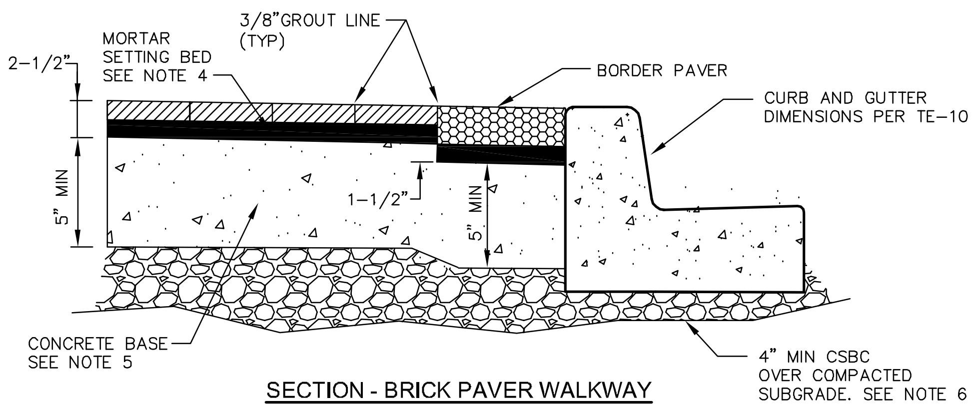
PLAN - BRICK PAVER WALKWAY



SIDEWALK PAVER



BORDER PAVER



SECTION - BRICK PAVER WALKWAY

NOTES:

1. SIDEWALK DIMENSIONS SHALL BE PER THE APPROVED PLANS.
2. 3/8" FULL DEPTH EXPANSION JOINT EVERY 10' OF WALKWAY LENGTH. EXPANSION JOINT SHALL RUN FROM BACK OF WALK TO FRONT OF CONCRETE GUTTER; AT FULL DEPTH FROM TOP OF PAVERS TO CONCRETE BASE. JOINT MATERIAL AND SEAL PER MANUFACTURER'S SPECIFICATIONS.
3. SEE STD. DWG. SW-100-1 FOR CURB AND GUTTER DIMENSIONS AND SPECIFICATIONS.
4. PLACE 1/16 INCH OR LESS SLURRY BOND COAT TO CONCRETE BASE IMMEDIATELY PRIOR TO INSTALLING MORTAR BED SETTING. MORTAR/ SLURRY SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
5. ADDITIONAL DEPTH MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER. CONCRETE SHALL BE AIR ENTRAINED CLASS 3000 PER WSDOT STANDARD SPECIFICATIONS. REBAR MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
6. CSBC THICKNESS MAY BE INCREASED AT THE DISCRETION OF THE ENGINEER. ENGINEER TO APPROVE SUBGRADE MATERIAL & COMPACTION PRIOR TO CONCRETE BASE INSTALLATION.
7. PAVERS SHALL BE MUTUAL MATERIALS CHESTNUT WITH WIRE CUT SURFACE FINISH. APPLY THIN SLURRY BOND COAT WITH TROWEL ON THE BOTTOM OF PAVER PRIOR TO INSTALLING IN MORTAR SETTING BED.
8. ALL VAULT/UTILITY/ JUNCTION BOX LIDS LOCATED IN THE WALKWAY SHALL HAVE A NON-SKID SURFACE, SLIPNOT GRIP PLATE GRADE 3 SURFACE, IKG INDUSTRIES MEBAC #1 OR APPROVED EQUAL AND ABLE TO BEAR HL-93 DESIGN VEHICLE WHEEL LOADING. MIN. 2" CONCRETE COLLAR REQUIRED.
9. ALL PAVERS AND GROUT LINES SHALL BE WATERSEALED PER MANUFACTURER'S SPECIFICATIONS.

City of Bellevue

BRICK PAVER INSTALLATION FOR OLD BELLEVUE DISTRICT

DRAWING NUMBER	DT-160-1
SCALE	NONE
REVISION DATE	2/24
DEPARTMENT	TRANS

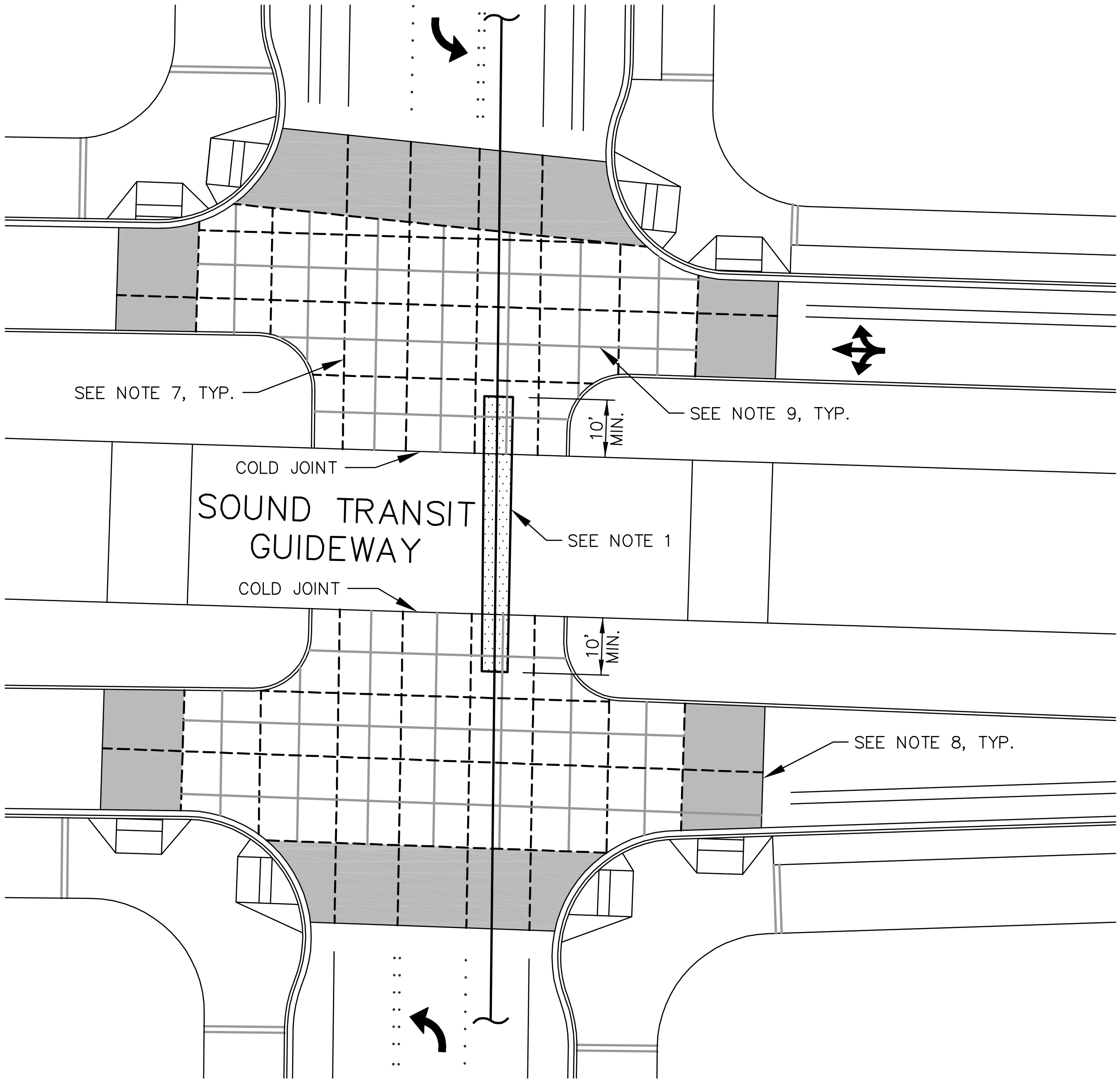
CITY OF BELLEVUE
WASHINGTON

TRANSPORTATION DESIGN MANUAL

BR Drawings

BelRed Corridor

CITY OF BELLEVUE
WASHINGTON



NOTES:

1. PUBLIC AND FRANCHISE UTILITIES SHALL BE ENCASED UNDERNEATH SOUND TRANSIT GUIDEWAY. CASINGS SHALL EXTEND MIN. 10-FEET BEYOND THE GUIDEWAY.
2. THE MINIMUM THICKNESS OF CONCRETE INTERSECTION AND CONCRETE CROSSWALK SHALL BE 10", OR AS DETERMINED BY THE ENGINEER.
3. INTERSECTION CONCRETE SHALL HAVE A MEDIUM BROOM FINISH.
4. SEE STD. DWG. BR-120-1 FOR MODIFIED CURB AND GUTTER SECTION WITHIN THE CONCRETE INTERSECTION.
5. CONCRETE JOINT SPACING SHALL NOT EXCEED 15-FEET AND SHALL BE APPROVED BY THE CITY.
6. THE CONCRETE JOINTS SHALL ALIGN WITH ULTIMATE LANE LINE PROJECTIONS.
7. FOR TRANSVERSE CONSTRUCTION JOINT AND COLD JOINT, SEE STD. DWG. BR-120-1.
8. FOR HMA TRANSITION DETAIL, SEE STD. DWG. BR-120-1.
9. SAWCUT SQUARE INTERSECTION SCORING PATTERN, 4' MIN DIMENSION EACH SIDE. CONTRACTOR SHALL VERIFY SCORING LAYOUT WITH ENGINEER PRIOR TO IMPLEMENTATION.
10. TRAFFIC LOOPS SHALL BE PLACED OUTSIDE OF AND LOOP STUBS POINTING AWAY FROM CONCRETE PANELS.
11. ALL CATCH BASINS, MANHOLES, VALVES, TEES, ETC SHALL BE PLACED A MIN OF 10' AWAY FROM SOUND TRANSIT GUIDEWAY.
12. SEE WSDOT STANDARD PLAN A-40.15-00 WHEN CATCH BASINS AND/OR MANHOLES ARE PLACED IN THE INTERSECTION.

DECORATIVE CONCRETE CROSSWALK

SCORED CONCRETE INTERSECTION

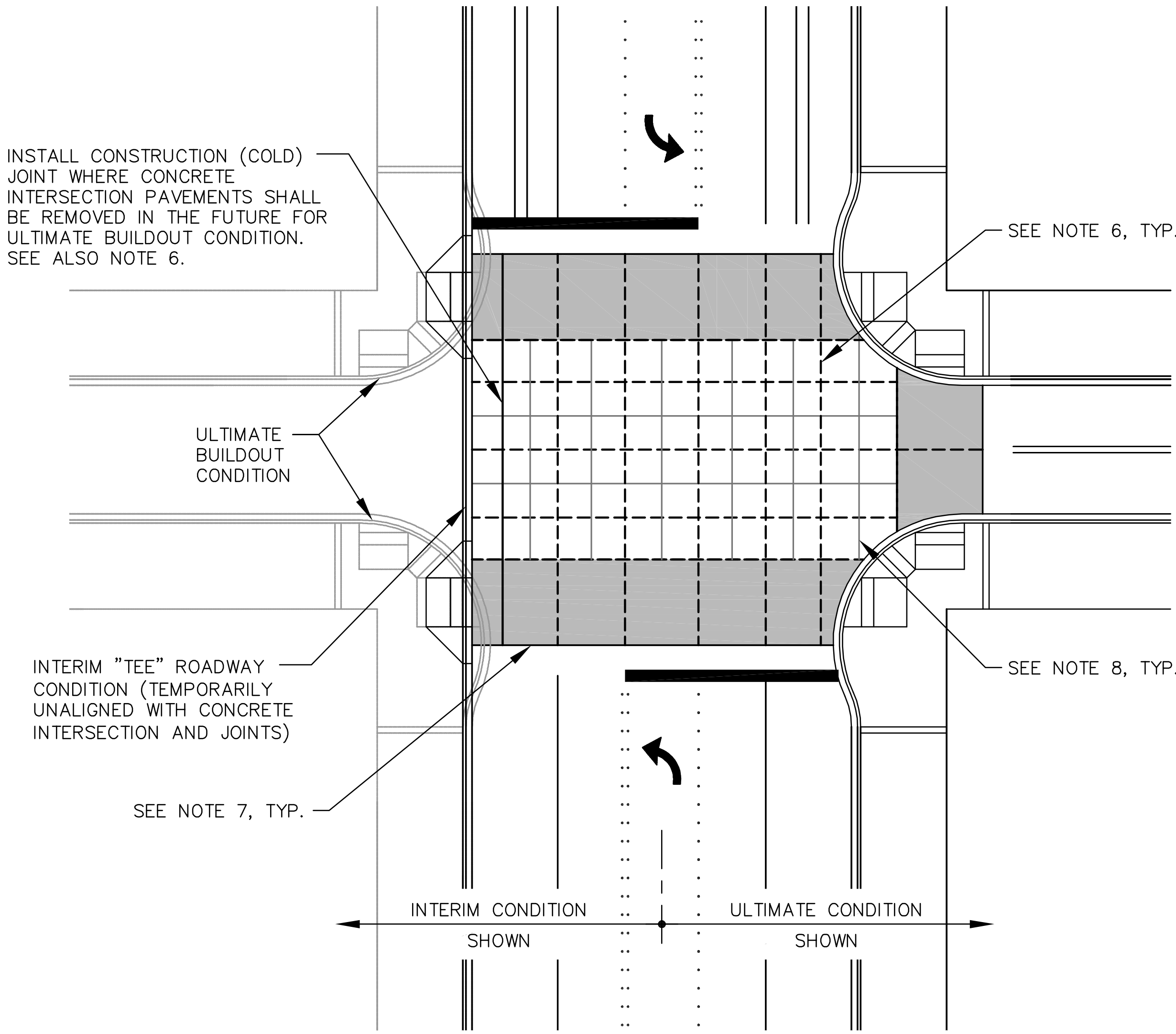
TRANSVERSE JOINT, PER WSDOT STANDARD. PLAN A-40.10-02

SAWCUT JOINT, 1/4" WIDE X 1/4" DEEP

City of Bellevue

CONCRETE INTERSECTION AT TRANSIT CROSSING

DRAWING NUMBER	BR-100-1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS



NOTES:

1. THE MINIMUM THICKNESS OF CONCRETE INTERSECTION AND CONCRETE CROSSWALK SHALL BE 10", OR AS DETERMINED BY THE ENGINEER.
2. INTERSECTION CONCRETE SHALL HAVE A MEDIUM BROOM FINISH.
3. SEE STD. DWG. BR-120-1 FOR MODIFIED CURB AND GUTTER SECTION WITHIN THE CONCRETE INTERSECTION.
4. CONCRETE JOINT SPACING SHALL NOT EXCEED 15-FEET AND SHALL BE APPROVED BY THE CITY.
5. THE CONCRETE JOINTS SHALL ALIGN WITH ULTIMATE LANE LINE PROJECTIONS.
6. FOR TRANSVERSE CONSTRUCTION JOINT AND COLD JOINT, SEE STD. DWG. BR-120-1.
7. FOR HMA TRANSITION DETAIL, SEE STD. DWG. BR-120-1.
8. SAWCUT SQUARE INTERSECTION SCORING PATTERN, 4' MIN DIMENSION EACH SIDE. CONTRACTOR SHALL VERIFY SCORING LAYOUT WITH ENGINEER PRIOR TO IMPLEMENTATION.
9. TRAFFIC LOOPS SHALL BE PLACED OUTSIDE OF AND LOOP STUBS POINTING AWAY FROM CONCRETE PANELS.
10. SEE WSDOT STANDARD PLAN A-40.15-00 WHEN CATCH BASINS AND/OR MANHOLES ARE PLACED IN THE INTERSECTION.

DECORATIVE CONCRETE CROSSWALK

SCORED CONCRETE INTERSECTION

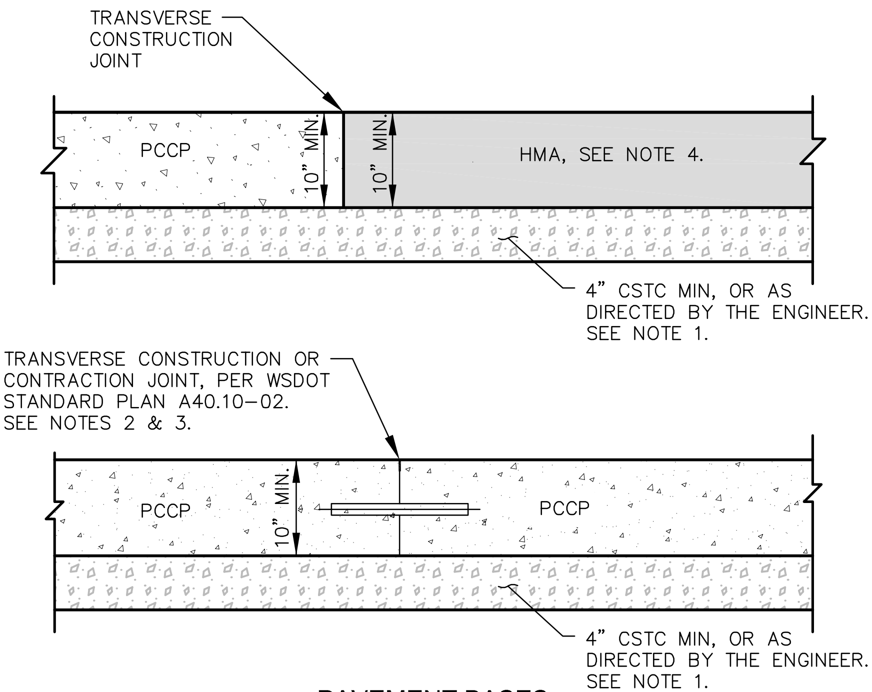
TRANSVERSE JOINT, PER WSDOT STANDARD. PLAN A-40.10-02

SAWCUT JOINT, 1/4" WIDE X 1/4" DEEP

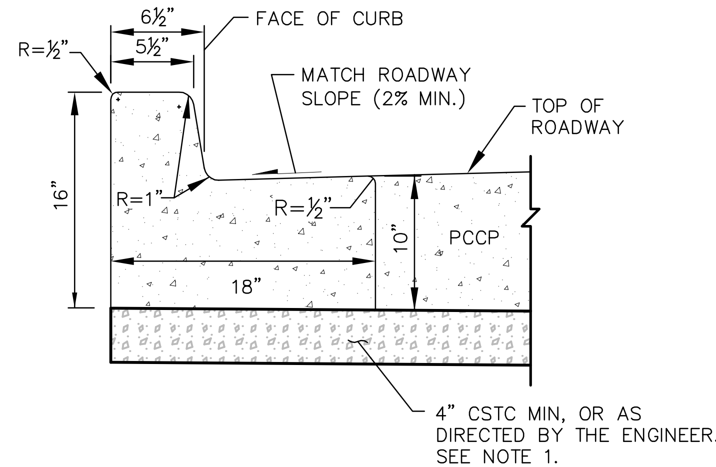
City of Bellevue

CONCRETE INTERSECTION

DRAWING NUMBER	BR-110-1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS



PAVEMENT BASES



MODIFIED CEMENT CONCRETE
TRAFFIC CURB & GUTTER

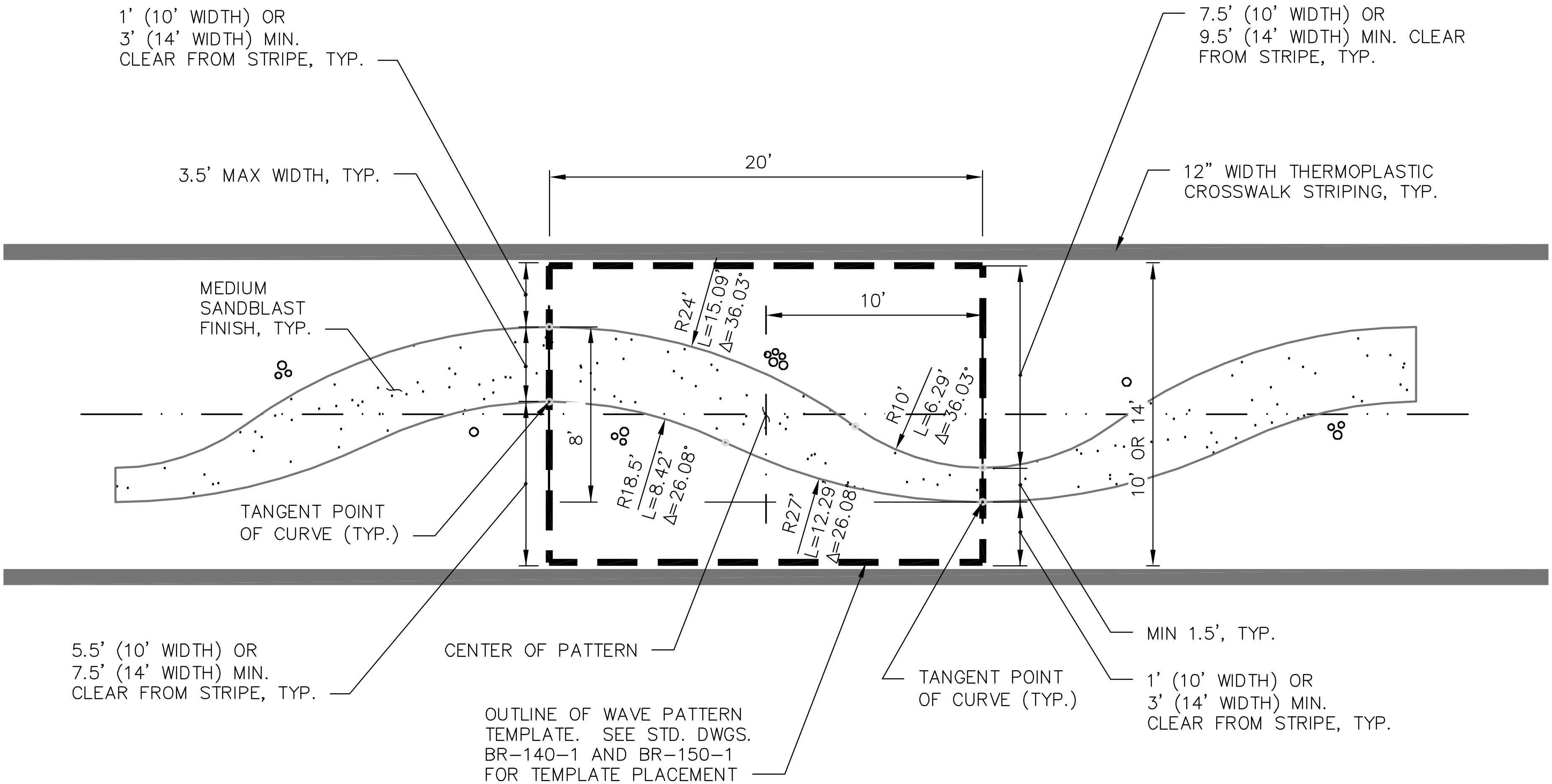
NOTES:

1. PROVIDE CONTINUOUS THICKNESS OF SUBBASE MATERIALS ACROSS ALL PAVEMENT TRANSITIONS. IF GEOTECHNICAL RECOMMENDATIONS FOR EACH SECTION DIFFER, USE THE GREATER FOR BOTH PAVEMENT SECTIONS.
2. SOLID STAINLESS STEEL DOWELS SHALL BE INSTALLED AT ALL CONCRETE PANEL JOINTS, EXCEPT WHERE CONCRETE PAVEMENT PANELS ABUT THE FOLLOWING:
   - CONCRETE HEADERS ASSOCIATED WITH SOUND TRANSIT GUIDEWAY;
   - CURB AND GUTTER; OR
   - CONSTRUCTION (COLD) JOINT FOR ULTIMATE BUILDOUT CONDITION
3. ALL DOWEL BARS SHALL HAVE A PARTING COMPOUND, GREASE OR OTHER APPROVED EQUAL APPLIED TO THEM PRIOR TO PLACEMENT.
4. SEE STD. DWG. RC-100-1 FOR PAVEMENT THICKNESSES.
5. CONCRETE PAVEMENT SHALL HAVE MEDIUM BROOM FINISH.

City of Bellevue

CONCRETE INTERSECTION DETAILS

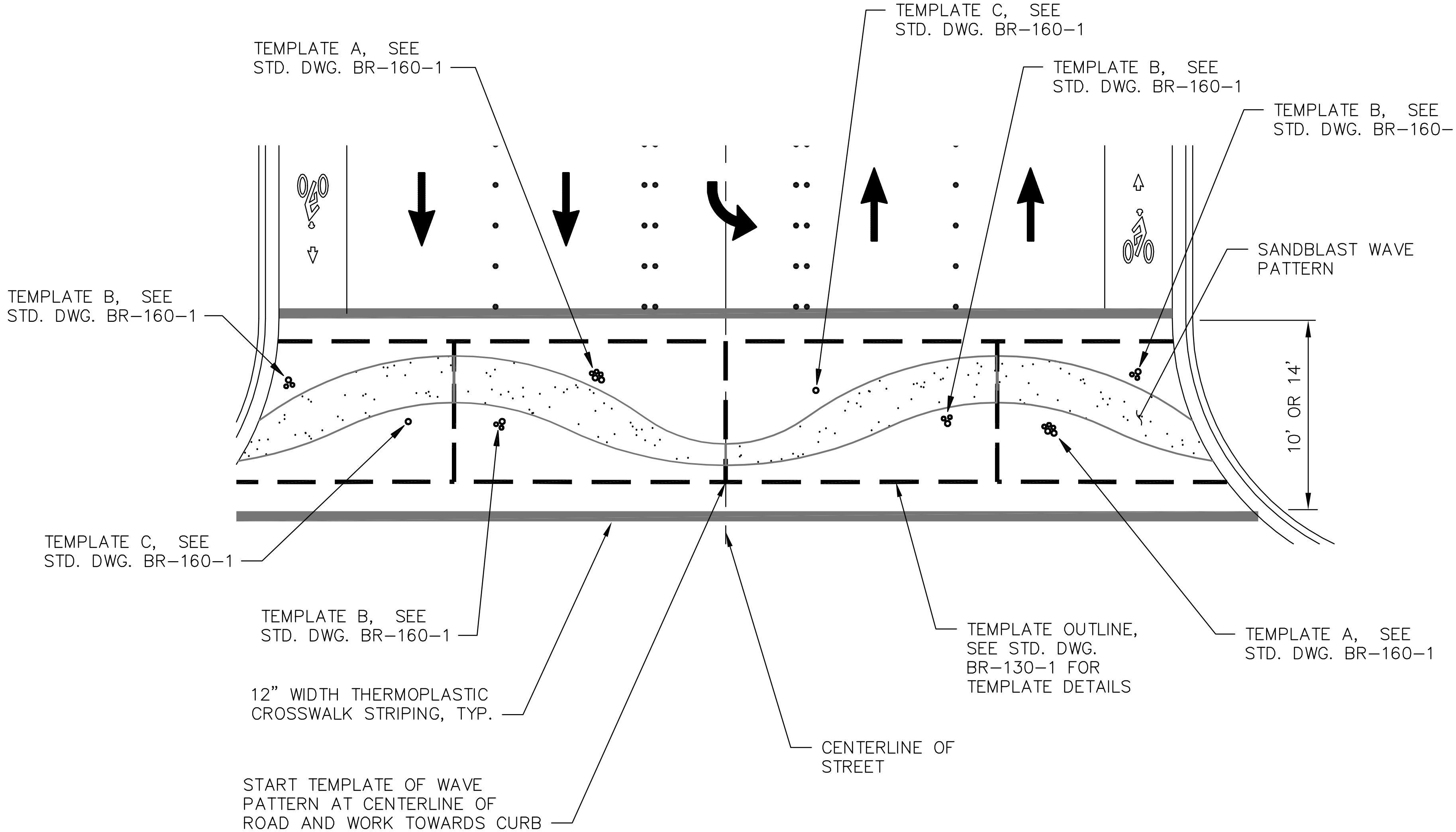
DRAWING NUMBER	BR-120-1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS



City of Bellevue

CROSSWALK WAVE PATTERN DETAIL

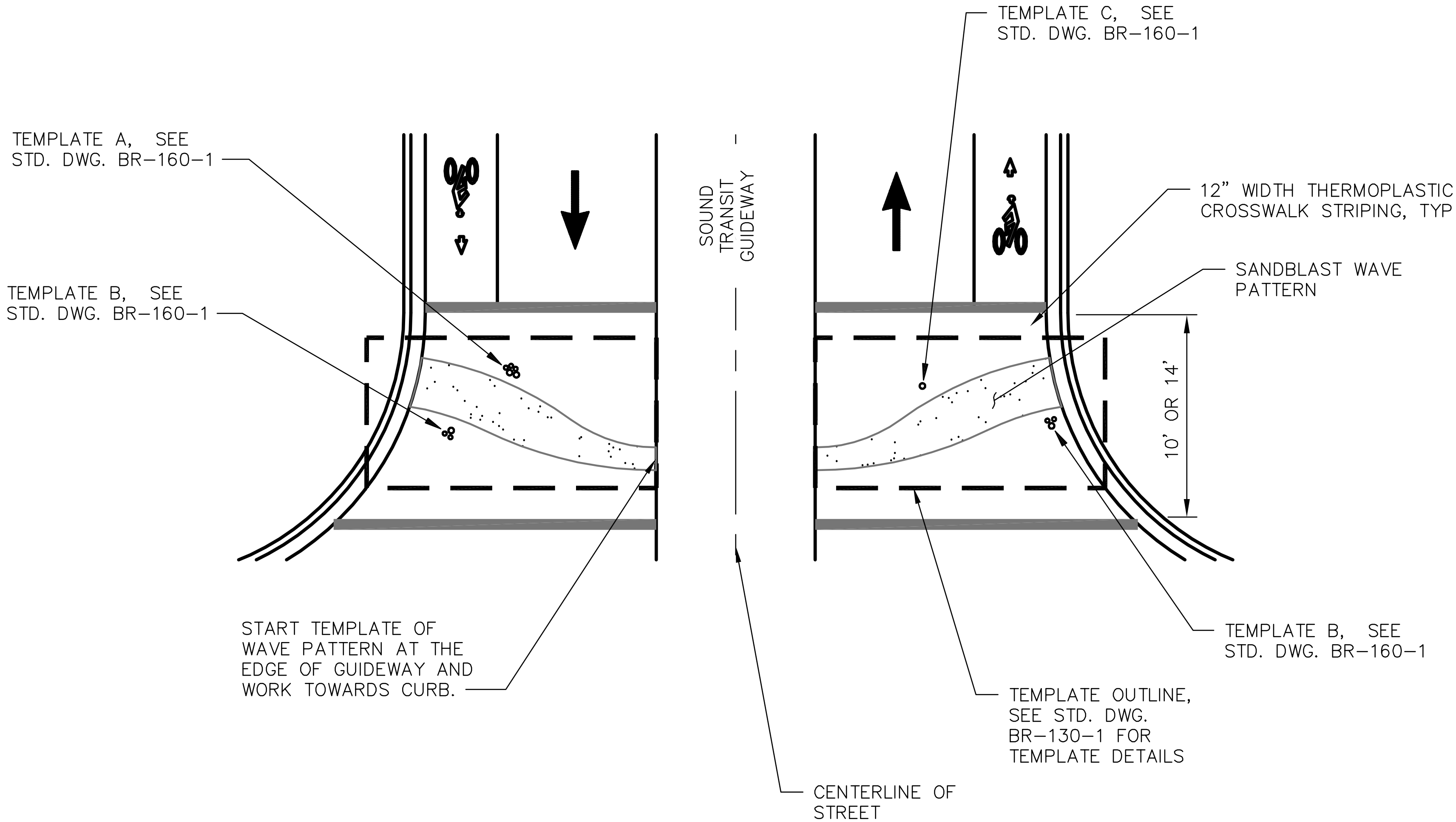
DRAWING NUMBER	BR-130-1
SCALE	NONE
REVISION DATE	2/22
DEPARTMENT	TRANS



City of Bellevue

CROSSWALK WAVE TEMPLATE PLACEMENT 5 LANE SECTION

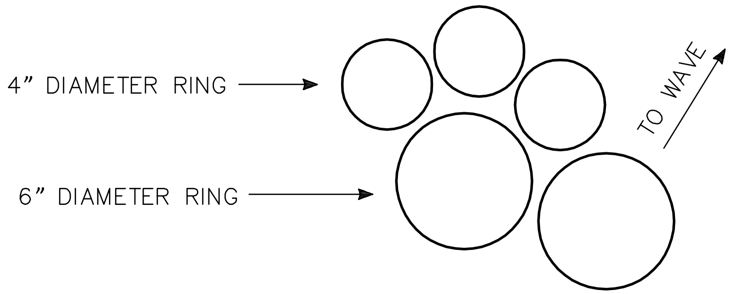
DRAWING NUMBER	BR-140-1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS



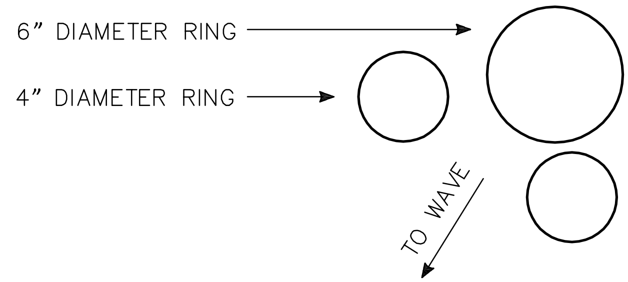
City of Bellevue

CROSSWALK WAVE TEMPLATE PLACEMENT WITH GUIDEWAY

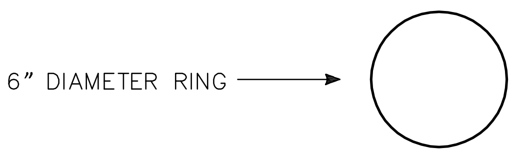
DRAWING NUMBER	BR-150-1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS



STAMPED RING TEMPLATE A



STAMPED RING TEMPLATE B



STAMPED RING TEMPLATE C

NOTES:

1. STAMPED TEMPLATE SHALL BE PLACED BETWEEN ONE AND TWO FEET FROM WAVE. FOR APPROXIMATE LOCATION SEE STD. DWGS. BR–140–1 AND BR–150–1. LOCATION OF STAMP SHOULD BE OUTSIDE OF THE WHEEL PATH.

2. THICKNESS OF STAMPED RING SHALL NOT EXCEED ¼”. DEPTH OF STAMPED RING SHALL NOT EXCEED ¼” INTO CONCRETE.

3. STAMPED RING LOCATION TO BE DETERMINED BY THE ENGINEER.

City of Bellevue

CROSSWALK WAVE – STAMPED RING TEMPLATES

DRAWING NUMBER	BR–160–1
SCALE	NONE
REVISION DATE	12/17
DEPARTMENT	TRANS

CITY OF BELLEVUE
WASHINGTON

Transportation Design Manual and Complete Streets Guide

Volume 1

Appendix A

Street Lighting Design Guide

Revised January 1, 2024

January 2024

I. GENERAL

The street lighting system should be a complete, unified design that addresses the various mobility needs within the City of Bellevue. Lighting levels should be appropriate for street function, classification, and pedestrian use. The lighting system should also have a pleasing appearance and complement surrounding features.

It is not practical, economically feasible, nor desirable to complete the illumination system for the entire City at one time. Development and road construction projects are constantly changing city streets. When consistent design criteria are applied to each project, an effective and functional overall lighting system can be established over time.

The City must maintain a consistent style, operational mode, and maintenance program in order to keep the overall lighting system manageable. This Street Lighting Design Guide has been prepared to assist the City, developers, and anyone involved in improvements to accomplish this objective.

II. PROCEDURES

The following is a summary of the procedures for obtaining approval of street lighting designs within the City.

A. Refer to the Transportation Development Review Engineer or assigned Traffic Engineering Reviewer (herein referred to as “Review Engineer”) who is assigned to review the proposed project to obtain site specific guidelines. They will provide requirements on if the system is to be City owned (typical) or if it can be allowed on existing PSE infrastructure (requires Review Engineer Approval). The review staff will also provide guidelines on the pole, fixture, and arm based on the location of the project.

B. Submit the following:

   1. Plans
   2. Specifications
   3. AGi32 Calculation File

   Development projects shall submit through the Permit Center or *mybuildingpermit.com*. Capital projects shall submit through the City’s project manager.

   Proposed deviations to standard should be discussed and agreed upon with the Review Engineer prior to submittal and documented in a submittal letter. The submittal will be reviewed and comments will be returned to the applicant.

C. Incorporate any review comments and re-submit as noted in Step B above.

D. After the Review Engineer verifies that all comments have been addressed and standards met, the plans and specifications will be approved, and permits issued. All work must be done by a qualified electrical contractor with experience in outside electrical work. Call for City inspections prior to starting work, as noted on the right-of-way use permit.

E. Call for final Transportation inspection and acceptance. Street lighting is required to be completed prior to issuance of a Temporary Certificate of Occupancy or the Certificate of Occupancy; street lighting cannot be bonded for.

F. When the improvements have been completed, inspected, and accepted, update the plans with all as-built information and provide them to the Review Engineer.

III. SUBMITTAL REQUIREMENTS

A. Plans

The preferred scale is 1" = 20’, provided on 24” x 36” sheets.

These plans must show any adjacent existing luminaires, the new luminaires, their stations, installation details, existing and proposed street trees, building awnings, overhangs, details of the service cabinet or connections to existing service cabinet, conduit locations, junction boxes, above and underground utilities including clearance distances, wire notes including a connection to Puget Sound Energy, and any additional information necessary to complete the electrical system.

Final plans must be signed and sealed by a Professional Engineer licensed in the state of Washington.

B. Specifications

The City of Bellevue uses the Standard Specifications for Road, Bridge, and Municipal Construction as published by the Washington State Department of Transportation and modified by the City of Bellevue Special Provisions.

C. Supporting Calculations

Street lighting is to be designed using the illuminance method for calculations prepared with AGi32 software. Digital design files from AGi32 are to be provided to the City, along with line loss calculations for the system.

IV. DESIGN PARAMETERS

Where street frontage improvements are required, new facilities shall be built to the current street light standards. If there is an existing street light system, the portion of system required to meet the photometric design values along the frontage shall be brought into compliance with the current street light standards.

The Review Engineer may approve deviations from the standards and requirements of this design guide based upon meeting sound engineering judgement, maintenance interests, appearance interests, and if it is in the public interest.

A. Poles

Street lighting is required to be installed on City owned facilities. Any new street light pole required shall be a City of Bellevue Steel Roadway Lighting Pole (Standard Drawing SL-100-2) or Aluminum Roadway Lighting Pole (Standard Drawing SL-111-1). Existing City owned poles may be reused if photometric design values can be met and with Review Engineer approval. Existing street lighting on PSE poles may need to be removed and City owned facilities installed.

The Review Engineer may approve a deviation to allow new and existing street lighting to be installed and remain on PSE owned utility poles.

New Steel Roadway Lighting Poles (per Standard Drawing SL-100-2) shall be utilized for Small Wireless Facility (SWF) installations and designed to support a future load of SWF equipment and antennas and a future city sign load as outlined in the Table 1 below:

TABLE 1: SMALL WIRELESS FACILITY EQUIPMENT

Item	Centroid Height	Weight	Wind Load
Pole Top Shroud and Antennas	37’6”	100lbs	218.6lbs
Equipment Cabinet	22’	200lbs	173.1lbs
5G Antennas/Radios	26’6”	87lbs	180.7lbs
Disconnect	20’	30lbs	32.1lbs
Sign	10’	66lbs	450lbs

The total loads at the base of a 35’ tall pole with 12’ luminaire arm cannot exceed the following:

- Bending Moment: 41,816 ft-lb
- Torsion: 2,330 ft-lb
- Shear: 1,814 lb
- Axial Force: 1,798 lb

B. Fixture

Light-Emitting Diode (LED) street lighting fixtures are required for new and retrofit installation. LED temperature color shall be 4000K unless approved otherwise by the Review Engineer. Distribution type shall be Type 2 for streets up to two lanes in width and Type 3 for streets with

3+ lanes. Distribution Type 4 or 5 may be permitted under special circumstances as approved by the Review Engineer. The wattage of the fixture will be recommended by the applicant's engineer based on the street light analysis. In no case shall the system be designed higher than 20% above the minimum average values.

Retrofit installations may require an adapter plate. Contact the Review Engineer for specific type of adapter plate required and include appropriate details in final plans.

Fixture color will typically match color of the pole. Confirm fixture colors with the Review Engineer prior to submittal.

LED fixtures shall include Wattage Label, ANSI 7-wire Photocontrol Receptacle, and Twist Lock Shorting Cap or Photocontrol.

Shield may be required as directed by the Review Engineer.

C. Arm

For new pole installations: See Standard Drawing SL-102-1 or Standard Drawing SL-112-1.

For retrofit installations: The arm length shall be recommended by the applicant's design engineer based on the street light analysis and on maintaining consistency along the public road.

