


The logo for the City of Auburn, Washington, features the words "CITY OF" in a small, red, sans-serif font above the word "AUBURN" in a large, red, serif font. Below "AUBURN" is the word "WASHINGTON" in a smaller, red, sans-serif font. The text is set against a background of three wavy, light blue lines and three small, blue, five-pointed stars.

CITY OF AUBURN WASHINGTON

ENGINEERING DESIGN STANDARDS

City of Auburn
Engineering Services
Public Works Department
25 West Main Street
Auburn, WA 98001-4998

Approved By:



Jacob Sweeting, P.E.
Assistant Director of Engineering Services/City Engineer

2/15/2024

Date

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ENGINEERING DESIGN STANDARDS

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Chapter 1: General Information

1.00 Preface

Per Auburn City Code (ACC) 12.04.020, all public work construction contracts of the City, including but not limited to streets and sidewalks, storm water and sanitary sewer systems, and water systems, and all work within City public right-of-way performed by the City and others shall conform to the Engineering Design Standards (EDS). The EDS applies to City capital projects and for work performed by developers and others under construction permits (CON), grading permits (GRA), storm permits (STM), other utility permits, and public facility extensions (FAC). The City of Auburn has adopted the EDS to require the standardization of design and construction elements for consistency, to assure that public safety needs are met, and to comply with Local, State, and Federal regulations.

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.

1.01 Definitions

Note that additional definitions are included in the documents referenced in **Section 1.03**.

AASHTO – American Association of State Highway and Transportation Officials.

Access Point – A driveway or private street that connects to the general public street system. A public street is not considered an access point.

ACC – Auburn City Code.

Activity Centers – Locations such as schools, parks, retail areas and shopping centers, places of employment, or public service areas that attract people.

Accessible – Meeting Americans with Disabilities Act (ADA) requirements as established by the City's ADA Transition Plan.

ADT – Average Daily Traffic. The total two-directional volume of traffic passing through a given point during a given time period, divided by the number of days in that time period.

Aggregate – A mixture of various soil components (e.g., sand, gravel, and silt).

Alley – Right-of-way, usually narrower than a street with an all-weather surface, which provides access to the rear boundary of 2 or more residential or non-residential properties and is not intended for general traffic circulation. An alley is considered to be a classification of roadway/street.

Apartment – See ACC Chapter 18.04.

Applicant – The owner or their agent seeking approval from the city for any land use or other related permit or approval referenced in City of Auburn Code and which requires utilization of these Standards. References: See Developer.

Appurtenance – Equipment and/or accessories that are a necessary part of an operating utility system or subsystem.

APWA – American Public Works Association.

ASTM – American Society for Testing and Materials.

Backfill – Replacement of excavated material with suitable material compacted as specified.

Backwater – Water held back by some obstruction, natural or artificial.

Backwater Curve – A plot of depth versus location along the channel containing backwater.

Bicycle Facilities – A general term referring to improvements that accommodate or encourage bicycling, including parking facilities, bike racks, bicycle route mapping and bicycle route development.

Boring/Jacking – Grade and alignment-controlled mechanical or other method of installing a pipe or casing under a street without disturbing the surrounding medium.

Breakaway Structure or Breakaway Design – A structure or installation that has been crash tested in accordance with National Cooperative Highway Research Program procedures. (NCHRP 230).

Capacity – (1) The maximum number of vehicles that have a reasonable expectation of passing over a given roadway or section of roadway in one direction during a given time period under prevailing roadway and traffic conditions. (2) The volume of liquid or gas that can be transported by a pipe. (3) The load-carrying limit of a structure.

Casing – A larger pipe enclosing another pipe that directly encloses a transmitted fluid or gas for the purpose of providing structural or other protection to the carrier and/or to allow for carrier replacement without re-excavation, jacking or boring.

CF – Cubic Feet.

Channelization – The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands or other suitable means to facilitate the safe and orderly movement of both vehicles and pedestrians.

Check – A short section of built-up channel placed in a canal or irrigation ditch and provided with gates or flashboards to control flow or raise upstream level for diversion.

City – The City of Auburn.

City Council – The City legislative authority.

City Engineer – The City Engineer for the City of Auburn. References: See Engineer.

Clean-Out – A pipe through which plumbing snakes can be pushed to unplug a sewer.

Clear Zone – The total streetside border area, starting at the edge of traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes, speeds, and the streetside geometry.

Coating – Protective material applied to the exterior of a pipe or conduit to prevent or reduce abrasion and/or corrosion damage.

Commercial Property Use – Property with residential developments with four or more dwelling units per parcel or commercial developments. This is consistent with building permit administration in City of Auburn.

Conduit – An enclosed tubular runway for protecting wires or cables.

Contractor – The individual, partnership, firm, corporation or joint venture, contracting with the Developer to do prescribed work.

Concrete Thrust Blocking – Concrete that is used to support fittings in water mains.

Control Zone – That streetside area defined by the “Control Zone Distance Table”; found in Appendix 5 of the WSDOT Utilities Manual, within the street right-of-way in which placement of utility objects is controlled.

Corporation Stop – A brass fitting used to connect service lines to a water main.

Cover – Depth to top of pipe, conduit, casing, or gallery below the grade of a street or ditch.

Cross Connection – Connecting fire, irrigation and drinking water supplies together, or connecting storm and sanitary sewers together.

Cul-de-sac – A street closed at one end by widened pavement of sufficient width for vehicles to turn around.

CSBC – Crushed Surfacing Base Course.

CSTC – Crushed Surfacing Top Course.

CTP – The City of Auburn’s current Comprehensive Transportation Plan. See **Section 1.03.03**.

CY – Cubic Yard.

Dead End Street – Street that accesses the roadway system only at one end. See also Stub End Street.

Dedication – The transfer of land or the interest of land by the owner of such land to the City for public uses, reserving no other rights than such are compatible with the full exercise and enjoyment of the uses the property has been dedicated.

Design Speed – Design speed is the maximum safe speed that can be maintained when conditions are so favorable that the design features of the highway govern.

Detention Tanks and Vaults – Detention tanks and vaults are underground facilities for the storage of surface water.

Developer – The Owner and any agent of the Owner authorized to represent the Owner. References see Applicant.

Development – All structures and other modifications of the natural site above and below ground on a particular site.

Domestic Water Service – Any service that connects directly to plumbing within a structure and is used for drinking, cooking, washing, and other standard uses of potable water.

Drain – Appurtenances to discharge accumulated liquids from casings or other enclosures.

Driveway – An access point providing motorized access to/from property(s), shared driveway or alleys to a street (public or private) or shared driveway. Driveway access roads and aprons are considered parts of a driveway.

Driveway Access Road – Driveway driving surface, including approach and adjacent non-motorized facilities (where present).

Driveway Approach – The portion of a driveway access road that connects the driving surface on the property(s), private street, or alley to the driveway apron.

Driveway Apron – The improved area that connects a driveway approach to a street, alley, or shared driveway which includes, when present, the sloped areas (wings) to the adjacent sidewalk or landscape strip, and also includes the area between the curb or edge of pavement and the back of the pedestrian pathway. Flush curbs across commercial driveway aprons are considered to be part of the driveway apron.

Easement – A right to use or control the property of another for designated purposes.

Edge of Traveled Way – The face of curb for streets that are or will be constructed to urban standards and the edge of pavement (not shoulder) for streets that are, or will be constructed to rural standards.

Embankment – A raised structure constructed of natural soil from an excavation or borrow source.

Encroachment – Occupancy of City right-of-way by non-roadway structures or other objects of any kind.

Engineer – The City Engineer for City of Auburn or any designee thereof.

Fixed Object – Any object that is not intended to move or break away upon impact.

Franchise – Occupancy and use document granted by the City required for occupancy of street rights of way.

Geometrics – The arrangement of the visible elements of a street such as alignment, grade, sight distance, widths, and slopes.

Grade – Rate or percent of change in slope, either ascending or descending from or along the roadway. It is measured along the centerline of the roadway or access point.

Gravity Distribution – A water supply that uses natural flow from an elevated tank or mountain reservoir to supply pressure.

Hazard – A side slope, an object, water, or a drainage device that, if impacted, would apply unacceptable impact forces on the vehicle occupants or place the occupants in a hazardous position. It may be either natural or man-made.

Hydraulic Analysis – A report that details the engineering process used to analyze water pressures, flow requirements, and velocities, for a development and the impacts on the system network as a result of the development.

Hydraulic Jump – The rapid change in the depth of flow from a low stage to a high stage resulting in an abrupt rise of water surface.

Impervious Layer – A geologic layer through which no water can pass.

Infiltration – (1) The act of stormwater permeating into the ground. (2) Groundwater that enters sewer pipe through cracks and joints, or the movement of water through the upper soil.

Interception – Rain that falls on vegetation and other impervious objects, which evaporates without contributing to the runoff.

Intersection – The connection of two or more public or private streets excluding alleys, driveways, and shared access roads.

Intersection Sight Distance – The distance required for a vehicle, traveling at or near the design speed to reduce its speed to avoid overtaking another vehicle, which has entered the intersection from another street. The entering vehicle can be making right, left-turning movements or crossings.

Island – A defined area between traffic lanes for control of vehicle movements and/or for pedestrian refuge.

Joint Use Driveway Tract – A jointly owned and maintained tract or easement serving 2 properties.

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

Lateral – A sewer line that goes off at right angles to another.

Manhole – An opening in an underground utility system into which workers or others may enter for the purpose of making installations, inspections, repairs, connections, cleaning, and testing.

Main – A principal pipe in a system that distributes water or collects sewage.

Median – That portion of a divided roadway separating the traveled ways for traffic in opposite directions.

MPH – Miles per hour.

MSE Walls – Mechanically Stabilized Earth Walls.

MUTCD – Refers to the latest edition of the Manual of Uniform Traffic Control Devices as adopted by the Washington State Department of Transportation and as modified by applicable WAC and RCW.

Neighborhood – For the purposes of these design standards, a neighborhood is considered to be one or more residential subdivisions and parcels that are interconnected by local residential streets and typically bound by arterial and collector streets or other boundaries such as rivers, critical slopes, or jurisdictional boundaries.

Nonpotable – Fluid that is not for human consumption, but may be used for other purposes, such as sewage and stormwater runoff. Gas mains are also considered nonpotable.

Outfall – The pipe that discharges completely treated wastewater or stormwater runoff into a lake, stream, or river.

Pavement – The combination of gravel base, crushed rock, and asphalt concrete pavement placed on a subgrade to support the traffic load and distribute it to the subgrade.

Pavement Width – The distance measured from face of curb to face of curb for curbed sections of roadway or the distance measured from outside edge of shoulder to outside edge of shoulder for shouldered sections of roadway.

PC – Point of Curvature.

Peak-Hour – That period experiencing the highest volume of traffic.

Peak Period – Two hours during any a.m. or p.m. period when vehicle arrival and departure from the site or corridor is the highest.

Pipe – A structural tubular product designed, tested, and produced for the transmittance of specific liquids and gases under specific conditions.

Posted Speed – Is the signed speed limit along a street.

Potable – Water that is Drinkable.

PRC – Point of reverse curvature.

Pressure – Internal gage pressure in a pipe in pounds per square inch, gage (psig).

Private Street – A privately owned and maintained access provided for by a tract, easement or other legal means.

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

Professional Land Surveyor – A surveyor licensed to practice in the State of Washington.

Public Street – A publicly owned facility that provides access, including the roadway and all other improvements.

Relocation – Planned change of location of an existing facility to a more advantageous place without changing the character or general physical nature of the facility.

Redevelopment – See ACC 13.48.010.

Replacement – Installation of a like element of a utility system or subsystem in the same or near-same physical location normally due to damage, wear or obsolescence of the element.

Restoration – All work necessary to replace, repair or otherwise restore the right-of-way and all features contained within to the same or equal condition as before any change or construction thereto.

Right-of-way (R/W) – All property in which the City has any form of ownership or title, and which is held for public street purposes, regardless of whether or not any street exists thereon or whether or not it is used, improved, or maintained for public travel.

Riprap – Pieces of broken stone used to protect the sides of waterways from erosion.

Roadway Intersection – location where two or more roadways intersect, including private roads but excluding alley's, driveways, shared driveways, and access tracts.

Rural – All lands regardless of current comprehensive plan designation not meeting the definition of Urban.

Separate Turn Lane – An auxiliary lane for traffic in one direction which has been physically separated from the intersection area by a traffic island or stripe. Separate turn lanes may be included within intersections or separated from intersection areas by traffic islands.

SF – Square Feet.

Shared Driveway – Driveway that provides access from a public or private street to more than one parcel or a driveway that provides access from a public or private street to a single parcel across one or more other parcels and/or an access tract or easement.

Shared Driveway Access Road – Shared driveway driving surface, including approach and non-motorized facilities (where present), but excluding parking lot drive aisles.

Shoulder – That portion of the roadway contiguous with the traveled way for accommodating stopped vehicles, for emergency use, and for lateral support of base and surface courses.

Slab – A cast concrete member of uniform thickness.

Standards – The City of Auburn Engineering Design Standards.

Stopping Sight Distance – The distance needed for a vehicle traveling at or near to stop before reaching a stationary object in its path.

Street or Roadway – A public way open for the passage of vehicles and persons. Limits include the outside edge of sidewalks, or curbs and gutters, or side ditches, including the appertaining shoulder and all slopes, ditches, channels, waterways, and other features necessary for proper drainage and protection within the right-of-way.

Street Frontage – Any part of private or public property that borders a public street.

Street Tree – A tree placed within the public right-of-way.

Substantial – In the sole opinion of the City Engineer, of ample or considerable amount, quantity, or size.

Surface Retention – That part of a storm that does not immediately appear as infiltration or surface runoff. Retention is made up of depression storage, interception, and evaporation.

Traffic Control – Those activities necessary to safeguard the general public, as well as all workers, during the construction and maintenance of roadway and other facilities within the right-of-way.

Traveled Way – That portion of the roadway intended for the movement of vehicles, exclusive of shoulders.

Trenched – Installation of a utility in an open excavation.

Trip – A one-direction movement that begins at the origin and ends at the destination. For example, a trip movement from a residence to a work place is a trip from home to work.

Trip Generation – A general term describing the analysis and application of the relationships that exist between the trip makers, the traffic study area, and the trip making. It relates to the number of trip ends in any part of the traffic study area.

Uniform Flow – Flow that has a constant depth, volume, and shape along its course.

Unopened Right-of-way – A City right-of-way that exists by dedication or deed, but for which no vehicular roadway has been constructed by the City or other parties, and the street is not maintained by the City.

Utility – A company providing such public services as gas, electric power, telephone, water, sewer, or cable television, whether or not such company is privately owned or owned by a governmental entity.

Wetpond – A stormwater pond that has been designed to retain a permanent pool of water “wetpool” to provide treatment of storm runoff.

Wetpool – The permanent pool of water retained in a wetpond or wetvault.

Wetvault – A stormwater vault that has been designed to retain a permanent pool of water “wetpool” to provide treatment of storm runoff.

1.02 Contact Information

Permit Center

Physical address:

Auburn Professional Plaza – Customer Service Center (2nd Floor)

One East Main Street

Mailing address:

25 West Main Street

Auburn, Washington 98001-4998

Email address: permitcenter@auburnwa.gov

Public Works Department – Engineering Services:

Phone:(253) 931-3010

Department of Community Development:

Building Phone: (253) 931-3020

Planning Phone: (253) 931-3090

Email address: development@auburnwa.gov and/or permitcenter@auburnwa.gov

1.03 City Reference Material

Unless noted otherwise, reference material referred to herein may be obtained from the City of Auburn’s website or by clicking on the hyperlink below:

[Auburn Reference Material](#)

1.03.01 City of Auburn Surface Water Management Manual (SWMM)

The City of Auburn Surface Water Management Manual (SWMM) is the 2019 Department of Ecology Stormwater Management Manual for Western Washington (DOE SWMMWW) and the City of Auburn Supplemental Manual. The SWMM is a manual of specific requirements related to storm drainage management. See **Section 8.07** for more information.

1.03.02 City of Auburn Engineering Construction Standards (ECS)

The Engineering Construction Standards (ECS) sets forth the standards used during the construction of all civil projects within the City's jurisdiction, including the extension of public water, sanitary sewer, storm drainage, and transportation facilities by private developments. The ECS includes three separate documents: General Special Provisions, Technical Special Provisions, and Standard Details. The General and Technical Special Provisions supplement and modify the current "Washington State Department of Transportation (WSDOT/APWA) Standard Specifications for Road, Bridge and Municipal Construction." The Standard Details, are comprised of the City's construction and design detail drawings for temporary erosion control, grading, water, sanitary sewer, storm drainage, and street work within the City. The Standard Details are supplemented by the "Washington State Department of Transportation's (WSDOT) Standard Plans."

The referenced details and plans in these Design Standards shall be the standard except as modified by the General and Technical Special Provisions and by this document, the Design Standards.

1.03.03 Planning Documents

The following planning documents can be found on the City's website or by clicking on the hyperlinks below:

[Auburn Comprehensive Plan](#)

[Transportation Improvement Program](#)

[Comprehensive Transportation Plan](#)

[2016 Comprehensive Sewer Plan](#)

[2015 Comprehensive Water Plan](#)

[2015 Comprehensive Storm Drainage Plan](#)

1.03.04 Informational Handouts

Handouts are currently available from the City to aid the public in planning and constructing development projects within the City of Auburn. Contact the Permit Center or see the City's website by clicking on the hyperlink below (select 'Information Handouts') for the most current list available:

https://www.auburnwa.gov/city_hall/public_works/standards_publications

1.03.05 Additional Technical Information

Additional design guidance and standards for specialized facilities such as pump stations, pressure reducing stations, and others are not included herein, but may be provided by the City as guidance to supplement efforts during design discussions.

1.03.06 Other Reference Material

The following publications are to be used for design applications and can typically be found on the publishing agency's website. In case of conflict between City publications and those referenced below, the City publication will take precedence:

- A. Auburn City Code (ACC) related to development requirements.
- B. Washington State Department of Transportation (WSDOT) "Standard Specifications for Street, Bridge and Municipal Construction" as amended by the City's Special Provisions (Part 1 of the Construction Standards). These will be referred to in City publications as the "WSDOT Standard Specifications."
- C. Washington State Department of Transportation (WSDOT) "Design Manual" (latest edition).
- D. Washington State Department of Transportation (WSDOT) "Standard Plans."
- E. American Association of State Highway and Transportation Officials' (AASHTO) "A Policy on Geometric Design of Highways and Streets" (latest edition).
- F. FHWA and Washington State Department of Transportation, MUTCD.
- G. Transportation Research Board's (TRB) Roundabouts: An Informational Guide, 2nd Edition (NCHRP 672).
- H. State of Washington Department of Ecology's "Criteria for Sewage Works Design" (latest edition).
- I. State of Washington Department of Health (DOH) "Water Systems Design Manual" (latest edition).
- J. American Water Works Association (AWWA) Standard Specifications (latest edition).
- K. "IES Lighting Handbook" (Illuminating Engineering Society of North America) (latest edition).
- L. American National Standard for Roadway Lighting ANSI/IESNA RP-8-00 (latest edition).

1.04 Deviation from Standards

In some cases, City standards may not best address a particular engineering application. In these instances, a design deviation from the City's standards may be requested from the City Engineer. Except deviations for City capital improvement projects, deviations shall be made using the City's Deviation Request Application and shall include applicable engineering justification for the deviation. Deviation requests and supporting justification must be sealed by a professional engineer. The City Engineer will evaluate the request and notify the applicant of a decision within 15 working days upon receipt of a complete deviation request or with the completion of the first review of the development review plans or plats (for Short Plats, Plats, FAC's and Grading Permits), whichever is later. Additional City review time may be required in certain circumstances and will be coordinated with the applicant. For deviation applications that are associated with a preliminary plat application submitted in compliance with ACC 17.10, the deviation application and a recommendation from the City Engineer must accompany the preliminary plat to the hearing examiner. The hearing examiner must obtain the concurrence of the City Engineer for any requests to modify any City of Auburn design or construction standard. Approved deviations must be shown on the final civil site improvement plans as specified in **Chapter 3**.

Deviations for City capital improvement projects will be reviewed and approved by the City Engineer during design review. The City Engineer signing the final plans as approved for construction constitute approval of any deviations from these Standards.

1.04.01 General Deviations

General deviations apply to all engineering design standards except for the Surface Water Management Manual's Minimum Requirement deviations.

The engineering design deviation, with compelling supporting justification, 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.

Additionally, the proposed deviation will meet or exceed the corresponding City standard for the following applicable criteria:

- A. The functional intent of the design element.
- B. Safety factors associated with the design element.
- C. Operational concerns associated with the design element.
- D. Maintenance concerns associated with the design element.
- E. Liability concerns associated with the design element.
- F. The capacity and/or efficiency of the design element.
- G. The design life, historical performance, and durability of the design element.
- H. The aesthetic and visual impacts of the design element.
- I. The cost effectiveness and availability of any replacement components or materials.
- J. Consistency with the spirit and purpose of the corresponding City design standard.
- K. Demonstration that the environment will not be adversely affected.
- L. Supported by published industry standards.
- M. The effect on buildable lands within the City of Auburn.

1.04.02 Surface Water Management Manual (SWMM) Deviations

A deviation request from any of the 10 Minimum Requirements in the SWMM goes through a different process which includes a public notice requirement. This is to ensure that the Department of Ecology mandated surface water regulations are complied with. The 10 Minimum Requirements of the SWMM can be found in **Section 8.07**.

Requests for deviations from the 10 Minimum Requirements of the SWMM shall be in accordance with ACC 13.48.226 and these standards.

1.04.03 Appeal of City Engineer's Decision

Appeal of the City Engineer's decision shall follow the following procedure:

The applicant shall have 15 working days from the date of receipt of the City Engineer's decision in which to submit a written notice to the Public Works Director contesting the decision of the City Engineer. The Public Works Director shall then have 15 working days to notify the applicant

of a decision to uphold or modify the City Engineer's decision. For appeals of engineering deviations requests, the Public Works Director's determination shall be final.

1.04.04 Changes to Standards

Per ACC 12.04.010, the City Engineer is authorized to make any additions, deletions, or modifications stated in these Standards with consultation with the City Council on policy issues or broad Citywide implications.

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Chapter 2: Plan Approval Process

2.00 Preface

This Chapter contains standards and procedures that apply to the review and approval process for civil engineering plans. Development or redevelopment of property within the City of Auburn, and/or within the limits of Auburn's Utility Service Area, that require civil engineered plans to support a development action must follow the processes outlined in the subsections below.

2.01 Types of Plans

This section contains information regarding the types of civil engineering plans submitted to the City. Specific plan requirements are described in detail in **Chapter 3**.

2.01.01 Grading (GRA) Plans

Grading plans are required prior to the issuance of a Grading Permit and before commencement of construction, if triggered per ACC 15.74.

2.01.02 Building Site Plans

A Building Site Plan includes all civil site development requirements including site layout, building location, site access, parking, code required landscaping, utility service, and storm drainage control. An approved Site Plan is required prior to the issuance of a Building Permit and before commencement of construction.

A building Site Plan is required for all new non-residential developments and residential construction of 3 units or more per lot.

2.01.03 Public Facility Extension (FAC) Plans and Agreement

City of Auburn approved Public Facilities Extension (FAC) Plans and an executed FAC Agreement are required prior to construction of City of Auburn infrastructure (sanitary sewer, water, storm drainage, and/or transportation facilities) by any party other than the City of Auburn.

2.01.04 Other Plans

Some projects may also require other types of plans. The requirements for these additional plans will usually be addressed early in the submittal process. These plans could include, but are not limited to, the following:

- A. Landscape plans, prepared in accordance with ACC 18.50.
- B. Land clearing plans, prepared in accordance with ACC 15.74.
- C. Irrigation plans, prepared in accordance with ACC 18.50.
- D. Critical Area restoration/enhancement plans, prepared in accordance with ACC 16.10.
- E. Retaining Wall Plans and Structural Calculations.
- F. Illumination/Site Lighting Plans, prepared in accordance with ACC 18.55.

2.02 Review and Approval Process

2.02.01 Submittals

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

- A. Applicants are encouraged to meet with City staff prior to plan submittal. Information on applying for a Pre-Application Meeting is available through the City of Auburn Permit Center. All plans and associated documents submitted to the City will be assigned a project number and receive a preliminary review to make sure they adequately address the minimum requirements of a complete application. Any such plans and associated documents not meeting these requirements will be returned to the applicant or the applicant's designee as unacceptable for review, with a written explanation of necessary corrections required prior to the subsequent resubmission.
- B. Prior to preparing civil engineering plans for submittal, the applicant shall review the submittal requirements outlined in the Civil Submittal Handout (FAC & GRA) on the City's website under Forms. This packet provides a summary of the Engineering Design Standard sections that apply to civil plan preparation but does not substitute for a thorough review of the Engineering Design Standards.
- C. Civil Engineering plans and associated documents are to be submitted to the City for processing. All submittal documents (Reports & Plans) must be single .pdfs and not require collating, with file names that clearly state the document type and may be submitted through www.MyBuildingPermit.com. If you have any questions regarding the application process or submittal requirements please contact the City Permit Center at permitcenter@auburnwa.gov, (253) 931-3020 or Development Engineering at development@auburnwa.gov, (253) 876-1969, or in person at the City of Auburn Permit Center on the Second Floor of the Auburn Professional Plaza, One East Main Street.
- D. After the receipt of a completed Civil Submittal, the City will make a preliminary review of the plans and supporting data to verify the scope of the proposed extension(s) and check for completeness of the application. The City requires 28 calendar days from the date of initial submittal, to determine if the application is complete. However, typical review times are generally shorter than this. Once the City is satisfied with the completeness of the application, the applicant will receive payment instructions, and once the application fees have been paid, the 1st detailed civil submittal review will begin.
- E. Once the length of the public extension(s) and/or hours required for review/inspection have been verified/calculated, 30% of the review and inspection fees are due with the application for 2nd review. Detailed FAC Plan review work for the 2nd review will not continue until 30% of the review and inspection fee is paid. If no 2nd review is needed, then payment of the full review and inspection fee is due before the City signs the facility extension agreement.
- F. All proposed public right-of-way dedications shall be dedicated to the City prior to start of construction with the exception of plats and short plats. 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. Title insurance shall be provided to the City for right-of-way dedications in the amount of \$50.00 per square foot of right-of-way area dedicated, or other amount as proposed by the Developer

and accepted by the City Engineer. Refer to the Right-of-Way Dedication Handout on the City's website under Forms for additional information. Easements shall be executed by the Applicant prior to start of construction. Easement documents will be held by the City until the end of construction, at which time the easement exhibits and descriptions may need to be updated by the Applicant, based on as-built conditions, except easements that are being granted by someone other than the Applicant which will be recorded prior to the start of construction. Once the easements are confirmed to match field conditions, the easements will be recorded by the City.