D. Typical Design Parameters

There are several streets and neighborhoods that require special decorative lighting in addition to the standard street lighting systems. Several of these locations are defined in Table 2:

TABLE 2: APPROVED FIXTURES AND USAGE

Location	Design Parameters
Downtown (except Old Bellevue)	<u>Street Scale: New Pole Installation</u> Pole: Roadway Lighting Pole (SL-100-2 or SL-111-1) Fixture: Leotek GreenCobra Series LED <u>Street Scale: Retrofit</u> Fixture: Leotek Arieta Series LED
Old Bellevue (except Main Street)	<u>Street Scale: New Pole Installation</u> Pole: Roadway Lighting Pole (SL-100-2 or SL-111-1) Fixture: Leotek GreenCobra Series LED <u>Pedestrian Scale</u> Pole: Round concrete pole Fixture: Cyclone post-top LED
Main Street in Old Bellevue	Pole: Round concrete pole Fixture: Cyclone post-top LED
Major, Collector, Tertiary Arterials Outside Downtown	<u>Street Scale: New Pole Installation:</u> Pole: Roadway Lighting Pole (SL-100-2 or SL-111-1) Fixture: Leotek GreenCobra Series LED <u>Street Scale: Retrofit</u> Fixture: Leotek GreenCobra Series LED Leotek Arieta Series LED
BelRed Subarea Arterials	See Design Manual Appendix B: The BelRed Corridor Plan
Local Streets	Pole: Roadway Lighting Pole (SL-100-2 or SL-111-1) Fixture: Leotek GreenCobra Series LED Leotek Arieta Series LED
Multi-family, Commercial, Light Industrial, School, or other institutional areas or streets	May be designed to the Tertiary Light Level. Verify with the Review Engineer prior to Design.

The above approved fixtures and usage is for typical cases although there may be site specific deviations. Check with Review Engineer for confirmation prior to design.

E. Midblock Crosswalks

For street light installations at new or existing midblock crosswalks, two streetlights (one on each side of the crosswalk) are required. The preference is for each streetlight to be placed in advance of the crosswalk with respect to the direction of vehicular travel. The Review Engineer may approve a deviation for a single streetlight installation.

F. Temporary Lighting

Temporary lighting shall be installed under the following circumstances:

- Any time a street light is going to be removed for more than 30 days.
- When more than one street light on the same block or within 400-feet of the subject street light (either side of the street) is impacted by construction.
- When the impacted street light is located within 50-feet of a crosswalk or intersection.
- As directed by the Review Engineer.

G. Additional Design Parameters

The designer should contact the project owner to verify final building layout and the location of windows that could be affected by the location of the required street light poles and luminaires. Consideration should be given to windows when locating poles and deciding on pole heights to minimize impacts to adjacent buildings. If light poles are proposed near windows, house-side shields should be utilized and reflected in the design calculations.

The design of the street lighting system shall be such that no street trees are placed within 25-feet of a new street light.

For new or retrofit systems, voltage drop must be equal to or less than 5%. Voltage drop greater than 5% will require upgrading the conductors to meet the 5% requirement.

See *Design Manual Appendix C – Fiber Optic Design Requirements* for information on spare conduits and junction boxes that shall be included with all projects requiring frontage improvements.

V. PHOTOMETRIC DESIGN VALUES

A. Lighting Levels

1. Arterial Streets

Bellevue's Transportation Department organizes streets into three classifications for arterial street light levels - Major, Collector, and Tertiary. These classifications are shown on Figure 1 with associated design parameters in Table 3.

For tertiary, Table 3 shows two values for uniformity. Lower uniformity should be provided for completely new city owned systems, whereas retrofit projects (where existing light poles are being utilized) or projects using existing PSE poles (with Review Engineer approval) may be designed to the higher uniformity value.

2. Local Streets

Streets not classified as Major, Collector, or Tertiary (see Figure 1) are considered local streets. No specific photometric design values have been established for local streets. However, where local streets intersect with arterial streets, local streets shall be considered as Tertiary for the intersection light level analysis. For new plats or newly developed local streets, city-owned systems are preferred and luminaires shall be installed as follows:

- at intersections
- at horizontal curves
- at vertical curves
- at street ends
- at marked pedestrian crossings
- at traffic calming devices
- and at no greater than 250 foot intervals

3. Sidewalks and Paths

For sidewalks adjacent to the roadway, whether curbside or separated by a planter strip, no separate calculations are conducted for light levels on the sidewalk area. This is the standard practice, in recognition that the sidewalk will be illuminated by the lighting system installed for the roadway and adjoining properties.

For Multipurpose Paths (MPPs) installed in lieu of or in addition to sidewalks and bike lanes, lighting is typically required with a minimum maintained average light level of 5 lux and a uniformity ratio of 10:1. Verify requirements for MPPs with the Review Engineer prior to starting design.

4. AGi32 Calculation Parameters

Limits for AGi32 Calculations shall be as follows:

- Roadway Segment calculations shall include project limits and extend to the adjacent intersections unless approved otherwise by the Review Engineer
- Intersection calculations shall fully encompass marked crosswalks or shall be to limits of curb returns if there are no marked crosswalks present
- Marked Midblock Pedestrian Crossing calculations shall fully encompass the width of the marked crosswalk

A maintenance factor of 0.80 is to be used for all LED systems.

B. PSE Modification

PSE Modification to design may apply on tertiary or collector arterials that:

1) Serve a residential area with a significant amount of single family residential driveways, and
2) Have above-ground electrical distribution on PSE poles that will remain above-ground after the project is complete.

Verify PSE Modification lighting design with the Review Engineer prior to proceeding with the design. For PSE Modification designs, the lighting design is typically limited to the PSE pole locations. Designs should meet the average light levels shown in Table 3 only to the extent practical, as the pole spacing and mounting heights may preclude the ability to reasonably meet minimum average light levels. Uniformity is not considered in PSE Modification designs. In-fill poles (new poles with lights only) are only required when necessary to meet the average light level at a marked midblock pedestrian crossing or an uncontrolled marked crosswalk at an intersection.

TABLE 3: ILLUMINANCE METHOD PHOTOMETRIC DESIGN VALUES

ROADWAY SEGMENTS

CLASSIFICATION	LIGHT LEVEL MINIMUM MAINTAINED AVERAGE VALUES* (LUX)		UNIFORMITY RATIO EAVG/EMIN
	ASPHALT CONCRETE	PORTLAND CEMENT CONCRETE	
MAJOR	13	9	4
COLLECTOR	9	6	4
TERTIARY	5	4	4 (New Systems) 6 (Retrofits)

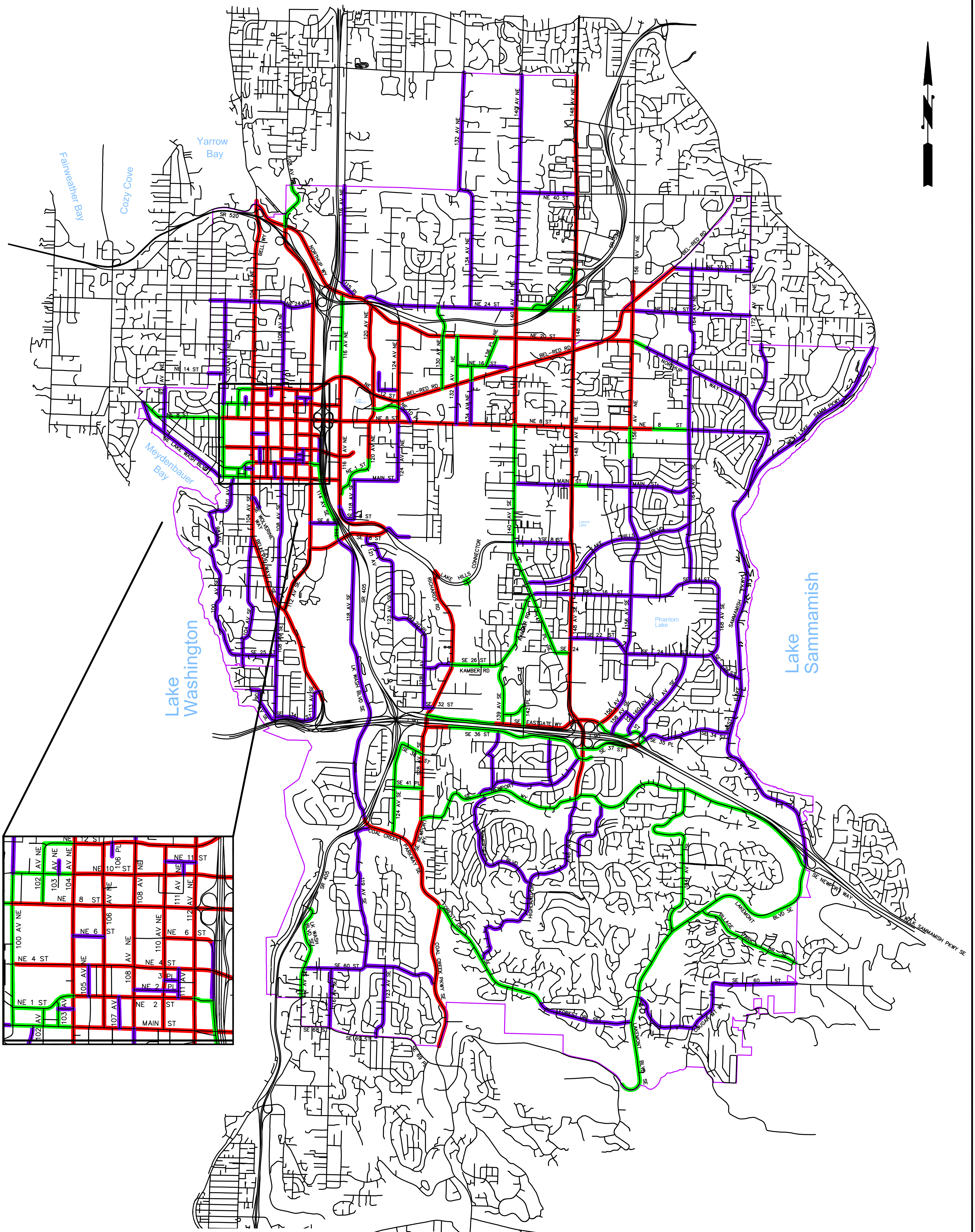
INTERSECTIONS

CLASSIFICATION	LIGHT LEVEL MINIMUM MAINTAINED AVERAGE VALUES* (LUX)		UNIFORMITY RATIO EAVG/EMIN
	ASPHALT CONCRETE	PORTLAND CEMENT CONCRETE	
MAJOR – MAJOR	26	18	4
MAJOR – COLLECTOR	22	15	4
MAJOR – TERTIARY	18	13	4
COLLECTOR – COLLECTOR	18	12	4
COLLECTOR – TERTIARY	14	10	4
TERTIARY - TERTIARY	10	8	4 (New Systems) 6 (Retrofits)

MARKED MIDBLOCK PEDESTRIAN CROSSING**

CLASSIFICATION	LIGHT LEVEL MINIMUM MAINTAINED AVERAGE VALUES* (LUX)		UNIFORMITY RATIO EAVG/EMIN
	ASPHALT CONCRETE	PORTLAND CEMENT CONCRETE	
MAJOR	26	18	N/A
COLLECTOR	18	12	N/A
TERTIARY	10	8	N/A

* Systems should be designed no higher than 20% above minimum average values
**Includes uncontrolled marked crosswalks at intersections



STREET LIGHT CLASSIFICATION LEGEND

- Major
- Collector
- Tertiary

City of Bellevue

FIGURE 1

STREET LIGHT LEVEL MAP

REVISION DATE	01/15
DEPARTMENT	TRANS

Transportation Design Manual and Complete Streets Guide

Volume 1

Appendix B

BelRed Streetscape Plan

Revised December 2021

CITY OF BELLEVUE
WASHINGTON

BELRED STREETSCAPE PLAN

DECEMBER 2021

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CONTENTS

01 INTRODUCTION

INTENT OF PLAN

BelRed is a dynamic place. Like anywhere, it has a history, a future, unique complexities, established and evolving identities, micro-climates and macro-climates and also like anywhere, what is unique about BelRed is in the details. This plan lays out a vision for BelRed's streets that anchors development of the largest part of our public realm, our streets, in what makes BelRed dynamic.

Included in this plan are necessary components to designing BelRed's streets - narrative, themes, design principles, guidelines, and standards. Each element is intended to build on top of one another resulting in a public realm that supports movement, current and future uses, the land use vision, BelRed's identity, is mindful of its past, and most of all, recognizes that streets are a key place in our public life.

BelRed's streets are a platform. They are places for movement of goods, and people. They are multimodal. They are places to gather, meet, rest, watch, exercise, eat, and enjoy art and culture. They are destinations, places to embark from, and spaces we move through. They are experienced at different speeds, with different levels of user engagement. Underlying all of this is the reality that we can make educated guesses about what the future of transportation will look like as new technologies emerge like autonomous vehicles, the shared transportation sector, and how current and future trends in mode use may, such as a potential shift to more remote work, or may not change how we use streets and get around.

Compounding these challenges is that BelRed's street network faces its own unique challenges. With street development linked to parcel development in most cases, BelRed's street network will develop piecemeal as land uses transition. This creates some unique challenges and opportunities for its street network.

From all this complexity, a number of questions arise that this plan intends to answer. How can a network support movement of goods and people and places for people to gather? How do you design a network of streets that prioritizes the safety of all users moving at different speeds and still be an interesting place to be? How can streets support environmental attributes, commerce, mobility and public life? And how can we design streets to be flexible enough to allow for change?

USING THIS DOCUMENT

The City of Bellevue developed the BelRed Streetscape Plan to provide design and policy guidance to governmental agencies, private developers, consultants, and community members on the planning and design of right-of-way improvements in BelRed. The guidelines and standards in this document are intended to ensure that BelRed's streets are safe for and accessible to all users, and to advance an efficient design and review process. BelRed is a geographically expansive area with a diverse built and natural environment. Designs for public streets must respond to varied local conditions, site constraints and intended functions that correspond to adjacent land uses. Successful street design requires flexibility to balance functional and engineering requirements with innovative design and best practices. This document has been developed to supplement the Bellevue Land Use Code, Part 20.25D – BelRed and the City of Bellevue's Transportation Design Manual.

DOCUMENT ORGANIZATION

Starting from a macro view of BelRed and moving towards smaller and specific components within a street design, this plan works to sequentially guide a development through the design of a BelRed street. The following sections discuss these pieces of the plan in detail:

SECTION 2: BACKGROUND

This section provides a brief description of the history and land use vision for BelRed. For more information regarding the Land Use Vision, consult the BelRed Subarea Plan and the BelRed Land Use Code (20.25D).

SECTION 3: NETWORK DESIGN

This section includes an overview of BelRed's multimodal network, design principles and associated standards and guidelines that apply to all streets district-wide.

SECTION 4: STREET TYPOLOGIES

This section provides standards and guidelines for all street types including Arterials, Green, Local, Shopping and Pedestrian Streets.

SECTION 5: PUBLIC ART

This section offers guidance on the integration of public art into BelRed's streets at important waypoints, thresholds and activity nodes.

SECTION 6: STREETSCAPE ELEMENTS

This section includes design guidelines and specifications for standard products, or approved equals, to be considered in the development of designs and selection of products for BelRed's streets.

DEFINITIONS

The following definitions are specific to this plan. For additional BelRed definitions, consult the BelRed Land Use Code (LUC 20.25D.020).

Amenity Zone: Area of the sidewalk adjacent to the curb. This zone includes a landscape buffer, furnishings, lighting, public art, bicycle racks, garbage cans and other amenities.

Americans with Disabilities Act (ADA): The Americans with Disabilities Act of 1990 (42 USC § 12101 et seq.) is a federal law that prohibits discrimination against individuals with disabilities across all aspects of public life, including the design of public and publicly accessible private spaces. The term "ADA Accessible" refers to spaces that are designed to meet the requirements of the ADA.

Bicycle Infrastructure: Elements of public and private spaces that support cycling as a mode of transportation and/or recreation, including designated facilities such as bicycle lanes or shared-use trails, as well as supporting infrastructure such as bike racks, wayfinding and route signage, or bicycle-specific traffic signals.

Buffer Area: The area between pedestrian-use areas or bicycle facilities and vehicle-use areas (e.g. travel lanes or on-street parking). Buffers provide separation from traffic and can contain a variety of streetscape elements, including planting areas, street trees, street furniture and amenities, lighting, and green-stormwater infrastructure.

Crime Prevention Through Environmental Design (CPTED): A multi-disciplinary approach to crime prevention that emphasizes the design and management of public spaces such as streets, plazas, parks or other outdoor environments. The goal is reduce both the incidence, and the fear, of crime through strategies such as improved sight lines, proper lighting levels, clear delineation between public and private spaces and consistent maintenance.

Crosswalk Paving Area: The hardscape area delineated by the outside edges of the crosswalk and the detectable warning surface on the adjacent curb ramp at each end. It can be constructed of concrete or asphalt and may include decorative treatments and/or thermoplastic striping or patterns.

Design Guideline: descriptive statements that illustrate the intended function, treatment, or vision of elements intended to guide development to actualize the BelRed Streetscape Plan.

Design Principle: fundamental concepts that contribute directly to the operation, aesthetics, and experience of BelRed's streets.

Elevated Structures: Includes light rail guideway and overpasses or areas where the roadway is elevated above natural features.

Frontage Zone: Area of the sidewalk adjacent to a development's frontage. This area is typically used for cafe and restaurant seating, window shopping, and other uses.

Green Stormwater Infrastructure (GSI): A set of stormwater management best practices that use or mimic natural processes to slow, infiltrate, store, evapotranspire or reuse stormwater runoff from pavement, buildings and other impervious surfaces in the urban environment. Green stormwater infrastructure relies on a wide variety of strategies ranging from bioretention and bioswales to vegetated roofs and pervious paving materials to improve downstream water quality and reduce flooding.

Intersection Paving Area: The hardscape area within an intersection, bounded by surrounding crosswalks. It can be constructed of concrete or asphalt, and may include decorative treatments.

Joints: Purposefully placed breaks in rigid pavement surfaces. Types of joints include expansion joints, isolation joints or construction joints, which are created by form work before the pavement is poured, and contraction joints, which are sawed, tooled into the surface of a slab after concrete is poured.

Mobility network: In this document the mobility network is defined as the complete network for movement and physical connection. This includes streets, transit routes and stops, bicycle and pedestrian off-street trails, parks, and connections through developments.

Multimodal Level Of Service (MMLOS): The MMLOS Metrics, Standards and Guidelines Final Report approved by the Bellevue Transportation Commission broadens how Bellevue measures level of service of transportation infrastructure beyond vehicle volumes and capacity to incorporate other modes including pedestrians, bicycles and transit. Taking a more comprehensive approach to mobility level of service can inform the design and investment of transportation infrastructure in Bellevue.

Node: An area or district where planned transportation facilities will support sufficient development intensity, amenities, recreation opportunities, and a mix of uses that foster a high level of pedestrian activity. These are located around the three light rail stations in BelRed - Wilburton Station (Medical Node), Spring District/120th Station (120th Node), and the 130th Station (130th Node).

Non-Motorized Transportation (also known as active transportation, bicycle transportation and human-powered transportation): Includes all modes of transportation that do not rely on a motorized vehicle, including walking, bicycling, small-wheeled transport (e.g. skates, skateboards and push scooters) and wheelchair travel.

Northwest Planting Character: Plantings that include plants with varying heights, different shades of green, and a variation in textures, with accents of color, flowers and seed heads. Characteristics include reflecting seasonal character including maintaining a visual presence in the winter. Northwest native plants that have proven durability in urban streetscapes are woven into designs to further evoke a northwest planting character.

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Overlook: Area outside of the main flow of pedestrian traffic on elevated structures that allows for territorial views, respite and social interaction. Overlooks may include amenities such as seating, lighting or art.

Pedestrian Paving Area: The hardscape within a pedestrian area (see Pedestrian Area definition). It can be constructed of pervious concrete, porous asphalt, or other forms of pervious or porous paving material, and may include decorative treatments.

Pedestrian Area: The area of the street designated for pedestrian use. This includes the sidewalk, buffer/amenity zones, and enlarged paving areas at intersections.

Pedestrian Route: A pedestrian route can be a path or through-block through a development or park. A Pedestrian Route is not a Pedestrian Street. See Pedestrian Street definition and the Pedestrian Street Typology in the Street Types Chapter for details on Pedestrian Streets.

Pedestrian Street: A Pedestrian Street is a public street that prioritizes pedestrian activity above all other modes of travel. Bicycle use is allowed although pedestrians are prioritized. A common element of a pedestrian street is open space and ample public amenities. See the Pedestrian Street Typology in the Street Types Chapter for additional details on Pedestrian Streets.

Public Art: Public art is a public amenity. It is defined as "public" by the artist's engagement with the community and/or site in the development of the artwork's design.

Public realm: The public realm refers to all areas, building facades, natural features or other elements that are open to the public or help define the experience of public space. This includes all public and private streets, sidewalks, pedestrian connections through development and open space that allow public access. It also includes built or natural elements that define the edges of public space such as building facades, weather protection, walls, wetlands, streams and riparian areas, etc.

Soil Volume: The amount of cubic continuous quality soil provided to a tree. The maximum depth used for calculating soil volume is 36 inches or the depth of the soil provided, whichever is less.

Standard: A prescriptive requirement to ensure consistency and operational goals are met in the development of BelRed's streets.

Streetscape: The physical and visual elements of a street, including the roadway itself as well as sidewalks, lighting, street furniture, trees, adjacent buildings and landscapes and other aspects of the street's design and context that contribute to someone's experience of the place.

Street Grid: The network of public streets in a neighborhood or community, as one might see them on a map. The size and shape of the grid influences many aspects of the look and feel of an area, from what types of infrastructure it will support and how development occurs, to the way people are able (or choose to) navigate it.

Street Typologies: The physical designation of a street based on its intended role within the larger street network. A street's land-use context and transportation characteristics guide the design of the street and which types of use are prioritized (e.g. local access or pedestrians and bicyclists). Street typologies can define everything from the width of the roadway or sidewalk, to the streetscape amenities, to the type of development that occurs.

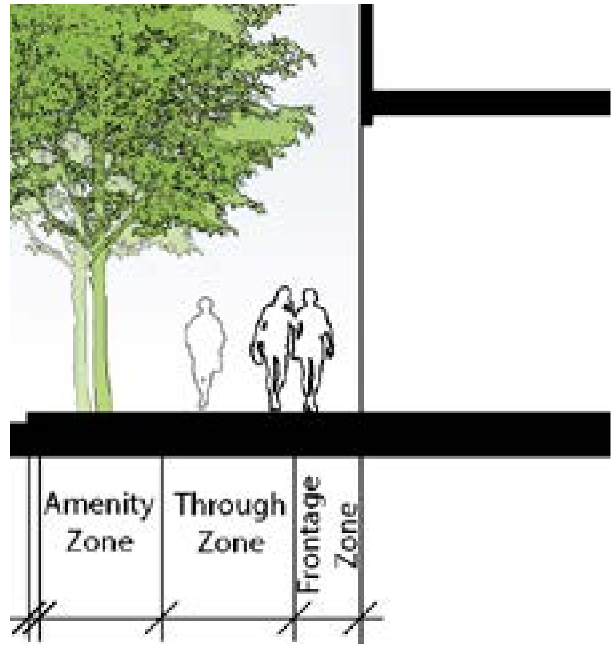


Figure 1. The BelRed Streetscape Plan frequently refers to the Amenity Zone, Through Zone and Frontage Zone as part of the sidewalk realm. For definitions of each zone, refer to the definitions provided. The figure above illustrates typical locations for each zone within a sidewalk. It is important to note that Pedestrian Streets typically have a different layout of the above zones although the zones typically perform similar functions from street type to street type. The exception to this could be when an event is being held on a Pedestrian Street and zones are repurposed for different uses during the event.

Through Zone: Area of the sidewalk most commonly used for pedestrian through traffic. Typically, the through zone is located in between the Amenity Zone and the Frontage Zone and should be kept free of obstructions.

02 BACKGROUND

HISTORY OF BELRED

On behalf of the City of Bellevue, this document acknowledges the land, today called BelRed, is part of the ancestral homelands of the Coast Salish people, the traditional home of all tribes and bands within the Duwamish and Snoqualmie Indian Tribe. We take this opportunity to honor and express our deepest respect to the original caretakers of this land; a people that are still here, continuing to honor their heritage.

BelRed has a history of clearing its land of one use to make way for another. Three hundred years ago, the community was home to a series of rich creek ecosystems surrounded by mixed coniferous old growth forests, wetlands and marshes. These natural ecosystems were devastated in the early 1800s when the logging industry drove the deforestation of old growth trees throughout the Pacific Northwest.

Logging in the BelRed area (1880s). Photo courtesy of the Eastside Heritage Center.

By the end of the 19th century, many of BelRed's trees had been logged. In 1904, a railroad running along the Eastern edge of Lake Washington from Renton to Woodinville called: the Lake Washington Belt Line, was constructed. The route cut through the western half of BelRed and was used to transport local freight between communities.

Around this time BelRed's land was surveyed, subdivided and converted to productive farmland. Homesteaders in the BelRed area employed mostly Japanese American immigrants who had come to the Seattle area to work on the railroads, to clear the land of marshes and tree stumps with dynamite. In exchange for clearing the land, many of these Japanese American workers were leased small farms to grow fruits and vegetables. As a network of farms leased by Japanese American families established

Japanese Americans farming in BelRed in 1904 prior to World War II and their incarceration by the Federal government. Japanese American farmers were responsible for a huge majority of the region's agricultural products and the Eastside economy prior to World War II. Photo courtesy of the Eastside Heritage Center.

The Bellevue Japanese Clubhouse was in many ways the center of the Japanese American community in Bellevue. Home to the Bellevue Vegetable Growers Association and a place for the community to meet the clubhouse played a critical role in the Eastside economy and community. Formerly located in what became known as BelRed, the clubhouse was torn down to make way for Sound Transit's light rail construction. Photo courtesy of the Eastside Heritage Center.

themselves, community institutions such as the Bellevue Japanese Clubhouse (a community center also known as the “Kokaido”) and the Bellevue Vegetable Growers Association (which shipped goods by train outside of the Seattle area) became the heart of BelRed’s character. The community lost its vibrancy and identity during WWII, when many of the Japanese American community were forced to leave their homes and move to incarceration camps in the inland.

Through the 20th century Bellevue became dominated by low density suburban development. Two floating bridges

Safeway Distribution Center in BelRed, completed 1958. Photo courtesy of Eastside Heritage Center.

constructed across Lake Washington in 1940 and then 1963, granted easy access to Seattle and encouraged the subdivision of large lots previously used for farming for wide swathes of suburban housing. BelRed emerged as the hub of light industry and low-density commercial services. Agricultural land was slowly replaced by large warehouses, production plants, and distribution buildings with vast surface parking lots.

Since the 1990s, industry in BelRed has began to decline as several big employers moved out or reduced their operations. Around BelRed, Bellevue has developed into a modern metropolis, becoming an “Edge City” with a dynamic, high-rise, employment, and residential

downtown core. The planned extension of the East Link light rail system to be completed in 2023 will run through BelRed, linking the neighborhood with Downtown Bellevue, Redmond, Seattle and the wider metropolitan area. This places BelRed on the cusp of another major change. High intensity development is currently beginning to reshape the district, slowly transforming it into a new, multicultural, transit-oriented community.

LAND USE VISION

BelRed is envisioned to be a unique neighborhood within the city of Bellevue and the entire Puget Sound region. Thriving businesses will be adjacent to, and sometimes mixed with, livable neighborhoods, and all will be served by a multi-modal transportation system that connects the area to the greater city and region. Environmental and community amenities will distinguish BelRed and serve residents and employees in the area, surrounding neighborhoods and the entire city.

BelRed is envisioned to have the following:

- A thriving economy,
- Vibrant, diverse and walkable neighborhoods,
- A comprehensive, connected parks & open space system,
- Environmental improvements,
- A multi-modal transportation system,
- A sense of place,
- A unique cultural environment,
- An appropriate scale of development,
- Timely development of transportation, other infrastructure and public amenities, and
- Sustainable design.

Figure 2. Rendering from the 2009 revisioning of BelRed from light industrial and services uses into dense mixed use neighborhoods.

BELRED'S NODAL DEVELOPMENT PATTERN

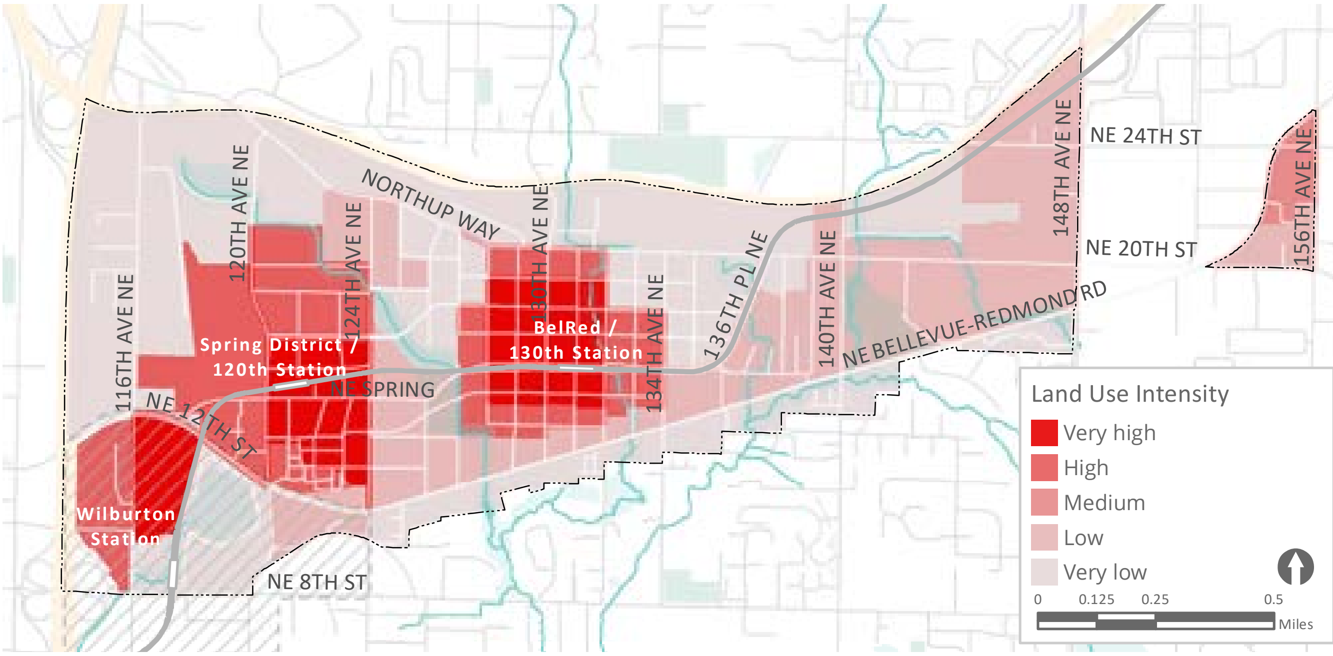
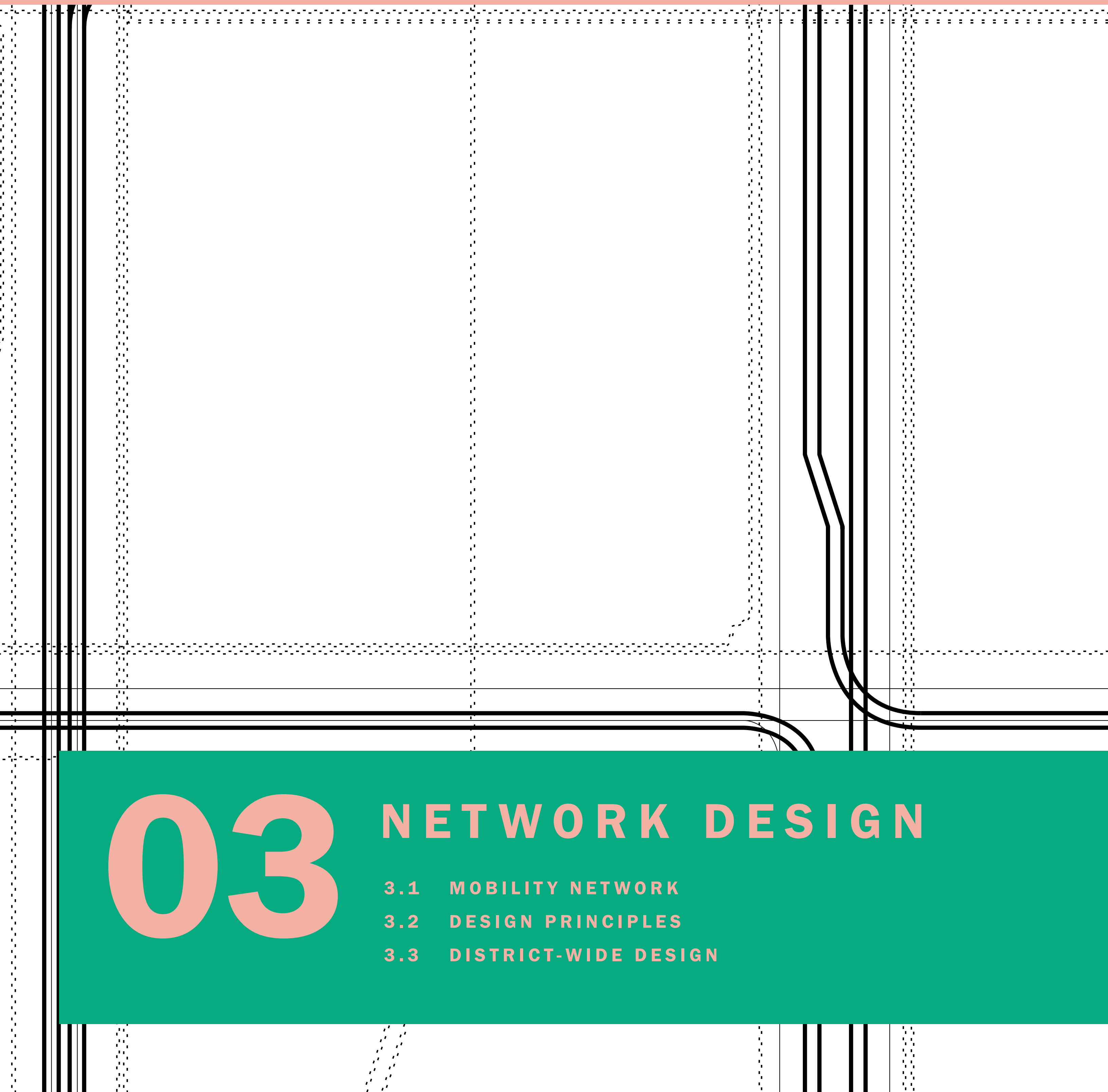


Figure 3. BelRed's nodal development is centered around the three light rail stations.

A distinguishing characteristic of BelRed will be its "nodal" development pattern, where development will be concentrated around future light rail stations. Future stations will be located east of Bellevue's medical district just north of NE 8th Street, at 122nd Avenue NE, at 131st Avenue NE and at Overlake Village in Redmond. The centers of nodes are envisioned to be relatively dense mixed-use areas, with a high level of pedestrian access and amenities. Lacking defined borders between nodes, the above map illustrates that nodal development is more related to the intensity of use than defined areas.

Nodes are intended to break down the large expanse of the subarea to create a series of neighborhoods, each with its own distinct character and sense of place. While every node will provide for a mix of uses, each node will have a unique emphasis. The node near the medical district will emphasize medical office, while the node centered roughly at 122nd will emphasize office; the node centered roughly at 130th NE will emphasize housing with an active retail street at its core.

As indicated in the map above, there are large areas of BelRed that have Low or Very Low intensities of Land Use. This doesn't mean that streets in these locations need not provide streets that promote walkability and other non-motorized uses - quite the opposite. These streets need to be designed to meet existing and future needs and also serve as important multimodal connections between more intense land use areas.



03 NETWORK DESIGN

MOBILITY NETWORK

BelRed's mobility network is designed to get people and goods to and from their destinations. The mobility network is comprised of the street, pedestrian, bike, transit, and freight networks. Many of these networks overlap within the street grid but some include trails and paths through open space to make important connections. Together they represent options that allow for flexibility for how people choose to get around.

BelRed's mobility network approach allows users to choose the best mix of mobility options to meet their needs. A transit user may take the train to the 130th Light Rail Station and transition to being a pedestrian to get home. Someone who drove in to work in the morning might use a shared bike to get to walking trails through parks at lunch. While walking, biking, and transit uses are prioritized, a connected street and freight network also provides easy connections for pickup, movement and delivery of goods.

MOBILITY NETWORK

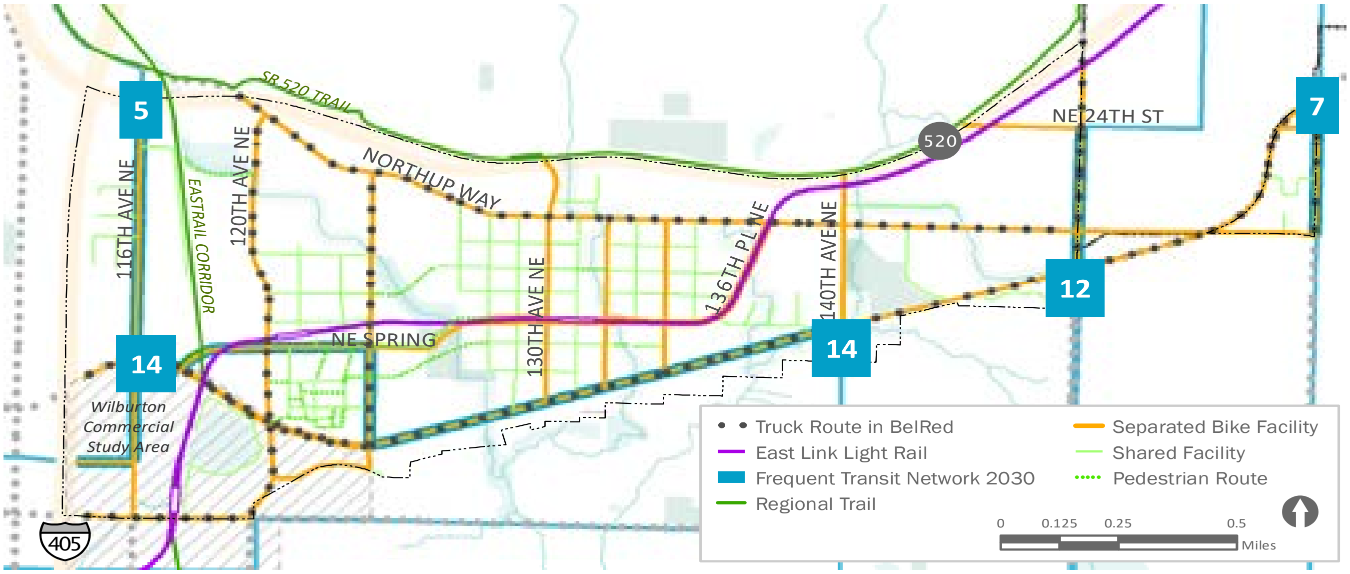


Figure 4. BelRed's Mobility Network is composed of all BelRed streets, parks, trails, transit, bike infrastructure (Figure 5, below) and freight routes. Frequent transit routes (numbered above) within the BelRed include: 5 - Totem Lake - Kirkland - Bellevue, 7 - Redmond - Crossroads - Eastgate - Factoria, 12 - Eastgate - Overlake Village - Kirkland, and 14 - Kirkland - Bel-Red - Eastgate.