- G. The following applicable information may be required along with the plan submittal:
 - 1. Title report.
 - 2. The final biologist report, including the wetland mitigation plan, when appropriate.
 - 3. Traffic reports.
 - 4. A copy of other applicable applications (Short Subdivisions, Subdivisions, etc.).
 - 5. Letter indicating how SEPA and/or other applicable application conditions have been accounted for in the development/plan process.
- H. All final plans, calculations, or reports submitted for review shall be stamped by a Professional Engineer. Electronically signed seals will only be accepted if they meet the requirements of WAC 196-23-070.
- I. Where the plan review process is running concurrent with other applications (SEPA, Subdivisions, etc.), the above-referenced information may not be available at time of plan submittal. In such instances, other required applications shall be provided prior to final plan approval.
- J. All final approved Plan submittals shall include the associated electronic AutoCAD files.
- K. If the project is to be phased, phasing plans must be submitted per the requirements specified herein.

2.02.02 City Review

The City will review plans and associated calculations, reports, and AutoCAD files for conformance with City development requirements, standards, and policies. Marked up construction drawings, calculations, reports, and written plan review comments will be returned to the applicant's designated contact person for revisions. The applicant's engineer shall revise construction drawings, calculations, or reports to address City plan review comments and provide comprehensive comment responses in a unique color directly on the marked-up documents along with the updated documents or in other formats as determine to be acceptable by the City Engineer, or designee. The revised drawings (the required number will be determined by the City) and associated calculations and reports, along with the redline comments, shall be resubmitted to the City for additional review.

2.02.03 Plan Approval

Once the plan review process is completed and all City review comments have been addressed, the City will request that one electronic copy of the sealed plans and reports be submitted for approval.

Final reproducible plans shall be produced in .pdf format, signed and stamped by a professional engineer and provided to the City for approval signatures, along with the final AutoCAD files. Electronically signed seals must meet the requirements of WAC 196-23-070 and also provide permissions for City staff to apply signatures to the approved plans. The City will return the signed and approved plans to the Applicant.

All applicable AutoCAD files shall be submitted to the City on a compact disk or electronically transferred to development@auburnwa.gov for integration into the City's Geographic Information System (GIS). For more information on AutoCAD file submittal, please see **Appendix F of Chapter 3**.

2.02.04 Construction Plan Revision

If after plan approval the applicant desires to make changes to the approved plan(s), a revised plan(s) reflecting such changes shall be required. In some cases, minor changes may be considered and approved by the City Engineer without a formal plan revision. City Inspectors may not authorize changes to the approved plans. The following is the general process required for submitting revisions to the approved plans after plan approval:

- A. Provide a written summary of the proposed plan/report changes to the Development Review Engineer assigned to the project and include development@auburnwa.gov on the email correspondence.
- B. Submit for City review, comment, and approval, the revised plans.
- C. Changes on the plans can be clouded for ease of review but will need to be removed prior to approval of the construction plan revision.
- D. Provide the text "REVISION" in 0.2" height bold text above the **Approval Block (B-3) in Appendix A** on all sheets that are being revised and submitted for review.
- E. Provide a date and brief revision description in the revision title block.
- F. Include the cover sheet of the plans even if revisions are not proposed on the cover sheet as the cover sheet is the sheet that has approval lines for the Planner and City Engineer.

The following list are examples of changes that would require a formal plan revision process (Note that this list does not include all potential changes that would require a plan revision process):

- A. Alternative pavement section;
- B. Revised structural elements such as walls;
- C. Revised City utility location of 2 feet or more horizontally or vertically;
- D. Addition of structures such as catch basin and manholes;
- E. Revised driveway location, width, or alignment;
- F. Change in storm pond facility embankment slopes;
- G. Addition of temporary irrigation;
- H. Phasing Construction.

2.02.05 Project Close Out

The following is the general process required for accepting construction completion on a project:

Construction Record Drawings (also referred to as the Construction Redlines) refer to the field changes the Applicant clearly tracks and marks on the final approved and signed plans that are retained throughout construction, in accordance with the requirements specified in the Construction Standards.

After completion of construction, the Applicant shall submit the Construction Record Drawings to the City electronically for review and comment. After the City has concurred the Construction Record Drawings reflect the as-built conditions and meet City record drawing standards, as described in the City Construction Standards, the Applicant shall utilize them to produce the Final As-built Record Drawing set for submission to the City. A copy of the "Record Construction Document Packet" which outlines the complete record drawing process in detail can be obtained from the City.

The Applicant shall also provide the City the current AutoCAD drawing files to reflect any revisions that occurred after plan approval and submit an electronic PDF set to the City.

The City will apply an 'As-Built' stamp on each sheet of the submitted Final As-built Record Drawing set and apply a "Record Drawing Certification" block on the Cover sheet. The Record Drawing Certification will be signed by the City and the Final As-built Record Drawings will be archived and imported into the City's GIS database.

A final Stormwater Site Plan certification letter shall be stamped, signed and submitted by the Engineer of Record to the City verifying that the storm facilities were installed as designed or note any minor changes during construction that require no changes to the Stormwater Site Plan report.

Submit an electronic copy of the Stormwater Site Plan report and Geotechnical Report if there have been changes during construction.

The following shall also be completed for projects prior to project close out:

- A. All legal documents, including Utility Easements, shall be updated as needed, executed, and recorded.
- B. FAC Agreement shall be recorded.
- C. For all FACs, a "Developer Contributions Document" for all public transportation, water, sewer, and storm facilities constructed as part of the project shall be obtained from the City, completed, and returned electronically to the City.
- D. All Warranty Bonds or Assignments of Funds for the 1 to 2-year warranty period shall be in place.

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Chapter 3: Plan Preparation Requirements

3.00 Preface

This Chapter describes City requirements for plans submitted to the City for review and approval. Civil engineering plans must meet these standards in order to move through the review process in an efficient manner and in order to receive approval.

3.01 General Requirements

The following general requirements apply to civil engineering plans submitted for review and approval by the City:

- A. The general construction requirements for the City shall be those contained in the City of Auburn's current Engineering Construction Standards Manual which supplements or modifies the "Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge and Municipal Construction," except where supplemented or modified by the City in this manual.
- B. The civil engineering plans shall reference City Standard Specifications, Standard Details, and WSDOT Standard Plans as necessary. The City's Standard Specifications and Standard Details are contained in the Engineering Construction Standards, a copy of which shall be on-site during construction.
- C. All civil engineering plans and reports shall be prepared and sealed by a professional engineer.
- D. Property surveys shall be performed and prepared per WAC 332-130-145, sealed and signed by a professional land surveyor and be tied to the current City datum (NAVD 88) and horizontal control datum shall be NAD83 (1991) as officially adjusted and published by the National Geodetic Survey. (WAC 332-160-060 and RCW 58.20). A list of City Benchmarks is available upon request.
- E. All civil engineering plans and calculations shall be neat, uncluttered, legible, and in conformance with the requirements herein.
- F. All plans shall be prepared utilizing AutoCAD software in accordance with the standards specified herein.
- G. For a Development project, all deviations from City's Engineering Design and Construction Standards must be shown on the plans with a note call-out and description that references the City assigned deviation number and deviation approval date. The format of these callouts and note descriptions shall be as shown in **Appendix C** of this Chapter.
- H. Except as approved otherwise by the City Engineer, a project may qualify for a Minor Grading Permit Submittal. Refer to **Appendix E** for project thresholds to qualify for a Minor Grading Permit and the submittal requirements.

3.02 Plan Format

The City requires that plan sets be submitted in an order consistent with this section. Depending on the complexity or simplicity of the project, the amount of detail and content required will be subject to change. Depending on the scope of the project the civil site improvement plans may be comprised of a combination of the grading, site and facility extension (FAC) plan elements outlined below to create a set of Civil Site Improvement Plans.

Civil Site Improvement Plans shall consist of the following sheets:

- A. Cover sheet (See **Section 3.04.01**).
- B. Temporary Erosion and Sediment Control (TESC)/Demo Sheet (Land Clearing when applicable) (See **Section 3.04.02**).
- C. Grading and Private Storm Drainage Plan (See **Section 3.04.03**).
- D. Utility Plan and Profiles if applicable (See **Sections 3.04.07 & 3.04.09**).
- E. Street and/or Storm Plan and Profiles if applicable (See **Sections 3.04.08 & 3.04.09**).
- F. Street Cross-Sections and Additional Street Elements if applicable (See **Section 3.04.09**).
- G. Cross-Sections (See **Section 3.04.04**).
- H. Details (See **Section 3.04.05**).
- I. Street and/or Site and Landscape Plan (See **Section 3.04.10**).
- J. Irrigation Plan if applicable (See **Section 3.04.11**).

If a separate associated grading plan has been submitted and approved, those areas covered under the grading plans will not need to be readdressed in the building site plans.

3.03 General Plan Requirements

3.03.01 Standard Plan Format

Applicable information in this section shall be shown on the plan set.

- A. Each sheet of the plan set shall be stamped by a professional engineer.
- B. North arrow.
- C. The title block shall include the development/Capital project title (in bold print), the name, address and phone number of the firm preparing the plan and the owner/developer, a revision block (showing the date of the latest revision), page of pages numbering, and sheet title (e.g., road and storm drainage, grading, erosion/sedimentation control, water and sanitary sewer).
- D. Indicate units of measurement for all slope callouts as either percent (%) or feet per foot (ft./ft.). Do not mix units of measurement on a plan set.
- E. Provide all match lines with matched sheet numbers (stationing).
- F. The street classification shall be provided under the street name on all plan views.
- G. For the approved Development project plans, a City of Auburn approval block (4"x2") shall be provided in lower right corner of each plan sheet except for the cover sheet which shall be per Section 3.04.01. Show project reference numbers (BLD for Building Permit, FAC for Public Facility Extension Plan, STM for Storm Permit and/or GRA for Grading/Erosion Control Permit) in the approval block area. A blank Auburn Engineering approval block is shown as **Approval Block (B-1) in Appendix A** of this Chapter.
- H. The locations of the title blocks, approval blocks, and engineer's stamp shall remain consistent throughout all the plan sheets.

- I. All survey monuments as defined by WAC 332-120-020 within 25 feet of proposed ground disturbing activities shall be shown on the plans and the plans shall indicate the Department of Natural Resources permit number(s) issued for disturbance and re-setting/replacement of the monuments in accordance with Section 10.18 of the Engineering Design Standards. In addition to those typically found marking the City's Right of Way, survey monuments include, but are not limited to, set property corners, curb pins, reference or offset points, etc.

3.03.02 Drafting Standards

Drafting requirements are as follows:

- A. Plan sheets should be formatted to print on 22"x34" size paper. Any variation must be approved by the City prior to plan submittal. Approved plans shall be produced per **Section 2.02.03** of the Engineering Design Standards. Margins should be set to provide for ½ size drawings to fit on 11"x 17" sheet size.
- B. Lettering size shall be no smaller than one tenth (1/10) of an inch in height and shall be uppercase. Callouts and other information shall be printed horizontally in most cases.
- C. Existing features shall be shown with dashed lines and/or screened back APWA line types and symbols (screening 45%).
- D. Proposed features shall be shown with APWA symbols and line types. The intent is to clearly distinguish existing features from proposed improvements.
- E. Minimum scale shall be:

- Site work: 1" = 40' horizontal.
- Public facility work: 1" = 20' horizontal.

Vertical scales are to be 1/10th the horizontal scale except for public facility work in areas with steep slopes, 1" = 5' may be used in place of 1" = 2'.

Use a scale that best utilizes paper space and gives the best overall view of the site.

- F. Use APWA AutoCAD symbols and line types in the legend to identify both existing and proposed improvements and utilities.
- G. Electronic AutoCAD files shall be prepared in accordance with the Layers Standard included in **Appendix F** of this Chapter. A .dwt file containing the AutoCAD layers can be found on the City's website or by clicking on the following hyperlink: [Development AutoCAD Layers and Linetypes](#)
- H. Electronic AutoCAD files shall be geo-referenced per the standards specified herein.

3.04 Plan Sheet Elements

The following section covers the basic elements that are required to be shown on the different plan sheets. While all plan sets will have a cover sheet, there are other sheets covered here that may or may not be included in a particular projects plan set.

3.04.01 Cover Sheet

The Cover Sheet and General Information Sheet(s) shall incorporate all the requirements listed in **Section 3.02**, plus the following applicable items:

- A. A general scaled site plan covering an area approximately 10 inches square.
- B. Vicinity map (approximate scale) with north arrow covering an area approximately 5 inches square.
- C. Site address.
- D. Owner/Applicant, address, contact, phone number, and e-mail address.
- E. Engineer/Surveyor/Architect address, contact, phone number, and e-mail address.
- F. Elevations with City datum (NAVD 88) tied to City benchmarks with reference to the benchmarks' numbers and locations indicated. Horizontal control information (NAD83). See **Appendix E** of this Chapter for more information on survey requirements.
- G. Monuments used for horizontal control per the City's horizontal control datum NAD83 (1991) with a description of the monument and northing and easting.
- H. The permit number in 1 inch bold lettering shall be above the title block (located on the right side of the sheet) on the cover sheet only.
- I. Sheet Index with reference to all civil, landscape, critical area mitigation and lighting plan sheets.
- J. Legend of all existing and proposed lines and symbols used on the plans.
- K. Full legal description(s) including quarter section, section, township, and range.
- L. Parcel number(s).
- M. Site zoning and adjacent zoning (may be shown on a separate vicinity map sheet).
- N. Applicable plat name and lot numbers.
- O. Applicable site information including the number of parking spaces required and the number of parking spaces provided.
- P. Type of building construction as defined by the adopted Building Code and the building height as defined in **Appendix D** of the International Fire Code.
- Q. Site access including adjacent driveways, roadways, and intersections that may have an impact on the location and type of site access.
- R. An overall site plan key map shall be shown if the scope of work requires that the site plan be divided between 4 or more plan sheets, unless otherwise directed by the city.
- S. Construction Sequence outlining a basic construction schedule for all elements of the project. (See **Section 5.05** for a sample construction sequence related to storm and TESC elements) In addition, depending upon the nature of the project, the construction of some public facilities may also dictate separate construction sequencing requirements that will also need to be indicated on the plans.
- T. The City of Auburn General Notes as shown in **Appendix B** of this Chapter.
- U. Provide a list of the additional non-building permits required for this project. The City will update this list with the 1st review comments.

- V. Indicate approximate fill and excavation quantities in CY. Refer to the Civil Submittal Handout (FAC & GRA) located on the City's website for required format.
- W. Storm drainage related quantities and information required to support calculation of System Development Charges (SDC). Refer to the Civil Submittal Handout (FAC & GRA) located on the City's website for required format.
- X. The City of Auburn Engineering Approval Block, (min size 2" x 8.5") as shown in **Appendix A** of this Chapter. A blank Auburn Engineering approval block is shown as **Approval Block (B-3) in Appendix A** of this Chapter.

3.04.02 Temporary Erosion and Sediment Control (TESC) Plan Sheet

TESC design shall be in accordance with **Chapter 5 – TESC, Clearing, and Grading**, and include the following applicable items:

- A. Marked clearing work limits, environmentally sensitive areas and their buffers, and trees that are to remain.
- B. Indicate the location of the construction entrance.
- C. Provide onsite stormwater facilities during construction.
- D. Indicate the minimum temporary erosion control measures to be used on the site during construction, this may include, silt fencing, interceptor ditches, detention or retention facilities, flow control structures, etc.
- E. Show containment locations for storing pollutants, including waste materials and demolition debris, prior to their removal from site.
- F. All existing site features and conditions shall be shown on this sheet including the existing topography.
- G. This sheet may also function as a demolition site plan and indicate all existing features and structures to be removed/demolished and those that will remain.
- H. Provide the Auburn Grading and Erosion Control Notes as shown in **Appendix B** of this section.

3.04.03 Grading and Private Storm Drainage Plan Sheet

The Grading design shall be in accordance with **Chapter 5 – TESC, Clearing, and Grading**, and include the following applicable items:

- A. Indicate slope of any fill or cut slopes.
- B. Show or provide reference for type of fill material and associated compaction requirements or provide a reference to the approved Geotechnical Report with a date of the report, the firm that prepared it and the section in the report to reference.
- C. Show existing significant trees and their dripline (6 inches in diameter and larger for evergreens and 4 inches in diameter or larger for deciduous). Indicate if tree is to either be retained or removed.
- D. Provide storm drainage retention or detention facilities including City control structure, water surface (W.S.) elevations, seasonal high groundwater elevation, orifice sizes, design storms for the W.S. elevations, and release rates.

- E. Show horizontal setback between the bottom of any fill placement and the top of the bank of a defined drainage channel per requirements noted in **Section 5.03**.
- F. Show typical ditch sections.
- G. Show connections of building roof and foundation drains to the site drainage system.
- H. Show the existing topography shaded back and overlaid by the proposed grades.
- I. Show existing and finished elevations and contours. Spot elevations may be required for relatively flat sites to supplement the contour elevations as necessary to adequately reflect existing and finish grades. Provide spot elevations along property line and a minimum of 30 feet beyond property line (at least 50-foot intervals).
- J. Provide notes to protect and maintain erosion control facilities during grading operations.
- K. Provide arrows to indicate drainage flow direction on paved surfaces.
- L. Show layout of the entire storm drainage pipe with length, slope, and material type labeled and direction of flow indicated.
- M. Provide site specific details and cross-section sheets for storm drainage detention or retention facilities.
- N. Indicate the emergency overflow to the public storm system.
- O. Show berm dimensions, materials, compaction requirements for ditches and detention ponds where applicable. When projects include storm ponds, include a storm pond profile sheet with seasonal high groundwater elevation, or reference to Geotechnical Engineering report detailing an accepted alternative analysis.
- P. Show locations of manholes and catch basins, indicating type, stationing, offset, lid type, rim, and invert elevations. Number manholes and catch basins consecutively.
- Q. Show existing and proposed sanitary sewers and water mains, identifying crossing and minimum vertical distance between utilities.
- R. Provide type of material and size of energy dissipaters (riprap, etc.).
- S. Provide details and cross sections of all low impact development, water quality, and flow control facilities for stormwater runoff.
- T. Show trash racks, if applicable.
- U. Show locations, widths, and types of easements.
- V. Show locations and types of pumps, if applicable.
- W. Provide planting and seeding requirements with establishment procedure in construction sequence for water quantity and quality systems.
- X. Show finish floor elevations.
- Y. Show the controlling downstream storm drainage elevations including the associated design conditions.

- Z. For ponds, provide: aesthetics, fencing, power (if applicable), maintenance access, control structure, critical water surface elevations, and other items, such as walls and liners.

AA. Address bypass surface flows.

BB. Address subsurface flows and indicate water surface elevations.

3.04.04 Cross-Section Sheet

The Cross-Section plan sheet(s) shall be provided for projects that propose grading activities 10 feet or closer to the property line, excavations over 5 feet or fill over 8 inches in depth or more and have the following applicable items:

- A. Cross-sections for fill and grading shall be shown through all properties to at least 30 feet beyond the property lines. Adequate cross-sections shall be shown to represent the site. At a minimum this shall include one shown in the north direction (west-east from left to right) and one shown in the east direction (south-north from left to right) cross-section.
- B. This sheet may also contain cross-sections for the temporary storm drainage pond.
- C. The scale used for the site cross-sections on this sheet should match the scale on the other sheets.
- D. Some projects may be able to combine the cross-section sheet with the grading sheet depending on the complexity of the project.

3.04.05 Detail Sheet

The Detail sheet(s) shall have the following applicable items:

- A. Any detail that is specific to this project.
- B. City of Auburn Standard Details are not to be shown on this sheet unless they need to be modified for a project specific application, in which case the detail would be shown with the modifications explicitly called out/labeled and shall not include the City Engineer's signature from the original detail.
- C. Storm control manholes shall be shown on this sheet.
- D. This sheet shall contain cross-sections for the storm facility.
- E. City of Auburn Standard Details and WSDOT Standard Plans are to be called out on the applicable plan sheet using the detail or standard plan number.

3.04.06 Utility Plan Sheets

The plan set shall include an overall utility plan that shows the private connections to the public water and sanitary sewer systems, together with the storm drainage system and proposed landscaping, and any required extensions of the public water and sanitary sewer systems. The overall utility plan shall be clearly visible on one to two plan sheets, with a maximum scale of 1"=100'. The overall utility plan is required in addition to plan/profile sheets prepared at the minimum scale defined in Section 3.03.02.E.

The scale of the plans may need to be increased to improve visibility. Construction Note Callouts shall be shown in the plan view (e.g., manholes, catch basins, etc.).

The more detailed Utility Plan sheet(s) shall have the applicable items identified in the following

sections.

3.04.06.A Water

Water system design shall be in accordance with **Chapter 7 – Water Facilities**, and shall include the following items:

- A. Water pipe and fitting size, location, and type of material.
- B. Details of connections to existing water mains, including details on the type(s) of connection fittings used.
- C. Valve size, locations, type, and fittings.
- D. Fire hydrant location(s).
- E. Air/vacuum relief valve and blow-off locations.
- F. Pressure reducing stations and associated valves, vaults and bypass piping as required.
- G. Concrete blocking, mechanical or flanged joint, or restrained joint or locking gasket.
- H. Water main, water meter, air and vacuum relieve valve, blowoff assembly, fire hydrant easements, and all appurtenances.
- I. Meter size and service line size, material type, and location.
- J. Irrigation meter size and service line size, material type, and location.
- K. Proposed fire line, FDC line, and PIV locations. Provide a note with the underground fire line noting that a separate fire permit will be required for the underground fire line between the connection to the public water main to the building.
- L. Backflow prevention assembly and detector check meter size, type and location.
- M. For buildings requiring fire sprinklers, the fire sprinkler notes shall be shown on the plan, as shown in **Appendix B** of this Chapter.
- N. Table or call out showing physical separation in feet between water lines and other utilities at crossings, when a profile is not required.
- O. Cross connection control notes included in **Appendix B** of this Chapter.
- P. For plat or road projects, provide unique stationing down the center of the road with the appropriate offset at all water main appurtenances. For all other projects, provide unique stationing down the center of the water main tied into known survey control.
- Q. Private water mains and hydrants are labeled as “Private” or “PVT” when applicable.

3.04.06.B Sanitary Sewer

Sanitary sewer system design shall be in accordance with **Chapter 8 – Sanitary Sewer and Storm Drainage Facilities**, and include the following items:

- A. Sanitary sewer pipe size, locations, and type of material.

- B. Location of manholes. Indicate type of manhole, stationing, offset, and number manholes consecutively. During the City review process, manhole numbers shall be assigned by the City to be incorporated into the next submittal.
- C. Indicate knockouts in manholes for future connections.
- D. The direction of sewage flow shall be indicated with an arrow at the manhole. Proposed sewer shall have solid arrowheads while existing pipe and manholes shall be shown in ghost or screened lines with the arrowhead and manhole not filled. The location of the frame and cover on the manhole, positioned over the widest part of the shelf and not over a flow channel, shall be shown.
- E. Drop manholes, if approved, are to be detailed on the plans.
- F. Length, slope, type and class of material, and inverts for side sewers.
- G. Stationing for side sewers, measured from downstream manholes.
- H. Connection of a side sewer to the City's sanitary sewer pipe shall be indicated with a tee.
- I. Locations of sanitary sewer cleanouts.
- J. Locations of sanitary sewer easements.
- K. Clearly define right-of-way and adjacent property lines. Parcel numbers for all lots adjacent to the improvements shall be indicated, with existing or proposed finished floor elevations.
- L. Floor drains, drains from other covered areas potentially subject to pollutants, and wash areas within parking lots shall be connected to the sanitary sewer through an approved oil/water separator.

3.04.06.C Storm Drainage

Grading and Storm Drainage system design shall be in accordance with **Chapter 5 – TESC, Clearing, and Grading**, and **Chapter 8 – Sanitary Sewer and Storm Drainage Facilities** (which incorporates by reference the SWMM), and include the following applicable items:

- A. The layout of all the storm drainage pipes with the length, slope, and material type indicated in the labeling of the storm drainage pipes. Provide arrows to indicate the direction of flow into the structures.
- B. Typical ditch section.
- C. Location of manholes and catch basins. Indicate type, stationing, offset, type of lid, rim and invert elevations, and number manholes and catch basins consecutively.
- D. Existing and proposed sanitary sewers and water mains. Identify crossings and minimum distance between utilities.
- E. Building downspouts or footing drain locations, inverts and connections to the storm drain system.
- F. For single-family home sites, indicate means for collection and discharge of water from roof, foundation drains, wall drains, and driveways.
- G. Provide arrows to indicate drainage direction in parking lots, roadway intersections and cul-de-sacs.

- H. Reference to the detail/BMP and/or cross-section sheets for storm drainage detention or retention facilities such as the control discharge structure and pond cross-sections. Indicate water surface elevations, allowable discharge rates, and design storms.
- I. Show an emergency overflow to the public storm drainage system.
- J. Berm dimensions, material, and compaction requirements for ditches and detention ponds.
- K. Indicate type of material and size of energy dissipaters (riprap, etc.).
- L. Provide details of the storm drainage water quality facility.
- M. Limits of surface water ponding within parking lots.
- N. Trash racks.
- O. Location and widths of easements.
- P. Location and type of pumps.
- Q. Stormwater treatment/quality control facility location, length, width, slopes, and cross-section.
- R. Planting and seeding requirements with establishment procedure (construction sequence) for water quantity or quality systems.
- S. Finish floor elevations of all buildings.
- T. Indicate separation from any pipe, infiltration trench, open ditch, water quality and stormwater facilities to any property line, structure and obstruction.
- U. For ponds, provide landscaping, fencing, maintenance access, critical water surface elevations, and other items, such as walls and liners.
- V. Number the storm drain structures (Numbers will be provided by the City prior to final plan approval).
- W. Low Impact Development (LID) facility location, length, width, slopes, and cross-section.
- X. Provide the Auburn Storm Drainage Detention Pond Notes as shown in **Appendix B** of this Chapter when public detention ponds are proposed.

3.04.07 Utility Profile Sheet

Utility Profiles are to be included on the associated utility plan sheet(s) with plan view above the profile view and corresponding unique stationing. All existing and proposed parallel and crossing utilities shall be shown on the profile.

3.04.07.A Storm Drainage

Profiles shall be created for all designed storm systems. These profiles are to include the following items where applicable:

- A. Structure size, location, type, station, invert elevation, type of lid or grate, rim elevation, stationing and offset.
- B. Pipe size, type of material, slope (ft./ft.), and lineal footage.
- C. Utility crossings shall identify size and type of utilities involved.