BIKE NETWORK

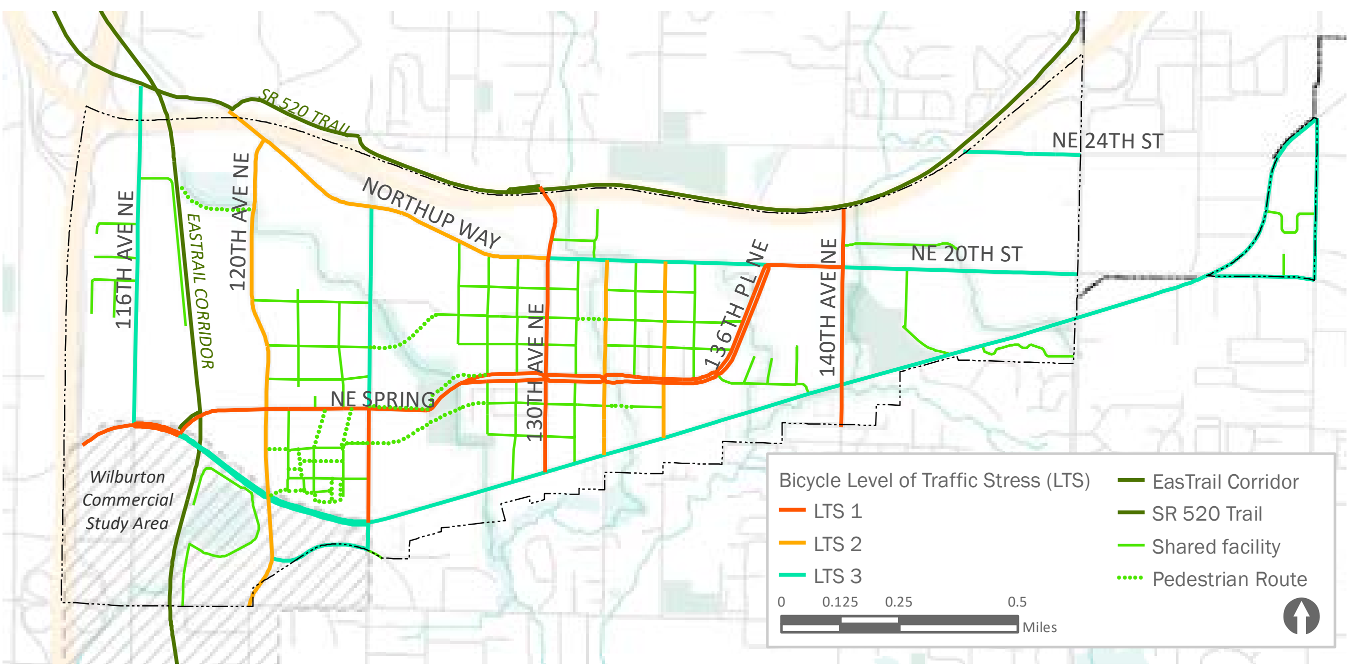


Figure 5. The bike network follows the multimodal level of service (MMLOS) approved by the City of Bellevue's Transportation Commission. For additional details on what the Level of Traffic Stress (LTS) is for a particular street and what that means for its design features, refer to MMLOS Metrics, Standards & Guidelines. On top of MMLOS, bicycle infrastructure should support quality connections between different facility types - particularly prioritizing access to transit and regional trails like Eastrail and the 520 Trail. Local, Green and Pedestrian Streets, while shared facilities, are critical to the functioning of the Bike Network as they support bicyclists of all abilities within the streetscape. Supportive features like directional signage, bicycle racks and lockers, shared use bicycle parking areas, adequate lighting and other elements are critical to the successful use of BelRed's Bike Network.

REQUIRED ON-STREET PARKING

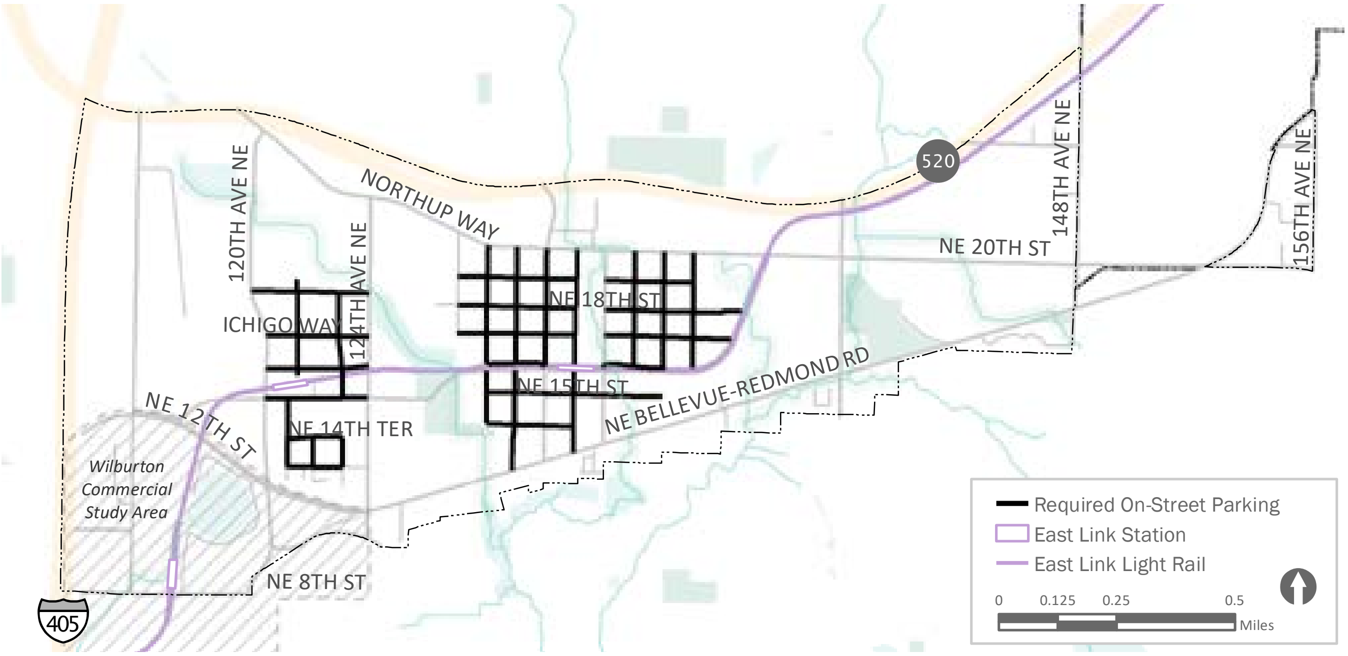


Figure 6. On-street parking is required on the above streets on both sides of the street. Exactly how much parking per block is required depends on driveway locations, other factors and whether a street is designated a Green Street. On Green Streets parking is required on both sides of the street while also alternating parking bays with expanded landscape areas. See the Green Streets street type on page 38 for additional details.

Note: On Spring Boulevard, between 120th Ave NE and 124th Ave NE, parking is only required on the north side of the street.

DESIGN PRINCIPLES

The intent of this plan is to serve as design guidance that leads to streets supporting and contributing to an active and lively public realm, a safe and efficient multimodal transportation network, and reflecting the unique character and community of BelRed. This plan focuses on central design principles that are integral to BelRed's community and neighborhood identity. These design principles support policies and strategies in the BelRed Subarea Plan, the 2020 Bellevue Economic Development Plan and other plans. These design principles reflect what type of place BelRed will be and therefore, drive design decisions on the urban design of streetscapes, our largest and most used part of the public realm.

Design principles for BelRed's streets include:

MULTIMODAL:

Design streetscapes to provide for safe access for all users and modes of travel by prioritizing safety for people walking, biking and other non-motorized modes, and accessing transit. Streets should also seamlessly connect to parks and trails, an important component of BelRed's mobility network, and efficiently move people that decide to drive and delivery of goods.

PEOPLE + PLACES:

Design streetscapes to be true places for people and not simply infrastructure for travel. Streets must be designed and managed to reflect the type of development and uses along the street edge. Streets should provide ample opportunities for social interaction whether street level uses are commercial, office, residential, or institutional.

GREEN:

Design streetscapes to integrate green elements including street trees, bioretention facilities, bioswales, permeable paving materials, and other elements to mitigate stormwater runoff and protect environmentally sensitive areas. from pollution. Street elements should also reflect the environmental and natural context they travel through. In locations where streams cross or are directly adjacent to streets, landscape and other streetscape elements should work to highlight these features.

SMART:

Design streetscapes to incorporate intelligent infrastructure including signals, meters, electric vehicle charging, car and bicycle sharing and wayfinding, and other emerging technologies that allow for a more efficient, convenient and adaptive network.

CREATIVE + ARTISTIC:

Design streetscapes to inspire creativity. Streets should be platforms for temporary and permanent public art, and where possible, for performance. Use of color, art, and natural elements are integrated into streetscapes to support BelRed's innovative identity and enhance and unify nodal character.

ADAPTIVE:

Design streetscapes that allows them to transition with land use development and evolving transportation options over time. Streets should be adaptable and support changing needs and priorities, including potentially repurposing space for new transportation modes, practices, and amenities, curb space management, parking needs, sidewalk uses, public space, stormwater management, art and performance, community events and markets, and other features.

DISTRICT-WIDE DESIGN

To ensure that design principles are achieved, the following design guidelines focus on district-wide applications.

MULTIMODAL

BSP-1. Utilize the street network to facilitate bicycle connections into, within and through BelRed. Bicycle infrastructure should be designed to mitigate risk and limit confusion at transitions from one type of bike facility to another.

BSP-2. Create an appropriate balance of bicycle vs. pedestrian amenities that accommodate fast and slower moving users.

BSP-3. Incorporate public transportation stops and short-term loading and delivery areas that do not endanger or push bicyclists out of bike lanes and into roadway traffic.

BSP-4. Incorporate parking for bicycle and other non-motorized uses, including space for shared bicycles or other alternatives, into streetscape design. In areas adjacent to light rail stations, provide bicycle lockers for public use.

BSP-5. Require midblock crossings when block length is greater than 300'. Align through-block connections with midblock crossings were possible.

BSP-6. Uphold City standards for sight distance setbacks for controlled and uncontrolled intersections.

PEOPLE + PLACES

BSP-7. Design streets as places for mobility, to experience culture, connect with friends and gather. To achieve this streets should be rich with amenities, provide spaces for people t6o sit, gather, experience art and activity. Delineation of the sidewalk zones is critical to the success of BelRed's streetscapes (through zone, amenity zone and frontage zone).

BSP-8. Provide adequate accessible parking throughout BelRed.

BSP-9. Permit the use of streets as places for temporary events (farmer's markets, festivals, street fairs, block parties, and other special or regular events).

BSP-10. Link the intensity of the Land Use Vision laid out in the BelRed Subarea Plan and Land Use Code with the provided infrastructure and amenities in the streetscape. Buildings at or facing public sidewalks should not be considered "back of house" and shall provide amenities to support an active pedestrian realm.

BSP-12. Where adjacent to pedestrian activated frontage, provide additional sidewalk area space to serve sidewalk cafes, outdoor seating areas, or window shopping.

BSP-13. Create an engaging pedestrian realm. This includes elements such as use of pedestrian-scaled materials in building facades at the street level, adjacent uses, integrated, standalone, temporary, or performance art, landscaping and street trees, design details in the sidewalk realm, wayfinding, furniture, pedestrian-scaled and in-grade lighting and other elements.

BSP-14. Utilize pedestrian-scaled lighting on all streets. Although preferred, the one exception is where adjacent parcels are zoned General Commercial (GC) in the current Bellevue Land Use Code.

BSP-15. Locate vehicular street lights at middle and corners of blocks, one side of the block only, or as required to meet design standards. Locate fire hydrants as close to corners of blocks as possible.

BSP-16. At locations with historical significance, incorporate interpretive and artistic elements to help share BelRed's story. Where contextually relevant, interpretive elements can highlight the Japanese American community that once lived and farmed much of BelRed.

BSP-17. Bring the active arts scene, currently largely hidden in BelRed, into the public realm by fulfilling the public art chapter included in this plan.

BSP-18. Locate waste and recycling receptacles on pads within landscape areas on opposing corners at the ends of blocks.

GREEN

BSP-19. Select trees and understory plants that emphasizes Northwest Planting Character (see definition on page 8), variety and biodiversity while reflecting BelRed's ecological and agricultural history.

BSP-20. Work to maximize tree canopy in BelRed's streetscapes by minimizing and consolidating driveways and by coordinating street lighting design and utilities with street tree locations.

BSP-21. Use accent trees at important locations like street corners, building entrances and where streams cross streets. Specific accent tree selection should be based off of site context and is subject to approval through the permitting process.

BSP-22. Highlight riparian areas and locations where streams cross streets by utilizing a riparian area planting palette in streetscape locations adjacent to these features. The change in plants should be noticeable in these locations.

BSP-23. Provide street trees with required soil volume to promote the health and longevity of trees and also to minimize sidewalk maintenance from root upheaval. Consolidate utilities that cross street planting areas, where possible, to avoid reductions in soil volume. See Parks' Environmental Best Management Practices Manual for required soil volume.

BSP-24. Work to treat and/or infiltrate stormwater runoff with GSI techniques where feasible. The goal of this design guideline is to mitigate impacts, specifically reducing pollution impacts to natural areas including streams, lakes and wetlands.

BSP-25. Install automatic irrigation systems for all streetscape plantings, including bioretention areas. Irrigation should be used in bioretention areas for supplemental purposes after plant establishment. The use of high-efficiency irrigation systems is required.

SMART

BSP-26. Incorporate technologies that allow the BelRed mobility network to be adaptive to changing traffic patterns, uses and new technologies.

BSP-27. Incorporate wayfinding and other mechanisms, where appropriate, to promote use of non-vehicular modes of travel. An example is planned tree lights at the 130th Station that change color down the block as a light rail train approaches (program is triggered when incoming trains are two minutes away and completes the cycle as the train approaches). Other examples include, but are not limited to, digital bicycle counter displays and artwork that responds to pedestrian movement or changing site conditions.

CREATIVE + ARTISTIC

BSP-28. Reflect BelRed's arts and creative identity by utilizing color, engaging art and design elements, and the incorporation of natural features into streetscapes. Streets should have a mix of signature or landmark artworks and smaller more intimate artworks as called for in the Public Art chapter of this plan.

BSP-29. Promote community gathering in streetscapes where possible. This could be done through smaller scale gathering spaces along busy streets, designing streets for periodic closure for events and festivals or the through the design of pedestrian streets as linear plazas with integrated permanent artwork and space for temporary art and performance.

ADAPTIVE

BSP-30. Where possible, design streets to allow for flexible use and reallocation of space as mobility and community uses change.

BSP-31. Utilize areas predominantly used for on-street parking so they provide the greatest public benefit. Examples could include: short and longer term parking, pick-up and drop-off areas, loading zones, parklets and streeteries, mobile artworks (see Public Art chapter), personal and shared bicycle or other non-motorized parking, etc. Ensure that adjacent landscape areas include breaks, or walk-through areas for access from sidewalks.

04 STREET TYPOLOGIES

STREET TYPES

Figure 7. BelRed street types.

The BelRed Land Use Code (LUC 20.25D.140) identifies five street types in BelRed. Each street type contributes to the functioning of the street network and the livability of BelRed in different ways.

ARTERIAL STREETS

Along with the East Link light rail alignment, BelRed's arterials will serve as the primary means of entrance to, and movement through BelRed. Accordingly, these streets should convey the character of the neighborhood and provide a strong "threshold experience" as one enters BelRed.

LOCAL STREETS

The majority of new streets to be built in BelRed will be Local Streets. They are intended to support residential and commercial development with smaller street widths, generous landscape and pedestrian furnishings.

GREEN STREETS

Green Streets are important east-west streets that connect the street network to parks and open space. Green Streets should be considered urban trails and extensions of parks and open spaces. They are important streets for pedestrians and bicyclists and are defined by their curbless design and green elements and infrastructure.

PEDESTRIAN STREETS

Pedestrian Streets are seen as a specific type of local street that supports primarily more active pedestrian uses. These streets are important components of the open space network, offer comfortable pedestrian-prioritized experiences, might support market, arts activity and outdoor dining, or simply offer a quite and green connection or respite.

SHOPPING STREET

BelRed's Shopping Street is intended to be an active corridor that support retail by providing wider sidewalks for dining and window shopping, grated trees for extra pedestrian maneuverability, and low furnishings for unobstructed sight lines to storefronts and on-street parking and loading. This street is designed for periodic closure for events and markets.

ARTERIAL STREETS

Figure 8. BelRed arterials.

Arterials in BelRed serve to bring people and goods into and through BelRed. These streets define BelRed's boundaries and will host the highest traffic volumes. While all of BelRed's streets emphasize multimodal use, arterial streets require the greatest distinction of space utilized by different modes.

STREET ORGANIZATION

BSP-32. Where possible, BelRed's Arterial Streets should have dedicated spaces for roadway traffic, bicyclists and pedestrians with buffers between uses. See Figure 9 for Arterial Street Dimensional requirements.

BSP-33. Include additional space and amenities for pedestrians and bicyclists on Arterial Streets abutting to or near light rail stations.

BICYCLE INFRASTRUCTURE

BSP-34. Utilize Arterials Streets as key regional and local bicycle connections into, within and through BelRed. Ensure that bicycle facilities are buffered from traffic and support the safety of all users of BelRed's streets. Vertical or spatial buffers are preferred. Where that isn't possible, use rounded or stepped curbs to delineate space.

BSP-35. Clearly define bike lanes on Arterial Streets through buffered and/or vertical separation, pavement color, pattern and materials. Vertical and buffered separation is preferred on arterials.

BSP-36. Reduce roadway cost by transferring bicycles off of expensive vehicular pavements.

SIDEWALKS

BSP-37. On Spring Boulevard, incorporate steel inlays at intersections with other streets. See Figure 12 for design details.

ELEVATED STRUCTURES

BSP-38. Reinforce district character through use of design and art elements on elevated structures. Examples could include painted murals, integrated artworks, use of vibrant color and other features like formliners. Elevated structures include both walls above five feet and all bridges.

ARTERIAL STREET STANDARD DIMENSIONS							
Arterial	Motorized Zones (total width)		Non-Motorized Zones (total width)				
	Travel Lanes	Parking	Bicycle		Amenity Zone		Sidewalk Zone
			Buffer	Lanes	Curb	Amenity	Pedestrian Thru Zone
116th Ave NE Bel-Red Rd east of 148th Ave NE	34' total		39' total				
	(2) 11' Travel Lanes (1) 12' Turn Lane	None	(2) 2' Buffers	(2) 6' Protected Bicycle Lanes	(2) 6" Curbs	(2) 5' Planting	(2) 6' Sidewalks
120th Ave NE 148th Ave NE 156th Ave NE	56' total		39' total				
	(4) 11' Travel Lanes (1) 12' Turn Lane	None	(2) 2' Buffers	(2) 6' Protected Bicycle Lanes	(2) 6" Curbs	(2) 5' Planting	(2) 6' Sidewalks
124th Ave NE	56' total		41' total				
	(4) 11' Travel Lanes (1) 12' Turn Lane	None	None	(2) 6' Protected Bicycle Lanes	(2) 6" Curbs	(2) 6' Planting	(2) 8'
130th Ave NE south of NE Spring Blvd	34' total		35' total				
	(2) 10.5' Travel Lanes (1) 12' Turn Lane	None	None	(2) 6' Protected Bicycle Lanes	(2) 6" Curbs	(2) 5' Planting	(2) 6' Sidewalks
Northup Way	56' total		39' total				
	(4) 11' Travel Lanes (1) 12' Turn Lane	None	None	(2) 6' Protected Bicycle Lanes	(2) 6" Curbs	(2) 5' Planting	(2) 8' Sidewalks

Figure 9. Arterial Street Standard Dimensional Requirements (Continued on next page). Note: On 130th Ave NE south of NE Spring Blvd. the bicycle lane is located adjacent to the sidewalk while the curb and amenity zone are located adjacent to the travel lanes.

ARTERIAL STREET STANDARD DIMENSIONS							
Arterial	Motorized Zones (total width)		Non-Motorized Zones (total width)				
	Travel Lanes	Parking	Bicycle		Amenity Zone		Sidewalk Zone
			Buffer	Lanes	Curb	Amenity	Pedestrian Thru Zone
Spring Blvd							
Spring Blvd - Zone 1	58' total		32' total				
West of 120th Ave NE	(2) 12' and (2) 11' Travel Lanes and (1) 12' Turn Lane and Median	None	None	None	(2) 6" Curbs	(1) 6' Planting and (1) 5' Planting	(1) 6' Sidewalk and (1) 14' Multipurpose Path
Spring Blvd - Zone 2	61' total		52' total				
120th Ave NE to 124th Ave NE	(2) 11' Travel Lanes and (2) 10' Travel Lanes and (1) 11' Turn Lane and Median	(1) 8' Parking Lane	(2) 1' Directional Tile Buffers	(2) 5' Cycle Paths adjacent to Sidewalk	(2) 6" Curbs	(2) 6' Planting	(2) 13.5' Sidewalks
Spring Blvd - Zone 4	22' total		49' total				
130th to 132nd	(2) 11' Travel Lanes	None	3' Buffer with 4" Rolled Curb	(2) 5.5' Bike Lane	(2) 6" Curbs with 2" Rolled Curb Height	(2) 5' Planting	(2) 10.5' Sidewalks
	34' total		51' total				
132nd Ave NE	(2) 11' Travel Lanes (1) 11' Turn Lane	None	None	(2) 6' Protected Bicycle Lanes	(2) 6" Curbs	(2) 16' Sidewalk and Landscape Buffer	
	34' total		35' total				
134th Ave NE	(2) 11' Travel Lanes (1) 12' Turn Lane	(2) 8' Parking Lanes	(2) 1.5' Buffers	(2) 5' Bicycle Lanes	(2) 1.5' Curb Zones	(2) 16' Sidewalk and Landscape Buffer	
	17' total		22' total				
134 Ave NE Interim Half Street	(1) 11' Travel Lane	(1) 8' Parking Lane	(1) 1.5' Buffer	(1) 5' Bicycle Lane	(1) 1.5' Curb Zone	(1) 5' Planting	(1) 9' Sidewalk
	56' total		56' total				
Bel-Red Rd from 124th Ave NE to 148th Ave NE	(4) 11' Travel Lanes (1) 12' Turn Lane	None	None*	None*	(2) 6" Curbs	(2) 20' Planting	(2) 8' Sidewalks

Figure 9. (continued from previous page). Arterial Street Standard Dimensional Requirements.

** Note: Bike lanes may be considered in the future on Bel-Red Rd.*

BSP-39. Incorporate overlooks to leverage views of Downtown, parks, open space, streams, public art, the Cascade Mountains and Mt. Rainier and to create social destinations (meet-ups, lunch, etc). Provide furniture, public art, interpretive graphics, and/or special accent lighting features at overlooks. An example of a constructed overlook in BelRed is on 124th Ave NE at the West Tributary.

BSP-40. Link art and design components at stream crossings by stream (similar design or art treatments or materials at overlooks of the West Tributary, as an example) can help make experiential connections between different overlooks. For direction on artwork for these locations see Crossings section on page 78 in the Public Art Chapter.

INTERSECTIONS

BSP-41. Minimize pedestrian crossing times through the use of curb bulbs, pedestrian refuges, scramble crossings (Barnes Dance crossings) and minimizing roadway widths.

BSP-42. Maintain minimum requirements for fire/police department safety and maneuverability of other large vehicle turning radii.

BSP-43. Define pedestrian space at key intersections and along key arterials with concrete intersections and crossings and specialty metal inlays (see Figure 12). As typical Arterial Streets include asphalt roadways, pedestrian crossings should be standard concrete color to provide contrast while the centers of intersections should be carbon-colored integral pigmented concrete. Streets and locations include:

- Spring Boulevard at all intersections
- All Arterial intersections with Green Streets

BSP-44. Protected intersection design is strongly preferred.

LANDSCAPE

BSP-45. Design understory plantings to reflect northwest planting character and local site conditions. See definition of northwest planting character on page 8. Example plants for reference: sword fern, heather, Epimedium, Hakonechloa, Fragaria chiloensis, geranium, Cornus kelseyi, evergreen huckleberry, hydrangea, rhododendron and azalea.

BSP-46. Utilize the Arterial Street Tree Palette for street tree selection.

Arterial Street Tree Palette

STREET	PRIMARY TREE	RESTRICTED SPACE TREE
BEL-RED RD	Platanus x acerifolia ‘Bloodgood’ or Quercus coccinea	Stewartia pseudocamellia
NE SPRING BLVD	Ginkgo biloba ‘Magyar’ or Acer miyabei ‘Morton’	Cornus kousa x nutallii ‘Venus’
NORTHUP WY / NE 20th ST	Acer rubrum ‘October Glory’ or Zelkova serrata ‘Green Vase’	Carpinus caroliniana ‘Palisade’
NE 24th ST	Cercidiphllum japonicum or Acer x freemanii ‘Jeffersred’	Syringa pedinensis ‘Morton’
116th AVE NE	Platanus x acerifolia ‘Bloodgood’ or Ulmus propinqua ‘JFS-Bieberich’	Maackia amurensis ‘JFS-Schichtel1’
120th AVE NE	Nyssa sylvatica ‘Afterburner’ or Ostrya virginiana	Cornus kousa x nutallii ‘Venus’
124th AVE NE	Ulmus propinqua ‘Emerald Sunshine’ or Styphnolobium japonicum ‘Regent’	Parrotia persica ‘Vanessa’
130th AVE NE (South of Spring)	Gleditsia tricanthos ‘Skyline’	Cornus kousa x nutallii ‘Venus’
132nd AVE NE	Ulmus ‘Morton Glossy’ or Ostrya virginiana	Cornus kousa x nutallii ‘Starlight’
134th AVE NE	Zelkova ‘Green Vase’ or Quercus bicolor	Parrotia persica ‘Vanessa’
140th AVE NE	Ginkgo biloba ‘Autumn Gold’ or Liriodendron tulipifera ‘JFS-Oz’	Carpinus caroliniana ‘Palisade’
148th AVE NE	Platanus x acerifolia ‘Bloodgood’ or Acer truncatum x platanoides ‘Keithsform’	Oxydendrum arboreum
156th AVE NE	Acer truncatum x platanoides ‘Warrenred’ or Quercus coccinea	Carpinus caroliniana ‘Native Flame’

Figure 10.

ARTERIAL STREET - TYPICAL

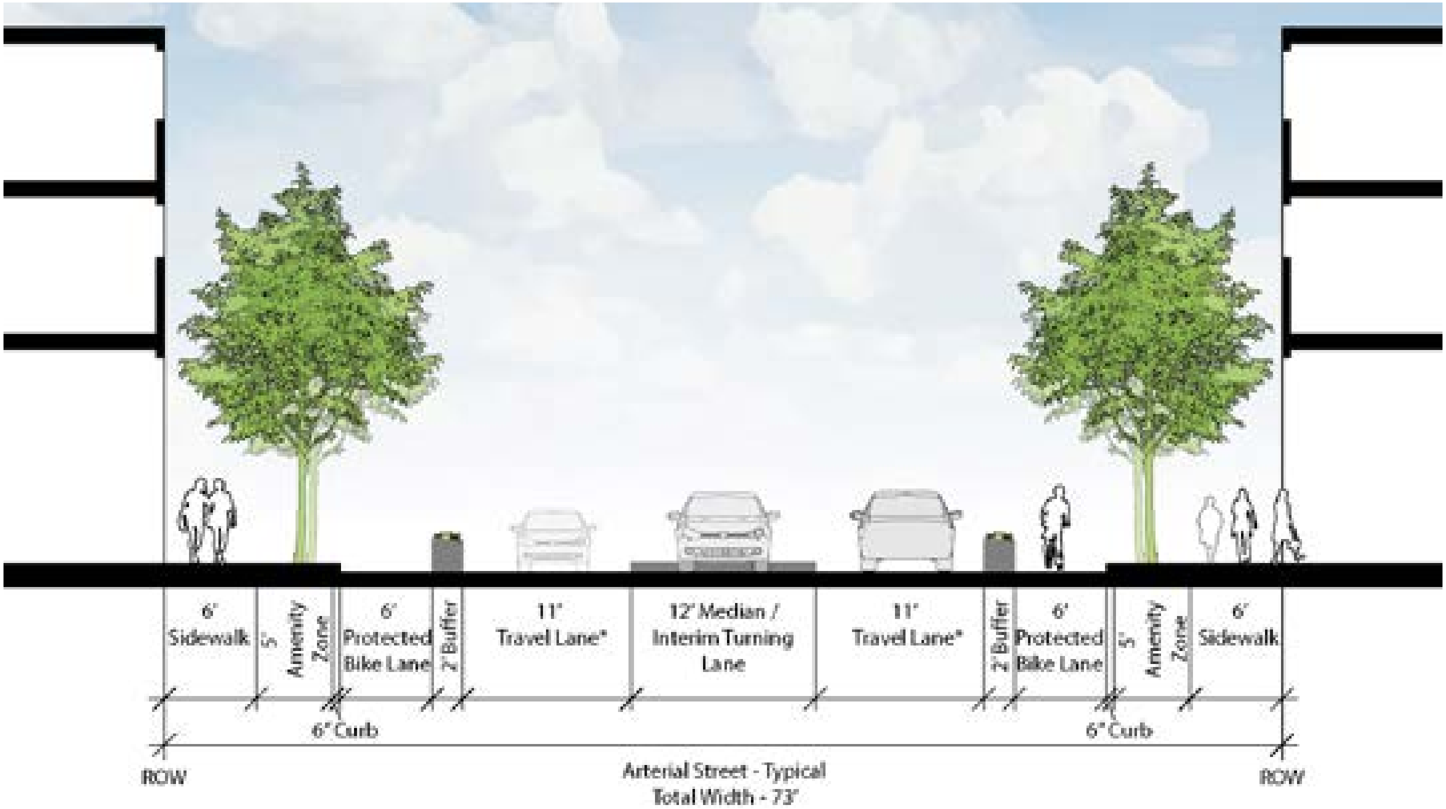


Figure 11. *Arterial Street Typical Section. Note: Arterial streets can accommodate 1-2 travel lanes in each direction. If a second lane is needed, the lane closest to the curb should be 11' in width and the lane farthest from the curb should be 10' in width. 130th Avenue NE north of Spring Boulevard is considered a Shopping Street and follows different standards and design guidelines. Sections of 124th Ave NE and Spring Boulevard have a different section - particularly the location of bike lanes. Where bike lanes are adjacent to sidewalk areas, a buffer with directional tiles is necessary between the bike lane and pedestrian areas.*

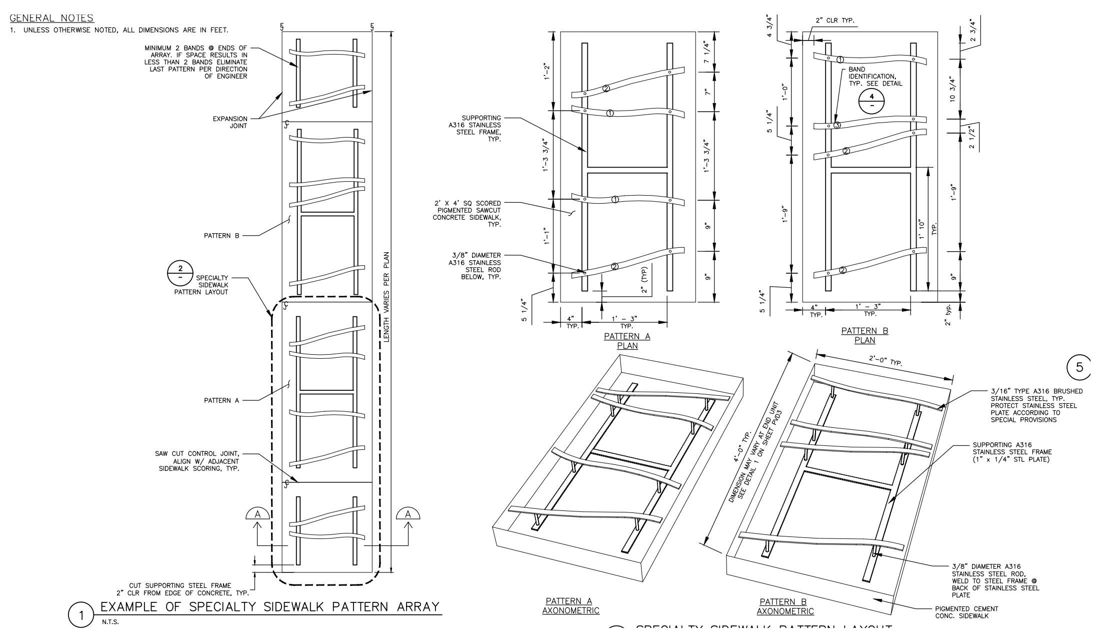


Figure 12. *Arterial Street Steel Inlays. See BSP-43 for specific locations where these inlays should be used. Figure 13 further illustrates their desired placement within the sidewalk realm. Inlays should be constructed with A316 Stainless Steel.*

ARTERIAL SIDEWALK STANDARDS

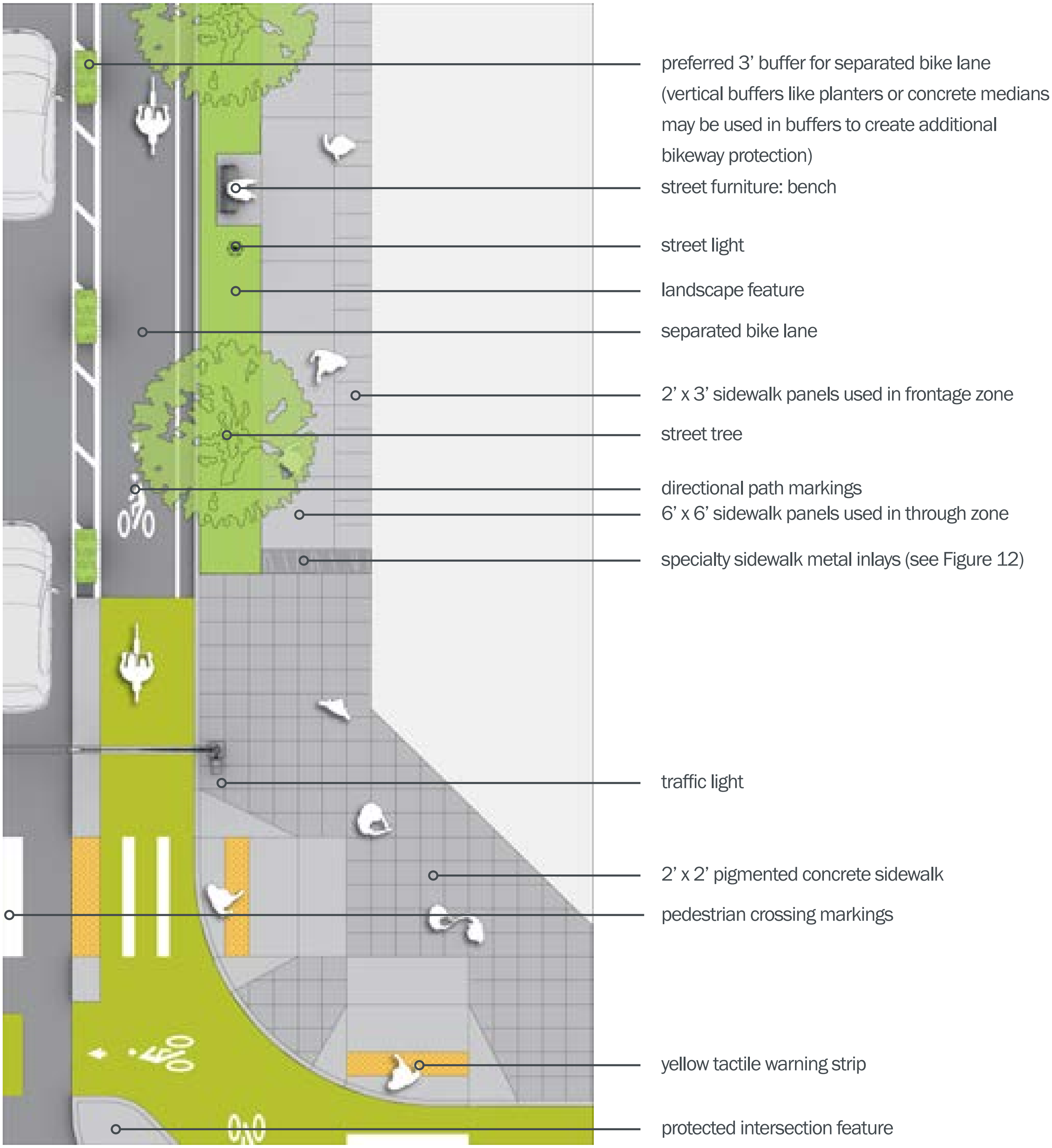


Figure 13. *Arterial Street Sidewalk Standards. Note: 130th Avenue NE north of Spring Boulevard is considered a Shopping Street and follows different standards and design guidelines.*

ARTERIAL STREET - INTERSECTION STANDARDS

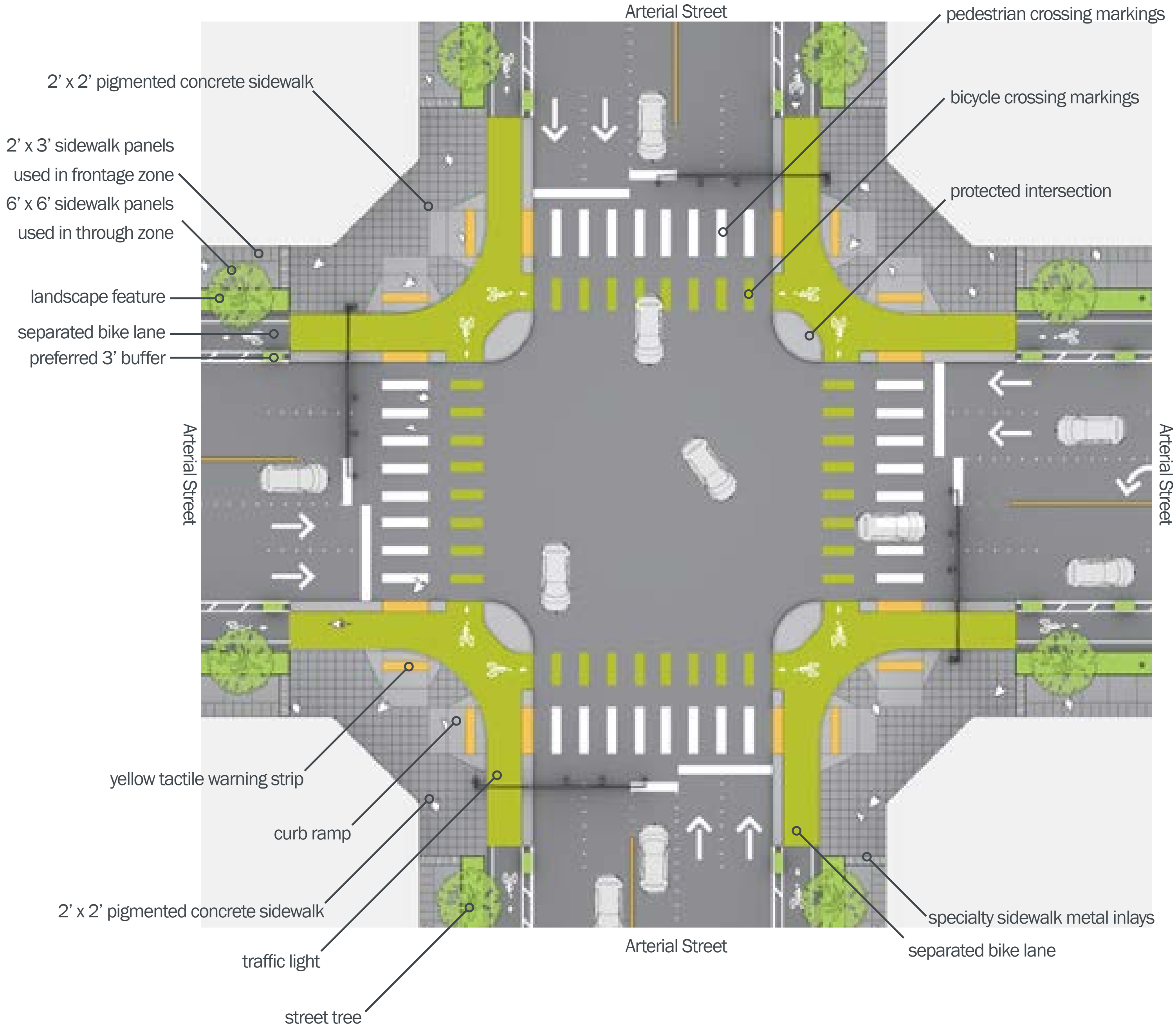


Figure 14. *Arterial Street Intersection Standards. Note: 130th Avenue NE north of Spring Boulevard is considered a Shopping Street and follows different standards and design guidelines.*

LOCAL STREETS

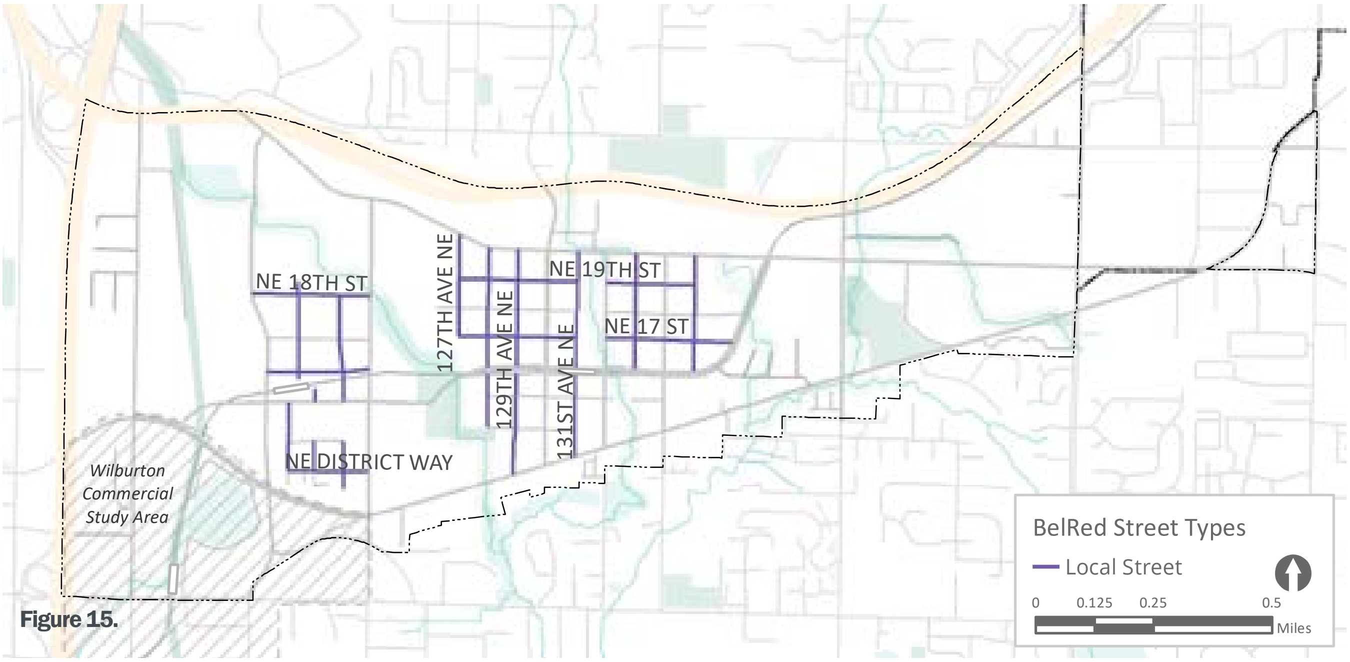


Figure 15.