- D. Ditches, size, type, and slope.
- E. Existing and finished grade along pipe centerline.
- F. Connections to existing structures.

3.04.07.B Water

Profiles shall be provided for all public water systems, including on-site systems and systems within the street/City right of way and easements, These profiles shall include the following items where applicable:

- A. Pipe size, type of material, lineal footage, cover, stationing and offset.
- B. Utility crossings shall identify size and type of utility involved.
- C. Existing and finished grade along pipe centerline.
- D. Connections to existing mains and fittings.
- E. Label fittings and valves, including concrete blocking.

3.04.07.C Sanitary Sewer

A profile will be required for all public sanitary sewer mains. These profiles are to include the following items where applicable:

- A. Structure size, location, type, station, invert elevations, type of lid, rim elevation, stationing and offset.
- B. Pipe size, type of material, slope (ft./ft.), and lineal footage.
- C. Utility crossings shall identify size and type of utility involved.
- D. Existing and finished grade along pipe centerline.
- E. Connections to existing structures.
- F. Side sewer locations, stationing and offset.

3.04.08 Public Street Plan and Profile Sheet

When a project includes construction within a public street, excluding utility connections, both a plan and a profile shall be included in the plan set. The Public Street Plan and Profile sheet(s), when required, shall have the applicable items identified below:

3.04.08.A Plan View

The plan view shall include the following items where applicable:

- A. Plan views shall be drawn at a 1" = 20' scale.
- B. Existing and proposed rights-of-way.
- C. Existing and proposed contours and elevations.
- D. Existing and proposed street names.
- E. Existing and proposed centerline bearing and distance.
- F. Existing and proposed signs and traffic control devices.
- G. Existing and proposed storm drainage systems.

- H. Existing and proposed sewers and water mains. Identify crossings and minimum distances between utilities.
- I. Horizontal curves.
- J. Horizontal stationing.
- K. Location of curbs, sidewalks, wheelchair ramps, and driveways (by station).
- L. Locations of monuments at all centerline intersections, cul-de-sacs, PCs, and PTs by station.
- M. Street luminaires, conduit for street lights, traffic signals, and traffic signal loop detectors located within the vicinity of the project.
- N. Mailbox types and locations where new or relocated mailboxes are proposed. Submit to postmaster for approval.
- O. Address any horizontal utility conflicts in plan.
- P. Street landscaping, if required.
- Q. Construction limits.
- R. Slope excavation and/or embankment limits.
- S. Pavement and lane tapers.
- T. Identify any non-standard street cross slopes.
- U. ADA Maximum Extent Feasible (MEF) documented on the Plans with a notation indicating the deficiency and that the curb ramp was designed to the MEF.
- V. All proposed and existing underground and overhead utilities shall be shown and labeled on the plan in grayscale. The locations shall be coordinated and approved through the appropriate utility purveyor.

3.04.08.B Profile

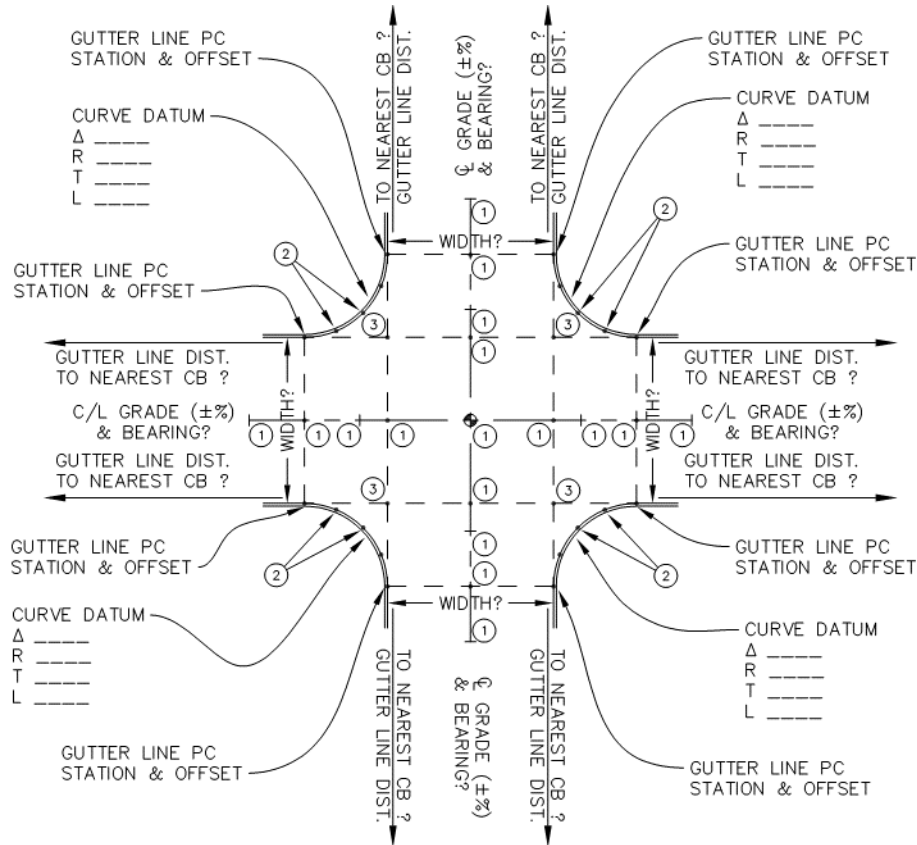
The profile shall include the following items where applicable:

- A. Profiles shall be drawn using 1" = 20' horizontal and 1" = 2' vertical scales. 1" = 5' vertical scale may be used in place of 1" = 2' in areas with steep slopes.
- B. Existing and proposed centerline road grade.
- C. Existing and proposed storm drainage systems.
- D. Existing and proposed sewers and water mains (use ghost lines). Identify crossings and minimum distances between utilities.
- E. Existing and proposed flowline grades.
- F. Finish grade elevations every 50 feet and every 25 feet for vertical curves along design centerlines.
- G. Vertical curve information in profile section.
- H. Address vertical utility conflicts in profile.

3.04.08.C Intersections

Intersection plans shall be 20 scale drawings in conformance with **Figure 3-1** below:

Figure 3-1 Intersection Plan Sheet Requirements



NOTES:

- A. LABEL INTERSECTION & STATIONING. SHOW FINISH ELEVATIONS AT:
 - ① CENTER LINES, AS SHOWN.
 - ② GUTTER LINE RADII: PC'S, PT'S, $\frac{1}{4}$ POINTS, & HIGH/LOW POINTS.
 - ③ GUTTER LINE PI'S.
- B. IF RADIUS POINT FOR R.O.W. & GUTTER LINE DIFFER, PROVIDE DATA OF R.O.W. CURVE.
- C. LABEL CENTERLINE INTERSECTION EQUATION STATIONS (IF APPLICABLE).

3.04.08.D Typical Roadway Sections

Typical roadway sections shall show pavement depths, widths and materials, cross-slopes of pavement (%), centerline, dimensioned right-of-way lines, curb and gutter, ditches, embankment and excavation slopes (1H:1V), walls, etc. Typical sections will be labeled within identified station ranges.

3.04.08.E Striping and Signing

Provide maximum 40 scale plans per these Standards, Auburn City Code, WSDOT and MUTCD, including lane markers, pavement markings, and signing.

3.04.08.F Signalization

Provide 20 scale separate detailed signalization plan per City of Auburn Standards, including poles, bases, conduits, and traffic loops.

Signal Plan Sheet

1. The plan sheet shall conform to the following requirements:
 - a. For areas that require greater detail (such as the corner that has the controller), a blown-up detail may be necessary at a 1"=10' scale.
 - b. All proposed signal equipment, including signal poles, mast arms, heads, signs, junction boxes, conduit, loops, controller, and service cabinet shall be shown as bold.
 - c. All existing and proposed right-of-way information shall be shown and labeled on the plan, including easements needed for signal equipment. The line type shall be different for easements and right-of-way.
 - d. All proposed curb, sidewalk, proposed striping, and existing curb/striping (to remain) information shall be shown on the plan in gray scale (screened back).
 - e. Sight triangle lines shall be shown on plans in gray scale.
 - f. All proposed and existing underground and overhead utilities shall be shown and labeled on the plan in gray scale.
 - g. Provide on the plan signal construction notes as shown in **Appendix B** of this chapter.
2. Construction notes shall contain, but not be limited to:
 - a. Signal pole and foundation installation (including pole type, mast arm length, and installation of items on the pole).
 - b. Controller cabinet and foundation installation.
 - c. Coordination of utility removal/relocation.
 - d. Coordination of connection of power, and power source type.
 - e. Interconnect connection to other signals.
 - f. Removal of existing signal and/or street light equipment.
3. Displays: The plan sheet shall include the following displays:
 - a. Phase diagram display.
 - b. Signal display showing signal layout of all vehicle signal heads and pedestrian heads.
4. Detection: The plan sheet shall include:
 - a. Stop bar, intermediate and advanced loop location, and numbering.
 - b. Pedestrian push button location.
 - c. Preemption detection location and numbering.
5. Signal Poles and Associated Equipment: The plan sheet shall contain, but not be limited to:

- a. Signal Pole Locations and Numbering: The locations shall be called out by the major arterial station and offset.
 - b. Signal head location and numbering.
 - c. Pedestrian head location and numbering.
6. Controller and Service Location:

At least one corner of the controller/service foundation shall be called out by the major arterial station and offset. The footprint of the foundation shall be shown on the plans with the controller and service cabinets oriented on the foundation as they would be placed in the field. If the information required to show all the controller/service conduit connections and foundation footprint makes the plan too cluttered, a blown-up detail of the corner containing this information is needed at a 1"=10' scale.
7. Power Source Location:

The location of the power source shall be identified on the plans.
8. Wire Schedule:
 - a. A wire schedule table shall include run numbers, conduit size, wire type, and comments.
 - b. Comments shall include, but not be limited to, number of twisted loop pairs for runs between the detection loops and adjacent junction box, identification of spare conduits, conduits utilized only by interconnect or illumination, and power cables.
 - c. For designs that include modifications to an existing signal, all existing wire runs affected by the design shall be shown on the wire schedule.
9. Junction box type and approximate location.
10. Signing:
 - a. Signs shall be shown on all mast arms. Signs that are post mounted but are signal related (such as a "signal ahead" sign) shall be shown on the signal plan.
 - b. A sign display shall be shown on the plan with the MUTCD sign designation, dimensions, and lettering type for all signs.
 - c. Indicate removal of existing stop signs after signal is in operation.
 - d. Installation of "New Signal Ahead" or "Signal Revision Ahead" signs.
11. Other Illumination:
 - a. Proposed illumination that will use the signal service cabinet, but is located outside the four quadrants of the intersection, shall be shown as proposed on a separate illumination plan sheet. On the signal plan sheet, the illumination shall be shown as gray scale and labeled as "proposed illumination, see illumination plans." However, once the illumination enters the quadrants of the intersection (i.e., when it is using the same junction box as the signal equipment), it shall be shown as proposed on the signal plan and gray scale on the illumination plan.
 - b. Indicate the circuit that street lights are on.

Wire Diagram Plan

In general, the wire diagram shall include the following:

1. All signal heads, pedestrian heads, pedestrian push buttons, luminaires, preemption detectors, loops, and junction boxes drawn in schematic forms.
2. All termination points in the controller cabinet. The wire diagram shall include every termination point the controller will have, including those that may not be used for this particular signal design.
3. All wiring associated with the items above, as well as the wiring for interconnect. The wire diagram shall show how these items are connected to the controller.
4. Location of wire splices.
5. All termination numbering at each end of each wire. For example, the 5-conductor cable connecting a signal head to the controller shall have the termination numbering called out at the signal head and in the termination points in the controller.
6. All wire colors at each end of the wire.
7. A call out to each wire run noting the number and type of each wire.
8. Intersection schematic with a north arrow showing approach phase.
9. Pole, signal head, pedestrian head, preemption detection, and loops shall be numbered on the wire diagram.

Pole Schedule Plan

The pole schedule shall include the following:

1. A signal standard detail chart.
2. Pole orientation attachment and base detail, pole foundation detail, and signal standard detail.

3.04.08.G Illumination

- A. Street Light Plans shall be labeled as Street Light Plans, and shall be prepared, stamped, signed, and dated by a professional engineer.
- B. Street Light Plans will include references to all applicable City of Auburn Standard Details and/or Washington State Department of Transportation (WSDOT) Standard Plans, or copies of other specific details applicable to the project shall be shown on the plans.
- C. Plans should show any proposed street trees and underground utilities in the background.

- D. Street Light Plans shall be provided on separate and uncluttered sheets that do not show unrelated street, utilities, or on-site improvements. Street Light Plans shall be drawn to a maximum engineer's scale of 1" = 40'.
- E. Street Light Plans shall at a minimum include the following applicable items for new or existing street lighting system:
 - 1. Lighting schedule with the following information in a table format:
 - a. Luminaire make and model
 - b. Lamp/Ballast type
 - c. Lamp wattage
 - d. Uniformity Ratio
 - e. Minimum Light Level
 - f. Average Maintained Light Level
 - g. Light standard type
 - h. Mounting height (ft.)
 - i. Bracket or davit arm length (ft.)
 - j. Light distribution pattern
 - k. Luminaire spacing distance (ft.)
 - 2. Light standard locations by station and offset from the centerline of the street to the center of the light standard. Show all existing street lights for a distance of 500 feet in both directions from the limits of the project site, including both sides of the street(s) and in medians.
- F. Wiring/Conduit schedule with the following information in a table format:
 - 1. Circuit number
 - 2. Conduit size, material, and purpose (street lighting, traffic signal interconnect, spares, etc.).
- G. Location of points of service (the PSE connection or service location and the new or existing City Electrical Service Cabinet(s).
- H. Location of junction boxes. Indicate junction box type and purpose (lighting, traffic signal, etc.).
- I. Existing topography, including but not limited to the location of driveways, street trees (including species), street intersections, overhead utilities (including maximum and minimum heights), underground utilities (including sizes), medians, curb, and lane widths (pavement markings).

3.04.08.H Streetscape

Provide information on planting of the public landscape strips along the street frontage. Information shall include the following:

- A. Type and size of trees.
- B. Tree spacing.
- C. Type of ground cover.

- D. Root control/barrier.
- E. Irrigation if applicable.
- F. Show all proposed and existing surface features and underground utilities.

3.04.08.I Other Features

Include locations of any other feature including mailboxes and bus stops. Any mailbox placement that requires approval from the postmaster shall include the Postmaster **Approval Block (B-2) in Appendix A** of this chapter.

3.04.09 Site and Landscape Plan Sheet

The site and landscape sheets (separate plans may be more appropriate), when required, shall have the following applicable items:

- A. Demonstrate conformance with ACC 18.50, "LANDSCAPING AND SCREENING" and ACC 18.52 "OFF-STREET PARKING AND LOADING".
- B. Label name, classification, and boundary of adjacent streets both public and private.
- C. Pavement types with unique hatching.
- D. Site signage and striping.
- E. The boundaries and dimensions of site.
- F. Show and label any easements.
- G. Show and label any critical areas and buffers affecting the site.
- H. The location of on-site buildings and their eaves or protrusions (decks, porches, covered entries, etc.) and other site features (generators, compressors, retaining walls, fuel tanks, etc.).
- I. The location of on-site parking stalls, drive aisles, and loading/unloading areas and required fire lanes with dimensions.
- J. The location and size of landscape areas (measured to the inside of curbs).
- K. Landscape area calculations as required by ACC 18.50.040, "Landscape development standards."
- L. The species (common and scientific name), condition (bare root, balled & bur lapped) or containerized) and size of planting materials (shown within a "planting schedule").
- M. Notation of which species are native to, or adapted to the Pacific Northwest (minimum 50%).
- N. Site preparation specifications (removal of construction debris, soil amendment, fertilizer, etc.).
- O. The location and type of non-vegetated groundcovers such as rock, mulch, etc.
- P. The location, size, and proposed screening of outdoor storage areas and dumpster/refuse areas.
- Q. The location, species, and size (diameter at DBH) of all existing trees and measures to protect them.

- R. Show all proposed and existing surface features and underground and above-ground utilities affecting the site.
- S. Landscaping notes, including:
 - a. Plant materials list substitutions requiring city approval and possibly “as-built plans.”
 - b. Planting notes (e.g., when to remove tree stakes).
 - c. Soil quality and installation.
 - d. Maintenance after installation.
- T. Site furnishings such as light posts, bike racks, benches, trash cans, and shopping cart racks.

3.04.10 Site Irrigation Plan sheet

The site irrigation sheets, when required, shall have the following applicable items:

- A. The connection point to the City system, together with the water meter size.
- B. The size, location, and type of the backflow prevention.
- C. The proposed layout of the irrigation system.
- D. Be consistent with the site’s building and landscaping plans.
- E. Show the existing and/or proposed location of all parcel lines.

3.04.11 Critical Area Restoration/Mitigation

A critical area restoration or mitigation sheet, when required, shall include the items as required by the City pursuant to ACC 16.10 and 15.68.

3.04.12 Phasing Plans

Applications that propose to complete projects in phases shall submit a phasing plan which incorporates all required conditions of approval and details infrastructure improvements and sequencing of the phases. Prior to occupancy of any buildings within a phased project, complete construction, inspection, acceptance, and transfer of ownership to the City via Bill of Sale as well as recorded easements are required for all public utilities (water, sewer, & storm) serving the building and public road improvements/right of way dedications must be complete. If the private utilities are proposed to be constructed in phases, the points of connection between phases and how the future phases will be constructed without affecting the operation of the previous phases must be shown.

Phasing plans are subject to approval by the City Engineer and Building Official and shall include the following information:

1. Illustrative maps for each proposed phase which clearly mark in heavy lines the boundaries of the subject phase, label the phase alphabetically (to avoid confusion with lot numbers), and depict roads, lots, infrastructure, easements, dedications and open space which are included within the subject phase. The plan shall also illustrate those proposed improvements which mitigate impacts associated with the unbuilt portions of the project which are not located within the boundaries of the subject phase. Previously established phases, including roads, lots, infrastructure, easements, dedications, and open space, should be shown on the map shaded or gray-scaled. All phasing maps shall be drawn at the same scale.

2. A narrative description or table which describes each phase and its associated improvements. In addition, the narrative or table shall demonstrate that each phase would comprise a “stand-alone” development which, should no subsequent phases be constructed, would meet or exceed City standards and all other conditions of approval. The narrative should also describe the proposed timeline for completion of the entire project. The narrative must address emergency access, street improvements, and alternative construction access.

Appendix A – Approval Blocks

Sample Approval Block (B-1):

PROJECT REF: _____

THESE PLANS ARE APPROVED FOR
CONFORMANCE WITH THE CITY OF AUBURN'S
REQUIREMENTS.

DEV. REVIEW ENGINEER: _____

DATE APPROVED: _____

Sample Postmaster Approval Block (B-2):

CITY OF AUBURN POSTMASTER APPROVAL

APPROVED BY: _____

TITLE/POSITION: _____

DATE APPROVED: _____

Sample Engineering Approval Block (B-3):

CITY OF AUBURN APPROVALS

THIS PLAN SET FOR PROJECT _____, SHEETS ____ TO ____ ARE APPROVED FOR CONSTRUCTION BY:

_____, P.E., CITY ENGINEER: _____

DATE: _____

_____, DEV. REVIEW ENGINEER: _____

DATE: _____

_____, PLANNER: _____

DATE: _____

Appendix B – Standard Notes

The following General Notes shall apply to Development projects:

GENERAL NOTES

1. CONSTRUCTION SHALL CONFORM TO THE CITY OF AUBURN'S ENGINEERING DESIGN AND CONSTRUCTION STANDARDS, EXCEPT AS OTHERWISE APPROVED BY DEVIATION, AND BE IN ACCORDANCE WITH THE APPROVED PLANS. ANY CHANGES FROM THE APPROVED PLAN WILL REQUIRE APPROVAL FROM THE OWNER, ENGINEER OF RECORD, AND THE CITY.
2. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE "WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (CURRENT EDITION)," EXCEPT WHERE SUPPLEMENTED OR MODIFIED BY THE CITY'S CONSTRUCTION STANDARDS MANUAL. THE ABOVE DOCUMENTS SHALL BE AVAILABLE AT THE JOB SITE DURING CONSTRUCTION.
3. A PRE-CONSTRUCTION MEETING SHALL BE REQUIRED PRIOR TO THE START OF ALL CONSTRUCTION. CONTACT THE PUBLIC WORKS DEPARTMENT AT (253) 931-3010, TO SCHEDULE A MEETING.
4. UNLESS STATED OTHERWISE, LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT OVERHEAD UTILITY LINES MAY NOT BE SHOWN ON THE DRAWINGS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE TRUE ELEVATIONS AND LOCATIONS OF ALL UNDERGROUND UTILITIES AND THE EXTENT OF ANY HAZARD CREATED BY OVERHEAD UTILITY LINES. IDENTIFICATION, LOCATION, MARKING, AND RESPONSIBILITY FOR UNDERGROUND FACILITIES OR UTILITIES, IS GOVERNED BY THE PROVISIONS OF SECTION 19.122 REVISED CODE OF WASHINGTON (RCW). PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL CALL ONE-CALL (811) FOR UTILITY LOCATIONS (WATER, SANITARY SEWER, STORM SEWER, GAS, POWER, TELEPHONE, AND CABLE).
5. IF A PROPOSED ROUTE IS NOT INCLUDED ON THESE PLANS, A PROPOSED ROUTE AND SCHEDULE FOR HAULING MATERIAL TO THE SITE SHALL BE SUBMITTED TO THE CITY FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION. IF THE CITY BELIEVES THAT THE PROPOSED HAUL ROUTE WILL ADVERSELY IMPACT THE STREET NETWORK, A SEPA AMENDMENT MAY BE REQUIRED TO EVALUATE THE IMPACTS AND DETERMINE MITIGATION REQUIREMENTS BEFORE BEGINNING WORK. HAULING MAY BE LIMITED TO APPROPRIATE OFF-PEAK HOURS OR ALTERNATIVE ROUTES, AS DETERMINED BY THE CITY.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PUBLIC SAFETY ON AND AROUND THE PROJECT. PRIOR TO THE START OF WORK, ALL METHODS AND EQUIPMENT USED FOR TRAFFIC CONTROL AND STREET MAINTENANCE SHALL BE SUBMITTED TO THE CITY FOR APPROVAL. CONTRACTORS AND THEIR SURETY SHALL BE LIABLE FOR INJURIES AND DAMAGES TO PERSONS AND PROPERTY SUFFERED BECAUSE OF CONTRACTORS OPERATIONS OR NEGLIGENCE CONNECTED WITH THEM.

7. ALL CONSTRUCTION SURVEYING FOR EXTENSIONS OF PUBLIC FACILITIES SHALL BE DONE UNDER THE DIRECTION OF A WASHINGTON LICENSED LAND SURVEYOR OR A WASHINGTON LICENSED PROFESSIONAL CIVIL ENGINEER.
8. CERTIFIED DRAWINGS ARE REQUIRED PRIOR TO PROJECT ACCEPTANCE. REFER TO THE CITY'S "DEVELOPMENT RECORD CONSTRUCTION DOCUMENT" HANDOUT.

GRADING AND EROSION CONTROL NOTES

1. WITHIN THE CITY OF AUBURN, ALL REQUIRED SEDIMENTATION AND EROSION CONTROL FACILITIES INDICATED ON THE PLANS MUST BE CONSTRUCTED AND IN OPERATION PRIOR TO LAND CLEARING AND/OR OTHER CONSTRUCTION ACTIVITIES. THESE FACILITIES SHALL BE MAINTAINED AND UPGRADED, IF NECESSARY, TO ENSURE THAT SEDIMENT-LADEN WATER AND STORM DRAINAGE RUNOFF DOES NOT IMPACT THE ADJACENT PROPERTIES, NATURAL DRAINAGE WAYS, OR THE EXISTING CITY STORM DRAINAGE SYSTEM.
2. THE SOURCES FOR ALL MATERIAL IMPORTED TO THE SITE SHALL BE APPROVED BY THE CITY.
3. THE STORM DRAINAGE DETENTION (RETENTION IF INFILTRATION SYSTEM IS USED), SEDIMENTATION AND EROSION CONTROL FACILITIES DEPICTED ON THE APPROVED DRAWINGS ARE INTENDED TO BE MINIMUM REQUIREMENTS TO MEET ANTICIPATED SITE CONDITIONS. ADDITIONAL DRAINAGE AND EROSION CONTROL FACILITIES MAY BE REQUIRED AS SITUATIONS WARRANT DURING CONSTRUCTION. THE IMPLEMENTATION, MAINTENANCE, REPLACEMENT AND ADDITIONS TO THESE CONTROL SYSTEMS SHALL BE THE RESPONSIBILITY OF THE PERMITEE.
4. THE TEMPORARY EROSION CONTROL FACILITIES, INCLUDING ALL PERIMETER CONTROLS AND THE DETENTION (RETENTION IF INFILTRATION SYSTEM IS USED), CONTROL PONDS, SHALL REMAIN IN PLACE UNTIL FINAL SITE CONSTRUCTION IS COMPLETED. AFTER CITY APPROVAL, THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING ALL TEMPORARY FACILITIES.
5. THE CONTRACTOR WILL BE REQUIRED TO WATER THE SITE, AS NECESSARY, TO REDUCE DUST EMISSIONS AS A RESULT OF CONSTRUCTION ACTIVITY.
6. NO TRACKING IN THE ROADWAY IS ALLOWED. IF SEDIMENT IS TRACKED ONTO THE ROAD, THE ROAD SHALL BE THOROUGHLY AND IMMEDIATELY CLEANED BY SHOVELING OR PICKUP SWEEPING. TRANSPORT SEDIMENT TO A CONTROLLED SEDIMENT DISPOSAL AREA. KEEP STREETS CLEAN AT ALL TIMES.
7. ALL AREAS OF ACTIVE EARTHWORK WHICH HAVE THE POTENTIAL FOR EROSION AND SEDIMENTATION IMPACTS ON ADJACENT PROPERTIES, NATURAL DRAINAGE WAYS, OR THE EXISTING CITY STORM DRAINAGE SYSTEM MUST BE STABILIZED ACCORDING TO THE FOLLOWING SCHEDULE: FROM MAY 1 TO SEPTEMBER 30, AREAS AT FINAL GRADE AND THOSE THAT ARE SCHEDULE TO REMAIN UN-WORKED FOR MORE THAN SEVEN (7) DAYS SHALL BE STABILIZED. FROM OCTOBER 1 TO APRIL 30 EARTHWORK ACTIVITIES SHALL BE CONDUCTED IN STAGES IN ORDER TO MINIMIZE SOIL EXPOSURE. EXPOSED

SOILS THAT WILL REMAIN UN-WORKED FOR MORE THAN TWO (2) DAYS SHALL BE STABILIZED IMMEDIATELY.

STORM DRAINAGE DETENTION POND NOTES

PUBLICLY OWNED AND MAINTAINED DETENTION FACILITIES SHALL MEET THE FOLLOWING REQUIREMENTS:

1. ALL POND CONSTRUCTION, LANDSCAPING, AND TEMPORARY IRRIGATION, IF USED AS NOTED BELOW, SHALL BE COMPLETED PRIOR TO SCHEDULING AN INITIAL PUNCHLIST INSPECTION. THE GRASS SHALL HAVE SPROUTED OVER AT LEAST 80% OF THE AREA TO BE SEEDED.
2. ALL POND ACCESS RAMPS SHALL BE CONSTRUCTED WITH A MINIMUM OF 8" COMPACTED BASE COURSE TOPPED WITH A MINIMUM OF 2" COMPACTED TOP COURSE. THE POND RAMP SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR.
3. THE POND SIDE SLOPES SHALL BE SCARIFIED, AND ALL VEGETATIVE AND CONSTRUCTION DEBRIS AND ROCKS LARGER THAN 2 INCHES SHALL BE REMOVED PRIOR TO HYDROSEEDING. HYDROSEEDING SHALL BE APPLIED OVER THE ENTIRE DETENTION POND BOTTOM (OR ON THE SLOPES ABOVE THE WATER QUALITY ELEVATION FOR WETPONDS) UP TO THE TOP OF THE BERM.
4. THE POND BOTTOM AND ALL INTERIOR SIDE SLOPES PER REQUIREMENT 3 ABOVE SHALL BE SEEDED WITH THE FOLLOWING GRASS MIXTURE:

TURF-TYPE TALL FESCUE AT	40%;
TURF-TYPE PERENNIAL RYE AT	30%;
RED FESCUE AT	25%;
COLONIAL BENTGRASS AT	5%
5. APPLICATION RATE: HYDROSEED AT 60 LBS/ACRE; HAND SEED AT 2 LBS/1,000 SQUARE FEET.
6. THE NEED FOR WATERING TO ESTABLISH THE HYDROSEEDING WILL DEPEND ON WHAT TIME OF YEAR THE HYDROSEEDING IS APPLIED AND HOW LONG IT TAKES FOR THE SEED TO BE ESTABLISHED. IF A TEMPORARY IRRIGATION SYSTEM IS USED, IT SHALL BE ATTACHED TO THE FENCE OR PLACED AT LOCATIONS THAT DO NOT INTERFERE WITH MOWING.
7. THE CONTRACTOR IS RESPONSIBLE FOR WEED CONTROL AND REMOVAL OF LITTER PRIOR TO PLANTING AND THROUGHOUT THE PLANT ESTABLISHMENT PERIOD.
8. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE TEMPORARY IRRIGATION SYSTEM PRIOR TO EXPIRATION OF THE 1-YEAR WARRANTY PERIOD.

FIRE SPRINKLER SYSTEMS NOTES

SPRINKLER SYSTEMS SHALL MEET CITY OF AUBURN STANDARD 7.06.02 AND THE FOLLOWING REQUIREMENTS:

1. PROPOSED FIRE LINE TO BE SIZED BY A FIRE PROTECTION ENGINEER.
2. BACKFLOW PROTECTION IS REQUIRED ON FIRE SPRINKLER LINES.
3. A SEPARATE DETAILED PLAN OF THE UNDERGROUND FIRE SPRINKLER SUPPLY LINE SHALL BE APPROVED BY THE FIRE MARSHAL AND INSTALLED BY A WASHINGTON STATE CERTIFIED LEVEL "U" CONTRACTOR IN ACCORDANCE WITH WAC 212-80-010.
4. A POST INDICATOR VALVE SHALL BE INSTALLED ON THE FIRE SPRINKLER SUPPLY LINE TO ISOLATE THE SYSTEM FROM THE CITY'S WATER SYSTEM WHEN REQUIRED FOR REPAIR.
5. BLOCKING, PIPING, AND RODDING DETAILS SHALL BE PROVIDED WITHIN THE SUBMITTAL.
6. APPROVAL OF THE CIVIL PLANS DOES NOT APPROVE THE INSTALLATION OF THE SPRINKLER SYSTEM SUPPLY PIPING.

CROSS CONNECTION CONTROL NOTES

CROSS CONNECTION CONTROL SHALL MEET THE FOLLOWING REQUIREMENTS:

1. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE INSTALLED IN A MANNER THAT WILL ALLOW PROPER OPERATION, AND IN-LINE TESTING AND MAINTENANCE.
2. A BACKFLOW ASSEMBLY PERMIT IS REQUIRED FOR ALL ASSEMBLIES INSTALLED WITHIN THE CITY OF AUBURN, AND/OR THE CITY'S WATER DISTRIBUTION SYSTEM.
3. BACKFLOW ASSEMBLIES MUST BE ON THE CURRENT WASHINGTON STATE DEPARTMENT OF HEALTH – BACKFLOW ASSEMBLIES APPROVED FOR INSTALLATION LIST.
4. BACKFLOW ASSEMBLIES MUST BE TESTED BY A STATE CERTIFIED BACKFLOW ASSEMBLY TESTER, AND INSPECTED AND APPROVED BY A CITY OF AUBURN CROSS CONNECTION CONTROL SPECIALIST.
5. UPON RECEIVING APPROPRIATE FEE PAYMENTS AND VERIFYING THAT REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) HAS BEEN INSTALLED (NOT BY CITY), THE CITY WILL INSTALL THE DOMESTIC METER INSIDE THE DOMESTIC METER BOX. THE PASSING TEST REPORT FOR THE RPBA MUST BE RECEIVED BY THE CITY WITHIN 72 HOURS OF THE INSTALLATION OF THE DOMESTIC METER.

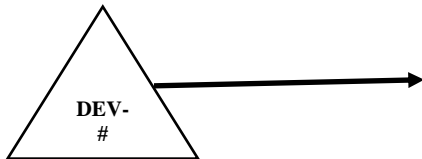
6. UPON RECEIVING APPROPRIATE FEE PAYMENTS AND VERIFYING THAT DOUBLE CHECK VAULT ASSEMBLY (DCVA) HAS BEEN INSTALLED (NOT BY CITY), THE CITY WILL INSTALL THE IRRIGATION METER INSIDE THE IRRIGATION METER BOX. THE PASSING TEST REPORT FOR THE DCVA MUST BE RECEIVED BY THE CITY WITHIN 72 HOURS OF THE INSTALLATION OF THE IRRIGATION METER.
7. DOUBLE CHECK VALVE ASSEMBLY (DCVA, NOT BY CITY) TO BE INSTALLED BY THE CONTRACTOR ONTO THE FIRE SERVICE LINE, THE PASSING TEST REPORT FOR THE DCVA MUST BE RECEIVED BY THE CITY WITHIN 72 HOURS OF THE CONNECTION OF THE BUILDING FIRE SERVICE LINE TO THE CITY MAIN.

SIGNAL CONSTRUCTION NOTES

1. THE LOCATION OF ALL CONDUIT, JUNCTION BOXES, AND CABINETS SHOWN ON THIS PLAN ARE FOR GRAPHIC PRESENTATION ONLY AND FINAL LOCATION SHALL BE DETERMINED BY THE ENGINEER.
2. ALL TRAFFIC SIGNAL AND PEDESTRIAN HEADS AND PUSH BUTTONS SHALL BE SECURELY AND COMPLETELY COVERED WHILE SIGNAL IS NOT IN OPERATION.
3. ALL CONDUCTORS FOR SIGNAL HEADS, LOOPS, PEDESTRIAN HEADS, PUSH BUTTONS AND STREET LIGHTS SHALL BE LABELED IN EACH JUNCTION BOX.

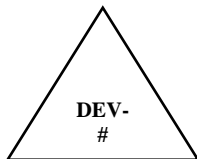
Appendix C – Deviations, Maximum Extents Feasible, and Deferral/Fee-In-Lieu

Plan Sheet Deviation Call-Out:



- Leader arrow points to deviation location.
- DEV-# is the City assigned deviation number.

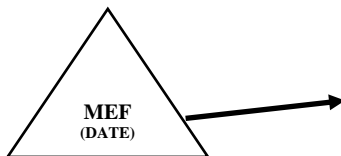
Plan Sheet Deviation Description:



SECTION X.X.X OF THE _____, APPROVED _____.

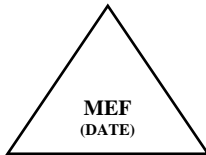
- Description is included with the construction notes on the plan sheet where the deviation is located.
- Description includes a specific citation to the Construction Standards, Design Standards, or SWMM Supplement, as applicable to the Deviation Request.
- Includes approval date in mm/dd/yyyy format.
- Includes a brief description stating why the deviation was allowed, as provided by the City.

Plan Sheet Maximum Extents Feasible (MEF) Call-Out:



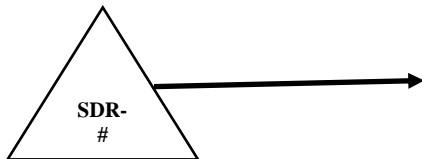
- Leader arrow points to the MEF location. Date is City approval date in mm/dd/yyyy format.

Plan Sheet MEF Description:



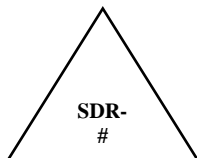
- Description is included with the construction notes on the plan sheet where the MEF is located.
- Description explains what aspect of the facility does not meet ADA requirements and what is constraining it from meeting requirements.
- Includes approval date in mm/dd/yyyy format.

Plan Sheet Deferral (Street Delay) or Fee-In-Lieu Call-Out:



- Leader arrow points to deviation location.
- SDR-# is the City assigned street delay number.

Plan Sheet Deferral (Street Delay) or Fee-In-Lieu Description:



- Description is included with the construction notes on the plan sheet where the deferred improvements would have been located.
- Description includes a summary of the deferred improvements.

Appendix D – Survey Standards

COA Horizontal Datum & Basis of Bearing Information (Ref RCW 58.09.060; WAC 332-130-050)

The City of Auburn's horizontal datum is NAD83(1991), Washington State Plane Coordinates, North Zone, 4601

Basis of Bearings: Provide the observed or calculated bearing between two existing, recoverable monuments, along with NAD83(1991) coordinates and an accurate physical description of the monuments, including type, size and date visited. Clearly depict on the survey map ties to the project site from the basis of bearings.

For Example:

HORIZONTAL DATUM

NAD83(1991), Washington State Plane Coordinates, North Zone, 4601

Basis of Bearings:

The monumented centerline of 17th Street NE from COA Mon 509-036 at the intersection of Auburn Way North to COA Mon 509-010 at the intersection of I Street NE = S 89°04'04" E

COA Mon 509-036

COA Mon 509-010

N: 121004.23

N: 120994.54

E: 1296131.38

E: 1296726.97

DESC: Encased brass disk with "X"

DESC: Encased brass disk with punch

COA Vertical Datum & Benchmark Information (Ref WAC 332-130-050)

The City's vertical datum is NAVD88

Provide Project Benchmark information that includes a physical description of the benchmark, date visited and elevation. Clearly depict the project benchmark on the survey map. If the project benchmark is located a significant distance from the project site, it is recommended that a site benchmark be established in close proximity to the project site and also clearly labeled and depicted on the survey map.

For example:

VERTICAL DATUM

NAV88

Project Benchmark: COA 509-036 (BM B19)

Brass disk in concrete in monument case at SI of Auburn Way North & 17th St NE

Elevation = 65.99 (NAVD88)

Appendix D – Survey Standards (continued)

-- Existing Conditions – Topographic Map Checklist (Ref. WAC 332-130-145)

Topographic elements on maps—Requirements. For the purposes of this section, topographic elements consist of information shown on a map which depicts the horizontal and vertical positions of natural and/or fabricated features and existing terrain surfaces.

The following requirements shall apply to maps that include topographic elements, prepared by professionals registered under chapters 18.43 and 18.210 RCW.

The following elements must be included on every map that includes topographic elements:

<input type="checkbox"/>	1	Name, stamp and dated signature of professional land surveyor licensed in State of Washington who prepared the map drawing.
<input type="checkbox"/>	2	Contact information including company name, address, email address and phone number
<input type="checkbox"/>	3	Location of site, including address (if applicable), tax parcel number, and quarter, quarter section, township and range
<input type="checkbox"/>	4	Legend of symbols used. Symbol size matches in legend and in depiction.
<input type="checkbox"/>	5	North Arrow.
<input type="checkbox"/>	6	Map scale and graphic scale bar
<input type="checkbox"/>	7	Legal description of the subject real property
<input type="checkbox"/>	8	Horizontal datum: NAD83(1991), Washington State Plane Coordinates (WSPC), North Zone.
<input type="checkbox"/>	9	Basis of Bearings statement: Provide the observed or calculated bearing between two existing, recoverable monuments, along with NAD83(1991) coordinates and an accurate physical description of the monuments, including type, size and date visited. Clearly depict on the survey map ties to the project site from the basis of bearings.
<input type="checkbox"/>	10	Vertical Datum: NAVD88
<input type="checkbox"/>	11	Basis of elevations statement: a listing of reference benchmarks shall be included on the topographic map including elevations, descriptions and date visited.
<input type="checkbox"/>	12	Listing of project benchmarks established on-site or in vicinity including descriptions and elevations clearly labeled and depicted in the map.
<input type="checkbox"/>	13	Statement of horizontal control accuracy per WAC 332-130
<input type="checkbox"/>	14	Clearly depict and label contours and intervals.
<input type="checkbox"/>	15	Statement of elevation and contour accuracy.
<input type="checkbox"/>	16	Statement on intended use and limitations of topographic elements shown on the map.
<input type="checkbox"/>	17	Statement on the source of boundary information and methods used to relate area mapped to said boundaries. Provide indexing information for all record documents referenced.
<input type="checkbox"/>	18	Statement specifying the source of all utilities depicted on the map (such as "surface markings", "as-built drawings", "potholing" or "field measurements")
<input type="checkbox"/>	19	Statement specifying the accuracy of all utilities depicted on the map (such as "locations of underground utilities shown hereon are based upon field measurements" or "...based upon City of Auburn Project CP1099 As-Built drawings")
<input type="checkbox"/>	20	Statement specifying the scope of work between the project owner and professional land surveyor regarding the comprehensiveness, exclusions, and limits of the utility investigations leading to utility depictions.

Appendix E – Minor Grading Permit Criteria

Except as approved otherwise by the City Engineer, projects meeting all of the following criteria qualify for a Minor Grading Permit Submittal:

- A. The project is located on a single family parcel with an existing home, and does not include the construction of a new single family home (accessory dwelling unit is not considered a single family home) or the project is a remodel/tenant improvement on a non-residential project with all work occurring inside the existing building that is not exempt from a grading permit per ACC 15.74.
- B. The project does not include the construction of public improvements and right of way dedications.
- C. Project does not construct walls that are over 7-feet tall that are within a setback area (typically within 10 feet from the property line).
- D. Combined cut and fill earthwork is less than 200 CY. Earthwork is calculated by adding cut and fill quantities together, no net earthwork volume.
- E. Grading activities do not change existing drainage patterns and are not within 10-feet of the property line.
- F. Project disturbs less than 1 acre of area.
- G. Total area of new and/or replaced hard surfaces is less than 5,000 SF.
- H. The project is a remodel/tenant improvement on a non-residential project that is inside of a building that is not exempt from a grading permit per ACC 15.74.

A project proposing 2,000 SF or more of new and/or replaced hard surfaces may qualify for a Minor Grading Permit in circumstances where the 2,000 SF threshold is exceeded due to utility work. Restoration associated with the utility work must replace the ground surface with in-kind materials with similar runoff characteristics. Applicability of this criteria to be determined at the discretion of the City Engineer, or designee.

Submittal Requirements – Refer to the Minor Grading Permit Guide on the City’s website under Forms for minimum submittal requirements.

Contact the Development Engineering team at development@auburnwa.gov for a plan template, if eligible for the scope of work proposed.

All other projects requiring a Grading Permit shall submit a Grading Permit per the Civil Submittal Handout.

Appendix F – AutoCAD Layers Standards

FORMAT: Digital files shall be provided in AutoCAD 2019 (2018 format) or older “.DWG” format. All support files required to display or plot the files in the same manner as developed shall be delivered along with these files. Scanned hard copy drawings using raster-to-vector conversion will not be an acceptable digital format. AutoCAD files shall be prepared in accordance with the Layers Standard included in Appendix F, Chapter 3 of the City of Auburn Engineering Design Standards and the latest version of the United States National CAD Standard (NCS).

MEDIA: Digital files shall be submitted via an electronic delivery method acceptable to the City of Auburn. Disks and/or drives shall be clearly labeled with the project name, drawing name(s), name of the drafting/engineering company or individual(s), date, and appropriate City of Auburn identifiers (e.g., BLD#, FAC#, etc.).

SPATIAL REFERENCES: Drawings will be at full scale and shall be accurately located in State Plane Coordinates Washington North Zone, 4601, and tied to two existing and recoverable City of Auburn horizontal control monuments. Datum will be noted on the drawings. All drawings shall use survey control datum NAD 83/91 for horizontal control and NAVD 88 for vertical control.

CONTENTS: The digital drawing files shall include, at a minimum, the following:

The overall project site plan showing new and existing construction, property lines, easements, and survey references.

New and existing water, sanitary sewer, and storm drainage elements showing location, size, and material of utility lines and structures.

Separate layering showing existing impervious surfaces, new impervious surfaces, and annotation on the area of each in square foot units. Layer features for impervious surfaces shall be created from closed polylines to aid in verifying calculations of impervious surface area.

DOCUMENTATION: Final recorded changes shall be clearly reflected when Certified Record Construction Drawings are processed. Proposed features shall use the layer names and descriptions given below. Any layers included that do not meet the descriptions below shall be accompanied by a detailed list of layers and layer descriptions.

Appendix F – AutoCAD Layers Standards (continued)

Proposed Feature	AutoCAD Layer Name
Commercial Fiber - Polyline	C-COMM-FIBR
Conduit: Polyline	C-COMM-CDNT
Easements - Polygon	C-PROP-ESMT
Power Service Cabinets - Point	C-POWR-VALT
Sewer Cleanouts - Point	C-SSWR-SSCO
Sewer Laterals - Polyline	C-SSWR-LATR
Sewer Mains: Polyline	C-SSWR-PIPE
Sewer Manholes - Point	C-SSWR-MHOL
Sidewalks - Polygon	C-PVMT-CONC-SDWK
Storm Catch Basins - Point	C-STRM-STRC
Storm Culverts - Polyline	C-STRM-CULV
Storm Manholes - Point	C-STRM-MHOL
Storm Pipes - Polyline	C-STRM-PIPE
Street Lights - Point	C-POWR-LITE
Street Painted Lines - Polyline	C-ROAD-MRKG
Traffic Signal Cabinets - Point	T-POWR-SGNL-CBNT
Traffic Signal Poles - Point	T-POWR-SGNL-POLE
Traffic Signs - Point	C-SITE-SIGN
Traffic Vaults	T-POWR-VALT
Utility Poles - Point	C-POWR-POLE
Water Auxiliary Equipment - Point	C-WATR-FTTG
Water Hydrants - Point	C-WATR-FHYD
Water Laterals - Polyline	C-WATR-LATR
Water Mains - Polyline	C-WATR-PIPE
Water Meters - Point	C-WATR-METR
Water Valves - Point	C-WATR-VALV
Wetlands - Polygon	C-WETL-DELN

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Chapter 4: Report Preparation Requirements

4.00 Preface

This Chapter describes how technical engineering reports are to be laid out to meet City requirements and provide a format that is easy to follow and understand. Reports need to meet these basic standards in order to move through the review process in an efficient manner.

4.01 General Requirements

The following general requirements shall be met for all technical engineering reports being submitted for review and approval:

- A. All reports and calculations shall be prepared, stamped, signed, and dated by a professional engineer.
- B. The topographic map prepared for the project shall be prepared, stamped, signed, and dated by a professional land surveyor.
- C. All reports and calculations shall be neat, uncluttered, legible, and in conformance with the requirements herein.
- D. All engineering reports shall be bound with the civil engineer's stamp clearly visible.
- E. Reports shall reference City Standards as necessary.
- F. All reports shall be provided in electronic format (PDF).

4.02 Report Types and Requirements

The following are basic types of reports submitted as supporting project information. Depending on the complexity or simplicity of the project and its location, the amount of detail, and the number and types of reports required will be subject to change. The examples given are the typical reports required for a standard project, there may be other reports required that are specific to a particular project.

4.02.01 Geotechnical Reports

Geotechnical reports are required to support the design and construction of various facilities as specified in the ACC, these design standards, the SWMM, the Engineering Construction Standards, and other documents. The geotechnical report format shall include (at a minimum) the following applicable items:

- A. Title page including project name and address.
- B. General information, which includes existing site conditions.
- C. Site history including any prior grading.
- D. Subsurface soil information and conditions including seasonal high groundwater and impermeable layer elevations. Seasonal groundwater levels shall be determined using groundwater monitoring well(s) and shall be required where consideration of groundwater levels is a design consideration.
- E. Soil log information and locations of explorations.
- F. Soil characteristics including suitability for fill and compaction requirements.
- G. Slope stability analysis.

- H. Seismic hazards.
- I. Geological hazard areas as defined in the ACC 16.10.
- J. Site plan showing the topography and proposed structures and paving.
- K. Grading information including depth of cuts and recommended slopes.
- L. Recommendations on temporary erosion and sediment control.
- M. Conclusions and recommendations for foundations.
- N. Appendix with test pit and boring logs.
- O. Information on infiltration rates for use in designing low impact design facilities, retention ponds and infiltration trenches.
- P. California Bearing Ratio (CBR) information for pavement design per Section 10.05 or AASHTO Pavement Design.
- Q. Additional requirements for geotechnical reports are included in Volume I of the SWMM.

4.02.02 Stormwater Site Plan Report

The Stormwater Site Plan Report shall contain the information as noted in Appendix I-I of Volume I of the SWMM.

4.02.03 Critical Area Report

- A. Title Page including project name, contact information for property owner, applicant, and preparer, a description of the proposal, site address, and the parcel number.
- B. Identify all local, state, and other critical area related permits/approvals required for the proposal.
- C. Indicate accuracy of the report.
- D. Documentation of field work (such as field data sheets, and rating worksheets in the case of wetlands).
- E. Description of methodologies used in the study.
- F. Identify and characterize all critical areas including wetlands, streams, water bodies, buffers, regulatory floodplain, wildlife habitat, groundwater protection areas, critical erosion hazard areas, landslide hazard areas, seismic hazard and volcanic hazard areas on or adjacent (within 300 feet of the project boundaries) to the proposed project area.
- G. Provide location and critical area rating/classification (if applicable) and required buffers based on a professional survey. Provide the classification according to ACC 16.10.080, "Classification and rating of critical areas" and identify the classification according to other agency standards for which permits/approvals are required.
- H. A description of proposed actions, including estimated area of impacts to the critical area(s), and the impact to buffer(s).
- I. An assessment of probable temporary, permanent, and cumulative impacts to the critical area(s) and buffer(s).

- J. Mitigation measures proposed and relationship to applicable mitigation standards.
- K. Scaled site plan.
- L. Qualifications of person(s) preparing the report.

4.02.04 Traffic Impact Analysis

- A. Title Page including project name and address.
- B. Executive Summary.
- C. Table of Contents.
- D. Introduction consisting of a description of the project, location, site plans with access to city streets, circulation network, land use and zoning, phasing plan, project developer and contact person, reference other studies.
- E. Traffic Analysis to include assumptions, existing and projected traffic volumes, project trip generations, trip distribution, level of service (LOS), and warrant analysis.
- F. Appendix with all calculations.
- G. Information as specified in **Section 10.01** of these design standards.

4.02.05 Construction Stormwater Pollution Prevention Plan (SWPPP)

See **Section 5.01.03** of these design standards and Section 2 of Volume II of the SWMM.

4.02.06 Other Reports

Other reports may be required on a site-specific basis. The specific information required in these reports shall be determined during the SEPA process or by the department requiring the report. These reports shall include the following basic items:

- A. Title page including project name and address.
- B. General information, which includes existing site conditions.
- C. Site plan showing the topography, proposed structures, and paving.
- D. Conclusions and recommendations.
- E. Appendix with collected field information.

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Chapter 5 TESC, Clearing and Grading

5.00 Preface

Temporary Erosion and Sediment Control (TESC), clearing, and grading shall conform to the requirements herein.

Compliance with these standards does not alleviate the design engineer from using sound professional engineering practices. 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.

The purpose of these requirements is to provide the design criteria necessary to preserve the City of Auburn's water courses; minimize surface and ground water quality degradation; control sedimentation in creeks, streams, rivers, ponds, lakes, and other water bodies; protect adjacent and downstream property owners from increased runoff rates which could cause erosion and flooding; and ensure the safety and stability of City of Auburn's roads and rights-of-way.

5.01 Temporary Erosion and Sediment Control (TESC)

TESC design requirements shall meet design criteria requirements as identified in Volume II of the City of Auburn Surface Water Management Manual (SWMM), and follow City of Auburn grading requirements.

All TESC measures regardless of design and implementation must meet the latest Nephelometric Turbidity Units (NTU) test requirements. The City may conduct tests and if the applicable limits are not met, the project will be halted until such time as it is brought into compliance.

The temporary sedimentation facilities (ponds and traps) shall be defined as the active storage available a minimum of 1 foot above the seasonal high ground water.

Any project with exposed soil meeting the requirements of the Chapter 2 of Volume II of the SWMM shall prepare a Stormwater Pollution Prevention Plan (SWPPP). The plan shall follow the SWPPP Template (available at the Dept. of Ecology's website) or City of Auburn Short Form (where approved by the City) from the SWMM.

For land clearing requirements see ACC 15.74 Plans for Land Clearing shall follow the requirements for Grading.

The TESC plan shall also include a construction sequence element which clearly identifies the timing and methodology required to:

- A. Contain areas of active earthwork to prevent uncontrolled discharge of storm drainage.
- B. Minimize erosion and the extent and time soils are exposed on-site.
- C. Prevent tracking of sediment onto City streets.
- D. Protect permanent on-site and off-site storm drainage systems.

5.02 Grading

The following section establishes the requirements for grading. These requirements do not supersede nor are they intended to be inconsistent with any landscaping requirement established by the Zoning Ordinance or other City action. A grading permit shall be required except for the situations described in ACC 15.74.050 and the following scenario:

- A. The City Engineer may approve the broadcasting of less than 500 CY of topsoil, peat, sawdust, mulch, bark, chips, or solid nutrients used for landscaping or soil conditioning on a lot, tract or parcel of land during any 24-month period, provided the finished depth does not increase the grade from the existing grade by more than 8 inches.