The majority of new streets to be built in BelRed will be Local Streets. These streets are intended to support residential development through their intimate scale, generous landscape and pedestrian furnishings. Their design intends to encourage a sense of neighborhood "ownership" and participation through the relationship of entrances, lobbies and courtyards with social spaces for seating and conversation in the street. Mid-block curb extensions will provide an amenity space for seating, additional landscaping, non-motorized transportation parking as well as a more frequent interval of crossing in the 300 foot blocks. Texture and detail are prioritized in design. These block types are meant to provide quiet juxtaposition to the busier retail streets or transit boulevards that they intersect. The intent is that when you turn the corner from these busier streets, you enter a quieter environment where you can "hear the birds sing".

STREET ORGANIZATION

BSP-47. Utilize the Local Streets Standard Dimensions table (Figure 16) for dimensional requirements for all Local Streets except where an interim street is being built by a developer on one side of the planned street's centerline but the other side will be built by another developer at another time.

BSP-48. Prioritize pedestrian crossings at intersections of Local Streets and intersections of Local Streets with Green Streets and midblocks on Local Streets.

STREET ORGANIZATION - INTERIM DESIGN

BSP-49. All interim streets should delineate future parking and curbside use space with a change in paving treatment. Interim street design should not limit ability of future installation of curb bulbs.

BSP-50. Interim One-Way streets may be proposed if adjacent street network can provide required fire safety access to all parts of development. These streets will need to be approved through the permitting process.

<table>
<tr><th colspan="9">LOCAL STREET STANDARD DIMENSIONS</th></tr>
<tr><th rowspan="3"></th><th colspan="2">Motorized Zones (total width)</th><th colspan="6">Non-Motorized Zones (total width)</th></tr>
<tr><th rowspan="2">Travel Lanes</th><th rowspan="2">Parking</th><th colspan="2">Bicycle</th><th colspan="2">Amenity Zone</th><th>Sidewalk Zone</th></tr>
<tr><th>Buffer</th><th>Lanes</th><th>Curb</th><th>Amenity</th><th>Pedestrian Thru Zone</th></tr>
<tr><td rowspan="2">Local Streets</td><td colspan="2">36' total</td><td colspan="5">25' total</td></tr>
<tr><td>(2) 10' Travel Lanes</td><td>(2) 8' Parking Lanes</td><td colspan="2">Shared Roadway</td><td>(2) 1.5' Curb zone</td><td>(2) 5' Planting</td><td>(2) 6' Sidewalks</td></tr>
</table>

Figure 16. *Local Street Standard Street Dimensions.*

<table>
<tr><th colspan="10">INTERIM LOCAL STREET STANDARD DIMENSIONS</th></tr>
<tr><th rowspan="3"></th><th colspan="2">Interim Boundary*</th><th colspan="2">Motorized Zones (total width)</th><th colspan="5">Non-Motorized Zones (total width)</th></tr>
<tr><th rowspan="2">Shy Distance</th><th rowspan="2">Curb / Retaining Wall</th><th rowspan="2">Travel Lanes</th><th rowspan="2">Parking</th><th colspan="2">Bicycle</th><th colspan="2">Amenity Zone</th><th>Sidewalk Zone</th></tr>
<tr><th>Buffer</th><th>Lanes</th><th>Curb</th><th>Amenity</th><th>Pedestrian Thru Zone</th></tr>
<tr><td rowspan="2">Local Streets</td><td colspan="4">~'20 total</td><td colspan="5">12.5' total</td></tr>
<tr><td>(1) 2' Paved Shoulder</td><td>Site dependent</td><td>(2) 9' Travel Lanes*</td><td>None</td><td colspan="2">Shared Roadway</td><td>(1) 1.5' Curb zone</td><td>(1) 5' Planting</td><td>(1) 6' Sidewalks</td></tr>
</table>

Figure 17. *Interim Local Street Standard Street Dimensions.*

** Additional width may be required based off of site and design conditions.*

BICYCLE INFRASTRUCTURE

BSP-51. Design Local Streets to be low speed streets where bicyclists of all abilities and vehicles safely mix.

BSP-52. Incorporate non-motorized transportation parking for personal and shared non-motorized transportation use into Local Streets. Preferred location are in bike corrals in on-street parking stalls close to adjacent building entrances. Also include a regular distribution of bicycle racks along all local streets with minor or major building entrances.

SIDEWALKS

BSP-53. Create a high quality pedestrian environment by defining the pedestrian realm. Local streets must incorporate ample street furniture, elements of interest like landscaping, street trees, public art in the amenity/buffer zone and vertical and flat work murals and pedestrian-scaled materials on building facades at the street level.

INTERSECTIONS

BSP-54. Maintain minimum requirements for fire/police department safety and maneuverability of other large vehicle turning radii. Curb radii at corners should be 25'. Curb bulbs at intersections should bump out no more than 5' from the curb of the adjacent parking lane providing an additional 3' of roadway for turning movements.

LANDSCAPE

BSP-55. Design understory plantings to reflect northwest planting character and local site conditions. Seasonal interest should be a component of understory plantings. See definition of northwest planting character on page 8. Example plants for reference: Epimedium, Cornus kelseyi, blue fescue, daylily, hosta, hebe, spirea, Mahonia, azalea, evergreen huckleberry, and snowberry.

BSP-56. Utilize the Local Street Tree Palette for street tree selection.

Local Street Tree Palette

NODE	OPTIONS FOR TREE SELECTION
MEDICAL NODE	Liriodendron tulipera 'JFS OZ' Quercus frainetto 'Schmidt' Magnolia 'Elizabeth' (only used as accent) Carpinus caroliniana 'Palisade'
120TH NODE	Ulmus 'Morton Glossy' Koelreuteria paniculata 'JFS Sunleaf' Cladrastis kentukea 'Rosea' (only used as accent) Cornus x kousa nutallii 'Venus'
130TH NODE	Quercus frainetto 'Schmidt' Cercidiphyllum japonicum Nyssa Sylvatica 'Wildfire' (only used as accent) Acer griseum

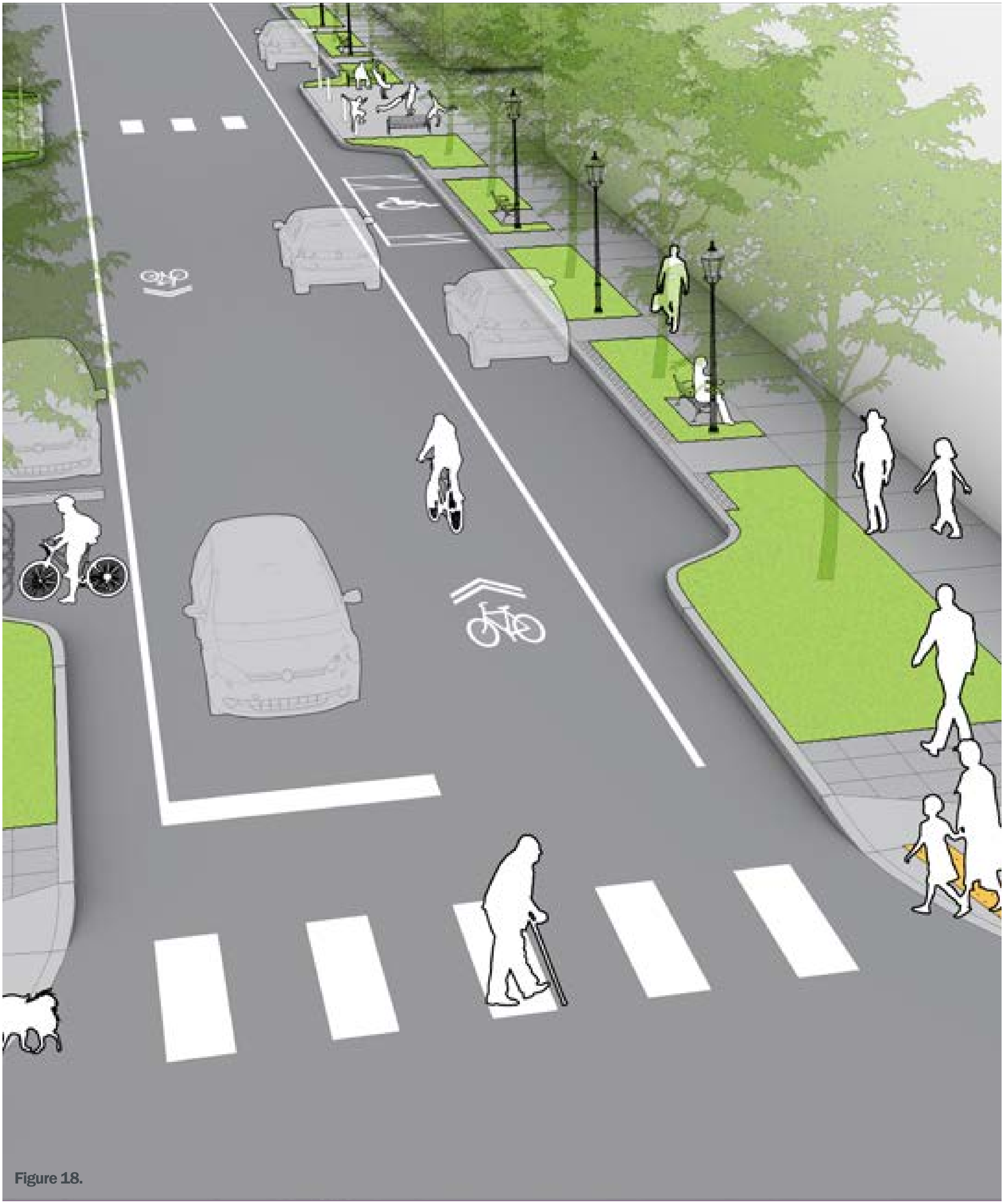


Figure 18.

LOCAL STREET - TYPICAL SECTION

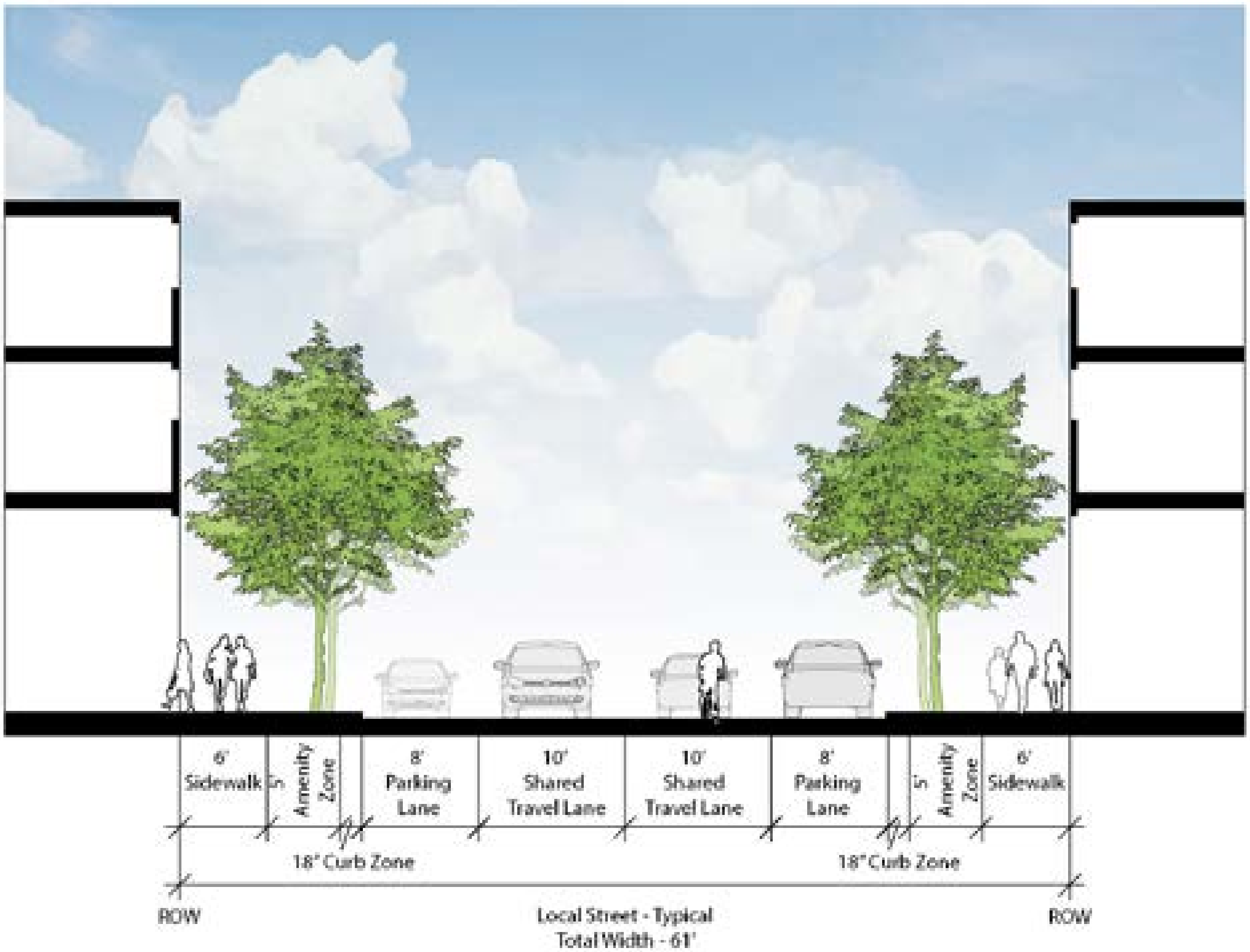


Figure 19. *Local Street typical section.*

LOCAL STREET - SIDEWALK STANDARDS

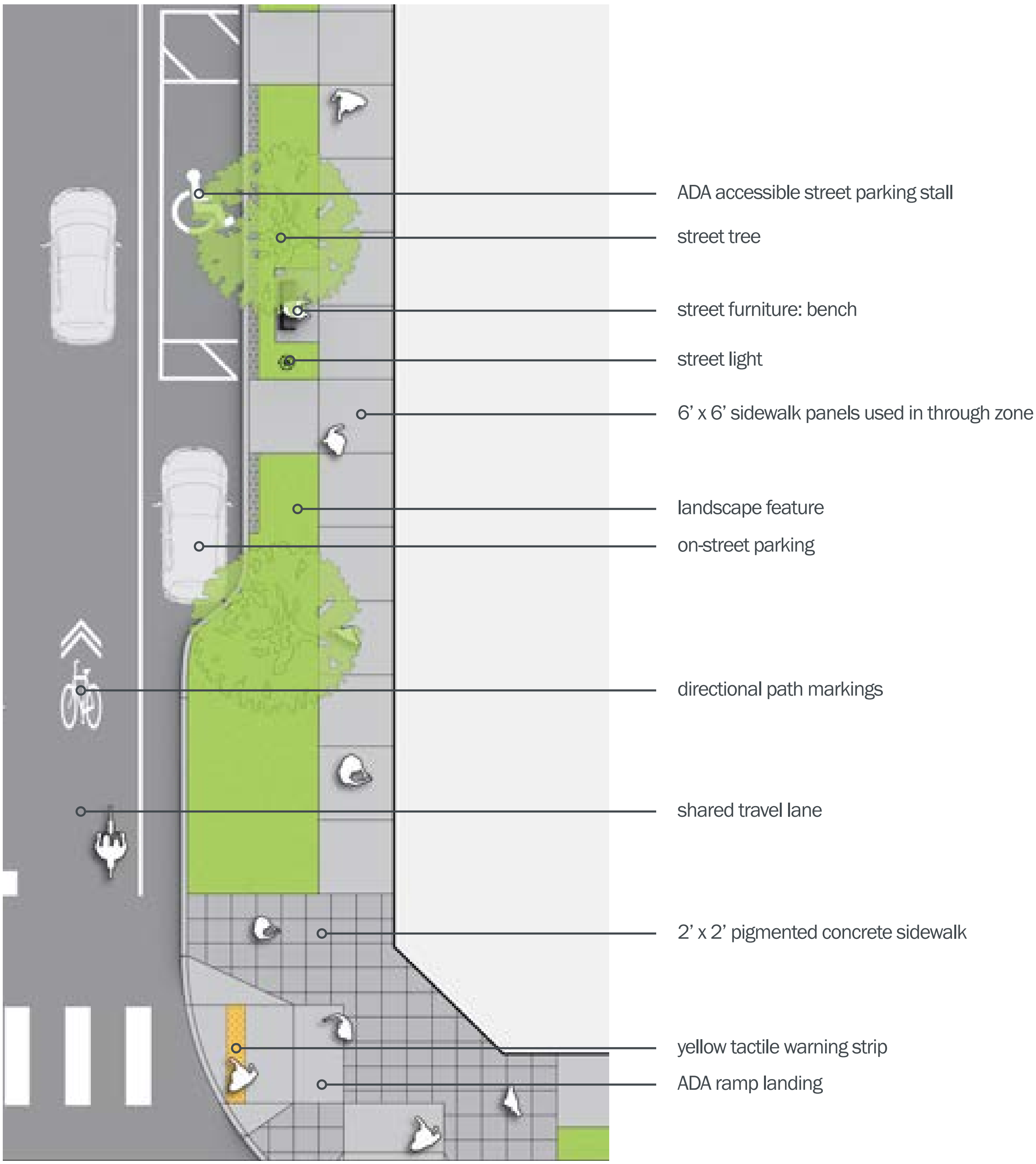


Figure 20. *Local Street Typical Sidewalk Standards.*

LOCAL STREET - INTERSECTION STANDARDS

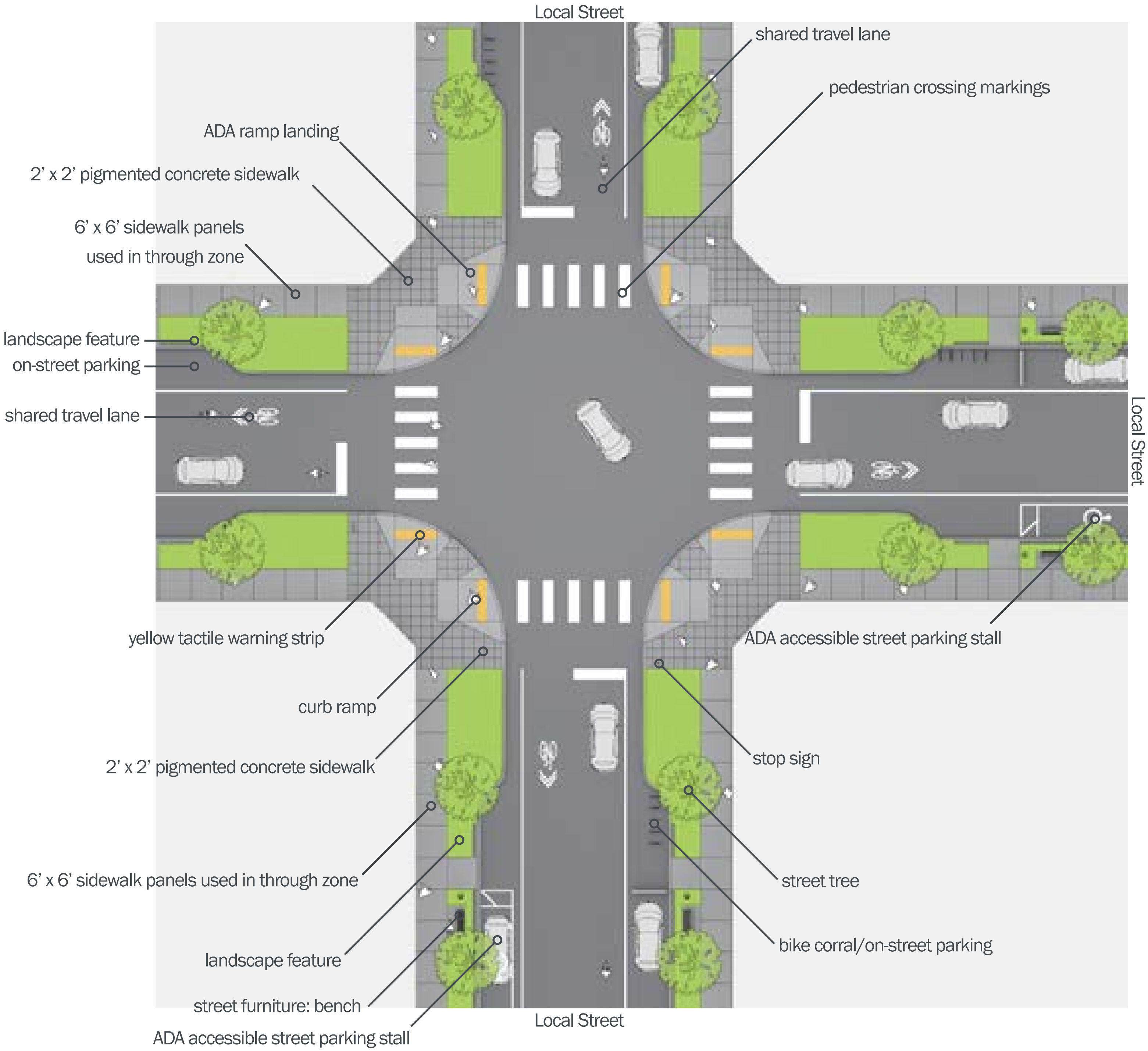


Figure 21. *Local Street Typical Intersection Standards.*

GREEN STREETS

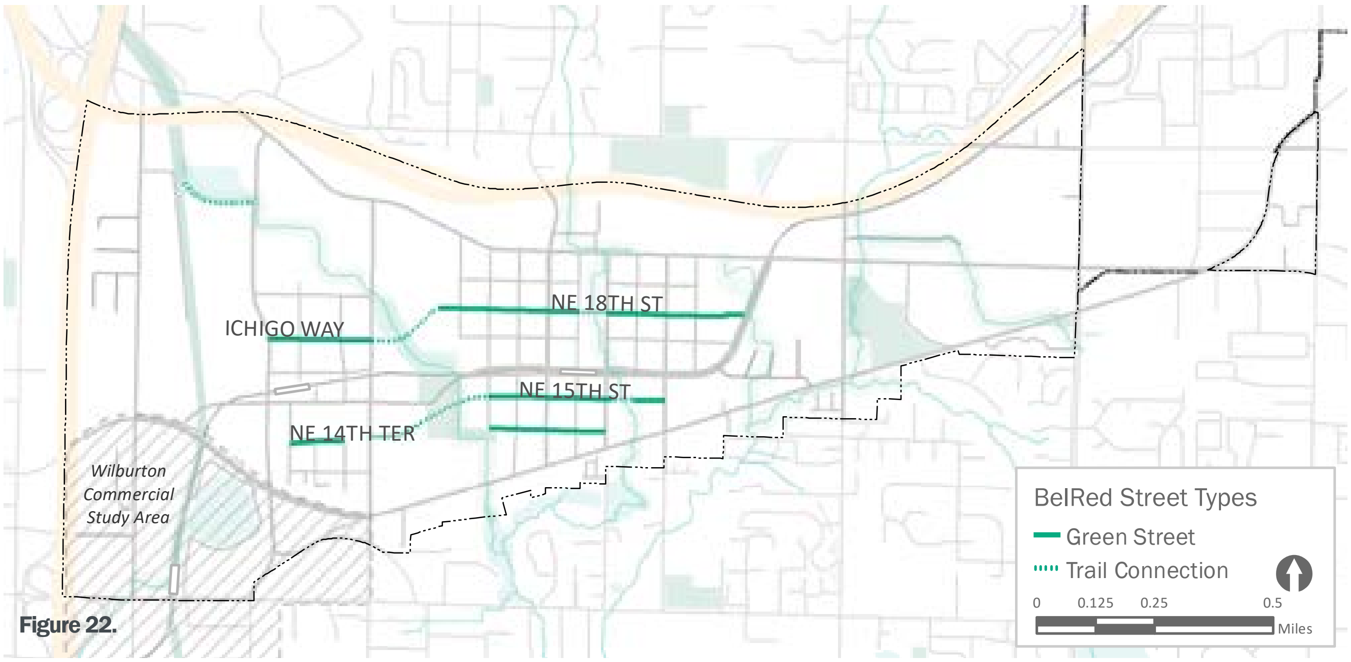


Figure 22.

Green Streets are seen as a specific type of local street that supports intensive residential uses, has a traffic-calmed character that is attractive to pedestrians and bicyclists and because of their east-west alignment, act as green connective corridors between subdistricts and riparian open spaces. At intersections on the edge of subdistricts, Green Streets transition to trails as they cross the riparian corridors. The emphasis of the Green Street typology is to put pedestrians and bicycles on equal or greater priority with minor, local automotive traffic, and to employ natural systems to assist with storm water management.

Green Streets are curbless environments with paving enhancements that feel plaza-like and could allow temporary closure for a pedestrian-oriented day festival or event. The street is punctuated by asymmetrically placed bioretention facilities in line with the parking bays. Trees are clumped into irregular groves within bioretention facilities, reinforcing a more natural extension of landscape from the riparian areas into the neighborhood street grid.

Stormwater is conveyed to the bioretention facilities along a crease in the pavement which feeds small cascades into the basins. The bioretention facilities will remove pollutants and suspended solids before returning water to the soil mantle. In heavy rainfall overflow structures convey water to the stormwater system to avoid flooding.

STREET ORGANIZATION

BSP-57. Utilize the Green Street Standard Dimensions table (Figure 22) for all Green Streets where both sides of a street are built at the same time. In cases where a development is proposed by one developer on one side of the planned centerline of a Green Street, and adjacent property isn't being developed concurrently, utilize the Interim Green Half Street Standard Dimensions table (Figure 23).

BSP-58. Develop Green Streets as concrete streets. Travel lanes and sidewalks are standard concrete color, with parking zones and center of intersections with integral charcoal gray pigment in the concrete.

GREEN STREET STANDARD DIMENSIONS							
	Motorized Zones (total width)		Non-Motorized Zones (total width)				
	Travel Lanes	Parking	Bicycle		Amenity Zone		Sidewalk Zone
			Buffer	Lanes	Curb	Amenity	Pedestrian Thru Zone
Green Streets	36' total		25' total				
	(2) 10' Travel Lanes	(2) 8' Parking Lanes interspersed with planting	Shared Roadway		(2) 0.5' Curbless Zones	(2) 11' Planting interspersed w/parking	(2) 8' Sidewalks

Figure 23. *Green Street Standard Dimensional Requirements.*

BSP-59. Develop Green Streets as curbless streets. Ramp adjacent Local Streets up to Green Streets. Ramp Green Streets down to Arterial Streets. The Shopping Street and Pedestrian Streets shouldn't require ramping to Green Streets as they are planned to be curbless.

BSP-60. Prioritize pedestrian crossings at intersections of Green Streets with Local Streets and Arterials Streets.

BSP-61. A Pedestrian Street can be proposed in place of a block of a Green Street. If done, the Pedestrian Street should follow the Pedestrian Street standards and guidelines outlined in this chapter while design elements, like landscape and tree palettes and other amenities, should create continuity between Green Streets and connecting East-West Pedestrian Streets.

BSP-62. Design required parking lanes on Green Streets to alternate between expanded landscape areas and parking stalls. See Figure 25 for illustration.

STREET ORGANIZATION - INTERIM DESIGN

BSP-63. All interim Green Half Streets should delineate future parking and curbside use space with a change in paving treatment.

INTERIM GREEN HALF STREET STANDARD DIMENSIONS									
	Interim Boundary*		Motorized Zones (total width)		Non-Motorized Zones (total width)				
	Curb / Retaining Wall	Shy Distance	Travel Lanes	Parking	Bicycle		Amenity Zone		Sidewalk Zone
					Buffer	Lanes	Curb	Amenity	Pedestrian Thru Zone
Green Half Streets	20' total +				12.5' total				
	Site dependent	(1) 2' Paved Shoulder	(2) 9.5' Travel Lanes	None	Shared Roadway		(1) 0.5' Curbless Zone	(1) 6' Planting	(1) 6' Sidewalk

Figure 24. *Interim Green Half Street Standard Dimensional Requirements.*

BICYCLE INFRASTRUCTURE

BSP-64. Incorporate ample bicycle parking for personal and shared bike use along Green Streets. Preferred location are in bike corrals in on-street parking stalls close to adjacent building entrances. Bike corrals on Green Streets should be considered design elements and should feature forms that evoke natural elements in BelRed.

SIDEWALKS

BSP-65. Create a high quality pedestrian environment by defining the pedestrian realm. Green Streets should be considered urban trails and an extension of the green spaces they connect to. Green elements, such as bioretention facilities, on-site stormwater management BMPs, ample landscaping that exemplifies Northwest character, furniture that uses natural materials and other elements help define the character of the pedestrian environment.

INTERSECTIONS

BSP-66. Design intersections between Green Streets and parks and open spaces to be seamless connections between the street and park environments.

BSP-67. Maintain minimum requirements for fire/police department safety and maneuverability of other large vehicle turning radii. Curb radii at corners should be 25'. Curb bulbs at intersections should bump out no more than 5' from the curb of the adjacent parking lane providing an additional 3' of roadway for turning movements.

LANDSCAPE

BSP-68. Utilize the Green Street Tree Palette for street tree selection.

Green Street Tree Palette

STREET	OPTIONS FOR TREE SELECTION
ALL GREEN STREETS	Quercus bicolor Betula nigra Carpinus caroliniana 'Native Flame' Ostrya virginiana Chioanthus retusus (for restricted space applications only)

BSP-69. Design Green Streets to reinforce the unique environmental character of BelRed and be attractive corridors for multimodal activity. Green Streets should incorporate both green space and Low Impact Development/Green Stormwater Infrastructure as defining elements of design. Green Streets should have a continuity of plant species and streetscape elements, with some variation to add interest along the corridor.

BSP-70. Work to locate areas with soil permeability within the amenity zones on Green Streets for inclusion of bioretention facilities and on-site BMPs such as infiltration, permeable pavements, etc.

BSP-71. Design landscape areas on Green Streets with perennials native or adapted to site conditions. Planting materials should reference the plant lists specified in the Stormwater Management Manual for Western Washington by the Washington State Department of Ecology. This is especially critical in bioretention and rain garden facilities. Plantings should have a year-round visible form.

Figure 25. *Example Green Street. Note: Required on-street parking alternates with expanded landscape areas.*

GREEN STREET - TYPICAL SECTION

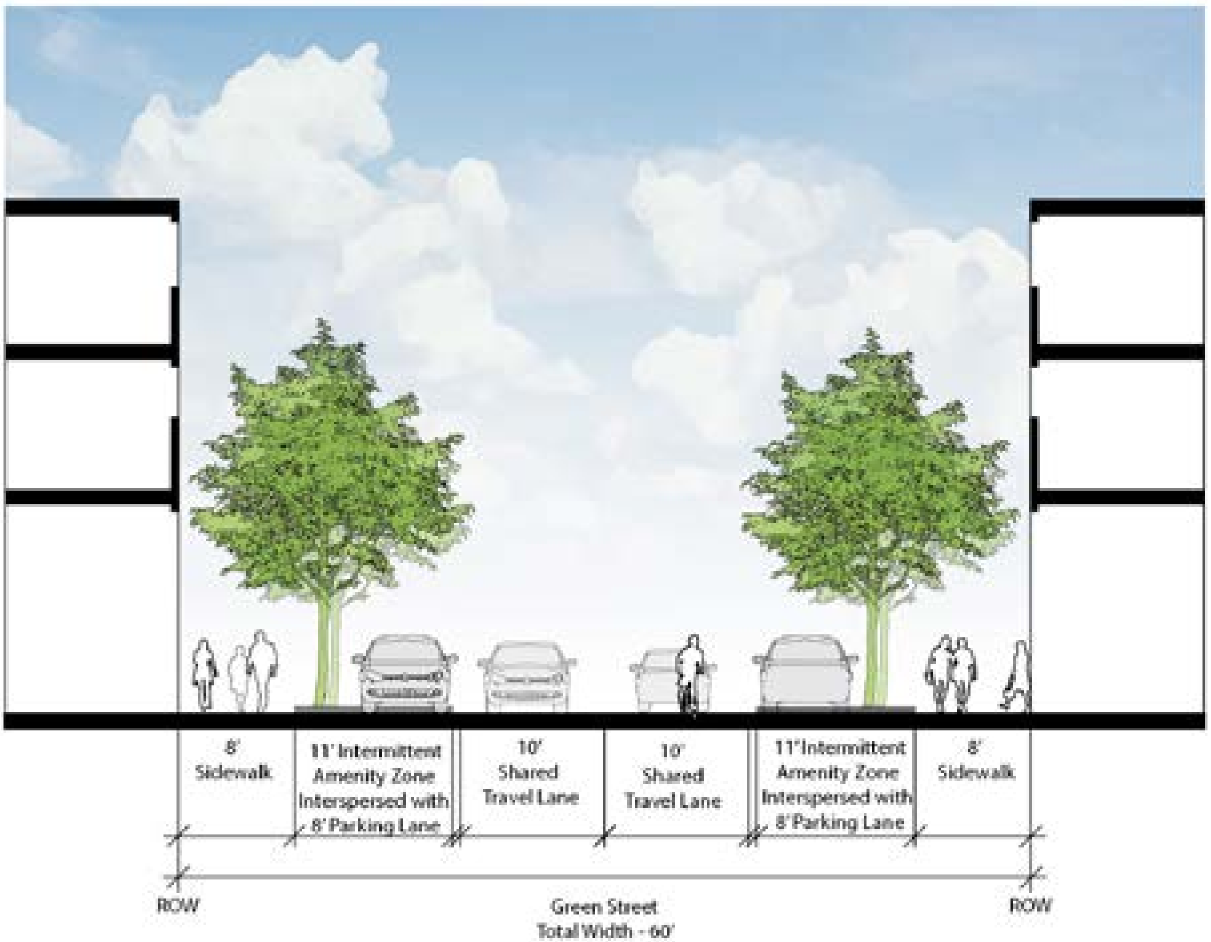


Figure 26. *Typical Section for a Green Street. Note: Required on-street parking alternates with expanded landscape areas.*

GREEN STREET - SIDEWALK STANDARDS

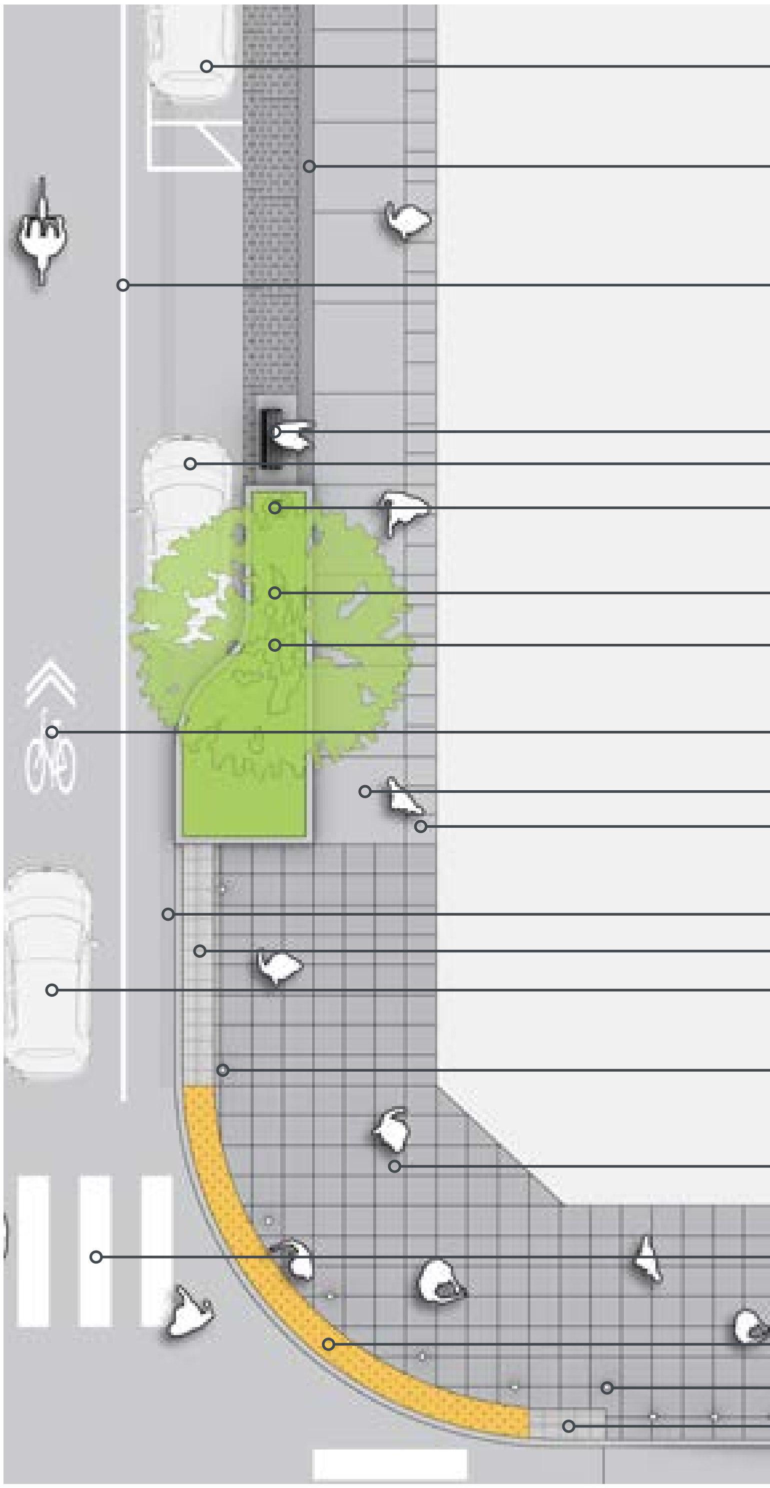


Figure 27. *Green Street Sidewalk Standards. Note: Required on-street parking alternates with expanded landscape areas.*

GREEN STREET - INTERSECTION STANDARDS

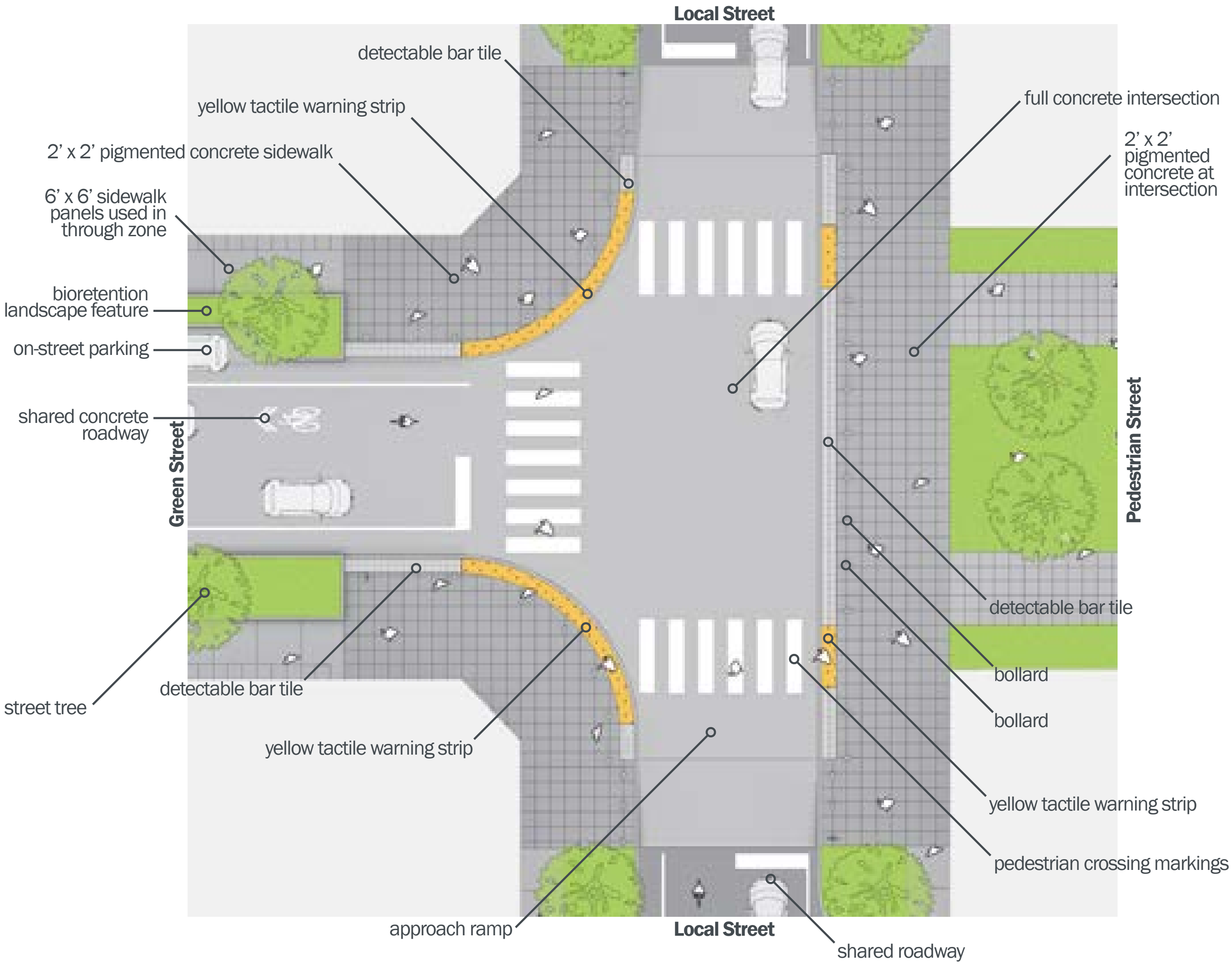


Figure 28. *Green Street Intersection Standards. This diagram shows how a Green Street could connect to a Pedestrian Street that replaced a designated Green Street. Note: Local Streets will ramp up to meet the grade of the curbless Green or Pedestrian Street.*

PEDESTRIAN STREETS

Pedestrian Streets are important public streets that are seamlessly connected to the broader mobility network. They not only prioritize pedestrian use above all other modes, they are places for people to experience public life.

Pedestrian Streets are streets that are closed to motorized vehicles or only allow limited access with no through access for motorized vehicles, with the possible exception of access by public safety vehicles. Pedestrian Streets should look and operate as linear plazas open to pedestrians and bicyclists. They should be attractive places for people to gather, walk, experience art, have lunch or dine outdoors at a cafe or restaurant, learn to ride a bike, sit and read a book, experience public art, large trees and beautiful landscaping, attend markets and cultural events, experience buskers and other types of performance and activity.

Pedestrian Streets may be approved through the permitting process. Pedestrian Streets cannot replace designated Arterial Streets or the Shopping Street.

STREET ORGANIZATION

BSP-72. Develop Pedestrian Streets as linear plazas with a mix of hard surface and green space. They should include obvious through zones for mobility with additional amenities for gathering, sitting, hosting community or cultural events or farmer's markets, etc. Pedestrian Streets should be inviting places for pedestrians and not simply pass-throughs. They should be curbless and prioritize pedestrian use over all other modes including bicycling, although it is permitted. See Figures 30-38 for additional design guidance.

BSP-73. Design Pedestrian Streets as important public spaces that help define or reinforce local context. Some examples include:

- Pedestrian Streets that cross streams should incorporate robust riparian planting areas with a bridge experience over the stream that celebrates the natural features.
- Pedestrian Streets that are within walking distance (1/4 mile) of the 130th Light Rail Station should incorporate space for arts activities, public art, market or cultural event space, and Art Platforms (as described in the Public Art Chapter of this plan).
- Pedestrian Streets that align with Green Streets should incorporate planting palettes and additional green space to create a connected and park-like experience.
- Pedestrian Streets that are located in areas with zoning focused on medical or office uses should have wider spaces for walking and additional seating areas to allow for a more contemplative pedestrian experience while also promoting outdoor use and activity of the office workers.

BSP-74. Pedestrian Streets should be designed to allow equitable access by all users despite the grade of the street or other challenges.

STREET ORGANIZATION - INTERIM DESIGN

BSP-75. Pedestrian Streets can't be installed in locations where an interim street is to be built due to different property ownership on each side of a planned street. Exceptions could be where grade challenges necessitate installation of a Pedestrian Street.

BICYCLE INFRASTRUCTURE

BSP-76. Allow bicycle and other non-motorized transportation use on Pedestrian Streets. Do not create separated lanes for specific uses on Pedestrian Streets.

BSP-77. Incorporate ample bicycle racks onto Pedestrian Streets to facilitate attending events or other uses via bike.

SIDEWALKS

BSP-78. Design Pedestrian Streets to prioritize pedestrians limiting instances where delineation of pedestrian space from non-pedestrian space is needed.

INTERSECTIONS

BSP-79. Clearly define through design elements and signage the intersections of Pedestrian Streets and all other street types. It should be clear when exiting a Pedestrian Street where pedestrians should go to remain safe. It should also be clear when entering a Pedestrian Street that pedestrians are prioritized over all other modes, that the street is public, and an active component of BelRed's mobility network.

LANDSCAPE

BSP-80. Design Pedestrian Streets to have a mix of purely landscape areas and areas that provide shade for walking and sitting. Some landscape areas should be bioretention facilities.

BSP-81. Design Pedestrian Streets to allow for large street trees. Incorporation of large evergreen trees into Pedestrian Streets, where appropriate and where it won't interfere with activity and a sense of safety, is desired. Additional soil volume, beyond what is required in the Environmental Best Management Practices Manual, may need to be provided for these large trees.

BSP-82. For Pedestrian Streets that connect to a Green Street, incorporate the street tree species used on adjacent Green Streets into the design of the Pedestrian Street. A possible exception could be in areas immediately adjacent to a stream or wetland where a different tree type reinforces the experience of the natural feature.

STREETSCAPE ELEMENTS

BSP-83. Incorporate elements to reinforce Pedestrian Streets as pedestrian environments. This includes hardscape, pedestrian-scaled lighting, public art, seating and other amenities. Other elements that support events, should be incorporated such as electrical outlets and event lighting mounts to allow additional lighting or lighting strands (at an appropriate height) above amenity and through zones. Maintenance should be a consideration when selecting materials and amenities. These elements should be maintainable but offer a unique experience compared to other street types.

Streetscape elements, particularly landscape elements within bioretention facilities should be designed to reduce hard surface to minimize the quantity of runoff and improve stormwater quality.

PEDESTRIAN STREETS - EXAMPLE SECTION

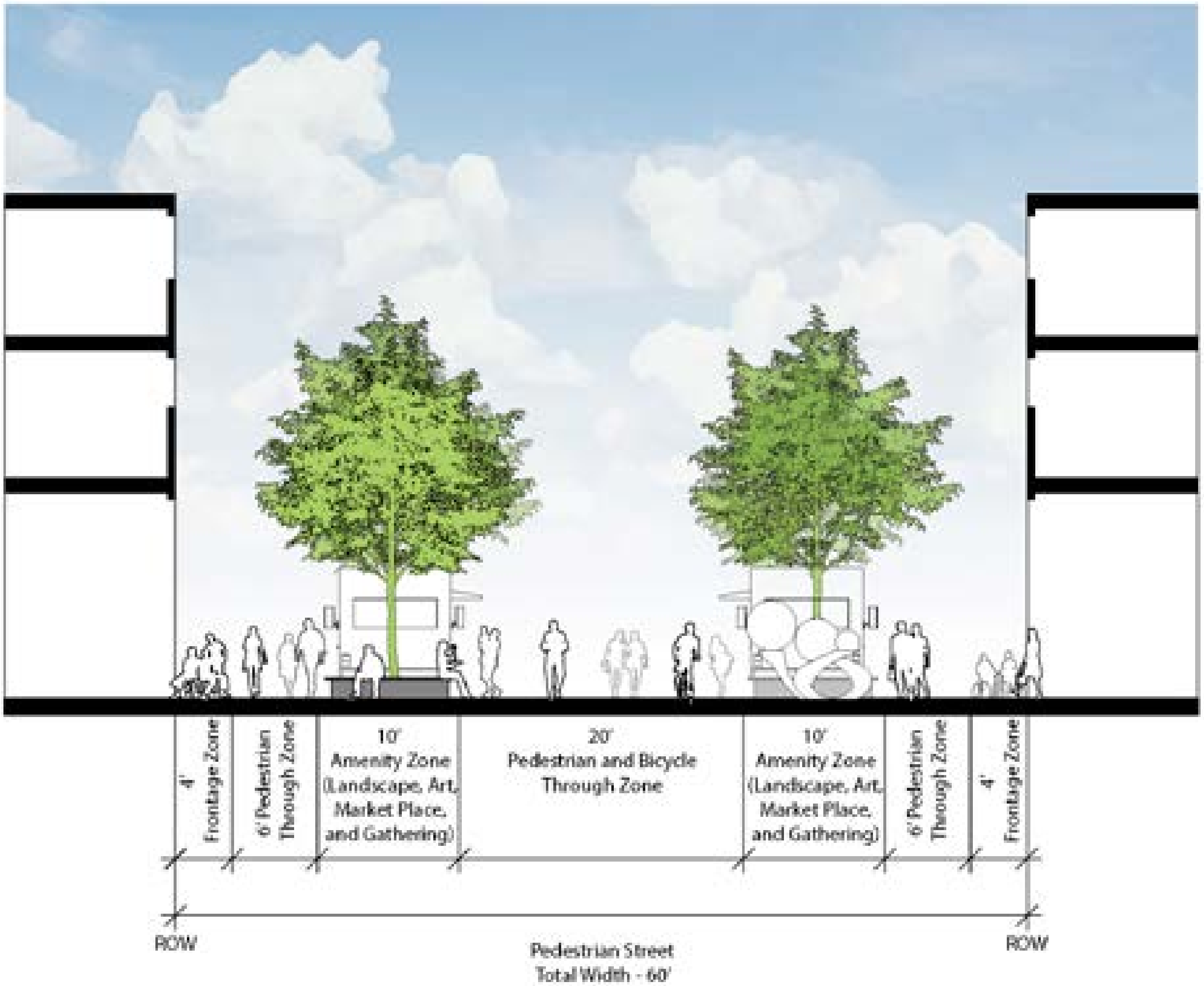


Figure 29. *Example Pedestrian Street showing how a Pedestrian Street could be designed in areas within walking distance of the 130th Light Rail Station. The following pages illustrate example Pedestrian Streets depending on their context.*


Figure 30.

PEDESTRIAN STREET EXAMPLE - WALKING DISTANCE TO 130TH LIGHT RAIL STATION

Pedestrian Streets that are within art and market context should demonstrate flexible ways to create high-quality and attractive public space for a diverse range of people to experience and explore. This street type should incorporate space for activities, public art, market or cultural event space, and casual gathering. Priorities: space for art and market activity

Figure 31.


PEDESTRIAN STREET EXAMPLE - RESIDENTIAL AREAS

Pedestrian Streets in the residential areas should provide enjoyable spaces for people to meet, relax, and play. This street type should be designed as an extension of parks and playground with additional planting palettes and green space to create a connected and park-like experience. Priorities: landscaping, sitting, walking

Figure 32.

PEDESTRIAN STREET EXAMPLE - STREAM CROSSINGS

Pedestrian Streets that cross streams should incorporate robust riparian planting areas with a bridge experience over the stream that celebrates the natural features. This street type should provide people the opportunity to step away from the busy urban life and enjoy natural walks between destinations for improved well-being and lower perceived stress. Priorities: view of streams, large trees and riparian area plantings

Figure 33.

PEDESTRIAN STREET EXAMPLE - CONTINUITY WITH GREEN STREETS

Pedestrian Streets that are connected with green streets should offer additional green spaces for daily activities and stormwater management. This street type should provide a variety of green elements such as extensive planing and landscaping to create healthy and livable communities. Priorities: Green Street character, LID/GSI features, green space

Figure 34.

PEDESTRIAN STREET EXAMPLE - MEDICAL OR OFFICE USE AREAS

Pedestrian Streets that are located in areas with zoning focused on medical or office uses should have wider spaces for walking and additional seating areas to allow for a more contemplative pedestrian experience while also promoting outdoor use and activity of the office workers. Priorities: texture and color in planting palette, larger central walking space, seating

Figure 35.

PEDESTRIAN STREET EXAMPLE - GRADE CHALLENGE

Pedestrian Streets with grade challenge should utilize the change of grade to create a variety of interesting and relaxing spaces along the steps and ramps such as cascading landscape or stormwater feature and built-in seating along raised planters. Note: Ramps should be designed to allow use by bicyclists. Priorities: ADA access, use grade to delineate spaces for different uses

PEDESTRIAN STREET - EXAMPLE PLAN SHOWING 130TH LIGHT RAIL CONTEXT

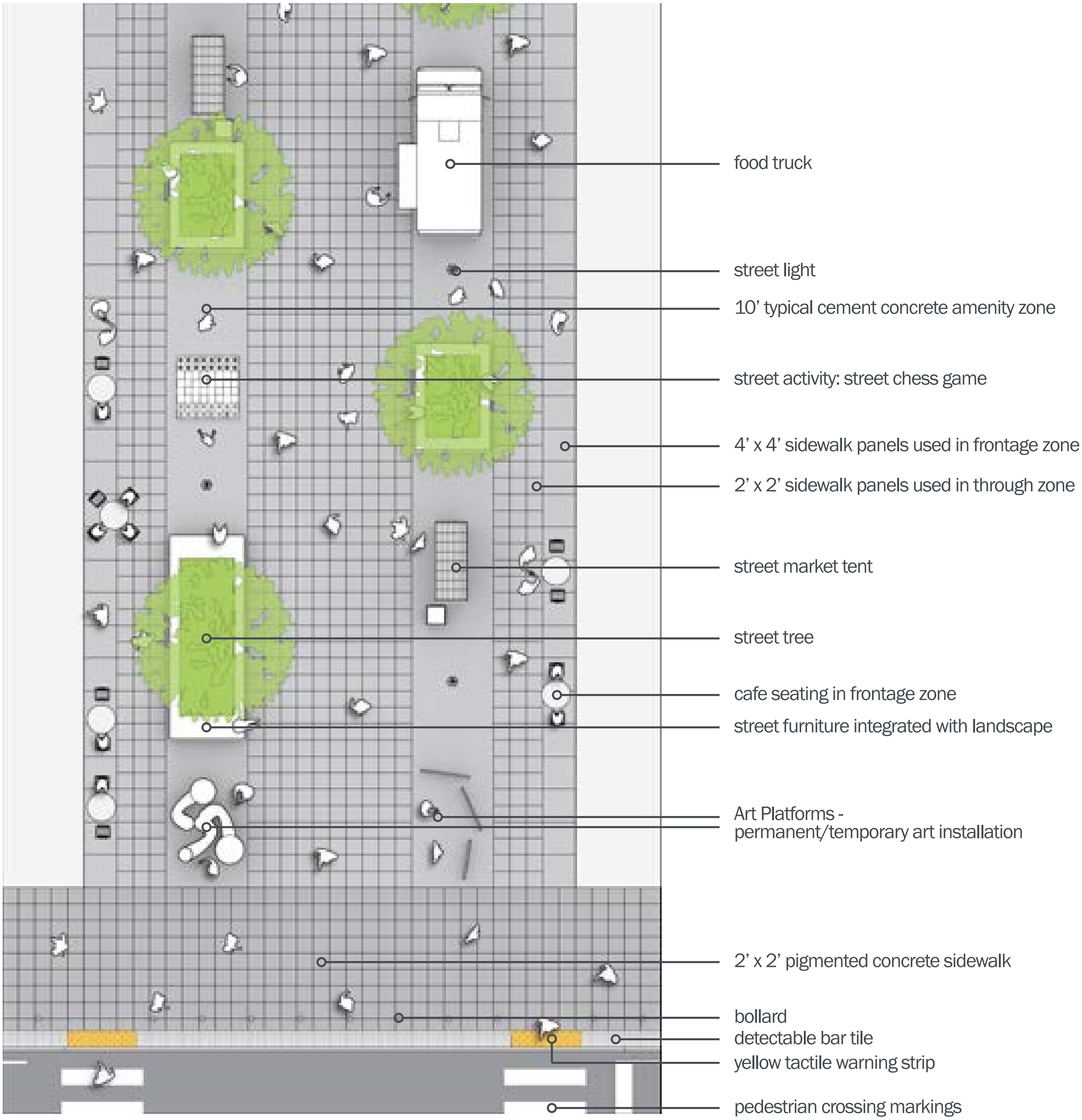


Figure 36. *Example Pedestrian Street in plan showing how a Pedestrian Street could be designed in areas within walking distance of the 130th Light Rail Station. Key features include the wider central through zone that could easily accommodate markets, Art Platforms and other active uses, and cafe seating.*

PEDESTRIAN STREET - EXAMPLE INTERSECTION WITH A GREEN AND LOCAL STREET

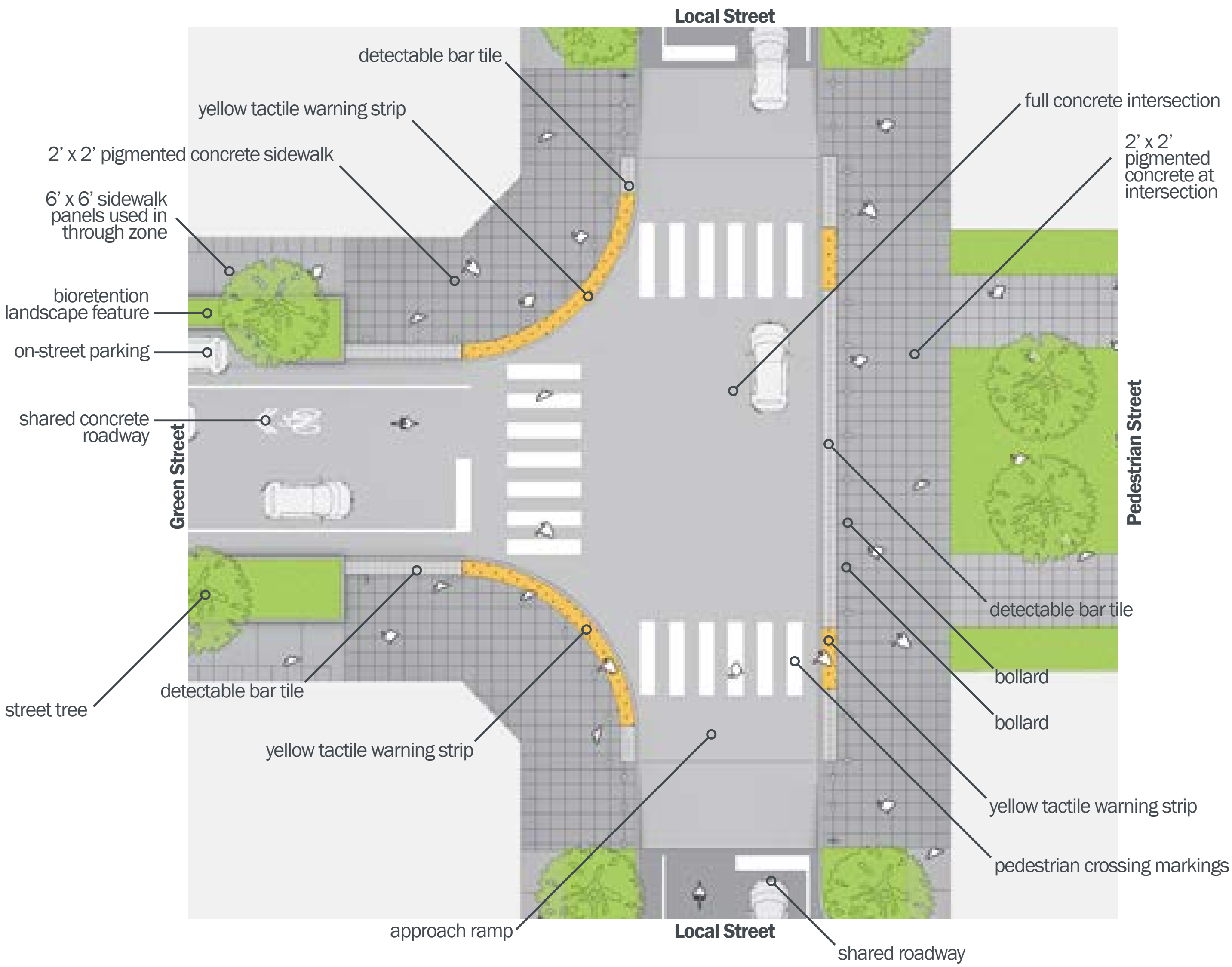


Figure 37. *Example intersection of a Pedestrian Street with a Green and Local Street.*

SHOPPING STREET

Figure 38.

Shopping Streets are intended to be active corridors that support retail by providing wider sidewalks for dining and window shopping, grated trees for extra pedestrian maneuverability, and low furnishings for unobstructed sight lines to store fronts and on-street parking and loading. 130th Avenue NE is designated as a Shopping Street in the BelRed Plan. Retail uses here are seen as the type that will serve the emerging high density residential neighborhood and not compete with regional retail in Downtown Bellevue. Smaller scale retail that is pedestrian-friendly will line both sides of 130th Avenue NE. To provide space adequate to serve all needs, a wider right-of-way is proposed. 130th Avenue NE is also a local bicycle corridor that will connect into the larger city-wide bicycle corridor proposed for the NE 15th/16th Street light rail corridor. As such it will include generous bicycle parking in front of businesses.

Because street trees on the Shopping Street will be grated instead of located in large open planters, provisions will need to be made for adequate root and soil volume. A root space protection zone is proposed from the face of adjacent development to the edge of the vehicular travel lane, in which a structural matrix can be used to support pavement over a high-quality growing medium.

STREET ORGANIZATION

BSP-84. Develop the Shopping Street consistent with the City of Bellevue's design for 130th AVE NE and this plan.

BSP-85. Work to allow the Shopping Street be utilized for community events such as, but not limited to, street fairs, farmer's markets, festivals, and other events that support BelRed's creative and artistic character.

BSP-86. Allow for the incorporation of parklets and streeteries into on-street parking areas.

SHOPPING STREET STANDARD DIMENSIONS						
Shopping Street	Motorized Zones (total width)		Non-Motorized Zones (total width)			
	Travel Lanes	Parking and valley curb	Bicycle		Amenity Zone	Sidewalk Zone
			Buffer	Lanes	Amenity	Pedestrian Thru Zone
130th Ave. NE north of NE Spring Blvd.	38' total		45' total			
	(2) 10.5' Travel Lanes	(2) 8.5' Parking lanes +valley gutter	(2) 3' Buffers	(2) 5' Protected Bicycle Lanes	(2) 5.5' Amenity Zones	(2) 9' Sidewalks

Figure 39. *Shopping Street Standard Dimensional Requirements.*

BSP-87. As 130th transitions into a mixed-use retail street, work to maintain access, and consolidate access points where possible, into existing uses. Where access to existing uses is provided it should be clear that pedestrians and bicyclists are prioritized.

BSP-88. As property is redeveloped access points for prior uses should be removed and replaced with frontage improvements consistent with the street design.

BICYCLE INFRASTRUCTURE

BSP-89. Incorporate ample bicycle parking for personal and shared bike use along the Shopping Street. Preferred locations are in bike corrals in on-street parking stalls at the front of a parking lane adjacent to intersections. Bike s on the Shopping Street should be considered design elements and should feature forms that evoke BelRed's creative and artistic identity. Also include a regular distribution of bicycle racks along the length of the Shopping Street.

SIDEWALKS

BSP-90. Provide a minimum of 9' of through zone on sidewalks.

BSP-91. Incorporate the paving design developed for 130th AVE NE by the City of Bellevue.

INTERSECTIONS

BSP-92. Minimize pedestrian crossing times through the use of curb bulbs and minimum roadway widths.

BSP-93. Maintain minimum requirements for fire and other large vehicle turning radii.

BSP-94. Incorporate artistic treatments to crosswalk areas that are ADA-compliant.

LANDSCAPE

BSP-95. Design understory plantings to reflect northwest planting character and conform to the planting design developed by the Bellevue Transportation Department for the Shopping Street. See definition of northwest planting character on page 8.

BSP-96. Utilize the Shopping Street Tree Palette for street tree selection.

Shopping Street Tree Palette

STREET	PRIMARY TREE 1	PRIMARY TREE 2
130th AVE NE - Spring to Northup Way	Gingko biloba 'Magyar'	Gleditsia tricanthos 'Skyline'

STREETSCAPE ELEMENTS

BSP-97. Incorporate artistic, colorful or interesting streetscape elements that reinforce BelRed's creative and artistic identity. See Streetscape Elements Chapter for standards and suggested uses.

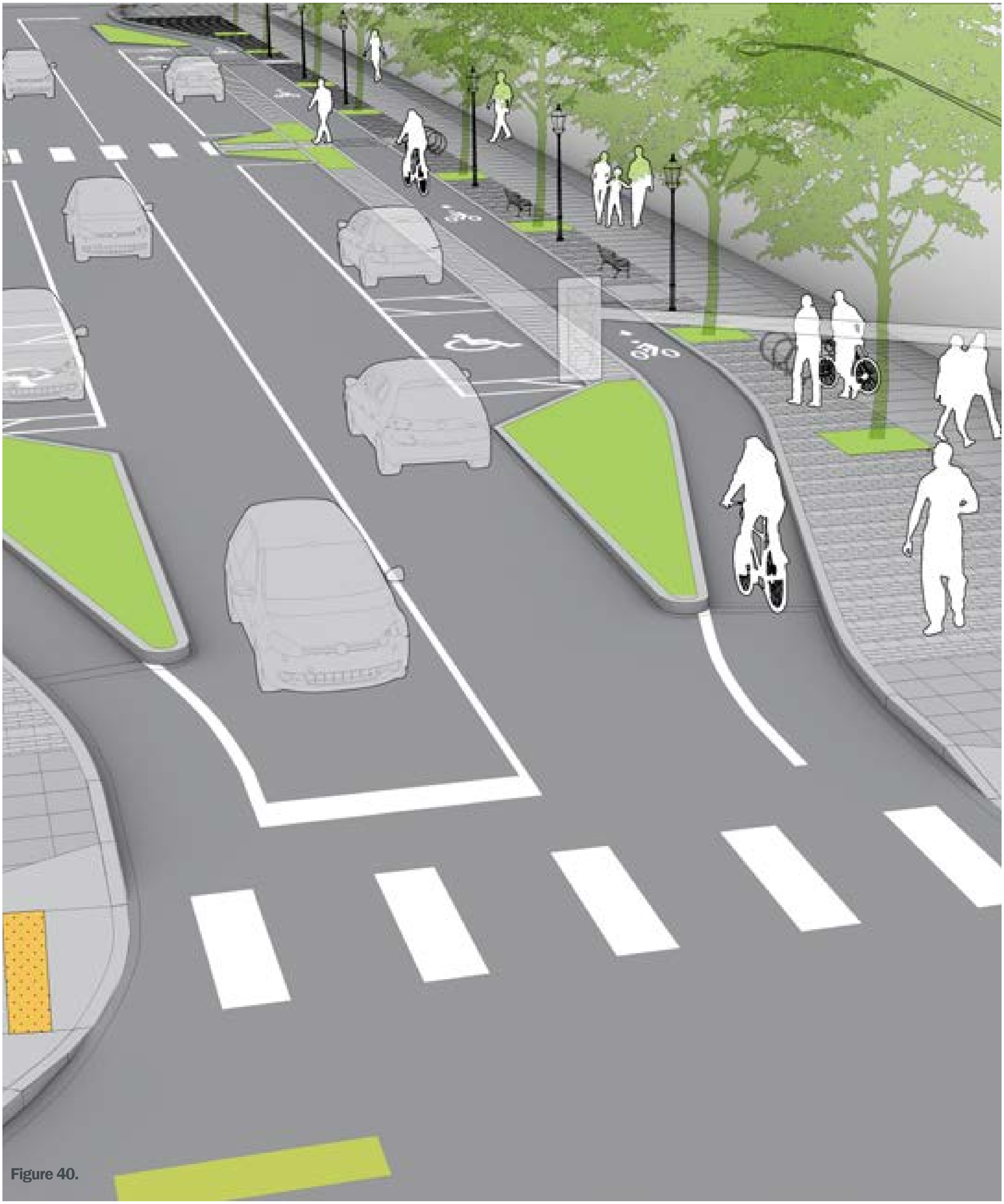


Figure 40.

SHOPPING STREET - TYPICAL NORTH OF SPRING

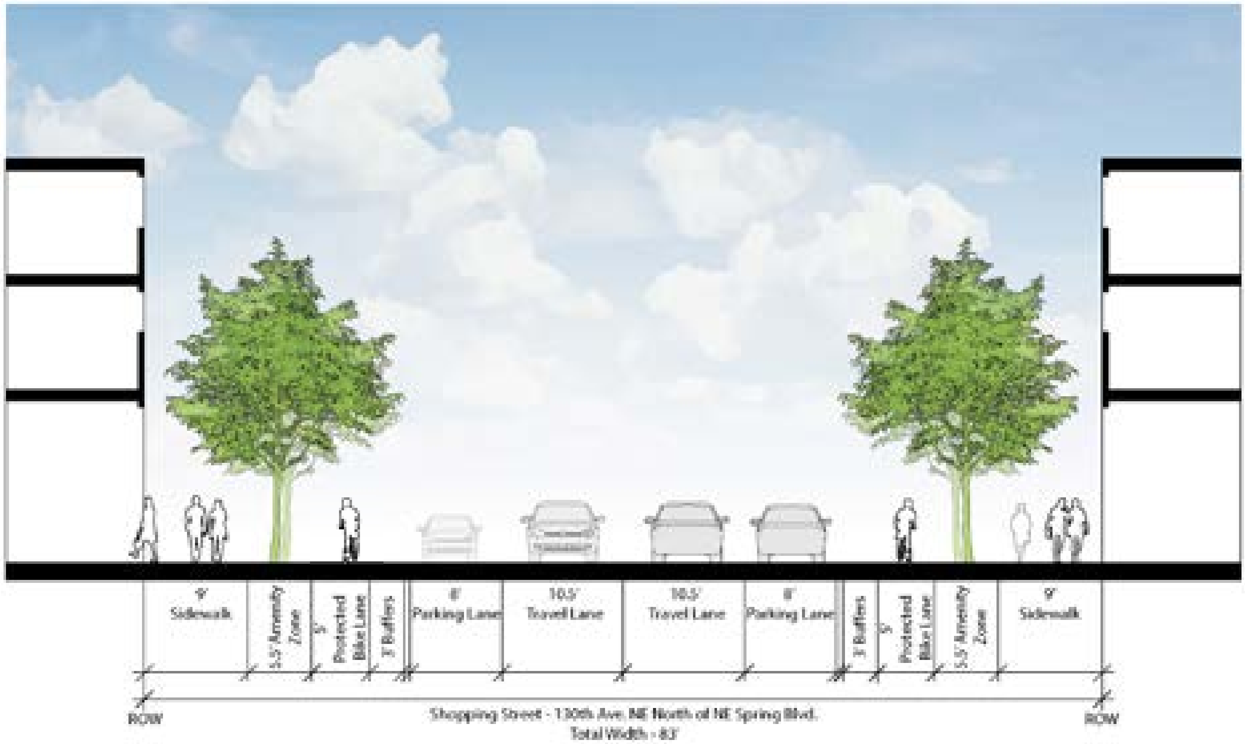


Figure 41. *Typical Section for the Shopping Street.*

SHOPPING STREET - SIDEWALK STANDARDS

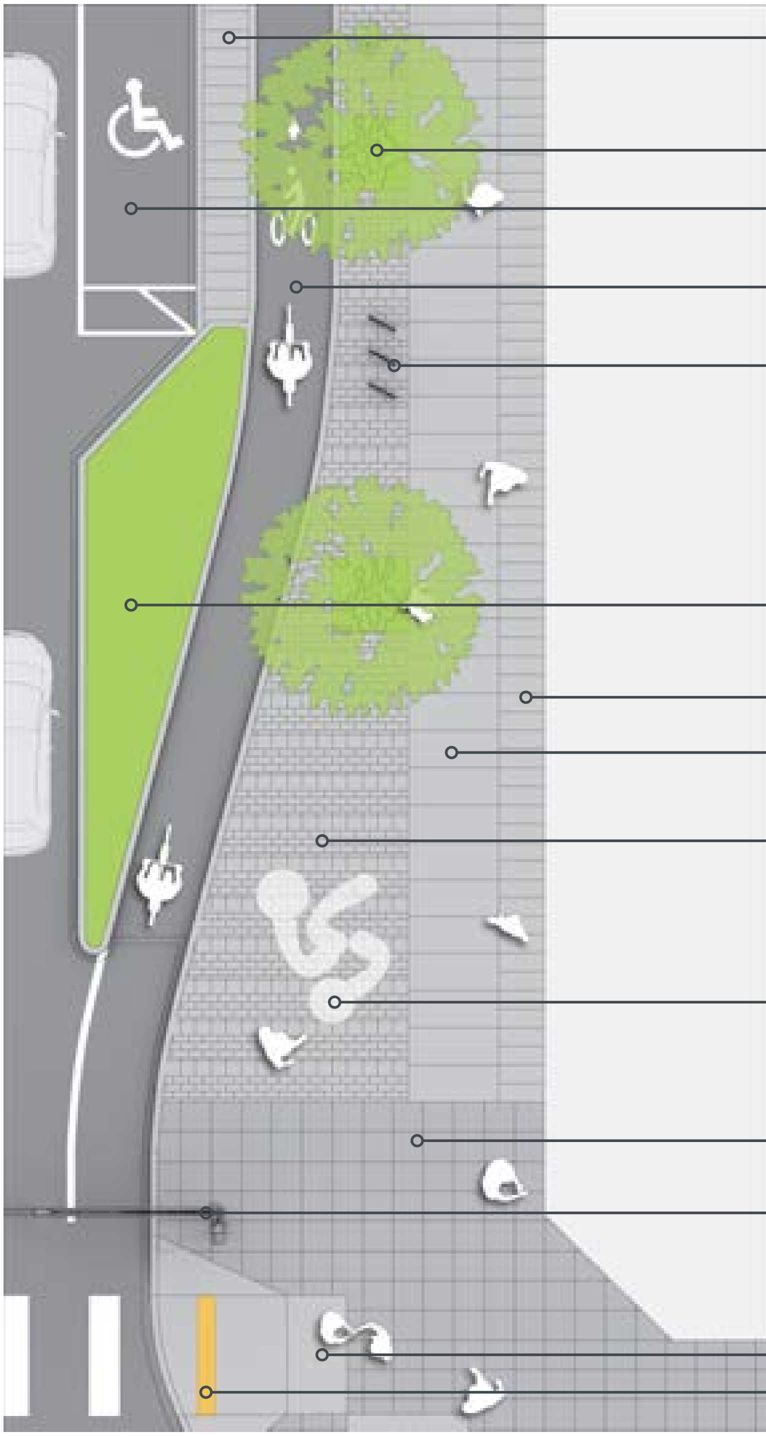


Figure 42. *Sidewalk standards for the Shopping Street. Design elements should match design developed by the City of Bellevue for 130th.*

SHOPPING STREET - INTERSECTION STANDARDS

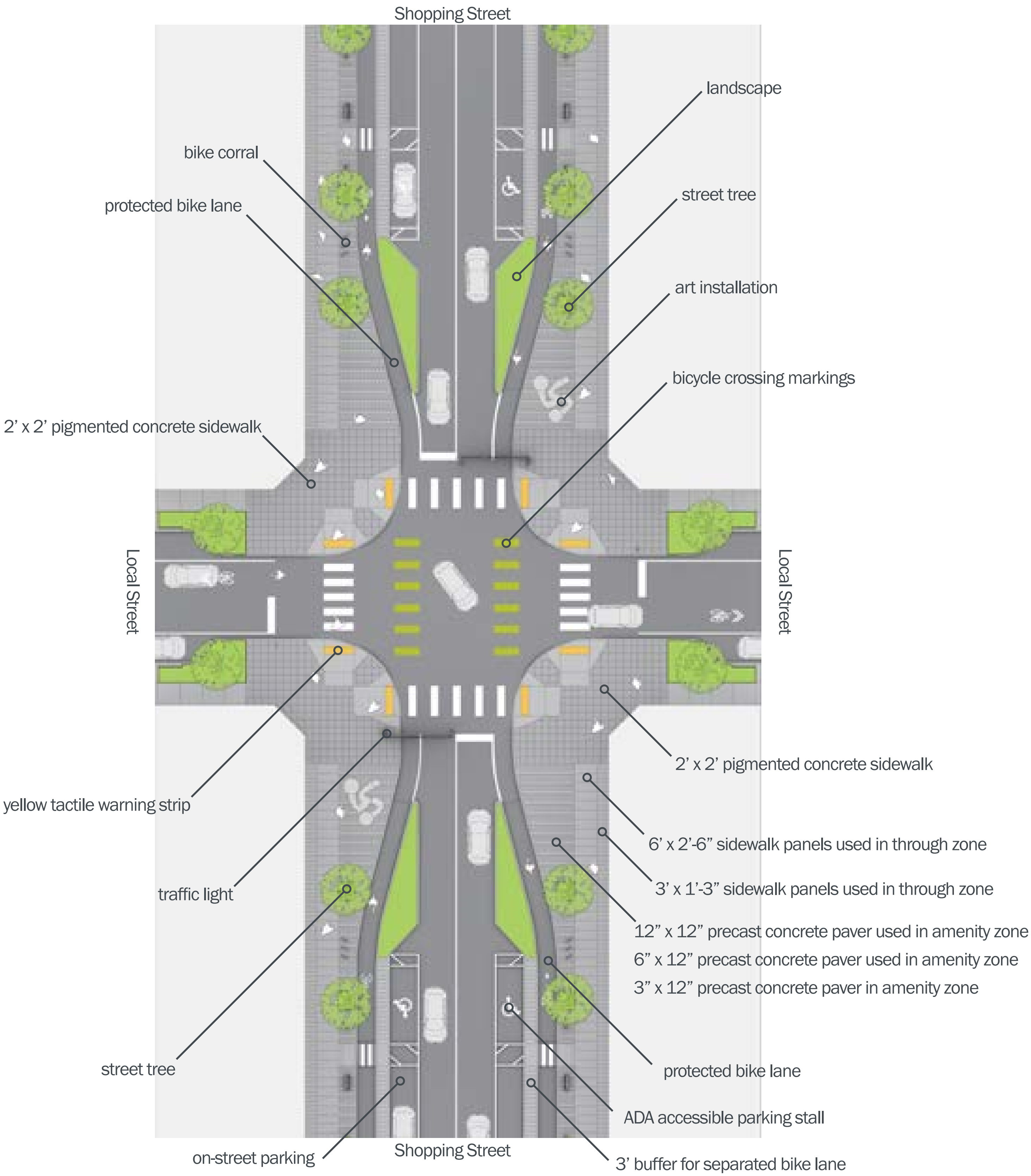


Figure 43. *Intersection standards for the Shopping Street intersecting with a Local Street. Design elements should match design developed by the City of Bellevue for 130th.*

05 PUBLIC ART

CULTURAL CONTEXT

Art in everyday life brings a sense of meaning and place to local residents, gives visitors a lasting memory and a reason to visit, and reflects a city's long-term investment in the future and the vitality of its citizens. Art plays a significant role in creating places where people feel connected, inspired and challenged, and where they want to return again and again. The art and cultural vision developed as part of the BelRed Streetscape Plan will play a vital role in creating community cohesion, active streetscapes and a new sense of place and engagement in the neighborhood.

The purpose of this public art plan is to guide how public art will become part of BelRed's streetscapes throughout their development and transformation. It aims to establish a strong and cohesive vision for public art, develop a thematic framework that helps tie together future public art opportunities in the district, and to outline the role public art will play in creating identifiable, vital places within the BelRed community.

The public art chapter of the BelRed Streetscape Plan is intended to address art in or facing streetscapes within BelRed. It understands BelRed's streetscapes as spaces that are constantly in flux and proposes ways in which public art can fit into a neighborhood where development is likely to take place over many years and stages.

BelRed's status as an Arts District positions it as an important place to encourage the creation and exhibition of art as part of the culture of the city of Bellevue as a whole. This plan is unable to address a chief concern of providing affordable and available space for artists and arts organizations within BelRed. It can, however, help anchor the arts into BelRed's public realm, working to provide space for artworks, performance, and artistic expression within the streetscape network.