5.03 Cut and Fill

Cut and fill slopes are subject to the requirements of ACC 16.10. Permanent cut and fill slopes shall be constructed no steeper than two horizontal to one vertical (2:1). Permanent cut and fill slopes within the public right of way or within 5 feet of a roadway shall be no steeper than three horizontal to one vertical (3:1). See **Section 5.04** for additional information.

Temporary fills, such as fill material placed for preloading of building pads, may use a slope one and one-half horizontal to one vertical (1.5:1).

Slopes shall be stabilized by terracing, cat tracking, jute mat, grass sod, hydro-seeding, or by other planting or surfacing materials acceptable to the City.

The City Engineer may require geotechnical analysis for the following:

- A. As supporting documentation for deviation from these standards.
- B. Cut or fill existing slopes of greater than five horizontal to one vertical (5:1).
- C. Slopes with sub-surface or surface water flows.
- D. In areas of questionable soils conditions or slope stability.
- E. Where the length of the slope requires terracing.

Additional requirements for placement of fill material are as follows:

- A. A minimum horizontal setback of 5 feet shall be provided between the bottom of any fill placement and the top of the bank of any defined drainage channel.
- B. When filling a site, particular care shall be taken to prevent impeding the existing upstream surface drainage flow.
- C. Prior to any fill being placed all vegetation, topsoil and other unsuitable material shall be removed unless dictated otherwise by the geotechnical engineer.
- D. Fill material shall be placed in lifts of no more than 12 inches and compacted to 90% or greater of the maximum dry density as determined by ASTM D1557 Modified Proctor or as directed by the geotechnical engineer.

5.04 Retaining Walls

Except retaining walls built with City capital projects or through deviation, retaining walls will be located outside the public right-of-way such that they do not support the public right-of-way, be privately owned and maintained, and are subject to ACC Title 15. In addition to the standard deviation criteria, a deviation request for a wall in the right-of-way or supporting the right-of-way would need to address the risk to the right-of-way if the wall was not adequately maintained or was otherwise compromised and digging restrictions associated with the wall that could complicate or compromise use of the right-of-way for utilities, street lighting, and other use. Walls within or adjacent to the right-of-way shall be placed to address clear zone and vehicle recovery requirements per WSDOT Design Manual M 22-01 Chapter 1600.

Retaining wall systems with a vertical difference of 30-inches or greater require protective fencing along the top edge for safety. Per ACC 12.12.232, maintaining barriers or fences

between the edge of pavement or back of curb along any public street and the abutting property (defined by ACC 12.12.020 as “sidewalk”), where the sidewalk is elevated more than two feet above the abutting property is the responsibility of the abutting property owner.

Retaining walls require the wall owner to have property rights of sufficient terms and area, in the opinion of the City Engineer, to allow for construction, access, maintenance, repair, removal, and reconstruction of the wall. The minimum easement width required for walls that are less than 10 feet tall is 10 feet centered on the wall face and a minimum of 5 feet beyond any and all structural elements behind the wall. The minimum easement width required for walls 10 feet and taller is 15 feet and shall include a maintenance road along the wall base that is fenced and gated.

Public walls shall be reinforced concrete walls or block walls as directed by the City Engineer. Other wall types require deviation to be considered for City ownership and maintenance.

Tiebacks, pins, geogrids, anchors, footings, and any other elements of private walls are not allowed within the right-of-way.

5.04.01 Underdrains

Underdrains are required for all retaining walls over 4 feet in height (i.e., concrete walls, MSE walls, soil nail walls, block retaining walls, etc.).

A minimum 6-inch diameter perforated or slotted drainpipe shall be placed in a shallow excavated trench located along the inside edge of the keyway. The pipe shall be bedded on and surrounded by “Gravel Backfill for Drains” (WSDOT/APWA 9-03.12(4)) to a minimum height of 18 inches above the bottom of the pipe. A filter fabric shall surround the gravel backfill and shall have a minimum of 1 foot overlap along the top surface of the gravel. The perforated pipe shall be connected to a storm drain system or to an acceptable outfall.

5.04.02 Rock Walls

Rock Walls may be used for containment of cut slopes or fill embankment up to a maximum height of 8 feet. Rock Walls over 4 feet in height, surcharged, or in areas of questionable soil stability will require an engineered design. The engineered design shall include a soils investigation and report by a geotechnical engineer and calculations to support the rockery design.

The rock material shall be as rectangular as possible. No stone shall be used that does not extend through the wall. The quarried rock shall be hard, sound, durable, and free from weathered portions, seams, cracks, and other defects. The rock density shall be a minimum of 160 pounds per CF, measured accordingly to WSDOT test method 107 (Bulk Specific Gravity – S.S.D. basis).

5.04.03 Block Retaining Walls

Block retaining walls, (e.g., Keystone, Allan Block, Ecology Block) may be used for containment of cut slopes or fill embankment. Block retaining walls over 4 feet in height, surcharged, or in areas of questionable soil stability will require an engineered design. The engineered design shall include a soils investigation and report by a geotechnical engineer and structural calculations to support the block wall design.

Blocks used for retaining walls shall be in good condition and structurally sound; cracked and/or broken blocks are not acceptable. Unless designed as a gravity wall (ecology blocks), block walls over 4 feet in height shall employ geo-grid type material to increase the structural stability of the wall.

5.04.04 Reinforced Concrete Walls

Reinforced concrete walls or cast-in-place concrete walls may be used for containment of cut slopes or fill embankment. Concrete retaining walls over 4 feet in height, surcharged, or in areas of questionable soil stability will require an engineered design. The engineered design shall include a soils investigation and report by a geotechnical engineer and structural calculations to support the concrete wall design.

A minimum 3,000-psi structural reinforced concrete shall be used in the design of concrete retaining walls.

5.04.05 Mechanically Stabilized Earth Walls (MSE Walls)

MSE walls may be used in conjunction with other retaining walls or as a stand-alone application when constructing fill slopes. MSE walls will require an engineered design. The engineered design shall include a soils investigation and report by a geotechnical engineer and calculations to support the MSE wall design.

MSE walls shall employ well-draining structural soil compacted to the geotechnical engineer's specifications.

MSE walls are not allowed in the right-of-way.

5.05 Construction Sequence

A construction sequence is intended to ensure that the timing and installation of storm drainage and erosion control measures are in place prior to activities that may cause erosion to occur. The following elements are to be included in a construction sequence:

- A. Establishment of clearing and grading limits.
- B. Construction of temporary construction entrance.
- C. Construction of perimeter ditches, filter fabric fences, and other erosion control devices as shown.
- D. Construction of storm drainage control (applicant to be specific) facilities including emergency overflow as applicable.
- E. Construction of ditches and swales as necessary to direct all surface water to the storm drainage control (be specific) facilities as clearing and grading progress. Prevention of uncontrolled surface water being allowed to leave the site at any time during the grading operations.
- F. Establishment of at what point grading activities can begin, which is usually only after all perimeter drainage and erosion control measures are in place.

For sites with a final development plan, the following shall also be addressed when applicable:

- A. Installation of on-site permanent storm drainage, sanitary sewer, and water facilities.
- B. Site paving.
- C. Indicate at what point building construction may begin.
- D. A description of how to transition from the temporary to permanent storm facilities.
- E. The possibilities of any phased construction.

- F. Any off-site public or private improvements including the general timing and duration.
- G. The removal of all TESC measures at project completion upon City approval.

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Chapter 6: Placement and Easement Requirements for City Facilities

6.00 Preface

This chapter includes placement and easement standards for all three City utilities (water, sanitary sewer, and storm drainage), City telecommunications, street lighting and other facilities such as power service cabinets, traffic signal poles, and traffic signal controller cabinets. Additional standards for City utilities are included in **Chapters 7, 8, and 9** of this document and in the Surface Water Management Manual (SWMM). **Chapter 9** describes specific additional requirements for City and non-City facilities, including utilities, within the public right-of-way. Chapter 10 includes specific requirements for street lighting and other street related facilities.

Compliance with these standards does not alleviate the design engineer from using sound professional engineering practices. 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.

6.01 Easements

Public Utility Easements are required for the placement, operation, and maintenance of City facilities located outside the public right-of-way and not in tracts/parcels owned by the City for the specific use of the City facility. Easements shall encompass all portions of the facilities including, but not limited to, valves, manholes, hydrants, meters, catch basins, channels, access roads, vaults, junction boxes, foundations, junction boxes, and other appurtenances. Easement requirements for storm ponds, ditches, and channels are specified in the SWMM.

6.01.01 Easement Width

Easement widths for City facilities shall provide adequate space for access, operations, maintenance, repair, and open cut replacements.

Table 6-1 shows minimum required easement widths for City Utility pipes and appurtenances based on depth of pipe/appurtenance. Under certain circumstances (e.g., steep slopes, pipe diameters greater than 12 inches, excessive depths) the City may require wider easements than shown in the table. Minimum easement widths for non-pipe facilities and appurtenances, such as channels and ditches, shall be the minimum width required for the City to access, operate, maintain, repair, and replace the facility and to meet the other requirements specified herein and in the SWMM.

Table 6-1 Minimum Easement Width for City Utilities

PIPE INVERT DEPTH, FEET	EASEMENT WIDTH, FEET
< 10	15
10 – 15	25
15 – 20	30
> 20	40

Table 6-2 shows minimum easement widths for City conduits, including, but not limited to, conduits for street lighting, telecommunications, and traffic control device systems.

Table 6-2 Minimum Easement Width for City Conduit

CONDUIT COVER DEPTH, FEET	EASEMENT WIDTH, FEET
2 - 3	5
>3 - 5	7
>5 – 7	10
>7	To be determined by City Engineer, or designee

Easements for non-linear facilities such as traffic signal cabinets, street lights, and power service cabinets shall encompass the entire perimeter of the facility plus a minimum of 2 foot offset distance for the facility edges. Additional offset may be required and determined by the City Engineer, or designee, to be required for facility maintenance, operations, repair, and replacement.

6.01.02 Easement Form

Easements shall be provided on the City's standard easement form, with a separate easement for each facility. A legal description of the easement and the property that the easement encumbers, along with a sketch showing both, shall be stamped and signed by a professional land surveyor and incorporated into the easement form as exhibits. The legal descriptions and sketch shall have margins acceptable to the County of recording. The easements may also be described and recorded on a final plat document. Encumbrances that would conflict with the City's rights and ability to access, operate, maintain, repair, and replace the facilities require release/clearing from title.

The City will record approved easements in the appropriate County prior to acceptance of the public facilities unless part of a final plat document.

6.01.03 Location of Facilities within Easement

Facilities shall be located within the easement as follows:

The preferred location of pipes, channels, structures, and appurtenances is to be centered within the easement. Where facilities are not centered in the easement, additional easement width may be required and it shall be demonstrated, to the satisfaction of the City Engineer, or designee, that the placement will not impede the City's ability to access, operate, maintain, repair, and replace the facilities using typical City practices.

Utility facilities must be located within the easement so that each pipe face or edge of channel, structure, or appurtenance is no closer than 5 feet from its adjacent easement boundary. Telecommunications facilities must be located within the easement so that each conduit, vault, or appurtenance is no closer than 2 feet from its adjacent easement boundary.

6.02 Utility Pipe Separation

6.02.01 Potable and Non-Potable Separation Requirements

The requirements of this section are based on WAC 246-290-200, Washington State Department of Health (DOH), and the Washington State Department of Ecology (DOE). Potable

pipes include pipes conveying water for domestic purposes, including domestic service and irrigation service lines. Non-potable pipes include, but are not limited to, pipes conveying sewage, storm drainage, natural gas, gasoline, and oxygen. Natural gas service lines, drain pipes (yard drains, down spout drains, and wall drains), and storm drain catch basin lateral pipes that carry runoff from a cumulative area of 5,000 SF or less, are not subject to the potable/non-potable separation requirements, but are still subject to general separation requirements as specified herein. The following requirements apply to separation between pipes and appurtenances of potable and non-potable materials:

- A. A Minimum of 10 feet horizontal separation is required between the outside walls/limits of parallel facilities where the crown of the non-potable pipe is less than 18 inches lower than the invert of the potable pipe.
- B. A Minimum of 4 feet horizontal separation is required between the outside walls/limits of parallel facilities where the crown of the non-potable pipe is at least 18 inches lower than the invert of the potable pipe.
- C. The invert of the potable pipe is required to be a minimum of 18 inches above the pipe crown of the non-potable pipe at crossings.

Where meeting separation requirements would require pumping/pressurization of an existing or new gravity non-potable pipe, the separation requirements may be reduced with the following additional requirements:

- A. For construction of new potable pipes, the potable pipe shall be encased with ductile iron or steel pipe designed to withstand a minimum static pressure of 150 psi and extending at least 10 feet to either side of the crossing per **City of Auburn Standard Detail W-26**.
- B. For construction of new non-potable pipes, the non-potable pipe shall be encased in controlled density fill for at least 10 feet to either side of the crossing.
- C. Where non-potable pipe crosses over potable pipe, 18-inches of separation shall be maintained and one or both utilities will be encased, as deemed necessary by the City Engineer or designee.

6.02.02 General Separation Requirements

The following separation requirements are in addition to the other separation requirements specified herein. Placement of new City utility facility mains shall be done in a manner that allows the City to access, operate, maintain, repair, and replace the facilities without impacting other adjacent facilities or structures in the vicinity. Facilities shall be located a minimum horizontal distance of 10 feet from above-ground structures and their foundations. Except as noted above (for crossings of potable water), underground facilities that cross each other shall have a minimum separation of 12 inches. Non-potable facilities require a minimum horizontal distance of 5 feet from all other underground utilities. Where 12 inch vertical separation cannot be achieved, use of an Ethafoam pad between the utilities may be permitted by the City Engineer or designee.

Additional separation of City utility facilities from structures may be required where soil conditions are poor, facility depth is greater than 10 feet, or other conditions are present that require additional separation to ensure the City may access, operate, repair, and replace the facilities using standard City methods. The minimum separation between an underground facility and an adjacent structure shall be such that the zone of influence from the weight of a structure shall be below the invert of the underground facility.

6.03 Utility Access Roads

Public utilities within a utility easement, tract, or parcel that have appurtenances such as manholes, catch basins, stormwater ponds, vaults, fire hydrants, valves, blowoffs, etc. shall have an access road. The access road shall be constructed of gravel, asphalt, pervious concrete or pervious asphalt, or other surface material as approved by the City Engineer, and shall conform to the following requirements:

- A. Maximum vertical profile shall be 12% for public facilities and 15% for private facilities.
- B. A paved commercial driveway apron meeting City design standards shall be required for both public and private access where access roads connect to paved public roadways.
- C. The driveway approach section of the access road shall not exceed a vertical profile of 5% for a minimum distance of 25 feet measured from the back of the driveway entrance. See City of Auburn Standard Detail T-34.
- D. The minimum access road length shall be 50 feet as measured from the back of the driveway entrance. See City of Auburn Standard Detail T-34.
- E. Access to the access road shall be limited by a double-posted gate with a minimum width of 15 feet (if the gate is connected to a fence), removable bollards, or other approved equal.
- F. Except as noted in **Section 7.06.04**, access roads shall be a minimum of 15 feet in width on curves and 12 feet in width on straight sections, centered within the easement. Easement width will need to be increased at curves to accommodate the wider road and adjacent ditch described below. A hammerhead or a turnaround meeting IFC standards is required at the end of all access roads unless drive-through access is provided.
- G. For access roads determined by the City Engineer, or designee, to require access by vector trucks or other large vehicles, inside turning radii shall be a minimum of 45 feet. For all other access roads, minimum inside turning radii shall be 28 feet. Turning analysis may be required to verify movement of equipment.
- H. Access roads whose vertical profile is greater than 8% shall be asphalt paved. See **Table 10-7** for paved access road requirements.
- I. Unpaved gravel access roads and pond ramps shall meet the requirements of **Table 10-7**.
- J. The access road shall have a cross slope of 2%.
- K. Access roads will be constructed with appropriate drainage to prevent stormwater ponding on the road.
- L. Access roads cut into a hillside will require regrading of the adjacent slopes. To reduce the length of unimpeded slope and to collect and reduce the probable impacts of sheet flow on the slope face, install benches at least 10 feet wide into the slopes adjacent to the access road, with 30 feet maximum vertical spacing between benches. On the uphill slope face, the first bench shall be adjacent to the ditch.

Chapter 7: Water Facilities

7.00 Preface

The design and construction of public and private Water Facilities shall conform to the State of Washington Department of Health (DOH) Design Standards for Group A Public Water Systems, the Standard Specifications of the American Water Works Association (AWWA), and the most recent published and adopted edition of the Uniform Plumbing Code (UPC), unless modified herein.

Compliance with these standards does not alleviate the design engineer from using sound professional engineering practices. 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. Contact the City of Auburn Public Works Department for specific requirements for the design of pump stations, wells, reservoirs, treatment systems, and other special facilities.

The design criteria used to estimate future line capacities are established in the City's Comprehensive Water Plan. Anyone proposing to extend or modify the City's water system should contact the Public Works Department for information. Applicants needing to construct public water improvements shall enter into a Developer Public Facility Extension Agreement (FAC) with the City. The City's Permit Center can provide information on this agreement as well as applicable permit and connection fee estimates.

7.01 Water Mains and Appurtenances

7.01.01 Materials

Unless otherwise approved by the City Engineer, all water mains shall be the following:

Pipe Type	Construction Standard	Notes
Ductile Iron Pipe, Special Class 52 or 53*	9-30.1(1) (Ductile Iron Pipe)	Asphaltic coating on the exterior and cement mortar lining on the interior

* Class 53 is required for installations with less than 42-inches of cover.

The list of acceptable valves, fittings, and other appurtenances for water facility construction is subject to change as new and improved components become available. Refer to the Construction Standards for the most current information on these requirements.

7.01.02 Water Main Sizing and Main Extensions

New water mains shall be sized to meet flow/demands, pressure requirements and pipe velocity constraints, and as follows:

- A. Water mains serving only properties and developments requiring 1,500 GPM @ 2 Hours per **Section 7.05.03** shall be a minimum of 8 inches in diameter.
- B. Water mains serving properties and developments requiring 2,500 GPM @ 3 Hours per **Section 7.05.03** shall be a minimum of 12 inches in diameter.

- C. Water mains serving properties and development requiring more than 2,500 GPM @ 3 Hours per **Section 7.05.03** shall require hydraulic analysis per **Section 7.06** for sizing and in no case shall be less than 12 inches in diameter.
- D. The minimum allowed diameter of a water main in a cul-de-sac, shared access driveway, or dead end street serving only single family/duplex residential properties may be reduced to 4 inches after the last fire hydrant connection serving the cul-de-sac, shared access driveway, or dead end street, unless the City Engineer determines the water main in the cul-de-sac, shared access driveway, or dead end street may be extended in the future or unless minimum pressure requirements cannot be achieved.

Public water main extensions are required where a new service is being requested and there is no existing water main fronting the property(ies) or the existing water main does not extend across the full width of the property(ies) being developed, and shall be as follows:

- A. Water main extensions shall be extended to and across the entire property frontage of the parcel being served. For cul-de-sacs or other similar instances where extending across the property frontage is not feasible, main extensions shall meet all other requirements herein, necessary to address fire flow and pressure requirements.
- B. Water mains may be required to be extended beyond the property frontage or looped, as determined by the City Engineer, to address system deficiencies created by the development. Water main loops shall have a minimum of two separate connection points to the existing water system, with sufficient valves so that water can be delivered through either connection point independent of the other.
- C. In addition to the water main extensions required in item A) and B) above, the City may require properties with service connections on more than one frontage to extend water main(s) across the frontage(s) with the service connection(s), as determined necessary by the City Engineer to accommodate future water system extensions and connections.
- D. Water main extensions that may serve adjacent property or to which adjacent property may connect future extension(s), require additional easements, as determined by the City Engineer or designee, to be needed to accommodate the future connections.

7.01.03 Water Main Upsizing

Public water main upsizing is required where a new or modified service is taken from an existing water main that fails to meet minimum pressure requirements per **Section 7.01.05**, fire flow requirements per **Section 7.05.03**, or pipe velocity constraints per **Section 7.01.04**, as demonstrated by a hydraulic analysis per **Section 7.06**. In such cases main upsizing shall be as follows:

- A. Existing water mains shall be upsized, at a minimum, across the entire property frontage of the parcel being served.
- B. Existing water mains may be required to be upsized beyond the property frontage, as determined by the City Engineer, to address system deficiencies created by the development.
- C. When main upsizing is required, in no case shall the mains be upsized to be less than the minimum sizes for new mains identified in **Section 7.01.02**.

7.01.04 Water Main Velocities

All water mains shall meet the following velocity requirements:

- A. The maximum flow velocity in distribution mains shall not exceed 8 feet per second under Peak Hour Demand (PHD) conditions. Maximum flow velocities in distribution mains may be exceeded under fire flow conditions, but in no case shall velocities exceed 18 feet per second when applying Maximum Day Demand plus Fire Flow (MDD + FF) conditions.
- B. The maximum flow velocity in transmission mains shall not exceed 5 feet per second under PHD conditions.

7.01.05 Water Main Pressure

All water mains shall meet the following minimum pressure requirements under the conditions listed:

- A. Peak Hour Demand - 30 psi
- B. Max Day Demand Plus Fire Flow – 20 psi

7.01.06 Water Main Location

Water mains shall be installed with no less than 42 inches and no more than 72 inches of finished cover. The City Engineer or designee, may grant exceptions to the minimum and maximum cover requirements and may require measures to mitigate impacts of the decreased or increased cover. Said exceptions will only be considered based on the potential impacts to City utilities of constructing the water main within the allowed cover ranges and topographic constraints. When a reduction in pipe cover is granted, in no case shall the finished cover be less than 30 inches.

Public water mains shall be located in the public right-of-way or within a public water utility easement. Public water mains within a utility easement with appurtenances such as hydrants, valves, blowoffs, etc. shall have an access road to such appurtenances conforming to **Chapter 6**. Water mains located in the public right-of-way shall meet the requirements of **Chapter 9**.

For separation requirements between utilities, see **Chapter 6**.

7.01.07 Water Main Appurtenances and Fittings

- A. Blow off assemblies (See **City of Auburn Standard Detail W-03 or W-04**) are required on dead-end water mains with a diameter of 6 inches or less; hydrants are required for dead-end mains over 6 inches in diameter. Blow off assemblies shall also be installed at the low point of a depressed “sag” section of a water main, except where a fire hydrant is installed within 50 feet of said area or on a short segment (20 feet or less) where the water main dips under other utilities. Blow off assemblies shall be placed in a level, clear area within the right-of-way or easement, be located as close to the main as possible, and be easily accessible to the City.
- B. Combination air and vacuum relief valves (See **City of Auburn Standard Detail W-02**) are required at high points in water mains when an abrupt vertical change in pipe elevation exceeds one pipe diameter, except where fire hydrants are installed within 50 feet of said area. Combination air and vacuum relief valves shall also be installed at the end of all dead-end water mains in addition of a blowoff or fire hydrant, when there is a vertical change in pipe elevation that

exceeds one pipe diameter, and the dead end main is greater than 50 feet in length. Combination air and vacuum relief valves shall be placed within a level clear area within the right-of-way or easement, be located as close to the main as possible, and be easily accessible to the City.

- C. All buried bends shall have mechanical restrained joints and concrete thrust blocking or flanged joints and concrete thrust blocking (See **City of Auburn Standard Detail W-01**). 90 degree bends are not allowed when making vertical pipeline adjustments.
- D. Tees shall have flanged joints unless there is no valve against the Tee, in which case the Tee may be flanged or mechanical restrained joints. Tees shall include concrete thrust blocking (See **City of Auburn Standard Detail W-01**). When connecting to an existing water main, a tapping tee and valve may be used, if only a single valve is needed at the tee, or unless otherwise approved or required by the City Engineer or designee.
- E. Tapping tees are not allowed on commercial fire lines or other water taps needing uninterruptible service; a cut-in tee or installed tee is required.
- F. Size-on-size taps are not allowed unless authorized by the City Engineer or designee.
- G. The maximum allowable deflection per joint for ductile iron water mains shall be half of the maximum joint deflection specified by the pipe manufacturer or 4 degrees, whichever is lesser.

7.02 Water Services

See **City of Auburn Standard Details W-06, W-13 through W-16a, and W-20.**

The City owns and shall maintain the water service line from the public main to the meter, the meter and setter, the meter radio, the meter tailpiece, and the meter box. The property owner owns and shall maintain the tailpiece connection fitting, shut-off valve, service line after the shut-off valve, and other facilities such as pressure reducing valves, pumps, or backflow prevention assemblies behind the meter.

For fire sprinkler connections, City ownership and maintenance responsibilities cease at the valve installed at the point of connection between the main and the fire service line.

7.02.01 Domestic Services

Domestic water services shall meet the following requirements:

- A. Each parcel receiving water service shall have its own meter. Non-single-family developments with multiple buildings on a single parcel shall have a meter for each building unless otherwise authorized by the City Engineer or designee.
- B. Water services shall be installed per City of Auburn Standard Details. All existing services shall be replaced when installing new water mains required for the project. The City will furnish and install the meter for services of 2 inches and smaller unless directed otherwise by the City Engineer.
- C. Water meters 3 inches and larger will be purchased from the City and installed by the developer/contractor under City observation. Where vaults are required, the vault roof shall contain a 2-inch port for remote reading device.
- D. Water meters shall be installed off City owned water mains and shall be located as close to the water main from which the service is taken as possible, while

meeting all other requirements as specified herein, with the distance not to exceed 50 feet.

- E. Water meters serving residential lots shall be located in the right-of-way along the frontage of the lot being served. Water meters serving residential lots without right-of-way frontage (such as lots that access the right-of-way via a shared driveway access road) shall be placed in the right-of-way adjacent to the access connection (driveway connection) to the roadway.
- F. Water meters shall be placed in landscape strips. If there is no landscape strip, the meter shall be placed behind the sidewalk (in a public water utility easement if not in right-of-way). If there is no landscape strip or sidewalk, the meter shall be placed at the right-of-way limits in a level area, outside of vehicle or pedestrian travel paths, outside parking areas, and away from obstructions.
- G. Meters in landscape strips and other landscaped or unimproved areas shall be set 2 inches above the finished grade including landscaping and mulch.
- H. Water meters that cannot be placed in the right-of-way while meeting other water meter location requirements may be placed within a public water utility easement adjacent to the right-of-way.
- I. Commercial and industrial sites shall have meters located near driveway entrances within the right-of-way or within public water utility easements in landscape islands located near access driveways when, placement in right-of-way, attempting to meet other location requirements of this section, is not practical.
- J. Meters may not be placed within sidewalks or pedestrian travel pathways except in cases where obstructions prevent the meter box from being placed behind the sidewalk or in a landscape strip (where a landscape strip is present). In such conditions, the meter box shall be placed in the back of the sidewalk.
- K. The water service diameter and meter size shall be sized per Tables 610.3 and 610.4 of the current Uniform Plumbing Code and, upon request by the City Engineer or designee, supporting documentation of the meter size selection provided to the City. The length of the private service line between the right-of-way line and the structure shall not exceed 300 feet.
- L. When installing multiple services to a public main, a minimum horizontal spacing of 5 feet shall be used between the corporation stops and tapping tees when the existing main material is ductile iron. A minimum spacing of 10 feet shall be used between the corporation stops and tapping tees on all other types of existing water main materials.
- M. Domestic water services shall be connected to the public water main. Domestic water services shall not be connected to private water mains.