This plan intends to create enriching, meaningful art opportunities for artists. "Enriching" means that the work does more than mark a location. Instead, it offers the chance to immerse the resident, visitor or passerby in a unique experience that incites pause, reflection and is an invitation to interact, respond or engage in a new perspective or way of thinking. The plan will provide history and cultural context, develop a vision and thematic framework for public art in the district, establish overarching public art principles, and determine public art typologies and potential art locations within BelRed's streetscapes.

BelRed is located between Bellevue's technology-heavy dense urban Downtown to the west, Microsoft headquarters in Redmond to the east, Overlake to the northeast, and Wilburton to the south. It currently is home to many light industrial production plants, small businesses, and commercial services. Due to much of BelRed being rezoned from light industrial to more dense mixed use neighborhoods in 2009 in preparation for light rail coming to Bellevue, BelRed is going through a significant transformation. This change will take place over many years, positioning BelRed within an interesting condition, with one foot in the past and one in the future.

The high level vision for BelRed looking forward, involves a pattern of nodal development that will create a series of unique communities within the wider district. The light rail stations at 120th Avenue (the Spring District node) and 130th Avenue (the Arts District node) will become their own identifiable neighborhoods with multi-story high density commercial and residential development. The intention is for these nodes to become smaller, walkable community pockets linked by mass transit. A third node focuses on medical and offices uses and is located roughly around Overlake Hospital and includes the Wilburton Light Rail Station, actually a part of BelRed.

Currently, different areas of the district are changing at different paces. Most development to date has been clustered in the Spring District node, the area closest to downtown. There, many projects are recently completed or under construction. Other areas of the district have yet to see significant change from when BelRed was zoned for light industrial. Though light industry has significantly declined since the turn of the 21st century, Safeway and Coca-cola still each have large bottling facilities and distribution centers located just outside of the Spring District. Further east, where the Arts District node at the 130th Avenue light rail station will be located, a high density of auto mechanic shops, beauty salons, self-storage yards, and car dealerships occupy existing strip malls that line many of the streets. Hidden within the fabric of these strip malls are some artists and art organizations who moved into the area as larger spaces became available for affordable rents.

Interestingly the BelRed area originally housed a diverse community of immigrants living and working on the land prior to WW2, before the district's conversion into a predominantly commercial and light industrial area.

BelRed's future vision is catalyzed by upcoming high density residential and office development, planned for the nodes located around the three light rail stations in the district. As people begin to settle in these homes and businesses in the offices, the community is becoming once again a multicultural, diverse place, with immigrants from around the world moving to the area to live and work.

As the streetscape and buildings of BelRed have began to transform so have the types of businesses settling in the district. Recently, many digital companies, startups and education centers in the tech industry have established themselves in BelRed, backed by its proximity to Downtown Bellevue and the Microsoft campus in Redmond. The Global Innovation Exchange (GIX), a global education partnership between the University of Washington, Tsinghua University in Beijing, and Microsoft to develop leaders in technology innovation, has its local campus in the Spring District.

At the heart of the new development in BelRed is a goal to create a network of parks and open space that stem from the restoration of a number of natural riparian

BelRed today, with light industrial buildings housing commercial services and the beginnings of development in the Spring District.

areas crossing the neighborhood. Five creeksheds cut through the district, but all have been neglected for many years. There are plans to daylight and establish a native plant riparian corridor around one stream system: West Tributary. Another creekshed, Goff Creek, has sections that currently run above ground and is likely to be partially restored. These natural corridors will bisect pockets of more intense development, providing access to open space and a reprieve from city life.

The route of the former Lake Washington Belt Line railway has recently been transformed into the Eastrail corridor, a dedicated cycling and pedestrian path that runs 24 miles through communities to the East of Lake Washington. The corridor is a crucial piece to connect the network of recreation trails that will spread through BelRed and beyond.

Due to the implementation of the BelRed Streetscape Plan, the district's streets will undergo rapid change over the next several years. It is likely that arterial streets will be built or refurbished before new buildings and smaller scale streets are constructed around them. This places the streetscapes, and the public art within them, as the mechanism through which change is taking place in BelRed moving forward.

Concept rendering of the future of BelRed, with pockets of intense urban development concentrated around rapid transit stations and bisected by natural corridors. Rendering developed by VIA Architects for the City of Bellevue's use.

ART IN BELRED

The decline of light industry throughout BelRed in recent years has led various artists, arts organizations, and creative businesses to move into empty commercial developments and warehouses in the district. Most are currently hidden from view, veiled within the fabric of the neighborhood. Many of these organizations and businesses are dedicated to children's arts programming as well as a substantial concentration of music-related businesses, including recording studios, practice spaces, custom guitar shops, music stores and businesses offering children's music lessons. There are also a number of dance studios in the area, including the Pacific Northwest Ballet's Francia Russell Center; a campus for one of the top ballet training institutions in the United States.

Recent cultural asset mapping shows many of the artists, art organizations and creative businesses located in BelRed are currently concentrated roughly around the 130th Station node. As a result, a high-level vision was proposed by the City for this area to become the heart of the BelRed Arts District: a vibrant neighborhood imagined to have artist live/work studios, galleries, art events, and public art. Much work still needs to be done to support and establish the vision for the arts district, and to support artists and art organizations in BelRed, especially as pressures on the arts community increase due to neighborhood development.

Public art, currently installed and in progress in multiple areas in BelRed is beginning to encourage creativity spilling into BelRed's streetscapes, which this plan will expand upon. Included in BelRed's current list of public art is Christian Moeller's *Nails*, a linear series of large-scale painted steel structures that resemble abstracted nails driven into the ground. The piece is located along the Eastrail beside Sound Transit's Operations and Maintenance Facility East, and alludes to the historical use of the corridor as a rail line.

Salmon Woman & Raven, a bronze sculpture by local Washington artist Tom Jay in 1991 is located within Bellevue Highlands Park, near one of BelRed's creeksheds. The piece speaks to the beauty of the natural world and its interconnectedness to human community, art and tradition.

Artist Po Shu Wang has an upcoming project in the district, located at the corner of 130th Avenue and Spring Blvd. His piece, to be completed with the construction of 130th Avenue, is a sound bath that transforms BelRed's unique magnetic declination into a sonic experience, creating a musical score that expresses the community's place and identity. The artist is also working with the project architect of 130th Avenue to integrate an abstraction of this musical score into the pavement design of the streetscape.

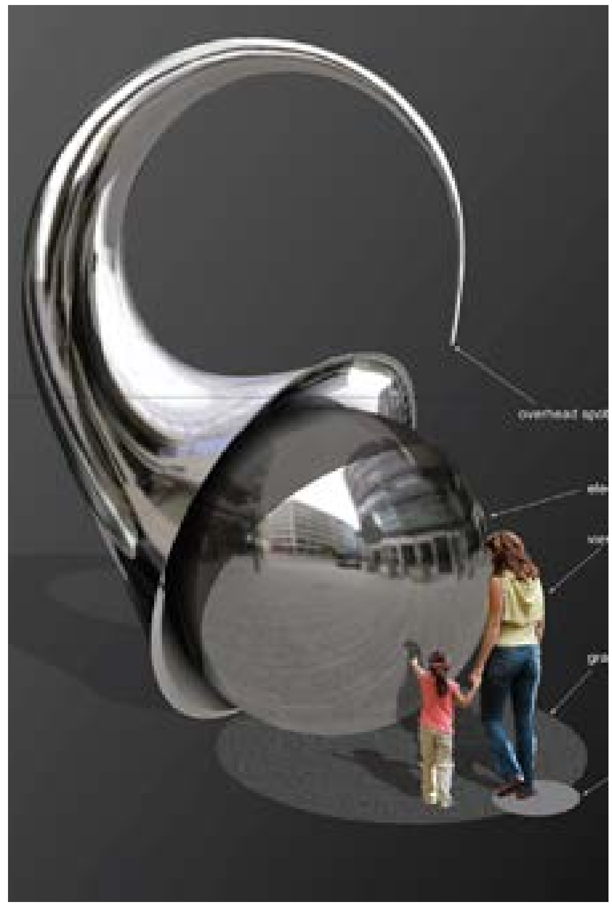
With the completion of the Eastlink rail system will come three more public art pieces integrated into the design of the stations. At Wilburton station (located at the south-western edge of BelRed), Philip K. Smith III is designing an active cross-shaped tower that reflects the surrounding context during the day and is illuminated by colorful internal lighting at dawn and dusk.

Louie Gong, an artist with both Indigenous and Asian heritage, is designing a series of cut metal pieces for the inside of 120th Station in the Spring District. The pieces represent a phoenix and a dragon, illustrating the blending of cultures and legends in the Pacific Northwest.

At 130th Station, in the Arts District, artist Patrick Marold is developing an integrated piece into the railing of the station. The artwork is activated by the natural environment, casting dynamic shadows on the ground when hit by the sun.

There is also an interpretive element honoring the story of Japanese Americans who lived in the area that will be located at the Bridge at NE 8th Street along the Eastside Rail Corridor.

Although vastly different in concept, materiality and scale, each of these existing and upcoming public art projects in BelRed, along with the public art opportunities proposed for BelRed's streetscapes in this plan, will help visitors and residents feel connected and inspired as BelRed develops into a uniquely rich and multi-layered new community with art and creativity at its center.



Artist Po Shu Wang's artwork (rendering above) will be located at the intersection of 130th and Spring Boulevard. It will be an interactive piece where pedestrians are enveloped in a soft sound bath made from layers of recordings of BelRed musicians.

Nails, by Christian Moeller, was installed by Sound Transit on the Eastrail on the west side of their operations and maintenance facility in BelRed.

CONCEPTUAL FRAMEWORK FOR PUBLIC ART

Through investigation of the existing context and future vision for BelRed, an overarching theme emerged that provides a conceptual framework for thinking about the proposed public art typologies within BelRed's streetscapes. This is summarized as:

"THE INTERMEDIARY/IN-BETWEEN"

BelRed's streetscapes occupy the liminal space between buildings, physically acting as the intermediary space between specific locations where people work, live and play. In this way they become the interstitial connective material of the community, with potential to become active, lively spaces where people want to congregate and exchange ideas. Public art can play a critical role in these streetscapes, mediating between private and public conditions and providing a layer of intrigue and wonder that activates and transforms the community.

As significant change continues to occur in BelRed over decades as the district develops, there exists an opportunity to also occupy a time between states, within the tension created between BelRed's history and its future. Public art can become a mediator of this "in-between"condition, helping to bridge this gap and providing opportunities to explore and question the tensions and dichotomies inherent in this ongoing transformation.

Streetscapes, and the public art created within them, can act as the driving mechanism through which change is taking place in BelRed. As many streets will be built or refurbished before new buildings along them are constructed, public art can be at the forefront of change, an opportunity to both contemplate the district's future and respect its past; a way to root identity and placemaking into the district's transformation over time.

Along with being rooted in this particular and unique conceptual frame of reference, artworks created for BelRed's streetscapes will also contribute to and support the overall mission for Public Art for the City of Bellevue as a whole.

BELLEVUE PUBLIC ART MISSION

"The City of Bellevue seeks to be a vital platform for cultural exchange and creative inspiration. The City turns to living artists to enrich the collective experience of Bellevue's public places through permanent commissions and a growing collection of movable artworks funded through the Public Art Program. A segment of the collection is devoted to artworks that raise the discourse on the defining aspects of Bellevue's civic life, exploring the diverse identities of our residents, converging cultures, international connections, technological currents and interplay between nature and the urban experience that make Bellevue's environment unique. Bellevue's art collection helps document the dynamic moments and complexities of Bellevue's cultural life and is an important resource for future generations."

PUBLIC ART VISION FOR BELRED

Public Art in BelRed will respond to and help to mediate the transitional nature of its streetscapes in both time and in space, reflecting the distinct character and experience of the district and its diverse communities. The collection of works created will strive to unite geographical, social and cultural contexts, enriching the experience of residents and visitors to the BelRed district and stimulating civic discourse. Public Art in BelRed's streetscapes will aspire to have an interest across time and across repeat visits for a broad range of public audiences, ensuring relevance as the district transforms in the future.

Note: While this plan is targeted on public investments in public art in BelRed's streetscapes, private developers may find this plan helpful in developing artwork on private property that is viewable from public rights-of-way.

THEMATIC FRAMEWORK

The following thematic framework derives from an in-depth investigation of the BelRed context as summarized in the earlier sections of this document. The conceptual underpinnings outlined in this section are not meant to be prescriptive, but rather to inspire future artists about BelRed's unique context and to give them a "jumping-off" point to develop their own response to the particular conditions of their project. Public art opportunities that develop as a result of this plan can vary in terms of scale, temporality, medium and approach but are expected to be responsive to BelRed's unique context in some way.

As BelRed continues to evolve over the next decade or more, the idea of change is critical. Although it is likely that many areas of BelRed will look drastically different within the span of a decade, change in the neighborhood will not be cohesive nor consistent. Thematically, artwork created as a response to, or mediator of change can help people adjust to and embrace the district's transitional state as well as forming an expansive framework that can tie the artworks created into a cohesive collection. The characteristics inherent in a transformation – namely a shift in appearance, in state, in experience, in location, or over time will inform each opportunity and the way each artist works.

Three themes for public art, rooted in the concept of change, represent a broad foundation for public art in BelRed. Each theme exists within an "in-between," drawing from BelRed's past, present and future to understand the neighborhood as a vibrant, unique place.

These themes include:

- Analog/Digital
- Natural Reclamation
- Intertwining Cultural Dialogues

ANALOG/DIGITAL

BelRed is currently undergoing a change from a place where physical products were once grown, farmed, made and stored, to a place where digital industries and information are developed.

Physical industry that grew or produced material goods once dominated BelRed, at first in the form of agricultural production and then more recently as packing plants, bottling factories, and self-storage yards. Agricultural production disappeared from the area by the 1960s and light industrial production has been in decline for many years. In its place, digital industry is beginning to establish, including a variety of tech startups and video game developers, as well as the Global Innovation Exchange (GIX) and major technology firms like Facebook. Additionally, BelRed's location along a mass transit corridor between Microsoft's headquarters in Redmond and Downtown Bellevue, positions it as a place where people working in digital industry are likely to live.

These extensive shifts in business and land use happen over decades. As BelRed continues to experience change, it is likely that analog and digital industries will continue to operate next to each other in changing amounts.

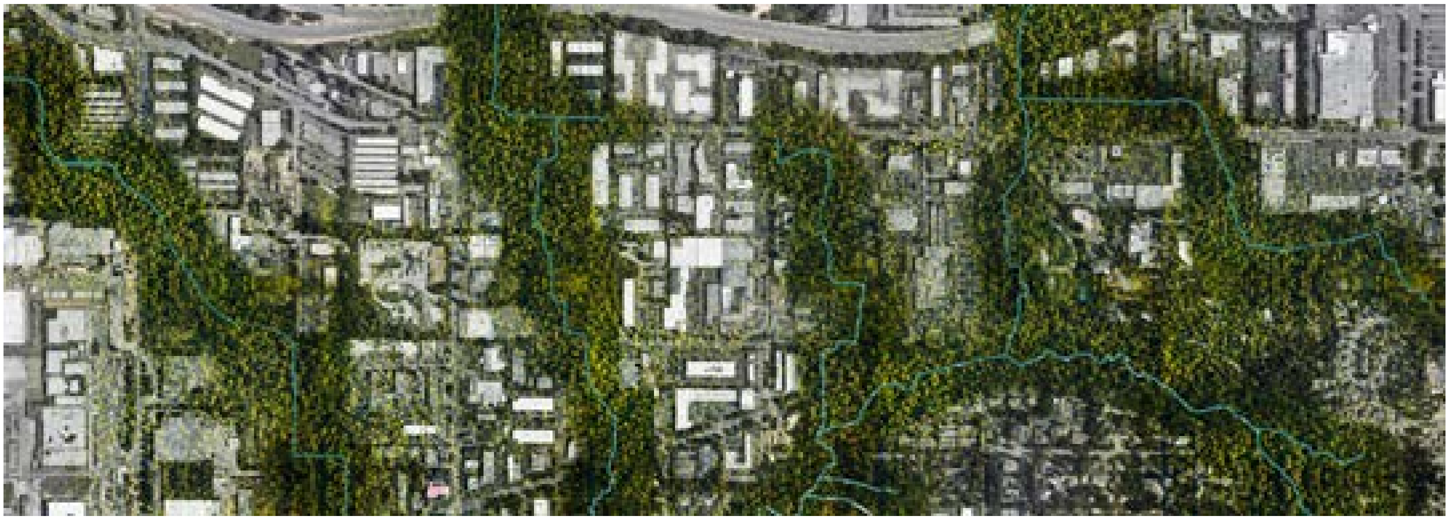
There is an opportunity for artists to investigate this push and pull between the analog and the digital present within BelRed, with explorations that examine the relationship between what we can physically touch and what exists only virtually. Investigations could range from such things as the *tangible* in relation to the *ephemeral*, the *concrete* to the *fleeting;* what exists *physically* in relation to what exists in "*the cloud*."

Possibility also exists for artists to consider the digitization of the analog world. Everyday life, over time, appears to be becoming more and more virtual, with work, social interaction and many services now facilitated by digital technology. How does technology change the way that we occupy and interact with place? What does this mean for how art is displayed and interpreted in the public realm?

These concepts could be considered both thematically and in the approach of the artwork created. Artwork could occupy the streetscape in a physical form, through a digital medium, or by way of an interplay between the two. Artists could also challenge how artwork occupies the streetscape at different time scales, with opportunities to create ephemeral works, temporary artworks and performance-based artworks.

Reference Projects:

- Sunset/Sunrise, Sans façon. Hamm, Germany, 2014
- Hello Lamp Post, PAN Studio. Various locations, 2013-present
- Variegation Index, Regents Place Campus London, 2019, Jason Bruges Studio
- McLarena, daily tous les jours, Various locations, 2014-present



NATURAL RECLAMATION

BelRed's history describes the process of clearing one land use to make way for another. Once a series of rich creek ecosystems, the land was logged, farmed and then cleared to build large industrial buildings. Now we have come full circle, with goals to restore the natural creek systems and forests that used to cover the area hundreds of years ago. Future plans to restore major riparian areas that have been neglected for a long time will position nature and open space at the heart of the community while being surrounded by urban development.

Along with this, the BelRed Streetscape Plan also envisions the development of new Green Streets replete with both natural and human-made elements such as trees, native vegetation and stormwater infrastructure that will provide ecological and hydrological functions as well as serve to connect open spaces across the corridor.

Nature and human industry have also been connected throughout BelRed's history. Recent industry ignored the hydrology and natural systems present in BelRed in favor of clearing the land to build large-scale factories, industrial strip malls and parking lots. In contrast, Japanese American farmers in the early 20th century utilized the stream systems to irrigate their farms by harnessing the power of gravity to pipe water from the streams to their crops.

Artists have the potential to reflect on the tensions between natural and urban settings. This includes exploring the vertical layering of these systems when they meet in the public realm (for instance, when a stream meets a street), as well the interplay between nature and the urban experience.

Nature could also be interrogated as a function and indicator of time. Our primary visual experience of time is through nature, as the sun moves across the sky over the course of a day or the seasons change over the course of a year.

Reference Projects:

- *Ground Water SeaLevel*, Germaine Koh. North Vancouver, BC, 2014
- *LIght Keeper*, Caitlind r.c. Brown, Wayne Garett, and Studio North. Toronto, ON, 2019
- *New York Crossings*, Ned Kahn. Queens Tunnel Midtown, NYC, 2017

INTERTWINING CULTURAL DIALOGUES

As BelRed develops, it is rapdily becoming a multicultural, diverse community, where immigrants from around the world are settling at increasing numbers. Today, 40% of Bellevue's population were born in another country.

BelRed's history is marred with racism and discrimination. In the early 20th century Japanese American people encountered countless prejudices. They were unable to gain American citizenship as immigrants and were barred from owning land in Washington State due to an alien land law passed in 1921. During WWII, after Japanese forces attacked Pearl Harbor, 300 Japanese American people from Bellevue were taken to incarceration camps. Their land was stolen and many of their homes burnt down.

It is impossible to think about BelRed's future as a place that welcomes diversity without contemplating its past. Art can try to bridge the gap between these two realities, providing opportunities for artists to honor and reflect on diverse cultural histories, identities and memories.

The growing cultural diversity of residents in BelRed also opens up opportunities to examine how cultures become intertwined over time. Artists have the chance to tackle and express in the streetscape what it means to live in a new place that is emerging within the space where cultures, ideas and people from around the world meet over time, pondering questions such as: What happens to the memories of those other places and cultures as time passes? What happens when there is an intersection of diverse cultures in the same space? How does the next generation contend with their own cultural identity and history in a multicultural space? How are dialogues complicated when diverse communities are embraced in the present when outlawed in the past?

The recurring history of displacement in BelRed could also be considered, with Japanese Americans being forced to leave their land during WWII and current businesses being forced out by new development today. Artworks could reflect on what it means to fill, occupy and live in space available because others are displaced.

Reference Projects:

- *White Ashes 9,* Kenji Stoll, Bellevue, WA , 2019
- *The Other Apartment*, Jon Rubin and Sohrab Kashani. Pittsburgh, US and Tehran, Iran, 2019-2020
- *Borrando la Frontera*, Ana Teresa Fernandez. Tijuana, USA/ Mexico, 2011
- *Breathing Lights*, Adam Frelin and Barbara Nelson. Various locations, NY, 2016
- *Teeter-Totter Wall,* Rael San Fratello, El Paso Texas/Juarez, Mexico 2019

PUBLIC ART PRINCIPLES

These principles are intended to inform, refine and shape the way in which art will take place in the BelRed district. These values form the foundation of the conceptual framework that will drive the process for public art. The principles are meant to be integral and integrated into every opportunity that results from this art plan, while also freeing and inspiring artists to delve, challenge and explore broad possibilities.

REFLECTIVE OF CONTEMPORARY PRACTICES

The program of works created will reflect contemporary art and the many ways in which artists practice; informed by and created in consideration of best practices and approaches internationally.

CONTEXT SPECIFIC

Artworks will be based in the geographical, historical and social context of a specific site and location within the city, characterized by the strong natural elements that converge here. This unique context will form the foundation of art opportunities creating a base knowledge that encourages interpretation and creative approaches that are unique, conscious and sensitive to place.

RESPOND TO TIME, DURATION AND CHANGE

Art created will not be static but will encourage and reflect the reality of change, evolution and transformation occurring within the District. Opportunities will focus on not just space, but also time allowing for an active and potentially evolving relationship with the viewer.

EXCHANGE, DIALOGUE AND DISCUSSION

The program of works created will seize the energy, ideas and connectedness that characterize innovative learning communities, channeling it to encourage social exchange, dialogue and discussion broad in nature and reflective of context.

A CONSIDERED FUTURE

Artworks and artistic approaches throughout will be mindful and intentional in considering overarching sustainability principles and objectives as well as environmental impact.

PUBLIC ART OPPORTUNITIES

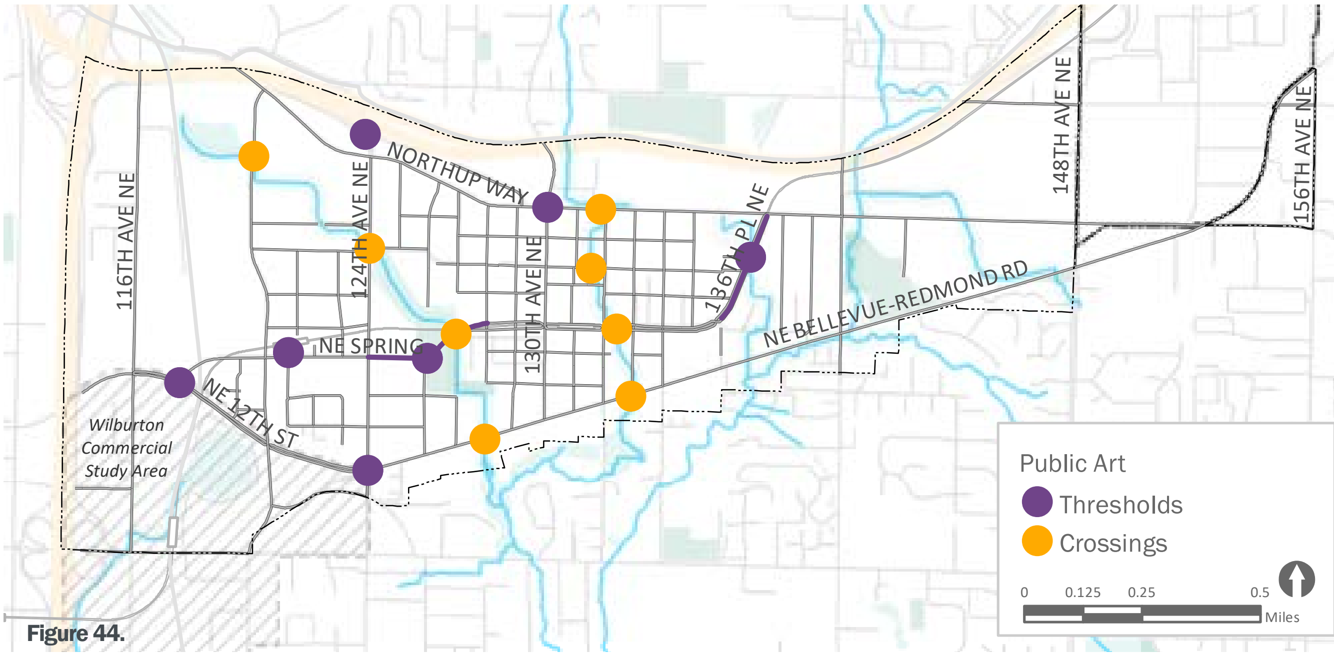


Figure 44.

Public art in BelRed's streetscapes has the chance to offer a contemporary approach, encouraging work to be made that is about, and reflects current context. Together, BelRed's public arts should express a cohesive artistic vision, while each individual commission contains a vitality that is brought through the specific approach and process of each contributing artist.

The art opportunities identified within BelRed are intended to create a diverse range of artistic explorations and expressions within the district throughout its transformation for many years to come. While the locations of opportunities are targeted towards city public art projects, private developers should consider this plan a useful tool for artists working to develop artworks for locations on private property that are viewable from public rights-of-way. These opportunities will reflect the public art vision and principles established in this document, involve artists in creating a dialogue between their practice and the site, and include a range of works in scale, temporality, medium and approaches. Art opportunities identified in this plan should not be considered an exhaustive list.

Additional opportunities include decorative crosswalks and intersection treatments, murals on walls along streetscapes and many other opportunities. Specific opportunities often depend on the unique design and conditions of a site.

The following list indicates the factors that contributed to the determination of prioritizing and selecting potential public art opportunities within BelRed:

- Visible and Accessible Location
- Timing and Open Opportunity for Artist Involvement
- Logistics of Site Development
- Reflective of Plan Principles
- Opportunity for Impact

PUBLIC ART TYPOLOGIES

The proposed art program for BelRed is intended to provide for a range of artistic approaches, supporting works that are longer-term as well as short-term and rotating. The goal is to inspire artists working at all scales and in various mediums to create pieces that are impactful and meaningful. Spanning multiple disciplines and durations, collectively these works will create a layered and multi-dimensional experience for viewers.

With this in mind, art opportunities have been classified into four typologies:

THRESHOLDS

Integrated, permanent physical elements which lend identity and character to their site, marking places of interest or significance within the community.

PLATFORMS

Platforms for public art that provide space for rotating, temporary or event-based artworks to animate streetscapes.

CROSSINGS

Groups of artworks that mark the intersection of natural and human systems.

MOBILE

Artworks that are temporary in location, activating different areas of the district over time as they move from place to place.

THRESHOLDS

A threshold represents the starting point of an experience or place. It can also be thought of as a suspended moment between two realities. Thresholds are distinguished from boundaries, referencing zones of transition instead of hard lines between two distinct ideas or spaces.

BelRed's location in northern Bellevue positions it between many established areas with their own unique and contrasting characters. High-rise buildings in Downtown Bellevue lie to the west, the more residential neighborhoods of Wilburton to the south, Bridle Trails State Park to the north, and the Microsoft campus in Overlake to the northeast.

As BelRed slowly transforms, its pattern of nodal development will create pockets of distinct character within the district. In particular, the light rail stations at 120th Avenue and 130th Avenue will each become their own identifiable neighborhoods, as well as a third centralized along the southwestern border of BelRed at the Wilburton Station

.

Artworks that create conceptual thresholds between all of these unique areas can help link them together, establishing central moments of identity within neighborhoods. They can mark a transition or change in character. They can register significant places in parks, plazas, corners, intersections and transit hubs. They will help lend identity to their site.

Threshold artworks will do more than just mark a location. They provide a chance to immerse the resident, visitor or passerby in a unique experience that incites pause and reflection, inviting people to interact, respond or engage in a new perspective or way of thinking about a particular place and time.

These works will mostly be seen by people in cars or on public transit but there will be some opportunity for engagement by cyclists and pedestrians. Threshold works should be of substantial scale and material in order to have presence within their specific site.

Reference Projects:

- *Monument to East Vancouver, Ken Lum. Vancouver, BC, 2009*
- *Untitled (Toronto Lamp Posts), Tadashi Kawamata. Toronto, ON, 2009*
- *Passage, Lilienthal + Zamora. Seattle, WA, 2015*
- *Transforest, Lead Pencil Studio, Seattle WA, 2019*

Figure 45.

1 NE 12TH STREET AND SPRING BLVD.

The intersection of NE 12th Street and Spring Boulevard is the main entrance and exit to BelRed, linking Downtown Bellevue to the neighborhood. It is a threshold to the Spring District, the node around 120th station that is currently in the process of development. The intersection acts as a connecting point for cars, pedestrians and cyclists to key elements of BelRed. It is both the beginning of NE Spring Boulevard, the main road that runs through the district, and a planned link for cyclists and pedestrians to enter the Eastrail, an integral piece to the network of trails that will spread through BelRed and beyond.

Goal: Artist to create a work (or possibly 2 pieces in dialogue across the street from one another) that strongly reflects the identity of BelRed. The work should leave a strong visual impression on those who pass by it and begin to connect and mitigate the space between BelRed and its surrounding context.

Figure 46. *Spring Blvd and NE 12th future Threshold artwork location.*

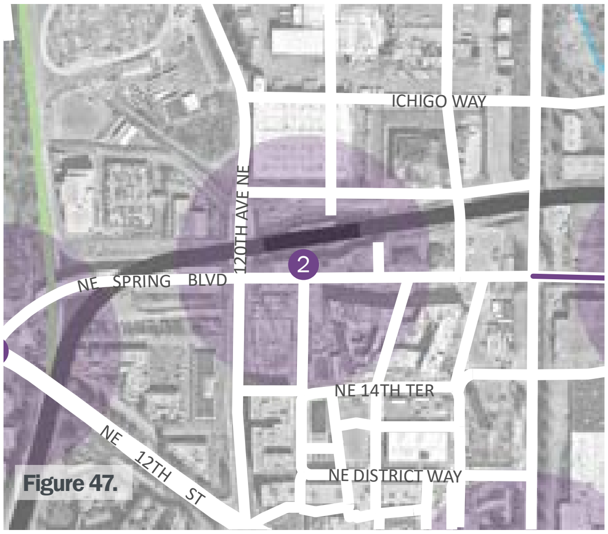


Figure 47.

2 SPRING BLVD SCRAMBLE AT 120TH STATION

This location marks the entrance to the 120th Station in the Spring District. One must pass by it when leaving the light rail station and walking towards the Spring District. It lies in the space between a pedestrian scramble and a plaza - two places of activity and intersection.

Goal: The artwork is to have a dialogue with pedestrians, commuters and cyclists who will likely pass by the piece multiple times a day during their commutes. It is to be interactive, welcoming, and/or spark contemplation and reflection about the work's immediate surroundings and the wider Spring District.

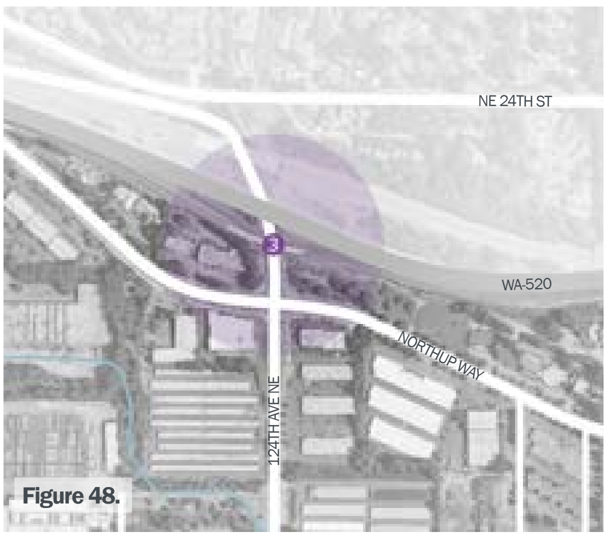


Figure 48.

3 124TH AVE AND NORTHUP WAY

This intersection is an important entrance and exit for cars to and from BelRed off of Highway 520, connecting the area to surrounding communities in Seattle, Redmond and Kirkland. The site is bisected by a highway overpass that has the potential to become a vibrant passageway if used as a canvas for art. It is visible to cars and pedestrians from 124th Ave NE. WSDOT plans to renovate the overpass. An artist should be included at the start of the renovation design process.

Goal: To create a vibrant and memorable entranceway into BelRed that is of a scale that it can be appreciated by people in a passing vehicle and pedestrians from a distance on 124th.

Figure 49.

4 124TH AVE NE AND BEL-RED RD

This location identifies a transition between BelRed and Wilburton along 124th Ave NE. It lies in an area once farmed by Japanese American farmers and at the threshold between a residential neighborhood, the heart of the former light industrial area and density of the Spring District. With the transition to mixed use development from light industrial happening at very different speeds depending on the property, this site is unique because of its history and changing and distinct conditions.

Goal: To create a work, or a linear series of works that visually connect BelRed's history, current context and possible future. The work could respond to time and reflect on the potential transformation of the spaces adjacent to site in the future.

5 SPRING BLVD ZONE 3

Zone 3 of NE Spring Blvd is planned to be an elevated road and multi-purpose path for cyclists and pedestrians that rises above the West Tributary. This future bridge will be highly-visible and afford views down to the open space below. An artist should be brought onto the design team at the beginning of the project to identify and realize a distinct opportunity for art within the design of the overland bridge.

Goal: Integrate art into the infrastructure design of the bridge in a way that creates a powerful experience for bicyclists, pedestrians motorists, and other users as they move through the district. The work could reflect on the layering of natural and human systems, possibly engaging with people both under and on top of the bridge.

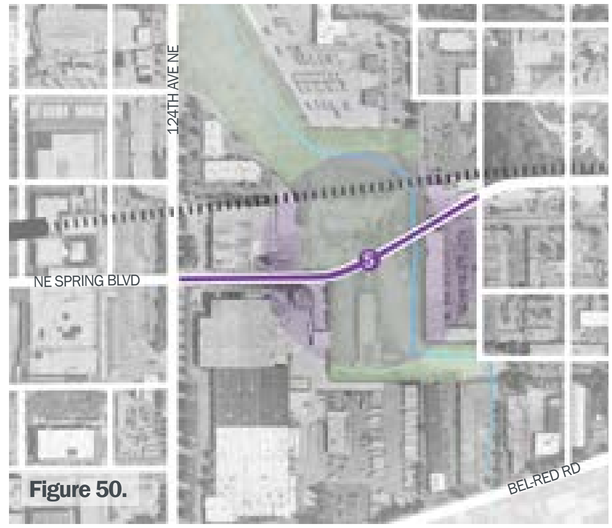


Figure 50.

6 130TH AVENUE NE AND NORTHUP WAY

130th Ave NE is to be a bustling, active, retail streetscape that acts as the heart of the 130th Station node, a more residential area imagined as the core of the arts district. This intersection with Northup Way marks the north end of 130th Ave and defines where pedestrians become a priority. It also delineates the start of Po Shu Wang's integrated streetscape art to be installed at key locations along the street.

Goal: Create a human-scaled, three-dimensional, interactive work that fosters a sense of play, activates the intersection and invites participation from passersby. The work should thoughtfully consider its dialogue with Po Shu Wang's nearby street surfacing project.

Figure 51.

7 SPRING BLVD ZONE 5

Along NE Spring Blvd Zone 5, the LRT is to sit at-grade beside the road. This road will act as the edge of the arts district and should embody the vibrancy envisioned for that area. The east side of the road is anticipated to be the beginning of the commercial node, an area that is likely to remain similar to its current state. The corridor is currently under construction, so art will likely need to be integrated after the roadway is complete.

Goal: Activate the space between the LRT line and the road through a linear, human-scaled, experiential artwork that captures the spirit of a community driven by the arts. The work should engage with both pedestrians and those traveling through the site on the LRT.

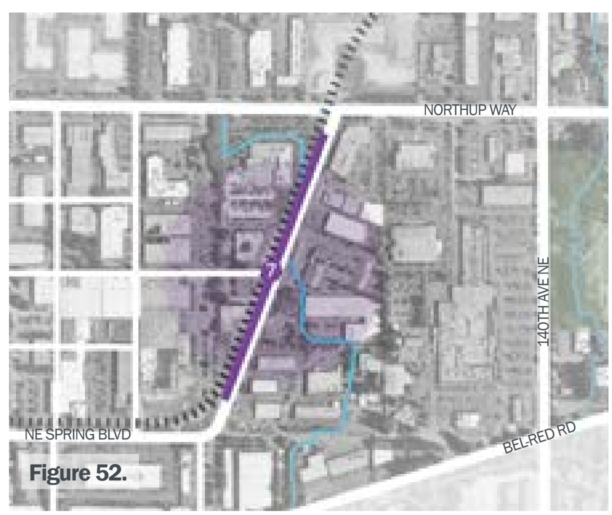
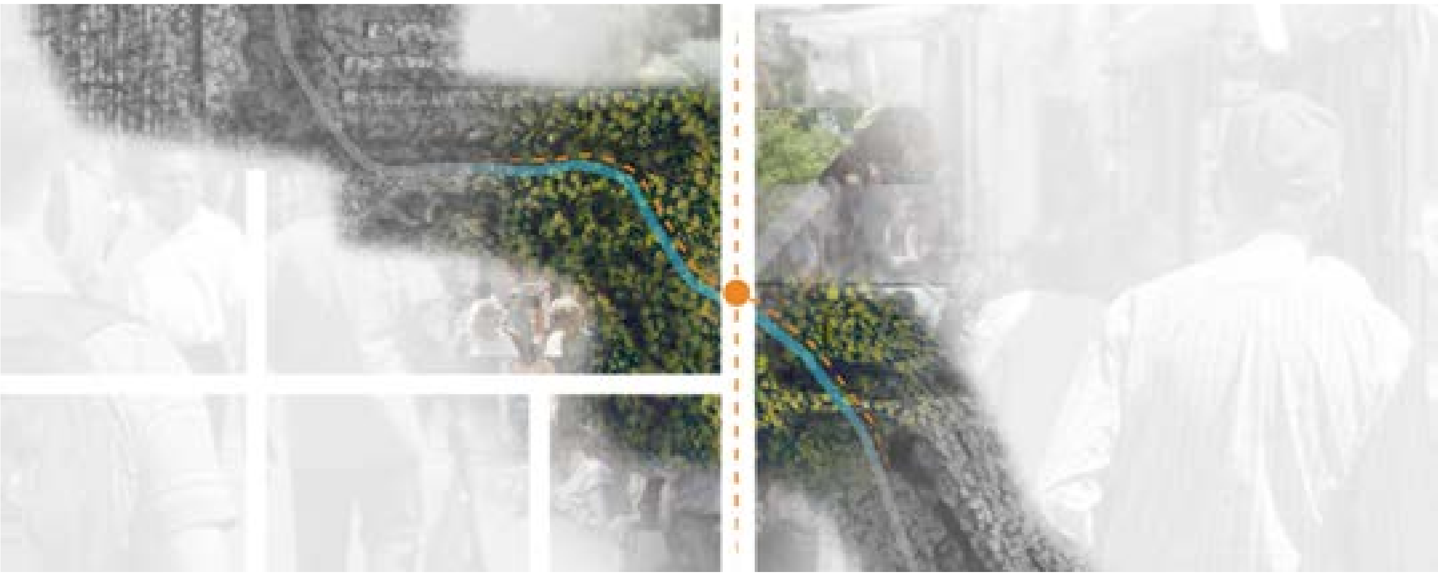


Figure 52.



CROSSINGS

Crossings are junctions where different elements intersect. They involve a layering of parts as systems compete for right of way within the same space. Crossings can also refer to a journey or action of moving through something, implying the presence of a narrative as one completes that journey.

“Crossing” artworks within the BelRed public art typologies are intended to interpret the intersection of natural and urban systems.