7.02.02 Other Services

Irrigation and other non-domestic water services shall meet all the above requirements as well as the following:

- A. An Irrigation meter shall be installed in cases where water is used for landscape purposes by non-single-family customers and does not enter the sanitary sewer system.
- B. For fire sprinkler service line requirements, see **Section 7.05.02**.

- C. Cross connection control devices shall be installed per **Section 7.04**.

7.02.03 Service Abandonment

Services shall be abandoned when properties are redeveloped, and existing services will no longer be used. The following actions are required after removal of the meter:

- A. Obtain the necessary permits (e.g., for work in the right-of-way, for meter abandonment)
- B. Shut off the corporation stop at the main.
- C. Disconnect the service line from the corporation stop.
- D. Remove the meter box.
- E. Restore the roadway or other surface(s) disturbed by construction activities (e.g., trench patch/overlay).

7.03 Water Valves

Water valves shall be as specified in the Construction Standards and the requirements of this section. See **City of Auburn Standard Details W-17 through W-19** for valve box and extensions.

Water valves shall be of the resilient wedge gate variety. Butterfly valves shall be placed on water mains 14" or larger in diameter. Valves larger than 12 inches may require the valve to be turned on its side with a gear to maintain minimum cover.

Water valves shall be located as follows:

- A. Water valves shall be installed at a maximum spacing of 400 feet and at the intersection of lateral lines. A maximum of 20 service connections between valves shall be maintained except on dead end residential streets where up to 30 service connections between valves are allowed.
- B. Water valves shall be located in clusters at tees and crosses when possible and shall be located so that each leg of the main line system can be isolated separately.
- C. When extending public water mains, a water valve may be required near the end of lines where future extensions are projected.
- D. Water valves shall not be placed within the wheel path of vehicle traffic.

A gravel or paved road surface may be required within the public water utility easement as needed to allow access to valves and other appurtenances.

Valves shall be adjusted to final grade in accordance with **City of Auburn Standard Detail T-05**.

7.04 Cross Connection Control

See **City of Auburn Standard Details W-22 through W-25**.

Water Systems shall be designed to protect the City water system from contamination via cross connection control in accordance with Washington State Law (WAC 246-290-490), Auburn City Code (ACC), the City's Cross Connection Control Program manual, and these design standards. Premises isolation shall be provided on service connections and proposed building tenant improvements in accordance with these standards.

7.04.01 Domestic Services

Backflow protection assemblies shall be installed on all new non-single family service connections. Backflow protection assemblies shall be installed on existing non-single family service connections as directed by the City Cross Connection Specialist. The type of backflow protection assembly shall be as determined by the City Cross Connection Specialists:

- A. A Reduced Pressure Backflow Assembly (RPBA) shall be installed adjacent to the meter or at an alternate location where the service line enters the building. RPBA assemblies installed at an alternate location, require the approval of the City, shall have no connections between the meter and the assembly, and shall be installed with adequate drainage to accommodate discharges from the RPBA.
- B. A Double Check Valve Assembly (DCVA) for domestic service shall be installed adjacent to the meter, unless installed at an alternate location approved by the City Cross Connection Specialists.

7.04.02 Irrigation Services

A backflow prevention assembly shall be installed on all irrigation service connections. The layout of the backflow prevention assembly shall be per **City of Auburn Standard Detail W-06** for single family residential services up to 2 inches and per **City of Auburn Standard Detail W-20** for non-single family residential services. The minimum level of backflow prevention required shall be provided by a Double Check Valve Assembly (DCVA) per **City of Auburn Standard Detail W-24**. A higher degree of protection may be required if deemed necessary by the City, which may include a Reduced Pressure Backflow Assembly (RPBA) per **City of Auburn Standard Detail W-22**.

The backflow prevention assembly shall be installed adjacent to the meter.

7.04.03 Fire Line Connections

A backflow prevention assembly shall be installed on all fire service connections. The layout of the backflow prevention assembly shall be per **City of Auburn Standard Detail W-09** for single-family residential services up to 2-inches and per **City of Auburn Standard Detail W-20** for non-single-family residential services. The minimum level of backflow prevention required shall be provided by a Double Check Valve Assembly (DCVA) per **City of Auburn Standard Detail W-24**. A higher degree of protection may be required if deemed necessary by the City, which may include a Reduced Pressure Backflow Assembly (RPBA) per **City of Auburn Standard Detail W-22**.

The backflow prevention assembly shall be located in the building riser room for non-single-family residential services.

7.04.04 General

- A. A DCVA shall be installed to provide adequate access for inspection, testing and maintenance.
- B. A DCVA located outside the building shall be installed in a vault, as described on **City of Auburn Standard Detail W-24**.
- C. A DCVA located inside the building shall be installed per **City of Auburn Standard Detail W-25**.

- D. An RPBA shall be installed in an above ground enclosure or at alternate location with no connections between the meter and assembly (See **City of Auburn Standard Detail W-23**). An RPBA is required for all services utilizing chemicals.
- E. Prior to installation, 2 sets of backflow prevention assembly plans, including the connection point to the City main, shall be submitted for review and approval by the City.
- F. Only assemblies listed on the current list of Backflow Prevention Assemblies Approved for Installation in Washington State shall be allowed. This list is maintained by the State of Washington and is available from the City.
- G. When multiple buildings are proposed on a parcel the building backflow prevention devices shall all be located outside the buildings or all be located inside the buildings per City of Auburn Standards.

7.05 Fire Systems

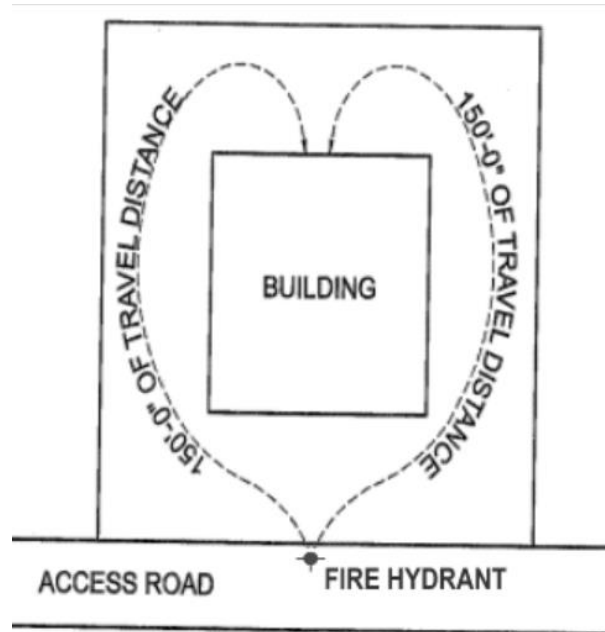
7.05.01 Fire Hydrant Assemblies

See **City of Auburn Standard Details W-07 & W-08**.

Fire Hydrant Assemblies shall meet the following requirements:

- A. Fire hydrant service lines shall be installed at right angles to 8 inch minimum diameter supply mains.
- B. Fire hydrants shall stand plumb, be set to meet manufacturer's specification for ground bury line, and have a clear, level area around the hydrant with a radius of no less than 36 inches.
- C. Fire hydrants shall be located no closer than 50 feet to the surrounding structures, or at a distance as determined by the Fire Marshal and approved by the City Engineer or designee. Fire hydrants shall be located such that no portion of the fire hydrant is within 5 feet of any portion of a driveway (including throat, apron, and wings).
- D. Fire hydrants shall be provided with two 2½ inch National Standard Thread (NST) hose ports and one 4½ inch NST by 5 inch hose port with a Storz adapter and cap.
- E. The pumper port shall face the street or fire access road and be readily accessible to any fire vehicle for firefighting and pumping operations. There shall be at least 18 inches clear from the face of the pumper port to the edge of pedestrian or traveled ways.
- F. The service line from the supply main to the fire hydrant shall be 6 inches in diameter unless the service line extends over 50 feet in length, in which case the service line shall be 8 inches in diameter. Service lines shall be restrained when the length of service line exceeds one pipe length.
- G. Fire hydrants shall be installed with a maximum spacing of 600 feet along streets in single-family zones and 300 feet in all other zones.
- H. The maximum distance allowed from any part of a single-family residential structure to the closest fire hydrant is 450 feet.
- I. Buildings, other than single-family residences, located with portions of the building more than 150 feet in vehicular travel (see figure below) from a fire

hydrant assembly or with building fire flow over 2500 gpm, shall require on-site fire hydrant assemblies. A maximum length of 150 feet of water main serving a single fire hydrant shall be allowed. Any length greater than 150 feet will require the fire hydrant(s) to be served by a water main that loops around the building, or complex of buildings, and reconnects back to the distribution supply main.



7.05.02 Private Fire Hydrants and Water Mains

Private fire hydrant assemblies and associated water mains serving the fire hydrants shall meet all of the same standards as is for public facilities identified in these standards, including the following requirements:

- A. The City Engineer, or designee, may require fire hydrants and water mains installed on private property solely for the purpose of providing fire protection to be privately owned and maintained by the benefitting property.
- B. Privately owned and maintained fire hydrants shall be painted Safety red per the City Construction Standards to distinguish between publicly owned and privately owned fire hydrants.
- C. Ownership of privately owned water mains begins immediately downstream of the valve at the point of connection to the public water main.
- D. Private fire hydrant water mains require backflow protection in the form of a Double Check Detector Assembly (DCDA) to be installed on private property as close to the connection to the public main as possible.
- E. Privately owned fire hydrants require fire hydrant use permits to be issued for non-maintenance activities to record the amount of water being used for said activity.

7.05.02 Fire Sprinkler Systems

Fire Sprinkler Systems shall meet the following requirements:

- A. Any contractor offering to design, install, test, and/or provide maintenance of fire sprinkler systems in the State of Washington must be licensed with the State Fire Marshal's Office, Licensing Section.
- B. Fire sprinkler systems shall be required in commercial/industrial and multifamily buildings according to the adopted fire code regulations. Sprinkler systems may be required in single-family residences when determined by the City and the Fire Authority.
- C. Fire sprinkler supply lines for commercial buildings, unless designed by a Fire Protection Engineer, shall be a minimum of 8 inches in diameter.
- D. Fire sprinkler supply lines for non-single-family buildings shall be connected to a looped water main.
- E. Fire sprinkler supply lines shall be separated from the public water main by a valve located at the point of connection. The fire sprinkler supply line shall be installed with a cut-in tee and shall have a 3-valve cluster unless otherwise approved by the City Engineer.
- F. The design of fire sprinkler supply lines for single-family/duplex shall be in accordance with **City of Auburn Standard Detail No. W-09**.
- G. A Washington State Certified Level "U" contractor shall install underground fire sprinkler supply lines in accordance with WAC 212-80-010. Prior to installation, 3 sets of underground fire sprinkler supply line plans shall be submitted to the City for approval by the Fire Marshal. Both a State Certified Level "U" contractor and a Fire Protection Engineer shall stamp these plans. A letter from a state certified sprinkler system designer stating "FOR DESIGN PURPOSES ONLY" may be attached in lieu of a stamp from the Fire Protection Engineer.
- H. A post indicator valve (PIV) shall be installed on the fire sprinkler supply line between the public water main and the building. PIV's shall be located in such a manner as to be easily visible to Fire Department personnel. A wall-mounted PIV may be installed when the exterior wall of the building is of non-combustible construction. A detail containing this information shall be included with the submitted plans.
- I. Fire Department Connections (FDC's) shall be placed within 50 feet of a fire hydrant or as directed by the Fire Marshal. FDC's must be identified and approved by the Fire Marshal.
- J. New water mains shall be constructed with valves on each side of fire line taps.
- K. Fire sprinkler systems shall have backflow prevention in accordance with **Section 7.04**.
- L. Fire sprinkler service lines shall not be connected to fire hydrant service lines.
- M. Flow-through fire sprinkler systems may be installed for single family residential only. Design shall be according to NFPA 13D. Backflow prevention is not required for flow-through systems.

7.05.03 Fire Flows

New developments, redevelopment of existing sites, or changes in land use are required to meet the minimum City fire flow requirements listed below while maintaining the required minimum pressures. The developer shall provide information to the City to define the project specific fire flow requirements.

The minimum fire flow requirements within the Auburn Water Service areas are:

- A. Single-Family Residential: 1,500 GPM @ 2 Hours
- B. Industrial/Commercial/Multi-Family: 2,500 GPM @ 3 Hours

Additional fire flow may be required per ACC 15.36A.

Minimum fire flows outside Auburn Water Service areas shall be determined by the water service provider and the Fire Marshal.

When a hydraulic analysis is required to demonstrate the system meets fire flow and minimum pressure requirements, the developer may request that the City perform hydraulic modeling to support the hydraulic analysis at the applicants cost and the City may or may not agree to provide the modeling depending on resource availability and other considerations. See **Section 7.06** for hydraulic analysis requirements.

The Developer shall be responsible for any on-site and/or off-site improvements such as water main extensions, additional connections, fire hydrants, etc. to meet these requirements.

7.05.04 Fire Authority and Hydrant Access

Fire Authority and hydrant access shall meet the following requirements:

- A. Access shall be a minimum of 20 feet wide with a minimum vertical clearance of 13½ feet.
- B. Access roads shall be designed using a minimum inside radius of 28 feet and a minimum outside radius of 48 feet.
- C. Except as noted otherwise in these standards, access that exceeds 150 feet in length from the face of curb or edge of the existing asphalt of the public road and does not return to a public road shall provide a turnaround within 150 feet of the dead-end. If a hammerhead configuration is utilized for the turnaround, it shall be designed per Figure D103.1 and Table D103.4 in Appendix D of the International Fire Code, or acceptable equivalent. If a cul-de-sac is utilized for the turnaround, it shall be designed per the City of Auburn Design Standards.
- D. Single-family residential driveways shall have an 18 foot wide driveway apron and a minimum 20 foot wide paved surface to a location where all portions of a dwelling unit structure are no more than 150-ft, as measured by an unobstructed route around the exterior of the building.

7.06 Hydraulic Analysis

7.06.01 General

Hydraulic analysis is required for all new or modified connection(s) to an existing main(s), except when determined by the City Engineer, or designee, to not be required. In determining if an exception from the hydraulic analysis requirement is appropriate, the City Engineer, or designee, will consider whether the existing main meets sizing requirements for new mains per

Section 7.02.02 and the proposed use of the modified or new service connection(s). When a hydraulic analysis is required for a project, it shall include the following:

- A. The hydraulic analysis shall be signed and sealed by a professional engineer.
- B. Include a description of the project, location, and identify existing water facilities adjacent to the project boundaries.
- C. Include a site map showing the project boundaries.
- D. Include locations of proposed new or upsized water mains to be installed as part of the project, including pipe diameters and the locations of fire hydrants, if known.
- E. For developments that are not solely single-family/duplex residential, provide the proposed type and size of meter(s) and backflow device(s).
- F. Show the source node provided by the City with Hydraulic Grade Line (HGL) and existing pressure information.
- G. Show on-site demand calculations.
- H. Input tables shall be provided for each of the pipes showing the following minimum information:

Pipe No.	Pipe Nodes (Begin and End)	Length (ft)	Diameter (in)	Friction Coefficient

- I. Input tables shall be provided for each of the nodes showing the following minimum information:

Node No.	Connecting Pipes	Elevation (ft)	Demand (gpm)

- J. A separate analysis and calculations shall be conducted for Maximum Day Demand (MDD), Maximum Day plus Fire Flow (MDD + FF), and Peak Hour Demand (PHD) scenarios. Explain any assumptions made.

- K. Output calculation results for pipes shall include, at a minimum, the following information:

Pipe No.	Flow Rate (gpm)	Velocity (fps)	Head Loss (ft)

- L. Output calculation results for nodes shall include, at a minimum, the following information:

Node No.	HGL (ft)	Pressure (psi)	Elevation (ft)	Demand (gpm)

- M. Provide a summary table for each scenario analyzed (MDD, PHD, and MDD + FF) and include minimum and maximum static and residual pressures.

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Chapter 8: Sanitary Sewer and Storm Drainage Facilities

8.00 Preface

Compliance with these standards does not alleviate the design engineer from using sound professional engineering practices. 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.

The City's Comprehensive Sanitary Sewer Plan and Comprehensive Storm Drainage Plan establish basins and design parameters used to estimate future line capacities. Anyone proposing to extend or modify the City's sanitary sewer system and/or storm drainage system should contact the Public Works Department for information on proposed line sizes and locations.

Sanitary Sewer:

The design of sanitary sewer facilities shall be in conformance with the State of Washington Department of Ecology's "Criteria for Sewage Works Design" manual (DOE Sewer Manual) unless modified herein. These standards are set forth as a minimum requirement for the planning and design of gravity sanitary sewer facilities. Sewage pump stations and special facilities are not included within this design manual due to the complexity of these facilities. When designing pump stations and special facilities, please contact the City of Auburn Engineering Services for specific requirements.

In lieu of constructing a public sewer system, the developer of a single, non-residential lot may construct a private sewer system, in accordance with the standards for public sanitary sewer systems consisting of manholes and sewer mains. The property owner is responsible for maintenance and repair of the private system. This option is only available if the sewer extension would not serve any additional upstream properties. Private sewer systems are not allowed in the public rights of way except where permitted through franchise agreement or right-of-way use permit.

Storm Drainage:

These storm drainage requirements provide the design criteria necessary to preserve the City of Auburn's water courses; to minimize surface and ground water quality degradation; to control the sedimentation in creeks, streams, rivers, ponds, lakes, and other water bodies; to protect adjacent and downstream property owners from increased runoff rates, which could cause erosion and flooding; to ensure the safety of City of Auburn's roads and rights-of-way; to decrease drainage-related damage to both public and private property, and to control runoff from development, redevelopment and construction sites. The design of storm drainage facilities shall be in conformance with the City of Auburn Surface Water Management Manual (SWMM) to comply with the Western Washington Phase II Municipal Stormwater Permit issued by the State of Washington Department of Ecology.

8.01 Sanitary Sewer and Storm Mains

8.01.01 Sizing/Slope

All new mains shall be sized as indicated in the City's current Comprehensive Plan. For lines not specified in the plan, the applicant must design the line with sufficient capacity to convey any future flows (based on current land use designations).

Sanitary sewer mains shall be designed and constructed to provide a minimum cleaning velocity of 2 ft/s when flowing at 80% full. If at final build out the planned contributing area will not achieve this capacity, additional provisions may be required.

Analysis of storm drainage pipe systems shall be per the requirements of the SWMM. The following are the minimum slopes for the corresponding Sanitary Sewer pipe sizes:

Table 8-1 Sanitary Sewer Pipe Sizes and Slopes

Pipe Diameter	Minimum Slope
8 inches*	0.50%
10 inches	0.30%
12 inches	0.25%
18 inches	0.15%

* Minimum sanitary sewer pipe size

8.01.02 Location

Standard installation depth for sanitary sewer mains is between 6 feet and 15 feet below the finished surface elevation. Mains less than 6 feet deep and over 15 feet deep, require approval by the City Engineer, or designee, and additional provisions may be required .

Mains shall be located in the public right-of-way or within a public utility easement per **Chapter 6**. Mains within a utility easement with appurtenances such as manholes shall have an access road to such appurtenances conforming to **Chapter 6**. Mains located in the public right-of-way shall meet the requirements of **Chapter 9**.

When the potential exists to serve upstream properties, mains shall extend through the property being served, through the shared driveway or access tract serving the property(s), or across the entire length of the lot frontage at the depth necessary to serve the upstream properties, as determined by the City Engineer or designee.

For separation requirements between utilities, see **Chapter 6**.

8.01.03 Material

The following is the City's list of required sanitary sewer and storm drainage pipe materials and depth criteria.

Table 8-2 Sanitary Sewer and Storm Drainage Pipe Material and Cover

Pipe Type	Construction Standard	Minimum Pipe Cover**	Maximum Pipe Depth
Solid Wall Polyvinyl Chloride (PVC) Pipe, SDR-21 *****	9-05.12(1) (Solid Wall PVC Culvert Pipe, Solid Wall PVC Storm Sewer Pipe, and Solid Wall PVC Sanitary Sewer Pipe)	18 inches	22 feet
Solid Wall Polyvinyl Chloride (PVC) Pipe, SDR-35 (Requires 14 foot lengths. *****	9-05.12(1) (Solid Wall PVC Culvert Pipe, Solid Wall PVC Storm Sewer Pipe, and Solid Wall PVC Sanitary Sewer Pipe)	3 feet	18 feet
Solid Wall Polyvinyl Chloride (PVC) Pipe, PS46 (Requires 14 foot lengths. *****	9-05.12(1) (Solid Wall PVC Culvert Pipe, Solid Wall PVC Storm Sewer Pipe, and Solid Wall PVC Sanitary Sewer Pipe)	3 feet	18 feet
Solid Wall Polyvinyl Chloride (PVC) Pipe, C900	9-05.12(1) (Solid Wall PVC Culvert Pipe, Solid Wall PVC Storm Sewer Pipe, and Solid Wall PVC Sanitary Sewer Pipe)	12 inches	30 feet*
Ductile Iron Pipe, Special Class 50	9-05.13 (Ductile Iron Sewer Pipe)	6 inches	30 feet*
High Density Polyethylene Sanitary Sewer Pipe (HDPE)***	9-05.23 (High Density Polyethylene Pipe (HDPE))	2 feet	30 feet*
Triple Wall Polypropylene Culvert and Storm Sewer Pipe****	9-05.24(1) (Polypropylene Culvert Pipe and Storm Sewer Pipe)	N/A	N/A

* Sanitary sewers and storm drainage pipes deeper than 30 feet will require pre-approval from the City Engineer or designee.

** Minimum cover is depth of cover excluding cover depth provided by flexible pavements. No portion of any pipe shall be allowed within 6 inches of the bottom of the flexible or concrete pavement.

*** The design engineer is responsible for specifying a thickness ratio adequate to withstand all loads anticipated for this application.

**** For use in Storm Drainage applications only.

***** These are the City preferred material types that must be utilized unless depth, loading, or other conditions necessitate the use of other material types indicated in the table. Consideration of alternate material type requires deviation.

8.02 Sanitary Sewer and Storm Drainage Structures

8.02.01 Type and Size

Manholes, Catch Basins, and Inlets shall be constructed per the following:

Table 8-3 Sanitary Sewer and Storm Drainage Structure Types

Type	Construction Standard	Notes
Manhole (48-inch to 60-inch)	WSDOT Standard Plan B-15.20 or B-15.60 with an eccentric cone	
Manhole (72-inch to 96-inch)	WSDOT Standard Plan B-15.40 with a flat top instead of riser	
Catch Basin Type I	WSDOT Standard Plan B-5.20	15-inch diameter max. pipe size, 5-foot max. depth to invert.
Catch Basin Type II	WSDOT Standard Plan B-10.20	
Concrete Inlet	WSDOT Standard Plan B-25.60	15-inch diameter max. pipe size, 5-foot max. depth to invert., only utilized for single pipe and where a full depth catch basin is not feasible.
Cement Concrete Curb and Gutter Pan	WSDOT Standard Plan F-10.16	Utilized along curb and gutter sections.
Rectangular Vaned Grate	WSDOT Standard Plan B-30.30	Utilized for all catch basins along curb and gutter sections unless in a sag condition.
Rectangular Frame (Reversible)	WSDOT Standard Plan B-30.10	Utilized for all catch basins.
Combination Inlet	WSDOT Standard Plan B-25.20	Utilized in sag conditions along curb and gutter.

Shallow manholes (32"-50" deep) shall conform to **City of Auburn Standard Detail S-06** and may only be used upon approval of the City Engineer or designee.

Additional design provisions may be required by the City Engineer or designee for manholes over 20 feet deep.

Manhole diameters shall meet the following requirements based on the manhole depth and the size, number, and configuration of pipes entering as shown on **Table 8-3**.

Manholes shall provide a minimum of 0.10 foot of drop between the inlet pipe and the outlet pipe. Pipes of differing diameters shall be aligned so that the crowns of the pipes match. Where the slope of a pipe entering or exiting a manhole is greater than 5%, the slope shall be continued through the manhole and the invert elevations indicated on the plans.

Manholes are to be channeled from the entering pipe to the outlet pipe, with the sidewalls of the channel extended above the top of the largest connected pipe. See **City of Auburn Standard Detail S-08**. When making a new connection to an existing manhole, the manhole shall be rechanneled to match the new pipe configuration.

Table 8-4 Sanitary Sewer and Storm Drainage Structure Sizing

Manhole Diameter	Number & Diameter of pipes/ Connections Allowed	Depth of Manhole
48" Diameter	1 Pipe, 21" 2 Pipes, 12" – 18" 3 Pipes, 8" – 10"	4' Minimum 12' Maximum
54" Diameter	1 Pipe, 36" 2 Pipes, 21" – 30" 3 Pipes, 12" – 18" 4 Pipes, 8" – 10"	6' Minimum 15' Maximum
60" Diameter	1 Pipe, 42" 2 Pipes, 24" – 36" 3 Pipes, 15" – 21" 4 Pipes, 10" – 12" 5 Pipes, 8"	8' Minimum 20' Maximum
72" Diameter	1 Pipe, 48" – 54" 2 Pipes, 36" – 42" 3 Pipes, 18" – 24" 4 Pipes, 12" – 15" 5 Pipes, 8" – 10"	8' Minimum 25' Maximum

Pipes entering manholes must have a minimum of 8 inches between their penetrations on the inside of the manhole (See **City of Auburn Standard Detail S-08**).

The angle between inlet pipes and the outlet pipe shall not be less than 90-degrees.

Drop manholes are discouraged and require approval from City Engineer or designee. When approved, drop manholes shall be inside drops conforming to **City of Auburn Standard Detail S-05**.