Each Crossing artwork is composed of a set of locations that mark where a restored natural creek system meets the street network. Each set corresponds to locations along the same stream, providing opportunity for the artist or artists to develop a narrative that links their series of artworks together. These sets of artworks will allow people to understand the stream networks that extend throughout the district and how those networks overlay on top of human systems. They reveal themselves slowly as one moves through the district, bringing attention to hidden systems below the ground.

Reference Projects:

- *Lost Streams*, Marian Penner Bancroft. Vancouver, BC, 1994
- *Reclamation*, Anna McDonald. Burke Gilman Trail, Seattle, WA, 2014
- *Lost Stream Found*, Jill Anholt. North Vancouver, BC, 2013

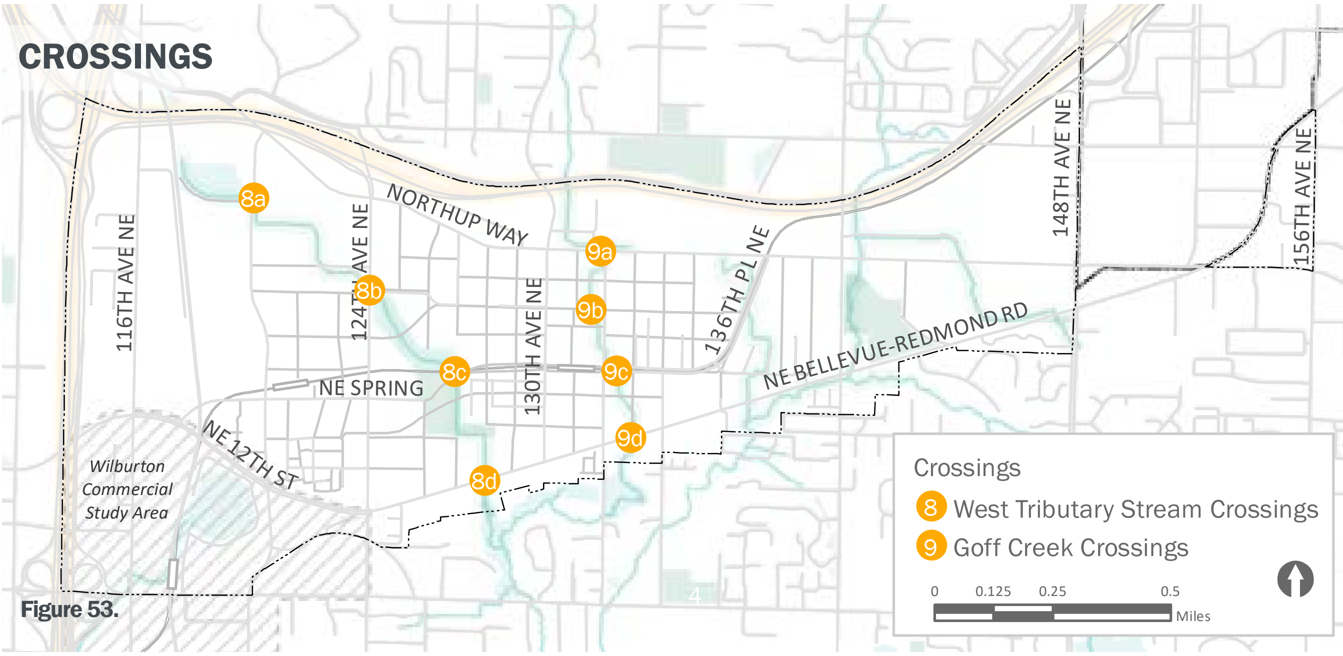

CROSSINGS
NORTHUP WAY
116TH AVE NE
124TH AVE NE
130TH AVE NE
136TH PL NE
148TH AVE NE
156TH AVE NE
NE SPRING
NE 12TH ST
NE BELLEVUE-REDMOND RD
Wilburton
Commercial
Study Area
8a
8b
8c
8d
9a
9b
9c
9d
Crossings
8 West Tributary Stream Crossings
9 Goff Creek Crossings
0
0.125
0.25
0.5
Miles

Figure 53.

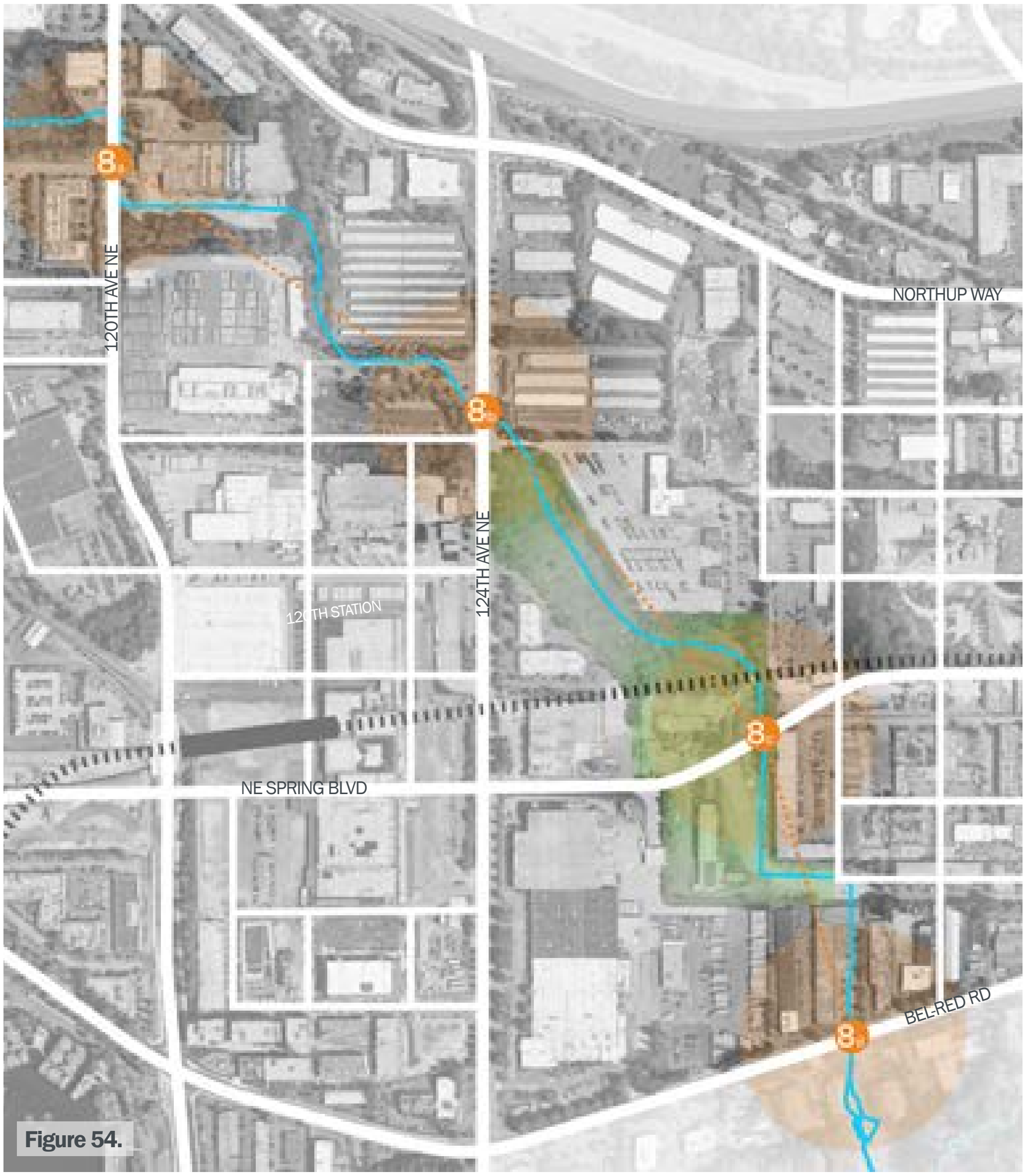


Figure 54.

8 WEST TRIBUTARY STREAM CROSSINGS

West Tributary is an arm of Kelsey Creek that bisects the Western half of BelRed. The majority of the creek is currently hidden from view or inaccessible, but the vision for the future includes daylighting the stream and restoring a 100-ft native plant riparian corridor on either side of the creek throughout its length in BelRed. There are also plans to develop a large community park around the stream where it cuts between the Spring District and 130th Station nodes in the center of the neighborhood. Places where West Tributary crosses major arterials provide opportunities to reveal the layers present below the ground on the streetscape.

Goal: One artist to create a set of four interrelated works that explore the layering of human and natural systems and consider a narrative that weaves through each work, revealing itself slowly as one moves through the district. The works could use the street as a surface for artwork, be standalone 3D works or utilize lighting and sound, but should have a dialogue with each other and the wider site.

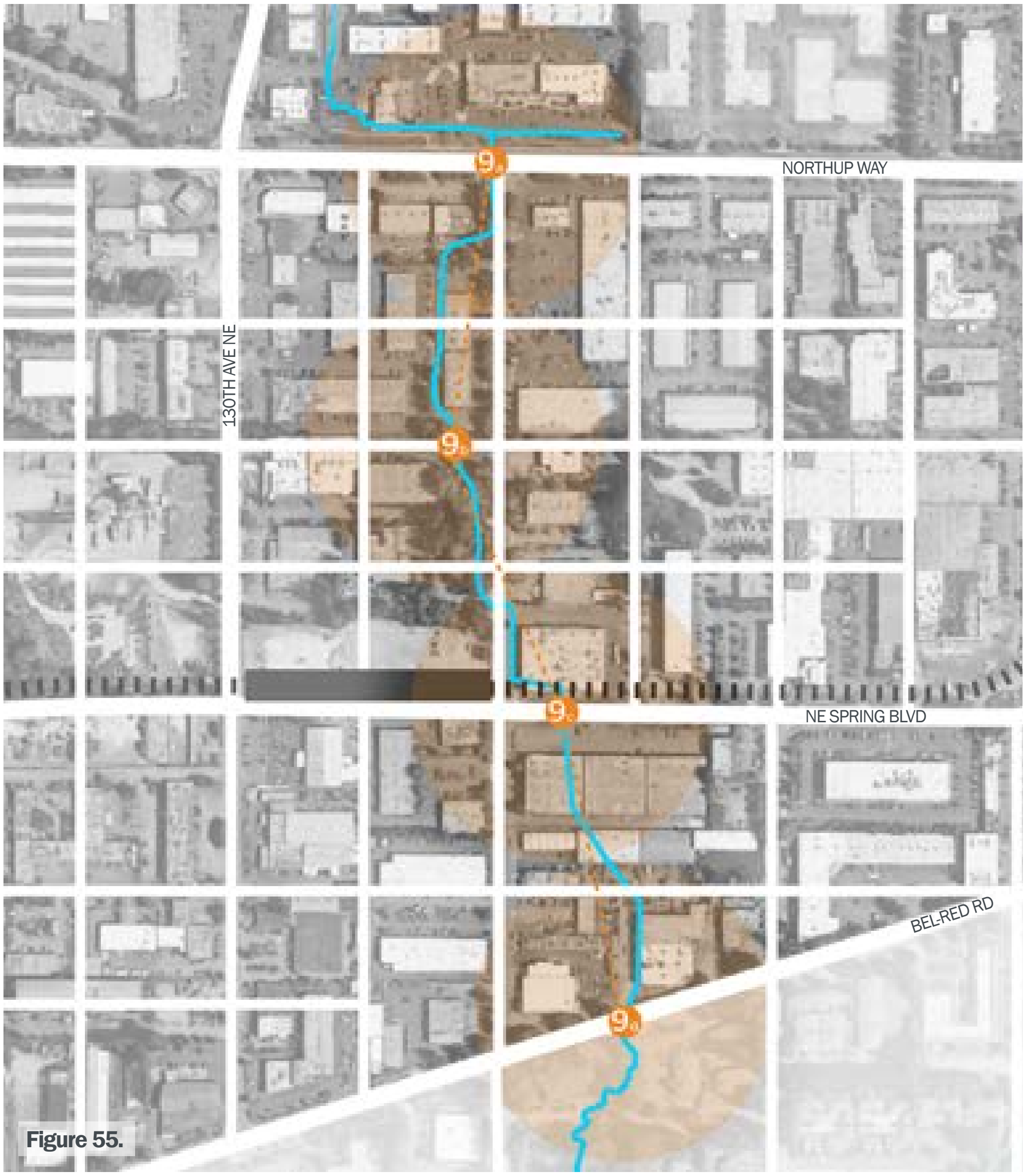


Figure 55.

9 GOFF CREEK STREAM CROSSINGS

Goff Creek is a small creek east of West Tributary stream that cuts through the middle of BelRed in the 130th Station node. It currently runs through back alleys and industrial parking lots, and will likely remain hidden for the foreseeable future, possibly even running underground beneath buildings yet to be constructed.

Goal: Various artists to contribute to a collection of works throughout publicly accessible locations on the path of the stream that explore the layering of human and natural systems and draw attention to the natural amenities that are hidden within our urban fabric. The commissioning of these works should be taken on by developers of the various sites that pass over Goff Creek. Artists may also consider examining the historical role streams played in diverting water to irrigate Japanese American farms.

PLATFORMS

Platforms serve as spaces designed to be activated by intervention. They are created to provide an opportunity for others to come and display or perform for an audience, forming a stage to exhibit expression and opinion.

Platforms for public art within BelRed are incorporated into the streetscape design of local and pedestrian streets. These platforms will build infrastructure for art and art programming into the streetscape, enabling public art to become the “in-between” that creates place in BelRed as the district continues to transform. They will create a dynamic layer of interest in the neighborhood, contributing to placemaking and interaction.

While Platforms can be integrated into any street type in BelRed, some street types offer some advantages for siting these features. In particular, Pedestrian Streets are perfect locations for Platforms. Platforms on Green and Local Streets can provide an engaging amenity and could be located at midblock gathering spaces or in parklets. The type of platform provided is to be open-ended. It could be, to provide some examples, a plinth with a supply of power for lighting, a wall, a ground surface, or an overhead canopy. Each platform design should be conceived with context in mind and designed with artist input to ensure they are suitable for the community.

The intent of these platforms is to provide a canvas that artists are able to populate however they chose; as a stage for performance-based artwork, plinth to exhibit work, surface to project digital artwork, etc. They are to be activated by rotating temporary artworks, a place for performance, or a site for permanent artwork with a focus on providing opportunities for local or emerging artists to display their work within the streetscape.

Platforms will help strengthen BelRed as an “Arts District” that people want to come back to over and over again. They will layer an element of change onto the streetscapes, allowing public art within BelRed to evolve over time as the community transforms around it.

PLATFORMS ALONG PEDESTRIAN STREETS

Pedestrian streets in BelRed will be active, lively streetscapes that give priority to pedestrians and cyclists. Integrated art will be a crucial factor in generating a feeling of place within these streets and drawing people to want to occupy them.

Goal: To create a sense of continual renewal and fresh perspectives along pedestrian streets by establishing large platforms for artistic expression for each pedestrian street. The platform(s) could be designed to allow for any number of artistic mediums and approaches to be displayed or performed, but should be incorporated in such a way that there is sufficient space for people to congregate and enjoy a broad artistic experience.

Reference Projects:

- *Vancouver Art Gallery Offsite*, Various Artists. Vancouver, BC, 2009-present
- *Midnight Moment*, Various Artists. Times Square, NYC, 2012-present
- *Columbus Never*, Janet Zweig. Columbus, OH, 2012
- *Fourth Plinth,* Various Artists. Trafalgar Square, London, 2003 - present
- *Storefront Theatre*, Matthew Mazzotta. Lyons, NE, 2015

PLATFORMS IN THE ARTS DISTRICT

The BelRed Arts District, to be located at the 130th Station node, is imagined to be a vibrant neighborhood with artist live/work studios, galleries, art events, and public art. Local streets in this area, to be designed and built largely by developers, provide an opportunity to integrate art into the urban fabric of the district. Any developer constructing a local street in this area is required to provide a platform for temporary artwork wherever there is a 30' x 65' plaza.

Goal: To provide a network of diverse, smaller-scale platforms for artistic experimentation within the urban fabric of BelRed's Arts District, helping bring artistic expression outside of the buildings and into the streetscape. Platforms should be designed with a focus on the types of work local artists are doing to provide artists working in the area space to exhibit or perform. Various platforms should also be designed to allow for spontaneous interventions by the public or local artists.

Reference Projects:

- *Forgotten Songs*, Michael Thomas Hill. Sydney, AU, 2011
- *Future Phenomena*, Amanda Browder. Columbus, OH, 2010
- *The Fourth Plinth*, Various Artists. London, UK, 2005-present

MOBILE WORKS

A mobile object is able to move freely within a space. It refers to something that is adaptable and versatile, with the ability to belong in many different contexts and locations.

Mobile artworks in BelRed will be works that can move, allowing them to be relocated within the district from time to time. The works themselves can be permanent, but their location will be temporary.

These mobile works will occupy BelRed's streetscapes, acting as an important factor in how the streets are activated as the neighborhood continues to transform from its current condition to a high-density, transit-oriented community. They will relocate from one location to another throughout the district, possibly in correlation with areas that are under construction or in the midst of a transformation. In each location, the mobile artwork will create a place in the streets that draws people to want to stay. This will help build community identity within the streetscapes during times of transition, when it is possible that streets will be constructed before new buildings are completed.

The intention of these mobile works is to activate and animate a street by becoming a focal point for people to gather around and interact with, draw attention to, create a dialogue about, or simply reflect BelRed's unique identity in some manner. They could be single works or multiple movable pieces in a series, occupiable or functional or could become a kind of mobile platform for artistic expression.

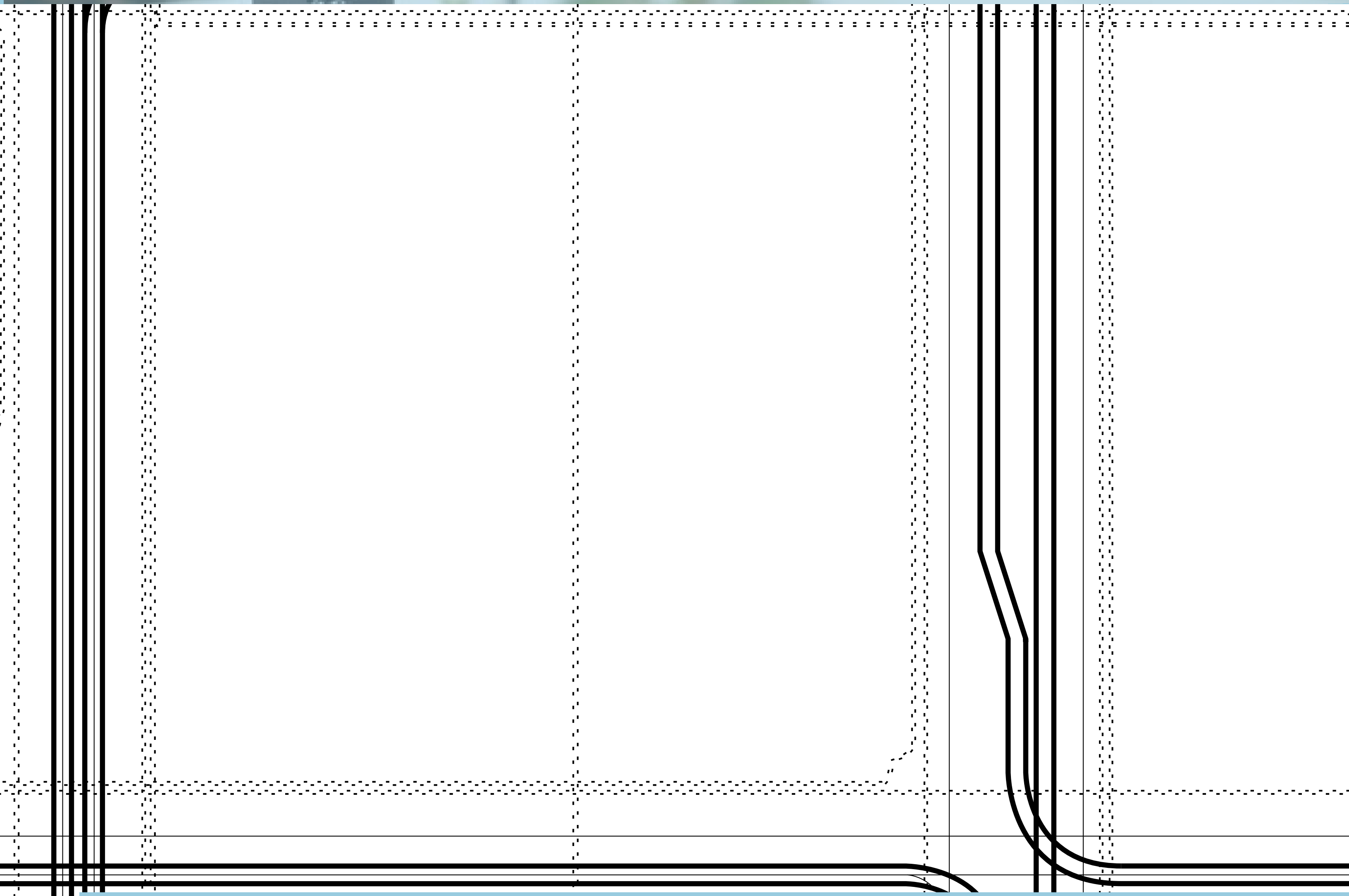
ARTWORK MOVES TO DIFFERENT LOCATIONS THROUGHOUT THE DISTRICT OVER TIME

As the district undergoes a transformation from its current condition to a high-density, transit-oriented community, BelRed's streetscapes will act as the first indication of change to come. Art becomes an important factor in how these streetscapes are activated in the time between now and the future.

Goal: Artist to create a work that is able to move to different places throughout the district, creating or facilitating wonder, intrigue and a sense of place in each location it occupies. The work could be a single mobile piece or multiple mobile pieces that occupy the streetscape right-of-way in some manner. The work or series of works, are not meant to be situated in sites permanently but rather should move or be moved according to altering events or development in the area as determined by the artist's concept.

Reference Projects:

- *Red Ball*, Kurt Peschke. Various Locations, 2001-present
- *Redmond Moving Art Center*, Janet Zweig. Redmond, WA, 2014-present
- *Park*, Marko Simcic. Vancouver, BC, 2008-present
- *Sign in the Northwest Passage*, Kevin Schmidt. Various locations, 2010



06 STREETSCAPE ELEMENTS

A KIT OF PARTS

Streetscape elements provide both functional and aesthetic amenities to roadways, enhancing the experience of all users, including drivers, cyclists and pedestrians. Streetscape elements can provide a consistent aesthetic that is unique and recognizable to the BelRed area.

This plan is structured to direct and guide in the development of functional, interesting, and character defining streets. With some exceptions, like street lighting, this plan offers a number of elements to help build streetscapes that fit the unique character and design of specific sites and context. While this chapter lays out a kit of parts including aesthetic and physical attributes for streetscape elements, it is important to note streetscape elements determined by Bellevue staff to be of equal or greater than those highlighted in this plan can be incorporated into streets with approval through the permitting process.

HARDSCAPE

NOTE: Hardscape color, materials and finishes in this section are recommended to help guide hardscape selections through their aesthetic and physical attributes rather than dictate a particular look. The ultimate hardscape selection shall be determined in final design based on availability, cost and other factors.

CONCRETE HARDSCAPE

Design Guidelines

- Standard concrete hardscape can be applied to crosswalk paving areas of raised intersections, plazas at mid-blocks, amenity and gathering spaces. (See Crosswalk Paving and Mid-Block Pedestrian Plaza in this document)
- Standard compliance: concrete, curing compound, spec and joint spacing per WSDOT
- City Standard Plans compliance: BR-120-1, DT-130-1

Physical Attribute

- Concrete pavement thickness shall vary depending on pedestrian or vehicular load.
- Special accent surface treatment such as sandblasting, acid-etching, stamping, color hardener and/or staining shall be reviewed and approved by City prior to construction.

STANDARD CONCRETE HARDSCAPE

Description: Fine scale 1'x1', 2'x2', 1/8" width x 1/2" deep
Method: Sawcut grid scoring on natural standard cement concrete pavement with light-medium broom finish

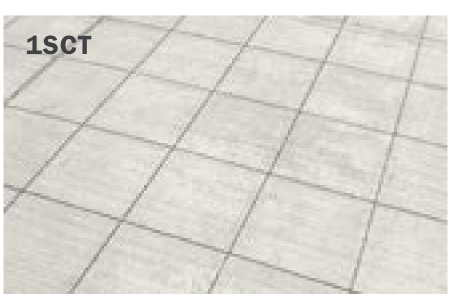
STANDARD CONCRETE HARDSCAPE

Description: Large scale 4'x4' or 6'x6', 1/8" width x 1/2" deep
Method: Sawcut grid scoring on natural standard cement concrete pavement with light-medium broom finish

CROSSWALK TREATMENT

Design Guidelines

- Align the score pattern grid with roadway centerline.
- Locations of raised crosswalks and intersections shall be determined as part of public improvement projects.



STANDARD CROSSWALK TREATMENT

Description: Fine scale 1'x1', 2'x2', 1/8" width x 1/2" deep
Method: Sawcut grid scoring on natural standard cement concrete pavement with medium broom finish
Scale: 10 ft minimum crosswalk widths
City Standard Plan Compliances: BR-140-1, BR-150-1, BR-160-1, CW-100, CW-120, CH-300, CW-100-1, CW-120-1

ACCENT HARDSCAPE

Design Guidelines

- Standard concrete hardscape can be applied to pedestrian paving areas, crosswalk paving areas, intersection paving areas of raised intersection, plazas at mid-blocks, amenity and gathering spaces. (See Pedestrian Paving Area, Crosswalk Paving Area, Intersection Paving Area and Mid-Block Pedestrian Plaza in this document)
- Standard compliance: concrete spec and joint spacing per WSDOT
- City Standard Plans compliance: BR-120-1, DT-130-1

ACCENT HARDSCAPE

Description: Scored colored cement concrete in various patterns

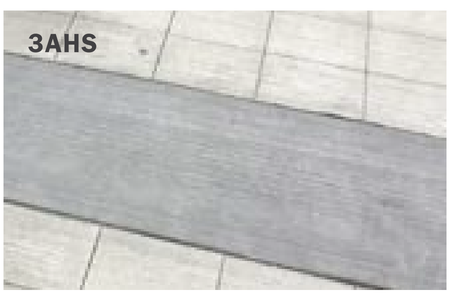
- Light-medium sandblast finish
- Medium-heavy sandblast finish

Color: “Midnight” by MasterColor. Dosage 42 lbs/yd3

ACCENT HARDSCAPE

Description: Cement concrete in bands in alternating patterns

Method: Light-medium sandblast or broom finish



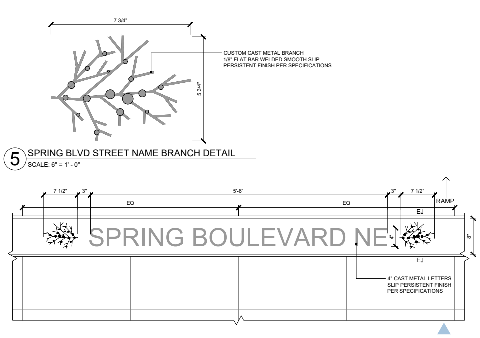
ACCENT HARDSCAPE

Description: Colored cement concrete

Method: Integral pigmented concrete

Color: “Midnight” by MasterColor. Dosage 42 lbs/yd3

4AHS



CAST METAL INLAYS IN HARDSCAPE

Description: Custom cast metal inlays in cement concrete sidewalk

Method: Wet set installation of welded metal inlay into concrete paving

PAVER HARDSCAPE

Design Guidelines

- Accent paver hardscape to crosswalk paving areas of raised intersection, plazas at mid-blocks, amenity and gathering spaces. (See Crosswalk Paving Area and Mid-Block Pedestrian Plaza in this document)
- Pavers shall not be used in through or frontage zones or within other connecting facilities (e.g. walk-throughs)

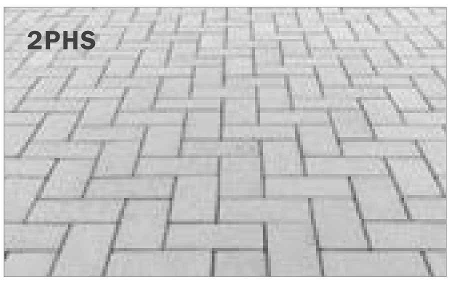
STANDARD PAVER HARDSCAPE

Manufacturer: Tectura Designs

Description: Granitex, long rectangular concrete pavers

Color: Warm gray, light gray and light beige tones

City Standard Plan Compliances: ADA



STANDARD PAVER HARDSCAPE

Manufacturer: Tectura Designs

Description: Exterior Terrazzo rectangular and square concrete pavers

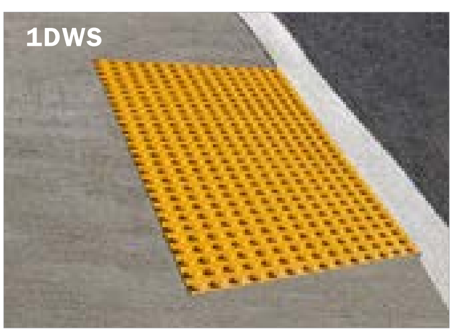
Color: Various speckled terrazzo colors

City Standard Plan Compliances: ADA

DETECTABLE WARNING SURFACES

Design Guidelines

- Detectable warning surfaces between the roadway and sidewalk shall meet accessibility requirements per ADA standards.



DETECTABLE WARNING SURFACES

Application: All intersections of the BelRed neighborhood (except Spring Boulevard between 120th and 124th)

Description: ADA Detectable Warning Surface (Truncated Dome), meet ADA requirements

Color: Yellow (Federal Color #33538)

City Standard Plan Compliances: SW-250-1, SW-260-1

WSDOT Standard Plan references: F-45.10-02

LIGHTING

NOTE: Lighting products in this section are provided to help guide product selections through their aesthetic and physical attributes rather than dictate the use of certain product(s). The ultimate lighting selection shall be determined in final design based on necessary illumination levels/uniformity, availability, cost and other factors.

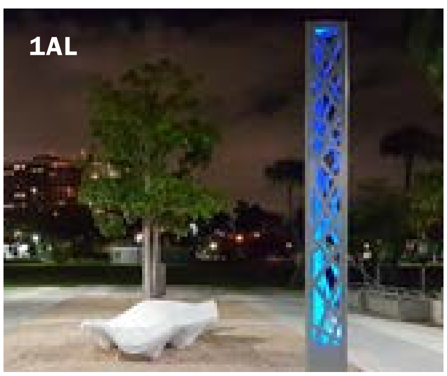
Design Guidelines

- All lighting (except accent pavement lighting) shall not occur within pedestrian access routes (PAR) walking areas and full sidewalk width.
- Accent lighting and accent pavement lighting is encouraged within private plazas behind the sidewalk.
- Special circumstances for custom foundations for accent lighting shall be designed to avoid utility conflicts and with proper geotechnical soil per standard with site considerations.
- Standard compliance: foundation standards, setback from curb, site distance for pedestrian lighting shall be approved by the City

Physical Attribute

- Fasteners: Tamper resistant and weather resistant as zinc-plated, galvanized steel or stainless steel material
- Metal & finishes: Galvanized steel, powder coating over aluminum/steel, stainless steel

ACCENT LIGHTING

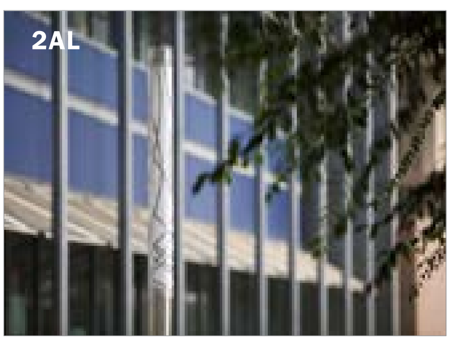


STANDARD ACCENT LIGHTING W/ CUSTOM DESIGNS

Manufacturer: Streetlife

Product Model: Open Pillars

Material Description: 20"x20 Triangular steel lighting columns with a lattice-like graphic pattern, CorTen steel or powder coated color, capable of supporting LED light strips



STANDARD ACCENT LIGHTING W/ CUSTOM DESIGNS

Manufacturer: Forms+Surfaces

Product Model: Light Column Bollard

Material Description: Stainless steel, satin finish, 17W custom LED light, 180 degree perforated shield (standard and custom patterns), UL, C-UL, ETL and C-ETL listed

STANDARD ACCENT LIGHTING W/ CUSTOM DESIGNS

Manufacturer: Structura

Product Model: Mac II XL Column

Material Description: High power, low wattage COB LED light source, solid ASTM D-2559 glulam wood construction, (4) concealed hot dip galvanized anchor bolt base and mounting hardware, aluminum parts polyester powder coat painted

ACCENT PAVEMENT LIGHTING

Design Guidelines

- Accent pavement lighting shall be located at plazas at mid-blocks, amenity and gathering spaces. (See Crosswalk Paving and Mid-Block Pedestrian Plaza in this document)

Physical Attribute

- Fasteners: Tamper resistant and weather resistant as zinc-plated, galvanized steel or stainless steel material
- Metal & finishes: Galvanized steel, powder coating over aluminum/steel, stainless steel

ACCENT PAVEMENT LIGHTING

Manufacturer: Lumascape

Product Model: LS553LED

Material Description: Compact and versatile side-emitting marker light, 2W, 3.7" dia. IP68 rating, 316 marine grade stainless steel, blue, red, white, yellow colors, various apertures, low-speed traffic areas.

Installation: Direct burial flush with finished grade

ACCENT PAVEMENT LIGHTING

Manufacturer: BEGA

Product Model: 77 849

Sizing & Material Description: 39-3/8" lengths x 3-1/2" width; 40W RGBW LED, IP67 UL listed, 120V-277V electronic LED driver

Finish: #4 brushed stainless steel

Installation: Direct burial flush with finished grade

ACCENT PAVEMENT LIGHTING

Manufacturer: Lumascape PowerSync

Product Model: Erden E4 In-ground LS3040

Material Description: EasyGlow visual comfort and CoolDrive thermal management technologies in various RGB colors, 16W, IP68 rating apertures, low-speed traffic areas

Installation: Direct burial flush with finished grade

PEDESTRIAN LIGHTING

NOTE: Refer to the Transportation Design Manual, Appendix A: Street Lighting Design Guide for currently approved products.

Design Guidelines

- Allow for lighting accessories such as street name signage, decorative banners, hanging flower baskets, irrigation.
- All lighting accessories including straps, banner arms, flower basket arms, surveillance cameras, and pole assembly shall be same color as finishes approved by City.
- Provide adequate vertical clearance of 8 ft from finished grade of sidewalk for any pole attachment (e.g.. flower basket or banner arms).
- Special circumstances for custom foundations for pedestrian lighting shall be designed to avoid utility conflicts and with proper geotechnical soil per standard with site considerations.
- If pedestrian lighting is included, determine appropriate lighting levels, uniformity and spacing for pedestrian lighting per current City of Bellevue illumination requirements.
- Pole spacing and illumination levels shall be based on specific project needs and site or design constraints.
- Standard compliance: foundation standards, setback from curb, site distance for pedestrian lighting shall be approved by the City
- Pedestrian lighting selection and layout shall undergo project review and approval by the City prior to construction.

STANDARD PEDESTRIAN LIGHTING

Manufacturer: AEC

Product Model: Eco Rays TP

Material Description: Integral 120V - 277V electronic LED driver and surge protection, 0-10 V dimming, LED color 3000K or 4000K, UL listed, IP66 rated. Removable optical and gear tray compartment. Opening wiring harness and optical compartment with common tools. Latched door. Finish Graphite Gray.

STANDARD PEDESTRIAN LIGHTING

Manufacturer: BEGA

Product Model: 88 978

Material Description: Integral 120V - 277V electronic LED driver and surge protection, 0-10 V dimming, LED color 3500K or 4000K, UL listed, IP65 rating, extruded aluminum with standard BEGA color finishes

FURNISHINGS

NOTE: Furnishing products provided in this section are recommended to help guide product selections through their aesthetic and physical attributes rather than dictate the use of certain product(s). The ultimate selection of actual furnishings shall be determined in final design based on availability, cost and other factors.

STANDARD & ACCENT BENCHES

Design Guidelines

- All benches shall be clear of through zone and frontage zone.
- Bench shall be set 2-ft back from edge of required sidewalk width and from parking access walkthroughs to ensure proper seated leg clearance.
- Bench locations shall be predictably and as evenly spaced along a streetscape as possible.
- Bench locations should be reviewed and approved by City as part of development approval and public improvement projects.
- Potential bench locations include areas adjacent to mixed-use and residential building entrances, near corners and intersections, at pocket parks, parklets and public gathering places.
- Other amenities, such as waste receptacles and bike racks shall also be considered to coordinate with bench locations.
- Bench accessories such as backs, armrests or dividers shall be considered given the site location, ease of use and site visibility.

Physical Attribute

- Wood & Sealer: 100% FSC hardwood w/ alkyd-urethane hybrid technology, no peel/flake/crack over time, UV resistant, water repellent, low VOC, clear satin finish oil sealer.
- Exposed fasteners for benches shall be corrosion and tamper resistant.

STANDARD BENCH W/ CUSTOM BACK OPTION

Manufacturer: Wabash Valley

Product Model: Dewart Collection

Sizing & Material: 6 Foot bench with back & arms,; 12 ga steel back and seat in heather pattern; aluminum casting frame; AAMA 2604-05 powder coating

Installation Type: Surface mount per manufacturer's recommendations

STANDARD BACKED BENCH

Manufacturer: Forms+Surfaces

Product Model: Pacifica Bench

Sizing & Material: 8 and 12 foot lengths; FSC 100% Jatoba hardwood slats; powder coated steel frames

Installation Type: Surface mount per manufacturer's recommendations

STANDARD BACKLESS BENCH

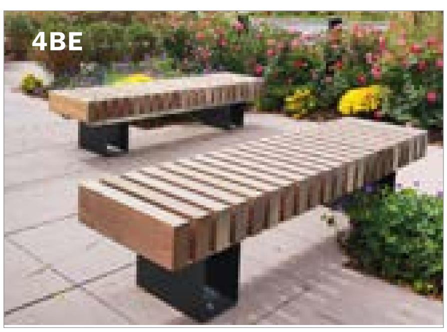
Manufacturer: Streetlife
Product Model: Stone Benches Travertino
Sizing & Material: 5" thick x 24" wide stone tablets; supports and base structure available in galvanized or RAL-coated steel
Installation Type: Surface mount per manufacturer's recommendations

STANDARD BACKLESS BENCH

Manufacturer: Forms+Surfaces
Product Model: Pacifica Bench
Sizing & Material: 8 and 12 foot lengths; FSC 100% Jatoba hardwood slats; powder coated steel frames
Installation Type: Surface mount per manufacturer's recommendations

STANDARD BACKLESS BENCH

Manufacturer: Forms+Surfaces
Product Model: Boardwalk Bench
Sizing & Material: 6 foot; FSC Recycled reclaimed Cumaru hardwood slats; cast aluminum frame; powder coated finish
Installation Type: Surface mount per manufacturer's recommendations



STANDARD BACKLESS BENCH

Manufacturer: Streetlife
Product Model: Rough&Ready Crosswise Benches
Sizing & Material: 2.8"x5.9" beams laid crosswise embedded in a support rail with Streetlock comb; black composite stands
Installation Type: Surface mount per manufacturer's recommendations

STANDARD BACKLESS BENCH

Manufacturer: Forms+Surfaces
Product Model: Vector Bench
Sizing & Material: 6 foot; aluminum slats; extruded aluminum frame; powder coat finish
Installation Type: Surface mount per manufacturer's recommendations
Feature Accommodation: Wifi

ACCENT BENCH W/ BACK

Manufacturer: Timberform

Product Model: Fortis 2214-1 Bench

Sizing & Material: 6 x 16; backrest is beveled 8 x 16; both are solid F.O.H.C. premium Douglas fir timbers; powder coated steel frames

Installation Type: Surface mount per manufacturer's recommendations

ACCENT BENCH SYSTEMS W/ ACCENT LIGHTING

Manufacturer: Streetlife

Product Model: Rough&Ready Curved Benches

Sizing & Material: 2.8"x5.9" beams laid crosswise embedded in a support rail with Streetlock comb in curved layout; black composite stands or powder coat finish available; LED box is available to house the drivers for LED lighting

Installation Type: Surface mount per manufacturer's recommendations

ACCENT BENCH SYSTEMS

Manufacturer: Streetlife

Product Model: Rough&Ready Curved Benches

Sizing & Material: 2.8"x5.9" beams laid crosswise embedded in a support rail with Streetlock comb in curved layout, black composite stands or powder coat finish available

Installation Type: Surface mount per manufacturer's recommendations

STANDARD PLANTERS

Design Guidelines

- Planters can be located in plazas at mid-blocks, amenity and gathering spaces including pocket parks, parklets/ streeteries, and at locations that do not conflict with site distance and pedestrian safety through CPTED.
- Maintain 36” minimum buffer around planters from other streetscape elements.
- Maintain 48” minimum buffer around planters from fire hydrants.