8.02.02 Structure Locations

The design of new sanitary sewer and storm drainage conveyance systems shall be done in a manner that minimizes the total number of structures (manholes and catch basins), using the following criteria:

- A. Structures shall be installed at a maximum spacing of 400 feet apart along the main.
- B. A structure shall be installed at all junctions of two or more mains.
- C. A structure is required whenever connecting to a main with an 8-inch or larger diameter pipe.
- D. A structure shall be installed at all changes in vertical slope, horizontal direction, and/or pipe size.
- E. In cases where a sewer main steeper than 5% must turn 90-degrees through a manhole, a transition manhole is required at least 20 feet upstream to reduce the pipe slope to a maximum of 2% and/or to change the angle to 45-degrees.
- F. All public sanitary sewer lines shall end with a manhole. All end of the line sanitary sewer manholes with no side sewers connected directly to them shall conform to **City of Auburn Standard Detail S-07**.

- G. Sanitary sewer manholes are not to be located within the limits of surface water ponding or flow lines associated with stormwater runoff.
- H. Structure covers shall be located outside the wheel paths of roadways and outside driveway aprons.
- I. Structures shall not be located within sidewalks, landscape strips, trails, or curb and gutters, except as approved by the City Engineer, or Designee. In cases where structures are located in walking paths, the structure cover shall be non-skid, smooth top.
- J. Cleanouts are not an acceptable alternative for structures (manholes or catch basins) except they may be used with City Engineer or designee approval at the end of a sanitary sewer main, when the future extension of the sanitary sewer main is planned, and the current end point is not a practical location for a manhole. When approved by the City Engineer or designee, public cleanouts shall conform to **City of Auburn Standard Detail S-03**.
- K. Structures shall not be located on portions of streets or access roads with a slope greater than 8%.
- L. Structures shall be subject to the separation requirements from buildings and structures specified in **Chapter 6**.
- M. Structures set in gravel areas shall be set at the center of a 6-foot concrete apron flush with the finished grade of the apron.
- N. Structures set in landscaped or unimproved areas shall be set 6 inches to 12 inches higher than the surrounding terrain and provided with a 6-foot diameter concrete apron around the manhole lid.
- O. Frames and covers shall conform to **City of Auburn Standard Detail S-04**.
- P. Structures shall be adjusted to grade per **City of Auburn Standard Detail T-05**. Rubberized adjustment rings may be required in certain circumstances as determined by the City Engineer.

8.03 Sanitary Side Sewers

See **City of Auburn Standard Details S-01, S-02 & S-03**.

Side sewers are defined as that portion of the sewer system that extends from 2 feet outside of the outer foundation wall of the structure to the public sanitary sewer main. The City maintains the portion of the side sewer located within the right-of-way. The property owner owns and maintains the portion of the side sewer located outside of the public right-of-way. Side sewers located within easements are the property owners' responsibility to maintain.

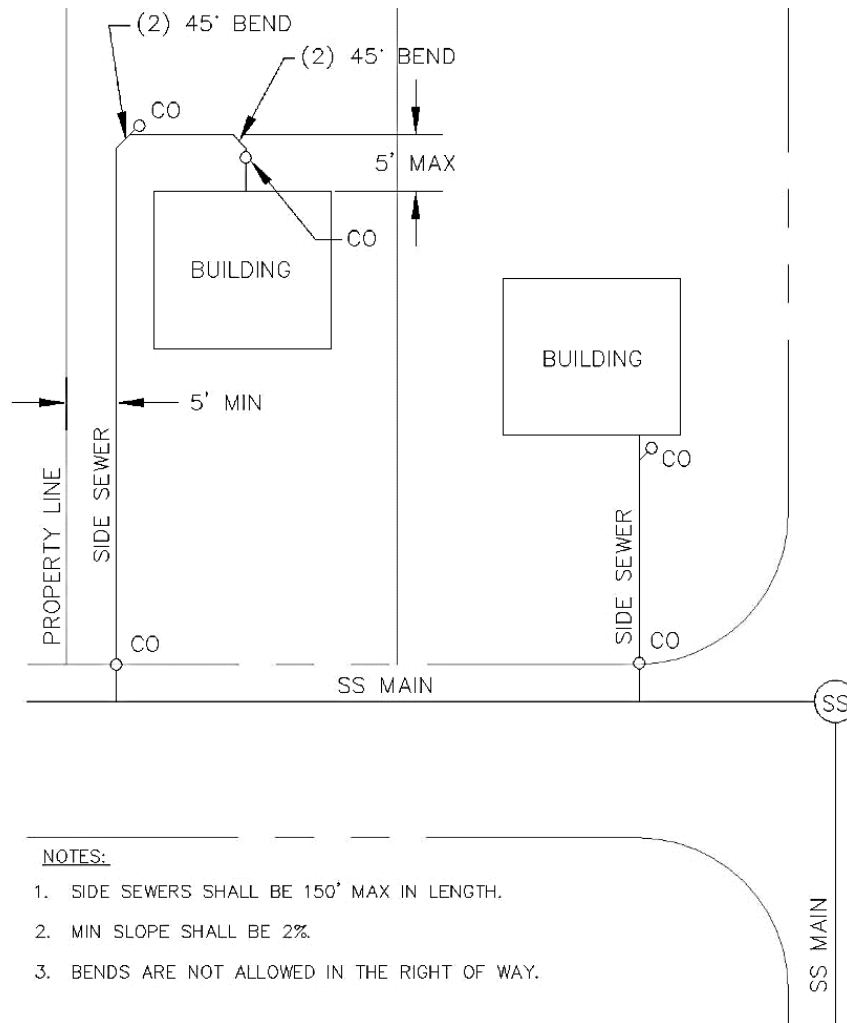
Side sewers shall meet the following requirements and shall be laid out per **Figure 8-01**:

- A. A separate and independent side sewer from the public main shall be provided for each and every parcel.
- B. A separate and independent side sewer from the public main shall be provided for each non-single family building on a parcel.
- C. Side sewers within the public right-of-way and side sewers serving non-single family development shall be a minimum of 6-inches in diameter. The private portion of side sewers serving single family residences may be 4-inches in diameter within the parcel that it serves.

- D. 6-inch diameter side sewers shall be connected to the public sanitary sewer main by the use of a tee (**City of Auburn Standard Detail S-01**) or connected directly to a manhole located along the public main. All side sewer manhole connections shall incorporate a channeled or rechanneled manhole.
- E. Side sewers with a diameter of 8-inches or greater shall be connected to the sanitary sewer system by use of a sanitary sewer manhole which shall be channeled or rechanneled.
- F. When constructing sanitary sewer mains in new developments, side sewer installation shall extend from the connection on the main line to the edge of any utility easements or the public right-of-way, whichever is further.
- G. When installing new sanitary sewer mains or replacing existing mains in developed areas, side sewers shall be installed for all existing occupied structures and any buildable lots. Side sewers shall extend to the property lines and their location shall be clearly marked in conformance with **City of Auburn Standard Detail S-01**.
- H. The maximum length of side sewer from the sanitary sewer main to the building shall not exceed 150 feet. The City Engineer or designee may allow this length to be exceeded in instances where the side sewer can maintain a 2% slope, a public sewer extension built to shorten the side sewer would not serve any other potential customers. Where the maximum length is exceeded and the minimum slope maintained, the City Engineer or designee may require additional cleanouts or other measures to mitigate the additional length.
- I. Side sewers shall be designed and constructed with a minimum 2% slope from the building to the tee or manhole connection. Where site constraints require that the slope be less than 2%, the City Engineer or designee may require larger diameter pipe and/or additional cleanouts.
- J. When an immediate connection to a building is not being made, side sewers shall be designed to provide a minimum depth at the property line of 5 feet below the floor to be served or 6 feet below the street, whichever is deeper. In cases of vacant properties with no anticipated building elevation, the side sewer shall be constructed at a 2% slope from the tee.
- K. Side Sewers shall not have horizontal or vertical bends located within the right-of-way.
- L. Side sewers shall have a minimum cover of 5 feet at the edge of right-of-way.
- M. Side sewers shall be a minimum of 5 feet from potable water service lines.
- N. Side sewer cleanouts shall be installed within 3 feet of the building foundation providing an access point into said line for future maintenance.
- O. Side sewer cleanouts shall be installed at the edge of the property owner's side of the public right-of-way line or utility easement where the ownership of the side sewer changes from private to public.
- P. Sanitary sewer cleanouts shall be installed in side sewers every 100 feet and for each change in direction totaling 90 degrees. See **Figure 8-01**.
- Q. If the private portion of the side sewer crosses another private property other than the property being served, a minimum of a 10 foot wide private sewer easement (5 feet on either side of the pipe centerline) must be obtained granting the property owner being served permission to cross said property.

- R. All side sewers must use push on gasketed joints. Glued joints are not allowed outside the building footprint.

Figure 8-01 Side Sewer Layout



8.04 Oil/Water Separators

Prior to discharging into the sanitary sewer system, oil separation facilities shall be used in pre-treating drainage flows from fuel islands, trash enclosures, wash pads, and floor drains where (in the opinion of the City Engineer or designee) heavy concentrations of oil may occur.

Pads with drains for trash enclosures and wash pads intended for washing the exterior surfaces of vehicles shall drain to a catch basin with a downturned 90-degree elbow prior to discharge to the sanitary sewer. Oil/water separators for other applications shall meet the following design criteria:

- A. A forebay to collect floatable and the larger settleable solids.

- B. A surface accessible inspection T inside the first chamber at the inflow pipe and a sample T at the last chamber at the outflow pipe.
- C. Access to the separator shall be maintained free for inspection at all times.
- D. A maximum of 200 SF of uncovered area open to rainfall may discharge to the separator. Refer to BMP S441 in the SWMM for applications where this may apply.
- E. If a pump mechanism is required to convey the discharge from the site to the sanitary sewer system, the pump must be designed for discharge to a controlled gravity outlet flow into the City system.
- F. The separator shall have a valve on the discharge pipe that can be closed during cleaning and in the event of a spill.
- G. All piping entering and leaving the separator must be 6 inches minimum diameter.
- H. Access points in the top of the separator vault must be provided to allow a minimum twelve-inch diameter access for observation and maintenance to all chambers of the separator.
- I. Access doors shall be galvanized spring-assisted diamond plate with a penta-head bolt-locking latch and recessed lift handle.
- J. Access doors must open a full 180 degrees.

8.05 Pressurized Sewer Systems

Private low pressure sewer systems are allowed only where the existing public system has already been extended to, or is within 200 feet of, the subject property and the elevation differences between the public sewer main and the subject property do not allow for a gravity connection. Extension of a private gravity sewer main onto the property(s) may be required if such extension could make gravity sewer service possible. Sewage from pressurized systems must be discharged into a minimum 6-inch diameter private gravity side sewer prior to connecting to the public portion of the side sewer.

Low pressure sewer systems are not allowed in public right-of-way or public easements.

Low pressure sewer systems shall be owned and maintained by those connecting to it. Systems serving multiple properties shall be within easements or tracts dedicated or owned by all properties connecting to the system.

All other proposed pressurized systems require deviation(s). In addition to the standard deviation considerations required by these standards, deviations requesting pressurized systems must show that extension of the public systems as intended per the Sewer Comprehensive Plan to serve the property(s) and that serving the property(s) with septic system(s) are not feasible. Septic systems may only be considered infeasible if there is no form or scale of a septic system(s) that the County would accept for at least one form of development of the property(s) that would be allowed under the current zoning and land use regulations. Determination that septic system(s) are not feasible require written documentation from the County.

8.06 Sanitary Sewer Meters

The use of sewer meters shall only be allowed if it is determined by the City Engineer that a sewer meter is the appropriate device for the accurate measurement of wastewater being sent into the public sewer system.

8.07 Storm Drainage System Requirements

All requests for developing a storm drainage system must comply with the City of Auburn Surface Water Management Manual (SWMM). The City has adopted the 2019 Department of Ecology Stormwater Management Manual for Western Washington and the City of Auburn Supplemental Manual as the SWMM. The Supplemental Manual provides guidance for applying specific sections of the Ecology document within the City of Auburn. All references to the City's SWMM include both documents. The City's Supplemental Manual can be found utilizing the following hyperlink:

[Supplemental Manual](#)

Storm drainage system design is guided by the 10 Minimum Requirements for Stormwater Management, listed below. The applicability of the Minimum Requirements is based on project size and the total new and/or replaced hard surfaces created by the project. It is recommended that the Minimum Requirements, especially LID, are considered at the beginning of project design to ensure that the required elements can be included in the project. The SWMM also addresses modeling standards and design criteria for conveyance, storage, treatment facilities, and other drainage system structures.

The SWMM is divided into five volumes that address different aspects of storm drainage system design. These volumes and the key components for design and application submittal are:

Volume I – What Requirements Apply to My Site?

The 10 Minimum Requirements (MR) for Stormwater Management are:

MR #1: Preparation of Stormwater Site Plans

MR #2: Construction Stormwater Pollution Prevention Plan

MR #3: Source Control of Pollution

MR #4: Preservation of Natural Drainage Systems and Outfalls

MR #5: On-Site Stormwater Management

MR #6: Runoff Treatment

MR #7: Flow Control

MR #8: Wetlands Protection

MR #9: Operations and Maintenance

MR #10: Off-Site Analysis and Mitigation (Supplemental Manual)

Volume II – Construction Stormwater Pollution Prevention

Volume III – Choosing, Modeling, and Documenting Your BMPs

Volume IV – Source Control BMP Library

Volume V – Runoff Treatment, Flow Control, and LID BMP Library

Chapter 9: Facilities in the Right of Way

9.00 Preface

The design of public and private facilities located within City right-of-way shall be in conformance with these standards. For the purposes of these standards, “facilities” shall include City owned and non-City owned potable water, irrigation water, sanitary sewer, storm drain, gas, communications, electrical, illumination, and any other utility facility and their appurtenances. This Chapter also covers non-utility facilities such as building foundation elements, awnings, and private signs.

When a non-City sponsored project requires the relocation of private utilities due to public utility extensions or other City required improvements, the cost of relocation of the private utility shall be borne by the developer.

9.01 Franchise/Public Way Agreement Requirement

Private facilities within the City right-of-way require prior approval from the City. Except as allowed otherwise by Auburn City Code, owners of private facilities in the right-of-way shall have a current franchise, public way agreement, or Right-of-Way Use Permit consistent with Title 20 and/or Title 13 and/or Title 12, if applicable, of the Auburn City Code.

9.02 Construction Permit Requirement

Any non-City entity intending to construct, repair, or replace any facility in City right-of-way shall apply for a construction permit. Applications for constructions permits can be made directly through MyBuildingPermit.com. A City permit must be obtained prior to any work within the City right-of-way.

9.03 Design Criteria

The City has established the following minimum requirements to ensure the efficient construction of facilities with the least impact to City transportation and public utility infrastructure:

- A. Public water, sewer, storm, and telecommunications facilities shall be constructed per the Engineering Design and Construction Standards.
- B. Private underground facilities shall be installed with no less than 36 inches of finished cover.
- C. Private underground facilities shall be located a minimum horizontal distance of 5 feet from buildings and public facilities.
- D. When crossing public underground facilities, private underground facilities shall be located a minimum vertical distance of 12 inches from the public utility. Additional separation may be required between potable and non-potable pipes per **Chapter 6** of these Engineering Design Standards.
- E. Manholes, valve boxes, power vaults, etc., that are located in the paved area of a street shall be located outside of the wheel paths of vehicles and flush with the pavement surface.
- F. The design of underground facilities shall seek to minimize the number of required structures and redundant pipes/conduits.

- G. Structures located within parking lots, sidewalks, and paths/trails shall also be flush with the surface. In areas where traffic will pass over the structure, load-bearing lids shall be incorporated in the design.
- H. Repair of existing cement concrete roadway panels shall be per **City of Auburn Standard Detail T-27**.
- I. The City Engineer may allow required restoration overlays per **City of Auburn Standard Details T-02 and T-02A** of individual trenches to be deferred where a program or project exists that would complete the restoration/overlay of multiple trenches as a single project or effort. In all cases, permanent repair of the trench is required per **City of Auburn Standard Detail T-01** with the trench construction and backfill and cannot be deferred or delayed.

9.04 Pavement Trenching and Restoration

Trenching, backfill, and restoration shall, within paved areas, be per **City of Auburn Standard Details T-01 and T-02**. Manhole covers, valve covers, vault lids, and other utility appurtenances within pavement restoration areas, including areas of grind and overlay, shall be first lowered beneath the final wear course, paved over, and then raised to final grade per **City of Auburn Standard Detail T-05** and per the Construction Standards. This requirement may be waived by the City Engineer or designee when the total area of the final wear course paving area is less than 100 SF.

The City Engineer may allow required restoration overlays per **City of Auburn Standard Details T-02 and T-02A** of individual trenches to be deferred where a program or project exists that would complete the restoration/overlay of multiple trenches as a single project or effort. In all cases, permanent repair of the trench is required per **City of Auburn Standard Detail T-01** with the trench construction and backfill and cannot be deferred or delayed.

9.04.01 Perpendicular Trenching in Asphalt Pavement

Trenching through and within intersections is considered perpendicular trenching.

- A. Perpendicular trench backfill shall be in accordance with **City of Auburn Standard Detail T-01**.
- B. Pavement restoration shall match existing pavement type and thickness with a minimum thickness of 4-inches.
- C. After trenching, the adjacent pavement on each side of the trench shall be sawcut and removed (full depth) to a minimum of 12 inches from the edges of trench to reveal a clean pavement edge to patch against. This is referred to as the "T-cut".
- D. In the process of perpendicular trenching, if the remaining section of pavement between the edge of T-cut and the edge of the pavement/gutter is less than 4 feet wide, the restoration/overlay will extend to the edge of the pavement/gutter.
- E. In the process of perpendicular trenching, remaining sections of pavement between the edge of T-cut and lane line/lane edges less than 4 feet wide, shall be included in the restoration/overlay area.
- F. When more than 1 perpendicular trench is constructed along a roadway, pavement areas between the limits of the restoration/overlay limits that are less than 10 feet wide are to be added to the required restoration/overlay area.

- G. Perpendicular trenching to roadways may not be allowed on newer roads or streets that have been constructed or overlaid within the last five years.
- H. Perpendicular trenching may not be allowed or may be limited to off-peak hours and/or weekends on principal arterials or where the construction activity will seriously impede large volume traffic patterns. Utility connections that have to be made within the roadway will be allowed after approval from the City.
- I. Jacking/boring alternatives may be required as substitute methods for perpendicular trenching.
- J. The minimum pavement patch width and overlay restoration for perpendicular/transverse trenches shall be per **City of Auburn Standard Detail T-02**.
- K. When multiple trenches are required in close proximity, the asphalt patch shall encompass all the trenches.
- L. The longitudinal edge of the perpendicular asphalt patch shall not lie within the wheel paths of vehicles.
- M. Requirements for curb ramp installation, replacement, and/or upgrade associated with the utility trench work shall be in accordance with **Chapter 10**.

9.04.02 Longitudinal Trenching in Asphalt Pavement

Trenching outside of intersection limits (curb returns) and running parallel, or within 30 degrees of parallel, to the edge of pavement/flowline is considered longitudinal trenching.

- A. Longitudinal trench backfill shall be in accordance with **City of Auburn Standard Detail T-01**.
- B. Pavement restoration shall match existing pavement type and thickness with a minimum thickness of 4-inches.
- C. After trenching, the adjacent pavement on each side of the trench shall be sawcut and removed (full depth) to a minimum of 12 inches from the edges of trench to reveal a clean pavement edge to patch against. This is referred to as the "T-cut".
- D. In the process of longitudinal trenching, if the remaining section of pavement between the edge of T-cut and the edge of the pavement/gutter is less than 4 feet wide, the restoration/overlay will extend from the trench to the edge of the pavement/gutter.
- E. In the process of longitudinal trenching, remaining sections of pavement between the edge of T-cut and adjacent lane line/lane limits less than 4 feet wide, shall be included in the restoration/overlay area.
- F. When more than 1 longitudinal trench is constructed along a roadway, pavement areas between the limits of the restoration/overlay limits that are less than 5 feet wide are to be added to the required restoration/overlay area.
- G. The longitudinal edges of the asphalt patch shall not lie within the wheel paths of vehicles.
- H. The minimum pavement patch width and overlay restoration for longitudinal trenches shall be per **City of Auburn Standard Detail T-02**.
- I. For streets that have been constructed or overlaid within the last 5 five years the City Engineer may require additional restoration area.

- J. For streets that have been constructed or overlaid within the last 5 five years, or for principal arterials where open trenching will impede large volume traffic patterns, the City Engineer may require that trenchless techniques be used as an alternative. The City Engineer may require that trenchless techniques be limited to off peak hours and/or weekends.
- K. Requirements for curb ramp installation, replacement, and/or upgrade associated with the utility trench work shall be in accordance with **Chapter 10**.
- L. The City Engineer may allow trench restoration/overlay of individual trenches to be included in a program or project to complete the restoration/overlay of multiple trenches as a single project or effort.

9.04.03 Trenching in Cement Concrete Pavement

- A. Repair of existing cement concrete roadway panels shall be per **City of Auburn Standard Detail T-27**.
- B. The edges of trenches in concrete pavement shall be sawcut prior to excavation to avoid damaging the slab. Concrete slabs 6 inches and over shall be drilled for the installation of dowels. Dowels shall be 1 and 1¼ inches in diameter, 18 inches long, and spaced 12 inches center to center.
- C. The minimum pavement patch width for concrete trenches shall be 4 feet.
- D. In the process of trenching concrete, if the section of pavement between the trench and the edge of the existing concrete panel is less than 4 feet, the section shall be removed and replaced.
- E. Longitudinal trenches in concrete may be repaved with an asphalt pavement thickness of equivalent strength upon City approval.

9.05 Non-Pavement Trenching

Trenching in areas other than paved surfaces, including sidewalks, gravel shoulders, and landscape strips, shall conform, where applicable, to the previous sections and replace the disturbed material in kind or as directed by the City. Utility trench bedding and backfill shall conform to **City of Auburn Standard Detail T-01** and to the Construction Standards.

9.06 Aboveground Facilities

Unless otherwise provided in a public way agreement, franchise, or lease, all facilities must be located underground. Exceptions to this standard are as follows:

- A. Fire Hydrants, Blow-offs, Air/Pressure Relief
- B. Pipe and cable crossings of rivers and freeways
- C. High voltage electrical facilities (transmission lines and substations)
- D. Illumination and signal facilities
- E. Telephone pedestals
- F. Aerial cables hung on existing utility poles (with approval of City Engineer)
- G. Small Wireless Facilities
- H. Other facilities, that in the opinion of the City Engineer, cannot be reasonably constructed underground.

Where underground requirements do not apply, the following parameters shall be addressed in locating or relocating aboveground utilities:

- A. Clear Zone Requirements: Non-breakaway utility poles and other fixed aboveground utility structures shall meet the clear zone requirements of these design standards, See **Chapter 10**. Respective utility owners shall be responsible for securing easements from adjacent property where clear zone requirements cannot be met within the public right of way.
- B. ADA Requirements: Utility poles and other aboveground utility structures shall not be located within the sidewalk. This requirement may be waived by the City Engineer if the pole location in the sidewalk allows a minimum of 48 inches of unobstructed pedestrian travel way and the pole/structure meets clear zone/lateral separation requirements described in **Chapter 10**.
- C. Utility poles and other aboveground utility structures shall be compatible with driveways, intersections, and all other road features. They shall not interfere with sight distance, road signing, traffic signals, culverts, etc. The City Engineer may require poles to be relocated to meet this requirement.
- D. No utility pole or other aboveground utility structures shall be located in such a way as to pose a hazard to the general public. Utility companies shall locate and replace poles and other structures with primary consideration given to public safety and roadway functionality.
- E. New overhead power and communications wires and appurtenances shall comply with the vertical clearance requirements established by WAC-468-34-290. Except as may be determined otherwise by the City Engineer to address safety issues, for the purposes of this overhead clearance requirement, replacement of existing facilities and overlash of existing cables/wires that do not reduce the existing minimum vertical clearances are not considered to be new. Whether considered to be new or not, plans for overhead power and communications wires and appurtenances must show the existing and proposed vertical clearance of the facilities being installed or modified at each midspan location between poles.
- F. If allowed by the City Engineer, wireless and radio facilities that are not considered Small Wireless Facilities per ACC 20.14 are subject to the concealment standards cited in **Chapter 9**.
- G. A net increase in the number of poles is not allowed except that the City Engineer may determine that additional poles with service lines only serving properties not included in the project (no distribution lines) may be allowed. In making this determination, the City Engineer will consider the potential impact to structures of undergrounding service line connections.

9.07 Building and Structure Related Facilities

Permanent buildings, building shoring systems that would leave any elements in the right-of-way after construction, footings and foundations, and privately owned walls, gates, and fences are not allowed in the public right-of-way.

Facilities such as Awnings, overhangs, and elevated decks/patios/railing (only in the Downtown Urban Center Zone), and bus shelters may be permitted by the City Engineer with special conditions and considered on a case-by-case basis and subject to ACC 12.60.

9.08 Small Wireless Facilities

This section describes design standards for Small Wireless Facilities as set forth in ACC 20.14. The purpose of these standards is to provide concealment and safety standards for Small Wireless Facilities in the public right-of-way.

9.08.01 General Requirements

- A. Small wireless facilities will comply with applicable Federal Communications Commission (FCC), Federal Aviation Administration (FAA), state, and City regulations and standards.
- B. A Small Wireless Facility will not be used for mounting signs, billboards or message displays except as approved by the City for the purpose of providing concealment.
- C. No lights, other than street lights, are permitted on any pole or antenna unless required by the Federal Communications Commission, the Federal Aviation Administration, or the City.
- D. No Small Wireless Facility may be attached to a tree or any other vegetation.
- E. Installation of a new pole in the public right of way to serve a Small Wireless Facility will not be allowed whenever an existing pole or other structure in the public right of way can meet technical and network location requirements and the owner of said pole or structure grants permission for the Small Wireless Facility Attachment. If the existing pole or structure does not meet the City's design standards or other requirements, with agreement from its owner, it may be replaced with a pole or structure that meets the design requirements and these standards. In these cases, all attachments must be transferred from the existing pole to the new pole and the existing pole must be completely removed and surface restored.
- F. Small Wireless Facilities and all associated facilities, including support poles or structures, will be free from all manufacturer decals and/or logos.
- G. Generators are not permitted for Small Wireless Facilities. A battery backup may be permitted through the submittal of a concealment plan and emergency spill response plan.
- H. Installation of Small Wireless Facilities is not allowed where it would create a sight distance issue for vehicular or non-motorized traffic, identified in the City of Auburn Engineering Design and Construction Standards.
- I. Applications for Small Wireless Facilities will include plans that conform to the plan requirements described in the City of Auburn Design and Construction Standards. Concealment plans will include photos of the proposed site location(s) with overlaid renderings of the proposed Small Wireless Facilities to demonstrate the facility's adherence to concealment standards.
- J. Small Wireless Facilities may not share power service connections with City facilities unless specified otherwise in the applicable use agreement for City-owned property.
- K. Record Construction Drawings are required in accordance with the City of Auburn Engineering Design and Construction standards.