Physical Attribute

- Wood & Sealer: 100% FSC hardwood w/ alkyd-urethane hybrid technology, no peel/flake/crack over time, UV resistant, water repellent, low VOC, clear satin finish oil sealer.

STANDARD TREE PLANTERS

Manufacturer: Streetlife

Product Model: Love Tubs

Sizing & Material: Brushed 316 Stainless, 1.25 to 2.5m - 44 to 88 cu ft are suitable for trees 5 to 6m tall, custom stainless steel letters or a lasered logo

Installation Type: Freestanding

STANDARD TREE PLANTERS

Manufacturer: Streetlife

Product Model: Highlife III

Sizing & Material: 59”, 67” or 79” square sizes x 35” standard height, FSC alternating hardwood slats with black metal frame, composite inner tub, Treetec Bottom Up system

Installation Type: Freestanding

STANDARD PLANTERS

Manufacturer: WAUSAU

Product Model: TF4106

Sizing & Material: 48” diameter x 18” concrete medium size bowl planter w/ (4) 5/8” diameter. lifting inserts, white (A20), buff (A21), charcoal (A26) standard acid wash finish

Installation Type: Freestanding

STANDARD PLANTERS

Manufacturer: WAUSAU

Product Model: TF4357

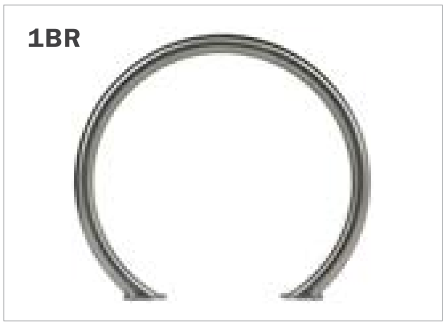
Sizing & Material: 60” x 16” x 36” concrete rectangle planter w/ (4) 5/8” diameter. lifting inserts, white (A20), buff (A21), charcoal (A26) standard acid wash finish

Installation Type: Freestanding

STANDARD BIKE RACKS

Design Guidelines

- A minimum of 1 rack for 2 or more bikes per 200 LF is recommended.
- Bike rack locations suggested near intersections, building entrances, and public gathering areas.
- Ensure bikes parked in racks will be clear of pedestrian walk zones.
- Determine final placement and number of racks during review of individual private developments and public improvement projects.
- Bike racks shall be oriented such that parked bikes are not an obstruction to pedestrian circulation paths and access to fire hydrants, waste receptacles and building doors.
- Exposed fasteners for bike racks shall be corrosion and tamper resistant.



STANDARD BIKE RACKS

Manufacturer: Reliance Foundry
Product Model: R-8464
Sizing & Material: 11 ga 316 stainless steel, 35.5" width x 31.5" ht, brushed finish or one of six durable powder coating colors
Installation Type: Surface mount per manufacturer's recommendations

STANDARD BIKE RACKS

Manufacturer: LandscapeForms
Product Model: Ring
Sizing & Material: 1.5" O.D. x 0.120" thick wall, 25" width, 27" ht, stainless steel tubing, with a electro-polish finish on bare stainless steel, available in powder coated steel
Installation Type: Embed mount per manufacturer's recommendations

STANDARD BIKE RACKS

Manufacturer: Sportworks
Product Model: Torfino No Scratch
Sizing & Material: 28.5" width x 33.4" ht, santoprene no scratch, brushed stainless steel, or mild steel in powder coated color
Installation Type: Surface mount per manufacturer's recommendations

STANDARD BOLLARDS

Design Guidelines

- Located in amenity and buffer zone areas: Along areas not impeding landscape zones, tree grates and utility vaults/lids
- Bollards shall be included wherever the City determines there is a need for additional pedestrian protection or better definition of pedestrian space.
- City Standard Plans Compliances: DT-150-1

STANDARD SECURITY BOLLARD

Manufacturer: Calpipe Security Bollards

Product Model: IBF12080 fixed security bollard

Sizing & Material: 12" diameter, high security, type 304/316 grade stainless steel, #4 polish finish

STANDARD REMOVABLE BOLLARDS

Manufacturer: Reliance Foundry

Product Model: R-8464

Sizing & Material: Internal locking, 35.5" ht, 4.5" diameter., 316 stainless steel, #6 satin finish, removable and fixed models available, white color reflector stripes

STANDARD RETRACTABLE SECURITY BOLLARDS

Note: Automatic retractable bollards shall be designed for repetitive cycles, ideal for high-level traffic and integrated with any access control option, including a key system, guard operated, proximity card, or any other system or software.

Manufacturer: Calpipe Security Bollards

Product Model: LBPA10080 Series automatic retractable bollard

Sizing & Material: 10" diameter, high security, type 304/316 grade stainless steel, #4 polish finish

Product Model: LBPA12080 Series automatic retractable bollard

Sizing & Material: 12" diameter, high security, type 304/316 grade stainless steel, #4 polish finish

STANDARD WASTE RECEPTACLE

Design Guidelines

- Maintain 36” minimum buffer around waste receptacles from other streetscape elements.
- Maintain 48” minimum buffer around waste receptacle from fire hydrants.
- Ensure one waste receptacle is provide per block face
- Additional waste receptacles may be needed in high traffic areas and larger public seating areas.

Proposed waste receptacle(s) deviating from the standard shall require review and approval by City Design Review Board. Approved equal to standard waste receptacle (above) shall meet the following attributes:

Physical Attributes:

- Durable, weather resistant material in metal materials/finishes including: brushed stainless steel/powder coated aluminum or steel, UV-resistant non-sacrificial anti-graffiti coating.
- Waste receptacle components includes: lid top with side opening, include polyethylene liner, surface mount installation with 4 inch minimum tamper resistant embedment.
- Other consideration for waste receptacles with split receptacle with recycle option, standalone recycle receptacle or solar trash compactor can be considered deviations for design review and approval process.

Aesthetic Attributes:

- Color, type and style shall be consistent to standard waste receptacle and yet bring not only functionality but will help control maintenance needs over time.

STANDARD WASTE RECEPTACLE

Manufacturer: Forms+Surfaces
Product Model: Universal
Sizing & Material: 12- to 36-gallons in five stainless steel finishes for receptacle body, variety of lid options, polyethylene liners
Installation Type: Surface mount per manufacturer’s recommendations

UTILITIES + INFRASTRUCTURE

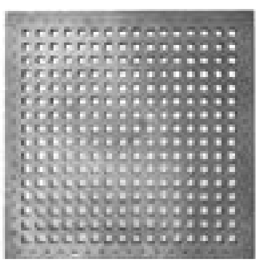
NOTE: Utilities and infrastructure elements provided in this section are recommended to help guide product selections through their aesthetic and physical attributes rather than dictate the use of certain product(s). The ultimate selection of actual streetscape elements shall be determined in final design based on availability, cost and other factors.

STANDARD DRAIN GRATES AND MANHOLE COVER

Design Guidelines

- Use of trench drain grates only if standard storm system infrastructure is demonstrated to not be physically feasible during project design.
- Utility vaults/lids shall located along buffer zones.
- Comply with ADA standards when utilizing drain grates.
- All utilities and infrastructure elements contribute to the placemaking of the streetscape.
- Trench drain grate and drain grate shall all be rated for vehicular loads and be slip resistant.

1DG



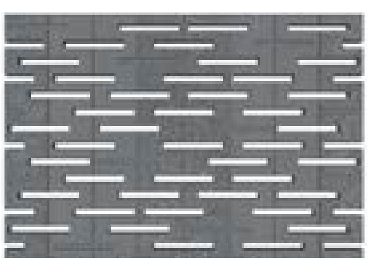
STANDARD DRAIN GRATE

Manufacturer: Urban Accessories | Standard ADA

Sizing & Material: 8", 12", 16", 18", 24", 36" square, 1/4" openings, 30"x48" rectangle

100% Recycled Grey Iron, per ASTM A48 class 35b Ductile Iron, per ASTM A536, class 65-45-12 100% Recycled Aluminum, per ASTM B26, ADA compliant

2DG



STANDARD DRAIN TRENCH GRATE (ABOVE)

Manufacturer: Urban Accessories | Cascade

Sizing & Material: 12"x18", 100% recycled grey iron, per ASTM A48 class 35b

ductile iron or 100% recycled aluminum per ASTM A536, class 65-45-12, per ASTM B26, ADA compliant

STANDARD ELECTRIC VEHICLE CHARGING STATION

Design Guidelines

- Currently, no privately managed electric vehicle charging stations are in the ROW. Before private installation of these occurs, the City will need to develop a plan for how these are managed and regulated.
- Required permits, additional installation/power connection guidance and approval of charger installations in ROW shall be through City process.
- City Charging stations and appropriate signage should be located at visible areas for ease of use and access.
- Chargers shall be located out of way of building doors and pedestrian circulation paths.
- Allow for adequate distance from electrical panel to the charger per manufacturer’s recommendations.

STANDARD ELECTRIC VEHICLE CHARGING STATION

Manufacturer: Ideal Power Xpress

Electric Vehicle Charging Station in Skyline decorative bollard

Sizing & Material: 58” ht x 6” schedule 40 galvanized steel x 48” sleeved in 1/4” LDPE plastic, 40V hybrid electrical vehicle charging unit

STANDARD TREE GRATES

Design Guidelines

- Tree grates shall be located along buffer zones and amenity zones not conflicting with overhead awnings and underground utilities.
- Tree grates shall not be considered part of the Pedestrian Access Route (PAR) minimum width.
- Comply with ADA standards and be slip resistant. Provide breakaway feature for tree grate opening.
- Ensure proper grades and minimize steep grade breaks to reduce tripping hazards.
- Tree grates as well as their trees contribute to the placemaking of the streetscape.
- City Standard Plan Compliances: SW-130-1, RL-100-1, RL-110-1, RL-120-1, DT-110-1

STANDARD TREE GRATES

Manufacturer: Iron Age Grates

Product Model: Rain RNX48-48I99TGHP

Sizing & Material: 4' sq x 1", Cast Iron, standard finish raw, baked on oil finish, or powder coating finish, ADA compliant

STANDARD TREE GRATES

Manufacturer: Iron Age Grates

Product Model: Spin RNX48-48I99TGHP

Sizing & Material: 4' sq x 1", break away tree opening, cast iron, standard finish raw, baked on oil finish, or powder coating finish, ADA compliant

STANDARD TREE GRATES

Manufacturer: Iron Age Grates

Product Model: Spin RNX48-48I99TGHP

Sizing & Material: 4' sq x 1", Cast Iron, standard finish raw, baked on oil finish, or powder coating finish, ADA compliant

4TG

STANDARD TREE GRATES W/FLEXIBLE LAYOUTS

Manufacturer: Streetlife

Product Model: Tree Grille Strips and Solid Grille Benches

Sizing & Material: 47", 59" or 71" standard lengths available in straight or diagonal supports

Materials: Untreated weathering steel, optionally at a surcharge finished in a double layer powder coating, ADA compliant

STANDARD UTILITY CABINETS

Design Guidelines

- Utility cabinets shall be located within ROW in and not within PAR routes and site lines at signalized street intersections.
- Utility cabinets can be located in amenity zones.
- Integrate public art in vinyl wrapped decal.

STANDARD ELECTRICAL/SIGNAL CABINETS

Material: 5052-H32 aluminum, 0.125” thick

Finishes: Brushed aluminum
Required Features: Anti-graffiti coating

CUSTOM VINYL WRAPPED UTILITY CABINET

Manufacturer: TrafficWrapz, or approved equal
Product Model: TW360hd
Sizing & Material: Various sizes, DuPont Tedlar polyvinyl fluoride (PVF) technology, conformable graffiti and chemical proof protective film, 1mil thick, fade resistant with AdhesiveGuard protection

FEATURES

NOTE: Featured elements provided in this section are all optional and can be incorporated into a development as approved by the City.

BIKE CORRALS

Bike corrals transform a standard parking space, or area of pavement within the sidewalk realm, into high density bicycle parking. Bike corrals are appropriate in areas of high density employment or restaurant/retail space where anticipated bicycle parking needs are high.

Design Guidelines

- Wheel stops and flexi-posts shall be used to protect the ends of the corral if located in a parking space.
- Rack shall allow bikes to be parked completely outside of roadway or pedestrian circulation route.

RELEVANT STREETSCAPE ELEMENTS

Standard Bike Racks: 1BR, 2BR, 3BR

Standard Concrete Hardscape: 1SHS, 2SHS, 3SHS

Standard Accent Pavers: 1AHS, 2AHS

DOCKLESS BIKE PARKING

Dockless bike parking areas provide easily identified space to park dockless bike-share bikes and scooters. Providing this dedicated space helps to encourage people to leave bikes and scooters in areas where they do not block access or pedestrian circulation. Dockless bike parking areas are appropriate near transit or in areas of high-density employment or restaurant/retail space where use of bike and/or scooter-share is expected to be high.

Design Guidelines

- Dockless parking areas should be delineated by distinctive pavement, such as through the use of paint, decorative pavers, or colored concrete.
- Parking area should include clear graphic icons indicating their intended use (e.g. bicycle symbol)
- Area shall be large enough to accommodate multiple bike-share bikes or scooters in a manner that provides sufficient offset from the roadway edge and does not encroach into the pedestrian circulation route.

RELEVANT STREETSCAPE ELEMENTS

Standard Bike Racks: 1BR, 2BR, 3BR

Standard Concrete Hardscape: 1SHS, 2SHS, 3SHS

Standard Accent Pavers: 1AHS, 2AHS

Accent Paving Lighting: 2PAL, 3PAL

PARKLETS & STREETERIES

Parklets are streeteries repurpose roadway space, typically an on-street parking space, as open space (parklet) or outdoor dining (streetery). These features are often installed at the request of adjacent businesses for use by their customers for dining or waiting, and can be either temporary or permanent.

Design Guidelines

- Per City of Bellevue Curbside Management Plan

RELEVANT STREETSCAPE ELEMENTS

Bollards
Standard or Accent Benches
Standard Waste Receptacle
Standard Planters
Bike Racks

City Standard Plan Compliances: ADA, CH-300-1

POCKET PARKS

Pocket parks are small areas of respite within the sidewalk realm (or behind the sidewalk within adjacent developments). Pocket parks are desirable in areas that lack larger open space areas to provide human-scale space for passive enjoyment of the streetscape.

Design Guidelines

- All elements shall be located outside of the pedestrian circulation route and with required minimum offset from the roadway

RELEVANT STREETSCAPE ELEMENTS

Accent Hardscape
Standard or Accent Benches
Standard Waste Receptacle
Standard Planters
Bike Racks

City Standard Plan Compliances: ADA

BIORETENTION PLANTERS

Bioretention planters are an element of Green Stormwater Infrastructure that can be used to treat and detain stormwater while also softening the urban environment through the use of appropriate plants and trees. In addition, bioretention can help bring attention to urban stormwater and how it can be sustainably managed.

Design Guidelines

- Per City of Bellevue Storm and Surface Water Engineering Standards
- Refer to bioretention alternatives (ZGF's content in Appendix)

City Standard Plan Compliances: NDP-1 thru NDP-10

ANGLE PARKING BAY

Back-in angle parking bays require greater right-of-way width than standard parallel on-street parking, however developments can elect to provide this additional space if desired to gain additional parking spaces or to provide a wider pedestrian/sidewalk realm in between bays (e.g. for use as a pocket park or other pedestrian-oriented space).

Design Guidelines

- Back-in parking provides greater visibility for the driver pulling out of a parking space, increasing safety especially for bicyclists on the roadway.
- Full sidewalk and planter width shall be provided at back of angle parking bay.

RELEVANT STREETSCAPE ELEMENTS

Standard Concrete Hardscape

City Standard Plan Compliances: ADA, CH-300-1

MID-BLOCK CROSSING

Mid-block crossings can be used to break-up long blocks and discourage pedestrians from crossing between crosswalks. In addition, mid-block crossings can be used where there may be a concentration of pedestrians wishing to cross.

Design Guidelines

- Provide clear markings and maintain good visibility in all directions.

RELEVANT STREETSCAPE ELEMENTS

Standard Concrete Hardscape
Standard Waste Receptacle
Bike Racks

City Standard Plan Compliances: ADA, CH-300-1, BR-140-1, BR-150-1, BR-160-1, RL-110-1, SW-250-1, SW-260-1, CW-100-1, CW-120-1

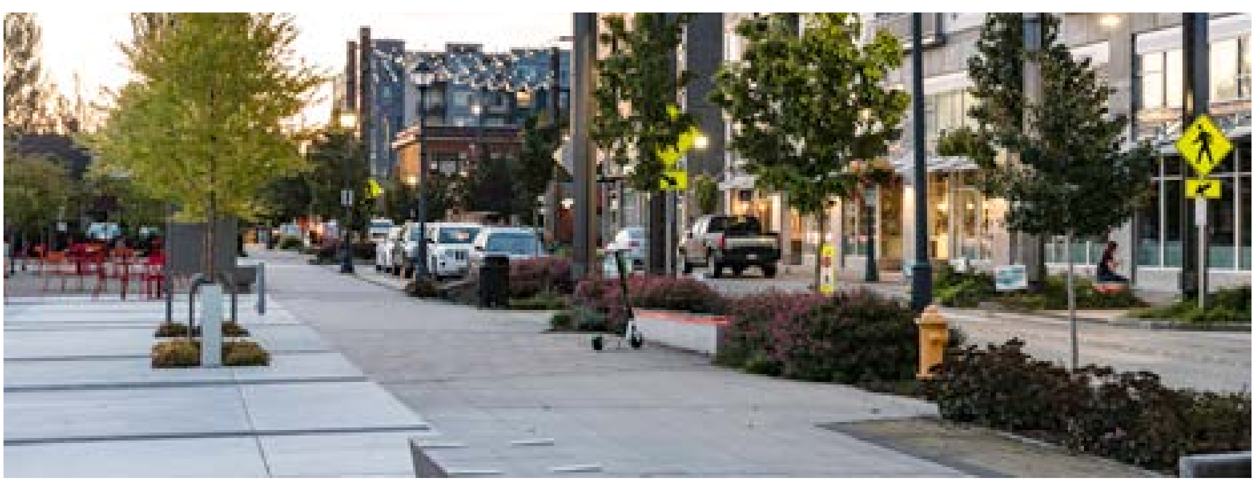
MID-BLOCK PEDESTRIAN PLAZA

Allowing additional plaza space at mid-block locations, similar to a pocket park, provides an area for seating, bike parking, art elements or other enhanced amenities to enliven the streetscape.

City Standard Plan Compliances: ADA, RL-120-1

RELEVANT STREETSCAPE ELEMENTS

Standard Concrete or Accent Hardscape
Bollards
Accent Lighting
Standard Waste Receptacle
Standard or Accent Benches
Bike Racks



CITY OF BELLEVUE
WASHINGTON

Transportation Design Manual and Complete Streets Guide

Volume 1

Appendix C

Fiber Optic Design Requirements

May 21, 2021

CITY OF BELLEVUE
WASHINGTON

FIBER OPTIC COMMUNICATION SYSTEM

The City of Bellevue operates and maintains an expansive citywide fiber optic system that provides network connectivity for critical city functions. Critical functions include, but are not limited to, network connectivity for traffic signal operations, traffic cameras, emergency services, and operations at off-site city facilities. Bellevue requires available conduit and fiber optic infrastructure to establish network connections and provision for future system expansion. The City of Bellevue's approach to communication system design aims to separate fiber optic cables in a dedicated infrastructure system, which is important for overall network management and system maintenance. This Design Requirements Manual describes the requirements necessary to accomplish this approach and applies to projects where the fiber optic system is impacted or where new communication systems are required. These standards ensure that City of Bellevue's communication network is available, functional and reliable.

I. GENERAL

Plan, specifications and estimate (PS&E) submittals in the City of Bellevue shall convey the necessary detail to provide clear instructions on how to establish communications to new traffic signals and Intelligent Transportation Systems (ITS) via a fiber optic communication system. Additionally, projects that disrupt the existing fiber communication systems within city right-of-way shall include the necessary design detail to maintain connectivity during construction.

A good design results in a complete, fully-functional and maintainable communication network. Fiber optic communication design may be included in the illumination and traffic signal plans, except in cases where separate ITS communication plans are necessary to provide design clarity and intent. The fiber optic components shown shall include all the information necessary for a complete review of the work being performed. They must also include all the information required for construction or installation, and for documentation of the completed work for future reference.

II. SUBMITTAL REQUIREMENTS

Plans:

- Title block, north arrow and scale bar
- Legend of symbols
- Existing communication conduit, junction box and splice vault layout
- Temporary fiber optic communications design, if necessary
- Permanent fiber optic communications design
- Fiber optic splice details
- Patch panel layout details
- One-line fiber distribution diagram (if design complexity necessitates)
- Details for all non-standard installations and elements
- All other information needed or required elsewhere to properly document the work being done

III. COMMUNICATION SYSTEM INFRASTRUCTURE DESIGN PARAMETERS

The City of Bellevue's communication system infrastructure standard implements purpose-built infrastructure that separates fiber optic cabling from all other conductor types. This approach is applied to conduit systems, junction boxes and splice vaults and is intended to provide a highly available, functional and reliable system as described in the overview.

A. Communication Junction Boxes

1. Fiber optic cables shall be routed through City of Bellevue Type 2 modified junction boxes (Standard Plan SL-180-1) or a large communication junction box (Standard Plan SL-181-1). Junction boxes are permitted for fiber routing where fiber splices do not exist. Fiber optic splices shall be located in fiber optic splice vaults only (see Section 1.1.2), unless otherwise directed by the City of Bellevue ITS Engineer.

2. New communication junction boxes shall not be located on paved roadway surfaces. If an existing communication junction box is located on a paved roadway surface, within the project limits, the junction box shall be relocated or the lid shall be upgraded to traffic bearing, if relocation is not possible.

3. All communication system junction boxes shall be marked as "COB COMM" on the lid.

4. All Junction boxes shall include a non-skid lid.

5. All junction boxes shall be located outside of existing or proposed curb ramps.

6. The minimum spacing between communication junction boxes and/or vaults is 200 ft, except on road crossings, infrastructure associated with Small Wireless Facility (SWF) communications, and other instances directed by the City of Bellevue ITS Engineer.

7. The maximum spacing between communication junction boxes and/or vaults is 600 ft.

8. Communication junction boxes are required at both ends of roadway crossings, borings, or bridges.

9. Conduits shall only enter the sides of a communication junction box, and not the bottom.

B. Fiber Optic Splice Vaults

1. Fiber optic splice enclosures shall only be permitted in a Fiber Optic Splice Vault in accordance with Bellevue Standard Plan SL-190-1, unless otherwise directed by the City of Bellevue ITS Engineer.

2. Each signalized intersection shall include a minimum of two fiber optic splice vaults, which may be located on the same corner or on adjacent corners. The location of the splice vaults shall be reviewed and approved by the City of Bellevue ITS Engineer. The conduit

configuration shall be in accordance with the layout shown on Figure 2, located at the end of this document.

3. All fiber optic splice vaults shall be marked as “COB COMM” on the lid.

4. Splice vaults are not permitted on paved surfaces, except sidewalk, unless otherwise approved by the City of Bellevue ITS Engineer.

5. All splice vaults shall include a non-skid lid.

6. The maximum space between two fiber optic splice vaults is 1,500 ft.

7. Conduits shall only enter the manufacturer’s designed entry points of a fiber optic splice vault.

C. Communication System Conduits

1. All new projects shall install a standard configuration of conduits for the purposes of communications, as shown on Figure 2. The standard configuration includes three 3” conduits and one 2” conduit along a project frontage, unless otherwise directed by the City of Bellevue ITS Engineer.

2. The standard configuration of communication system conduits shall be placed on both sides of the road for any roadway classified as a Major, Minor, and Collector Arterial.

3. Neighborhood streets shall include one 3” conduit on both sides of the road for communication purposes where the improvements exceed 200’ along the roadway, unless otherwise directed by the City of Bellevue ITS Engineer.

4. Communication conduits shall connect with junction boxes and vaults in accordance with the layout shown on Figure 2.

5. Communication conduits shall only connect with communication junction boxes and fiber optic splice vaults, unless otherwise directed by the City of Bellevue ITS Engineer. The only exception to this requirement is the final fiber optic cable conduit entry into the signal cabinet foundation as shown on Figure 2. The City of Bellevue ITS Engineer may also specify other communication conduit tie-in points.

6. Existing conduits used for the installations of a new communication system shall conform to the conduit and junction box layouts as shown on Figure 2. Coordination with the City of Bellevue signal shop staff will be necessary to identify conduit and junction box upgrades needed for conformity.

7. Projects will be required to tie into existing communication system conduits across the road or driveway at its project limits where a continued communication conduit pathway exists.

8. Projects that do interface with a traffic signal shall terminate communication conduits at a Type 2 modified junction boxes (Standard Plan SL-180-1) at the project limits or alternative location determined by the City of Bellevue ITS Engineer. Separate junction boxes will be required for the SWF system infrastructure described in Section 1.2.

9. All communication system conduits shall include detectable mule tape. Detectable mule tape shall be replaced for any instance where it is used for pulling new communication cabling.

10. Parallel communication conduits shall be combined in the same trench or bore location to the maximum extents feasible. Conduits shall be installed in accordance with the trench detail shown on Bellevue Standard Plan SL-122-1.

11. Communication conduits, as specified in Section 1.1.3.2 and 1.1.3.3, shall be included in a shared roadway crossing trench or underground bore where other utility infrastructure is proposed. A communication junction box shall be installed on both sides of the road to receive the communication conduits.

12. Communication conduits, as specified in Section 1.1.3.2 and 1.1.3.3, shall be extended by means of a roadway conduit crossing to connect with an existing communication conduit system, where one exists. **This requirement may result in infrastructure improvements extending beyond the property limits of a project.**

IV. SMALL WIRELESS FACILITY (SWF) COMMUNICATION INFRASTRUCTURE DESIGN PARAMETERS

The City of Bellevue's communication system design standards is forward-compatible with Small Wireless Facility (SWF) deployments. SWF equipment will occupy city-owned streetlight poles and require a conduit system capable of providing SWF power and communications. Figure 2, located at the end of this document, identifies the City of Bellevue's standard for SWF deployments and is intended for application on new construction projects in the city. Adherence to this standard is required for the installation of any new street light pole owned by the City of Bellevue. In cases where the street lighting system is impacted, the project shall coordinate with the City of Bellevue Transportation Department to determine application of the standard depicted in Figure 2.

A. A: SWF Communication Junction Boxes

1. One large communication junction box is required for SWF at each corner of a signalized intersection in accordance with the layout shown on Figure 2, unless a fiber optic splice vault exists or is proposed for SWF. A large junction box shall be deployed in accordance with the Bellevue Standard Plan SL-181-1.

2. One Type 2 modified junction box as shown on Bellevue Standard Plan SL-180-1 shall be placed adjacent to each streetlight pole, in addition to the standard street lighting junction box.

3. All SWF junction boxes shall be marked as "SWF COMM" on the lid.

4. All SWF junction boxes shall include a non-skid lid.

5. All SWF junction boxes shall be separate from the City of Bellevue street lighting, communications and traffic signal conduit systems, unless otherwise specified by the City of Bellevue ITS Engineer.

V. FIBER OPTIC CABLING DESIGN PARAMETERS

The City of Bellevue deploys Single Mode Fiber Optic (SMFO) as an Outside Plant (OSP) standard in the city. Fiber optic cables are deployed as they support long distance network communications and high-speed data. This section outlines the deployment standards for Bellevue's trunk, distribution, and lateral fiber optic cables.

A. Installation

1. Fiber optic cables shall be only be placed in conduit systems separated from all other conductive cabling, except low-voltage Ethernet cables.

2. Fiber optic cables shall not use cabinets as a raceway or junction box. If a cable is not intended for use in a cabinet, it shall not be installed into or through that cabinet.

B. Slack Fiber Optic Cable

1. All fiber optic cables pulled continuously through a vault must contain a minimum of 100 feet of slack. Slack fiber optic cable shall be racked in a "Figure 8" configuration inside each vault.

2. 100 feet of slack cable shall be provided for each direction of every cable entering a splice enclosure, unless otherwise specified by the ITS Engineer.

C. Removal of Unused Cabling

Any fiber optic or copper interconnect cables that are not part of a permanent ITS network shall be removed on a given project, unless otherwise directed by the City of Bellevue ITS Engineer.

D. Fiber Optic Trunk Cables

Fiber optic trunk cables are purposed for backhaul communications between two major splice points or fiber termination points. Trunk cables may carry multiple owner/operators and are intended to have as few splices as possible to preserve data transmission quality.

1. The minimum strand count for new fiber optic trunk cables shall be 144 count single-mode fiber, unless specified otherwise by the City of Bellevue ITS Engineer.

2. Where an existing trunk fiber optic cable is impacted by a project, the cable shall be replaced between existing splices (i.e. no new splices shall be added, unless approved the City of Bellevue ITS Engineer). **Infrastructure improvements may extend beyond the project limits to re-install the replacement fiber optic trunk cable.**

3. New fiber optic trunk cables shall be required for all major and minor arterials where the project area exceeds ½ mile (2,640 ft) of continuous roadway improvements. Splices points for the new fiber optic trunk cable shall be determined by the City of Bellevue ITS Engineer.

E. Fiber Optic Distribution Cables

Fiber optic distribution cables are used for providing connections to field devices including, but not limited to, traffic signal systems, traffic cameras, data collection devices, and Wi-Fi antennas. Distribution fiber optic cables typically only carry City of Bellevue applications.

1. The minimum fiber optic distribution cable shall be 96 count single-mode fiber, unless specified otherwise by the City of Bellevue ITS Engineer.

2. Where an existing fiber optic distribution cable is impacted by a project, the project shall coordinate with the City of Bellevue ITS Engineer and signal shop staff to determine the appropriate design for the replacement cable. **Infrastructure improvements may extend beyond the project limits to re-install the replacement fiber optic distribution cable.**

3. A new fiber optic distribution cable shall be required for all major, minor and collector arterials, unless otherwise directed by the City of Bellevue ITS Engineer. A new fiber optic distribution cable is not required when an existing distribution cable that meets current design standards already exists.

F. Fiber Optic Lateral and Drop Cables

In the City of Bellevue. fiber optic lateral and drop cables are used to provide a network connection between the fiber distribution cable and an end-device. These single end-point connections are also referred to as drop cables as they provide a network drop to the end-device. Lateral cables typically connect to the distribution fiber optic cable but may also connect to trunk cables in limited scenarios.

1. The minimum strand count for a fiber optic lateral cable is 24ct when the end-device is a traffic signal cabinet. All other applications shall be reviewed by the City of Bellevue ITS Engineer.

2. The length of lateral fiber optic cables shall not exceed the distance between two fiber optic splice enclosures that are along the conduit pathway to the end-device.

3. Lateral fiber optic cables are permitted in traffic signal and illumination junction boxes when the end-device is owned and operated by the City of Bellevue. All other applications will require a dedicated communication system for the lateral fiber optic cable as described in the overview.

G. Fiber Optic Splices

Fiber optic splices vary in configuration due to many factors, including but not limited to, the availability of dark strands on existing fiber optic cables, necessary connections to end-devices, number of cables meeting at a splice point, etc. As a result of this variability, a standardized splice in the City of Bellevue does not exist. This section provides general design guidance for a typical splice at a traffic signal cabinet location.

1. A typical fiber optic splice in the City of Bellevue includes a single 24ct SMFO drop cable from a distribution fiber optic cable to a traffic signal cabinet. The typical layout is shown in Figure 1 below:

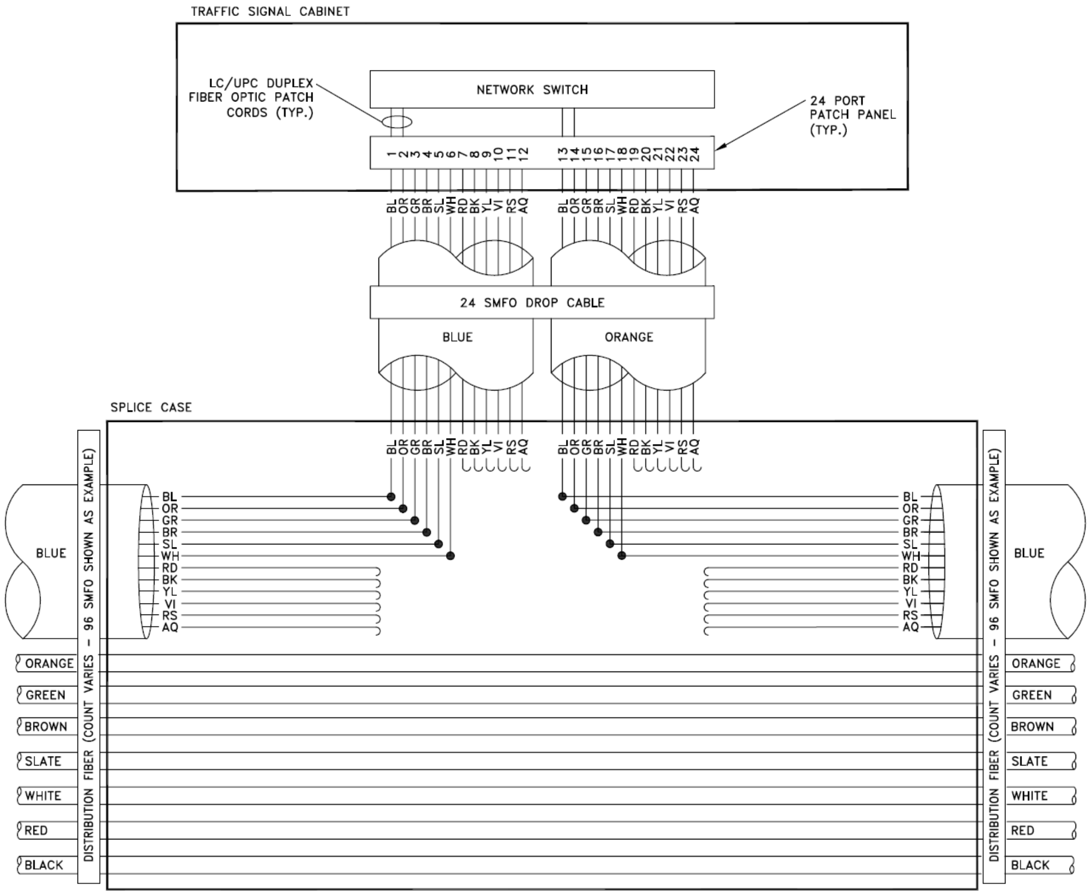


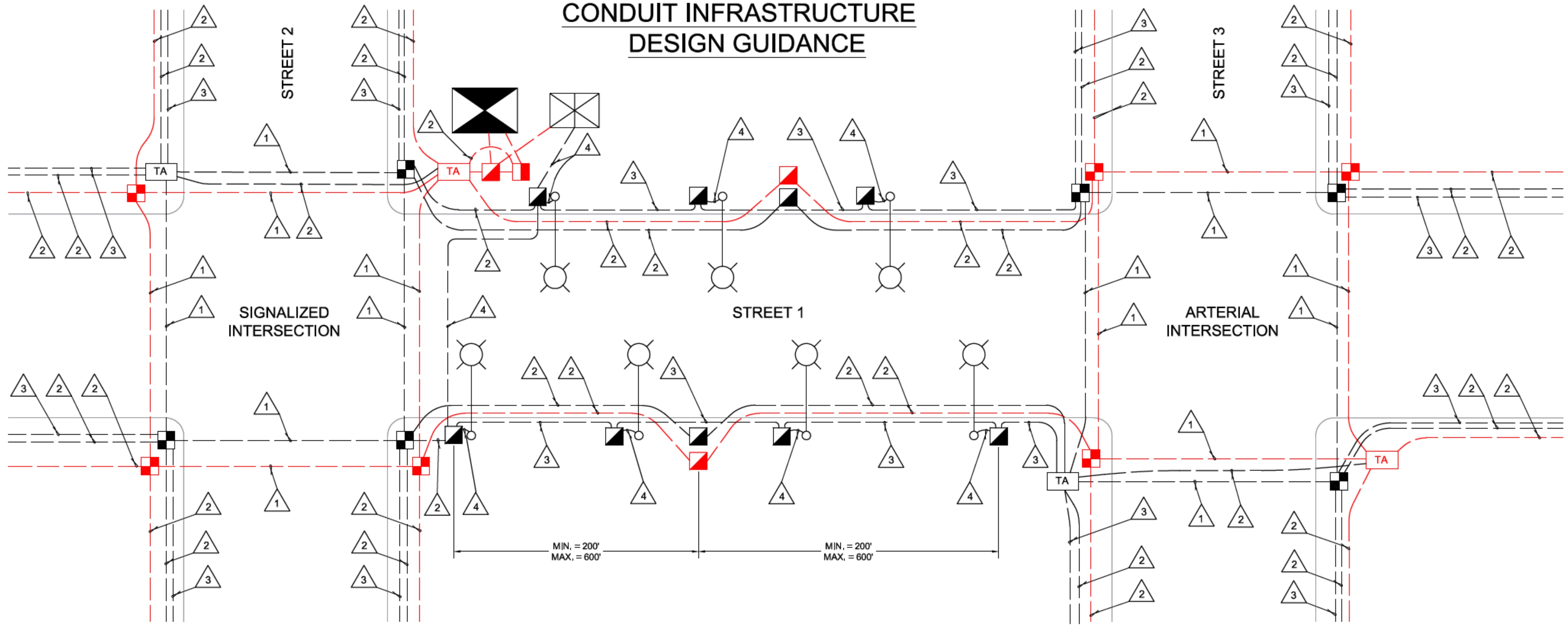
Figure 1: Typical Splice Detail at Traffic Signal Cabinet Location

2. All fiber optic splice designs shall be coordinated with and approved by the City of Bellevue ITS Engineer.

V. TEMPORARY FIBER OPTIC COMMUNICATION SYSTEMS

During construction, it is necessary to maintain operations of the communication system at the project owner’s expense. Impacts to the communication system are typically encountered when a communication conduit system is disturbed. In many cases, it will be necessary to temporarily relocate or modify the City of Bellevue’s fiber optic system to maintain operations. For all instances where the communication system is impacted, the project shall coordinate with the City of Bellevue Transportation Department on available options to maintain network connectivity. Temporary network connections may include, but are not limited to, the installation of temporary fiber optic cables, fiber optic splices, conduit, and other network equipment.

SMALL WIRELESS FACILITY CONDUIT INFRASTRUCTURE DESIGN GUIDANCE



LEGEND

- TYPE 8 JUNCTION BOX (BELLEVUE STD. DWG. NO. SL-170-1)
- MODIFIED TYPE 2 JUNCTION BOX (BELLEVUE STD. DWG. NO. SL-180-1)
- COB LARGE COMM. JUNCTION BOX (BELLEVUE STD. DWG. NO. SL-181-1)
- TA FIBER OPTIC SPLICE VAULT (BELLEVUE STD. DWG. NO. SL-190-1)
- TRAFFIC SIGNAL CABINET
- ELECTRICAL SERVICE CABINET
- SWF COMPATIBLE LIGHT POLE (BELLEVUE STD. DWG. NO. SL-100-2)
- CITY CONDUIT INFRASTRUCTURE
- SWF CONDUIT INFRASTRUCTURE

GENERAL NOTES

1. ALL CONDUITS WITHOUT WIRE NOTES SHALL BE SPECIFIED AND SIZED IN THE TRAFFIC SIGNAL DESIGN.
2. LOCATIONS OF JUNCTION BOXES AND VAULTS ARE SCHEMATICALLY SHOWN AND NOT TO SCALE.
3. CITY OF BELLEVUE ILLUMINATION POWER IS NOT SHOWN IN THIS SCHEMATIC.

COMMUNICATION SYSTEM WIRE SCHEDULE

WIRE NOTE	MIN. CONDUIT SIZE	FUNCTIONAL USE
1	4"	COMMUNICATIONS
2	3"	COMMUNICATIONS
3	2"	POWER (SWF)
	3"	COMMUNICATIONS
4	2"	POWER (SWF)
5	4"	COMMUNICATIONS

Transportation

Figure 2: Small Wireless Facility Conduit Infrastructure Design Guidance

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Appendix D

Small Wireless Facilities

The information for this appendix is available on a separate webpage at https://bellevuewa.gov/city-government/departments/development/permits/right-way-permits/small-wireless-facility-permit

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Appendix E

Preliminary Civil Plans Requirements

The information for this appendix is available on a separate webpage at
https://bellevuewa.gov/sites/default/files/media/file/2020/Preliminary%20Civil%20Plans%20Requirements.pdf

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Appendix F

Wilburton Transit Oriented Development (TOD) Access Concepts Design

This document is currently under final review with the expected publishing date of Summer 2025. See Review Engineer for current requirements.

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