9.08.02 Attachments to City Facilities

- A. Attachment, modification, relocation, or replacement of City facilities requires an executed agreement with the City in addition to any applicable franchise or public right-of-way agreements.
- B. Attachment to an existing City pole requires calculations sealed by a Professional Engineer that shows the existing pole can support the Small Wireless Facility. Where the existing facility being attached to is a City owned street light, signal pole, sign support structure, or Dynamic Message Sign (DMS) support structure, calculations must show compliance with the strength and loading parameters stated in the City's Construction Standards. The loading calculations will include consideration of potential future loading with planned or potential future City facility attachments.
- C. Small Wireless Facilities are not permitted on City street light poles where they would interfere with street lighting, City banners, flower baskets, holiday lighting, holiday decorations, or other City uses of the pole.
- D. Replaced City light poles will be of the same color and similar style as adjacent existing City light poles, unless otherwise approved by the City Engineer. Where a City light pole has been replaced or relocated the davit arm length will be replaced as needed to place the luminaire in-line with the other luminaires along the roadway and in accordance with City design standards.
- E. Installation of Small Wireless Facilities on City facilities within secured sites is not allowed. Secure City facilities are those facilities that are enclosed by a fence with locked gate access and typically include water reservoirs, water treatment plants, pump stations, and water wells.
- F. Installation of Small Wireless Facilities on traffic signal mast arms is not allowed.

9.08.03 General Pole Requirements

- A. Installation of Small Wireless Facilities on poles intended to break-away from vehicular impact is not allowed.
- B. New, replaced, or relocated poles are not allowed within the clear zone (as identified in the City of Auburn Engineering Design and Construction Standards). For the purposes of determining clear zone requirements, poles with Small Wireless Facilities attached are considered utility poles.
- C. Small Wireless Facilities will be mounted such that no portion of the facility, including antenna, are higher than 50 feet, or 10% higher than the height of buildings or structures immediately adjacent to the right-of-way, or the Small Wireless Facility attachment does not extend the height of the pole to more than 50 feet or by more than 10 percent, whichever is greater.
- D. A pole that is relocated or replaced for the purpose of attaching a Small Wireless Facility is considered an existing structure.

9.08.04 Wiring and Conduit

- A. All wiring must be inspected and accepted by Washington Department of Labor and Industries and associated documentation provided to the City prior to being placed into service.

- B. Except on wooden poles and other support structures where internal routing is not feasible, all cables, wires, and fiber must be routed internally in the pole or support structure and must not be visible externally.
- C. Wiring, cables, and fiber associated with the Small Wireless Facility will be in their own conduit, interducts, and channels so they are not co-mingled with conduits and cables serving other uses. Electrical wiring will be separated from communications wiring with interduct or separate channels.
- D. All interducts, channels, cables, and wiring will be clearly labeled at the pole ends, handholes, junction boxes, and other termination points. Record construction drawings will show and label all cables/wiring, interduct, and channels.

9.08.05 Concealment

Small Wireless Facilities will be screened, concealed, or camouflaged employing the best available technology, such as compatible materials, shrouding, location, color, and other tactics to minimize visibility of the facility.

Pole mounted equipment, antenna, conduits, cables, mounting hardware, and other visible components will match the color of the pole they are attached to unless specifically approved by the City. The City Engineer or the City Engineer's designee will consider the cumulative visual effects on the visual character of the surrounding area of Small Wireless Facilities mounted on existing structures and/or located on a given permitted site in evaluating concealment requirements.

Where conduit or cables are mounted external to the support structure, the outside cable conduit or cable will be the color of the support structure, and the City may require that the cable be placed in conduit. Full concealment of all conduits, cables, wires, and fiber is required within mounting brackets, shrouds, canisters, or sleeves if attaching to exterior antennas or equipment.

9.08.06 Pole Mounted Antennas and Equipment

Antennas will be located, mounted and designed so that visual and aesthetic impacts upon surrounding land uses and structures are minimized, and so that they blend into the existing environment.

Panel antennas shall not be mounted more than 12 inches from the surface of the utility pole, with the distance measured from inside edge of the antenna to the surface of the pole, unless an additional distance is required by the pole owner. An applicant may install a side-mounted canister antenna, so long as the inside edge of the antenna is no more than 12 inches from the surface of the pole.

Pole mounted equipment other than the antenna(s), electric meter, and disconnect switch must be concealed within equipment enclosures. Equipment enclosures will be installed flush to the pole and not extend more than 24 inches from the face of the pole.

All attachments to a pole that are projecting, or any equipment or appurtenance mounted on the ground, will comply with the Engineering Design and Construction Standards, the Americans with Disabilities Act (ADA) standards and will not obstruct an existing or planned sidewalk or walkway.

All proposed projecting attachments to the pole will provide a minimum vertical clearance of 12 feet over sidewalks, 16 feet over driveways, and 20 feet over roadways.

9.08.07 Non-Pole Mounted Equipment

- A. Non-pole mounted equipment facilities will be placed underground if doing so is technically feasible and would not defeat the purpose of the facility.
- B. Above ground equipment facilities that are not pole mounted will be screened from any street and adjacent property with fencing, landscaping, shrouding, topography, or a combination of these methods,
- C. Above ground equipment facilities that are not pole mounted will be treated with graffiti resistant paint or material.

9.08.08 Strand Mounted Small Wireless Facilities

- A. Each strand mounted Small Wireless Facility will not exceed three CF in volume.
- B. The strand mounted Small Wireless Facility will be placed as close as possible to the nearest utility pole, but no more than five feet from the pole unless a greater distance is technically necessary or required by the pole owner for safety clearance.
- C. No strand mounted Small Wireless Facility will be located in or above the portion of the roadway open to vehicular or non-motorized traffic.
- D. Strand mounted small wireless facilities must be installed to cause the least visual impact and with the minimum excess exterior cabling or wires (other than the original strand) necessary to meet the technological needs of the facility.

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Chapter 10: Transportation

10.00 Preface

The intent of this Chapter is to encourage the uniform development of an integrated and accessible transportation system that will support all modes. Through the implementation of these standards, streets are built as transportation facilities as well as public space, contributing positively to the character of the City. These standards help create an efficient multimodal transportation system while minimizing environmental impacts to the community.

The design of Streets within the City of Auburn shall conform to the standards provided herein. The current editions of the American Association of State Highway and Transportation Officials (AASHTO), FHWA and Washington State Department of Transportation, MUTCD, and the State of Washington Department of Transportation (WSDOT) standards shall be utilized by the City Engineer when the design standards, standard specifications, or standard drawings are not covered by the scope of the City's standards.

The design criteria used to estimate future street usage are established in the City's Comprehensive Transportation Plan (CTP).

All streets shall be designed and constructed to comply with Federal Americans with Disabilities Act (ADA) laws. Additional guidelines and information can be found at WSDOT's ADA web page by clicking on the following hyperlink:

<https://wsdot.wa.gov/about/americans-disabilities-act-ada>

10.01 Development Activity Requirements

10.01.01 Traffic Impact Analysis

Per the Comprehensive Transportation Plan (CTP), development shall not be allowed when the impacts of the development on the transportation system degrade the level of service (LOS) below the adopted LOS standard, unless the impacts are mitigated by the improvements provided by the development. For more details regarding level of service standards and when mitigation is triggered, see the CTP.

A traffic impact analysis (TIA) is used to identify capacity and safety concerns, to assist in the evaluation of site design as it relates to traffic engineering issues, and to identify appropriate solutions and mitigation.

Projected trip generation shall be calculated based on the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.

10.01.01.A When Traffic Impact Analyses are Required

To adequately assess a development's traffic impact, the City Engineer, or designee, may require a TIA. The requirement for a TIA will be based on the size of the development proposed, existing street and intersection conditions, traffic volumes, crash history, safety considerations, community concerns, and other pertinent factors relating to traffic impacts attributable to the development. A traffic impact analysis is required for development activities that create one or more of the following conditions:

- A. The development could potentially affect an intersection or corridor where an existing level of service is at or below standard.

- B. The development generates more than 30 PM or AM peak hour trips on a corridor or intersection.
- C. The development may potentially affect the implementation of the street system as outlined in the Comprehensive Transportation Plan and Six Year Transportation Improvement Program (TIP), or of any other documented transportation project.
- D. The development proposes a rezone of the subject property.
- E. The original Traffic Impact Analysis for a future development is outdated due to changes in traffic volumes in the vicinity of the proposed project or approved pipeline projects or a change in the proposed land use's trip generation and/or distribution.
- F. The development could potentially affect safety or requires an analysis to assist in designing appropriate access.
- G. Special event land uses which do not exhibit typical trip generation characteristics may require unique analysis, including but not limited to weekend and off-peak scenarios, and AM versus PM time frames. Examples of such uses would be school, concert stadiums, racetracks or uses which exhibit substantial traffic peaking associated with special events that are scheduled on a periodic basis. The traffic analysis for such uses may include a traffic management plan to control traffic impacts associated with the special events.

10.01.01.B Elements of a Traffic Impact Analysis

Development activities have a wide range of considerations and potential issues that vary depending on the proposed development and its setting. The TIA will be cooperatively scoped by the developer and City Engineer, or designee. However, the City Engineer, or designee, will make the final decision regarding what analyses must be included in the TIA. The TIA may include all or some of the following analyses:

- A. Vehicle level of service analyses (Intersection delay and Intersection queueing).
- B. Analysis of proposed street connections to other new and existing streets and resulting volumes to demonstrate the requirements of **Section 10.03.01** are met.
- C. Critical gap analyses.
- D. Roundabout analyses.
- E. Traffic signal warrant analyses.
- F. Stop control warrant analyses.
- G. Turn lane warrant analyses.
- H. Traffic calming evaluation.
- I. Access management evaluation.
- J. Mitigation identification and analyses confirm proposed mitigation addresses impacts. See Mitigation Identification section.
- K. Neighborhood Circulation Plan. See Neighborhood Circulation Plan section.
- L. Truck trip generation and routing analysis.

- M. Evaluation of existing transit services and facilities and identification of modified or new transit services and facilities needed to serve the project.
- N. Other analyses and information as required by the City Engineer, or designee.

10.01.01.C Mitigation Identification and Recommendation

To address the potential adverse impacts of a development activity and to fulfill an identified need for public services within the impacted area related to the development, the TIA shall identify any impacts and needs required to be addressed by the development. The TIA shall identify measures to address the impacts and needs and demonstrate through modeling and/or other analyses that the proposed measures provide adequate mitigation and fulfillment of the needs. The developer is responsible for mitigating on-site and off-site deficiencies for present and proposed phases of the development. The TIA shall propose improvements necessary for safe and efficient traffic flow and bicycle, pedestrian, and transit movement and access proportional to the identified impacts. Build-out year, and project phasing impacts shall be considered. Long range forecast modeling is required for proposed zoning changes or non-conforming uses. All or some of the following items are to be included in the mitigation identification:

- A. Measures for mitigating on-site impacts and proposed mitigation.
- B. Measures for mitigating off-site impacts and proposed mitigation.
- C. Discussion of whether on-site and off-site improvements are justified, reasonably related to, and proportional to the impacts of the proposed development. In situations where mitigation of a development's impacts provides mitigation beyond what is caused by the development and beyond the required half street improvements, the City Engineer may consider under certain conditions and in accordance with applicable City Code, a traffic impact fee credit and/or a payback agreement.
- D. Any requirements or mitigation measures associated with the Neighborhood Circulation Plan.

The Traffic Impact Analysis shall clearly state the mitigation measures recommended by the analysis and shall summarize how the recommended mitigations are proportional to the identified impacts. The recommended mitigation measures shall be explained in sufficient detail in the analysis to allow them to be understood and evaluated. The recommendation shall also include the following:

- A. Clear statements of the applicant's recommended mitigation measures.
- B. Conceptual plans depicting recommended mitigation improvements and their relationship to existing and proposed conditions if drawings are needed.

10.01.02 Neighborhood Circulation Plan

Per ACC 17.16, a Neighborhood Circulation Plan is a conceptual plan that outlines the vehicular and nonmotorized circulation within and between a proposed subdivision and the surrounding area consistent with the CTP. Per ACC 17.10, a Neighborhood Circulation Plan is required with all subdivision applications that meets the requirements of ACC 17.16 and RCW 58.17.110(2) for safe walking paths for students. This requirement applies to both residential and non-residential subdivisions. To satisfy this requirement, plans and supporting documentation (such as a TIA where applicable), must satisfy and demonstrate the following:

- A. The planned street system must be compatible with the CTP. Development which is proposed in areas of the city which have a planned street system which

is a part of the comprehensive plan or the city's six-year plan, and any other street plan, shall make provisions for such streets and must not cause implementation of such street plans to become unattainable.

- B. Make provisions for, and not otherwise obstruct, planned routes or facilities for bicycles, equestrian, or other nonmotorized transportation mode which is a part of the CTP or Transportation Improvement Plan (TIP).
- C. Provide a nonmotorized circulation system that is integrated into the overall subdivision and the surrounding area as follows:
 - Includes an integrated nonmotorized circulation system that connects buildings, open spaces, and parking areas with the adjacent street sidewalk system.
 - Provides connections to existing or potential future trails/pedestrian routes on adjacent properties unless there are physical constraints such as sensitive areas that preclude the construction of a pedestrian connection.
- D. For residential subdivisions, in coordination with the applicable school district(s), identify walking routes for students within the subdivision for which bus services are not provided or planned to be provided by the school district(s). At locations where the identified route is not on a sidewalk meeting minimum City standards or where the route crosses a roadway, the project shall include enhancements to meet the requirements of RCW 58.17.110(2). Enhancements shall be identified, designed, and documented by a professional engineer and are subject to acceptance by the City Engineer. In deciding whether the proposed enhancements are acceptable the City Engineer will consider factors such as operations, maintenance, and replacement. Roadway crossings at uncontrolled intersection legs or not at intersections shall require enhancement per **Section 10.09.05**.

10.01.03 Half Street Improvements

10.01.03.A Half-Street Triggers

The requirements described in this section are in addition to any requirements determined during the SEPA process and/or the traffic study process described in **Section 10.01.01**, to mitigate localized impacts of the proposed development activity. This section describes the requirements for public improvements triggered by permitted actions as set forth in ACC 12.64A.

10.01.03.B Half-Street Extents

A public street or alley frontage that requires public improvements is referred to as a "Half-Street". The Half-Street extents are determined using the frontage street's cross section applicable to the street's roadway classification as defined in the CTP. The Half-Street may apply to an existing roadway or to a planned roadway which has not yet been built and extends along the entire length of the subject property frontage(s) with vehicular and/or non-motorized access. When Half-Streets connect to an intersection, the nearest corner of the intersection on the side being improved shall be designed and constructed for the full build-out of the street and shall extend, at a minimum, the intersection curb returns. Half-Street elements may extend beyond the property frontage(s) as described herein to transition to existing improvements or to provide additional improvements as described in **Section 10.01.04**. Half-Street requirements associated with alley frontage is described in **Section 10.01.03.E**.

10.01.03.C Half-Street Width

Along existing roadways, the Half-Street width is the area from the planned right-of-way limits to the planned roadway centerline based on the roadway classification and the typical cross sections in **Section 10.03.06**. Along planned or unimproved roadways, the Half-Street width is either 1) the area from the planned right-of-way limits to the planned roadway centerline or 2) the area from the planned right-of-way limits to the limit required to provide 24 feet of pavement, whichever is greater.

10.01.03.D Required Half-Street New Improvements

Half-Streets shall include construction of the following elements: paved roadway, sidewalks, curb/gutter, street landscaping, street lighting system, storm drainage, and conduit for City telecommunications. Half-street improvements to planned or unimproved roadways shall include improvements to the un-finished side of the roadway (opposite of the subject property frontage), as follows: temporary curbing, shoulders, clear zones, guardrail, slope treatments, and drainage accommodations to assure proper drainage, bank stability, and traffic safety.

If a Half-Street does not connect at both ends to other streets, construction of a permanent or temporary cul-de-sac will be required.

Where Half-Streets are connected to existing streets, lane markings transition tapers are required in accordance with AASHTO where edges of pavement do not match. Pavement transition tapers shall be constructed to a minimum of 5:1 or as constrained by the existing right-of-way.

All public utility improvements required for the project and service connections in the right-of-way shall be installed during the Half-Street construction. The Half-Street will be designed to provide drainage for the constructed portion of the street and to connect to the existing storm drain systems (where present), or be designed to allow for connection of the system to future planned storm drain systems.

10.01.03.E Required Half-Street Existing Improvements

Half-Street improvements shall include removing and replacing existing driveway aprons that do not meet current ADA requirements. Half-Street improvements shall include addressing sidewalk obstructions in the Half-Street area, including, but not limited to, replacing existing sidewalk areas that are an ADA obstruction.

Additionally, the City Engineer may make a determination that existing improvements within the Half-Street that do not conform to current City standards require improvement, upgrade, modification, or re-construction. In making this determination, the City Engineer will consider the proportionality of the required work to the potential impacts of the project, pedestrian and vehicular safety, ADA requirements, consistency and conformity with adjacent existing and planned improvements, and other factors as deemed relevant by the City Engineer. As part of this determination, the City Engineer may require existing driveway access(es) that do not meet current standards to be removed, relocated, and modified.

10.01.03.F Half-Street ROW Dedication

Right-of-way dedication is required for areas of the subject property within the Half-Street area along all frontages that are not already dedicated as right-of-way. Additional right-of-way dedication may be required as determined by the City Engineer per **Section 10.01.04**.

10.01.03.G Alley Half-Streets

Half-Street improvements in alleys shall include paving the alley to a width of 20 feet along the frontage of the property and, if the property frontage extends to the connection(s) of the alley to the roadway, the improvements shall also include construction of commercial driveway apron(s) at the alley entrance(s). Where a driveway apron already exists, the project shall be required to remove and replace it if the apron does not meet ADA requirements. Additional Half-Street improvements in alleys for projects constructing anything other than one single family residential unit shall include paving the alley to a width of 20 feet along the frontage limits and to the alley's roadway connection. For right-of-way dedication purposes, the Half-Street width along alley frontage is the area between the planned or existing centerline of the alley and the alley limits along the frontage (typically 10 feet offset towards the frontage along the planned or existing alley centerline), as determined by the City Engineer. The required paving width is reduced, as needed, to provide the maximum paved width available within the limits of the existing right-of-way and right-of-way dedicated by the project.

10.01.04 Additional Public Improvements

Additional public improvements besides the Half-Street improvements may be required as determined by the City Engineer to be necessary to mitigate the impacts of the development activity that may include the following improvements, not necessarily located on the property frontage:

- A. Additional street lighting.
- B. Additional storm drainage systems.
- C. Traffic control and other safety systems including, but not limited to, roadway channelization, signage, non-motorized safety, and traffic calming.
- D. Dedication of public right-of-way on public street frontages without vehicular or non-motorized access.
- E. Off-site improvements identified in the TIA and/or through the SEPA process.

10.01.05 Deferred Public Improvements

Public improvements triggered per ACC 12.64A and/or undergrounding of overhead wiring triggered per ACC 13.32A for which the City Engineer has approved deferral or payment of a fee-in-lieu shall be documented on the Plans with a notation indicating the City street delay application number (SDR-####) and the applicable agreement(s) shall be signed by the applicant and returned to the City prior to Plan approval. Agreements associated with grading permit(s) shall be executed by the City and recorded prior to issuance of notice to proceed with construction activities. Agreements associated with FAC plans/agreements shall be executed and recorded by the City with final acceptance of the FAC.

10.02 Right of Way

Required right-of-way widths are shown on the typical cross sections in this Chapter. The required right-of-way will depend upon the width of the street and other improvements. Additional right-of-way may be required for bike/pedestrian trails, retaining walls, or storm facilities, for example. Right-of-way requirements may be variable within a street corridor due to intersections, turn lanes, bus loading zones, and other street features. Right-of-way radii required at intersections is shown on **Table 10-6**.

Right-of-way shall be conveyed to the City on a recorded plat, by a right-of-way dedication, or

a separate instrument. Right-of-way shall be free of title encumbrances that, in the opinion of the City Engineer, would conflict or inhibit existing or future use of the right-of-way and/or present an unacceptable risk or burden on the City. Right-of-way dedications shall require title insurance as deemed appropriate by the City Engineer.

10.03 Roadway Network

New streets and/or new street systems, other than local residential streets serving residential neighborhoods, shall be configured in conformance with the CTP guidelines and policies. Where the comprehensive plan lacks clear guidance to address a particular situation, the City may require traffic studies and other supporting analysis to help define the configuration and nature of the planned street system.

Streets and street networks will be configured to deter speeding and cut-through traffic. Cut-through traffic is traffic that utilizes local street(s) to connect from one arterial or collector street to another arterial or collector street. Traffic calming measures may also be required to deter speeding and cut-through traffic.

10.03.01 Connections and Vehicle Volumes

Analysis of proposed street connections to other new and existing streets and resulting volumes shall be submitted to demonstrate the requirements of this section are met.

Connection of new streets to existing streets or connections within new proposed street networks shall not be allowed if the connections result in traffic volumes in excess of the upper limit of the average daily traffic volume range for the roadway's classification as listed in **Table 10-1** below.

The layout of local street networks shall be such that the number of local street connections to arterials and collectors is the minimum number of connections required to limit the design ADT on existing and planned local streets in the network to be within the ADT range listed in **Table 10-1** below. This requirement generally limits local street networks with only a single connection to an arterial or collector street to 100 or less units. Traffic volume limits shall not restrict the improvement of an existing parcel to include one single family residential unit.

Table 10-1 Traffic Volumes by Roadway Classification

Roadway Classification*	Average Daily Traffic (ADT)
Principal Arterial	Over 15,000
Minor Arterial	10,000 – 15,000
Residential Collector	2,500 – 10,000
Non-Residential Collector	2,500 – 5,000
Rustic Collector	1,000 – 5,000
Local Residential	Up to 1,200
Local Non-Residential	Up to 1,200
Rustic Residential	Up to 1,000

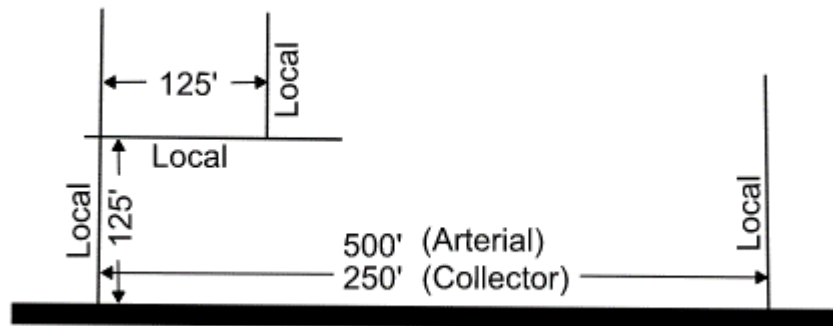
* Roadway classifications are listed from highest to lowest classification.

10.03.02 Intersection Layout and Spacing

The horizontal approach angle of street intersections shall be between 85° and 95° at the centerlines of intersecting streets. Intersections shall be aligned so that opposing single left turn lanes and through lanes are not offset more than 4 feet as measured from the lane centerline approach tangent.

Intersection spacing for classified roadways shall be determined by the City Engineer on a case-by-case basis using the CTP, AASHTO, and contextual considerations. Local roadway intersections shall meet the minimum centerline spacing requirements as shown in **Figure 10-1** below. Local roadways shall not exceed 1,300 feet in length between intersections.

Figure 10-1 Minimum Local Street Intersection Spacing from Centerline to Centerline



10.03.03 Intersection Control (Local Residential Streets)

New local street intersections shall be designed with sufficient intersection sight distance such that all intersection legs do not require stop control. Design speeds for approaches without intersection control may be lowered per **Table 10-3** when the intersection includes a center traffic island and design speed justification documentation is provided. Projects creating new intersections or modifying existing intersections of local residential streets are required to provide analysis and documentation justifying the proposed intersection control approach.

10.03.04 Intersection Control (Traffic Signals and Roundabouts)

Per the City's Comprehensive Transportation Plan, roundabouts are generally preferred over traffic signals. Where a traffic signal is warranted, an evaluation to determine the feasibility of installing a roundabout instead of a traffic signal will be performed. The feasibility criteria will include right-of-way constraints and property impacts, critical areas, geometrics, context, and other factors as determined to be relevant.

Roundabouts shall be designed per WSDOT Design Manual Chapter 1320 and the Transportation Research Board's (TRB) Roundabouts: An informational Guide, 2nd Edition – Second Edition (NCHRP 672).

Traffic signals shall be designed per **Section 10.21.12**.

10.03.05 Dead End Streets and Cul-De-Sacs

New streets shall be planned, designed and constructed to connect to existing or future streets except when the City Engineer has determined that a new dead-end street is allowed. Where a dead-end street is allowed, the City Engineer will determine whether the dead-end street is considered permanent or temporary. In making these determinations, the City Engineer will

consider whether or not a future through street to connect adjacent properties and/or other streets is reasonably anticipated, feasible, needed, and desirable. Existing dead-end streets shall be linked to new or existing streets as determined by the City Engineer to be required. The following requirements apply to dead-end streets:

- A. Dead-end streets that exceed 150 feet in length shall end in a cul-de-sac per the requirements of **Table 10-2**.
- B. Dead-end streets shall not be more than 800 feet in length as measured from the center of the nearest intersection to the center of the cul-de-sac.
- C. Dead-end streets shall not serve more than 30 dwelling units unless secondary emergency vehicle access is provided. See **Section 10.08.10** for emergency vehicle access driveway requirements.
- D. Dead-end streets determined by the City Engineer to be temporary shall include a sign posted at the end of the road indicating the road is planned to be extended in the future and to contact the City of Auburn Public Works Department for further information.
- E. When applicable, non-motorized paths shall be provided at the end of dead-end streets to connect to adjacent streets, trails, schools, parks, neighborhoods, or other features.

Table 10-2 Cul-De-Sac Design Requirement

Requirement	Temporary Cul-De-Sac	Permanent Cul-De-Sac
Maximum cross slope and vertical grade as measured from center of cul-de-sac to all points along the curb	5%	5%
Minimum paved surface diameter	65 feet	75 feet
ROW Diameter (Easement allowed for temporary cul-de-sac)	65 feet	90 feet
Sidewalk width (street lights, fire hydrants, and other pathway obstructions must be placed in easement behind the sidewalk)	Not Required	7 feet

10.03.06 Street Classifications

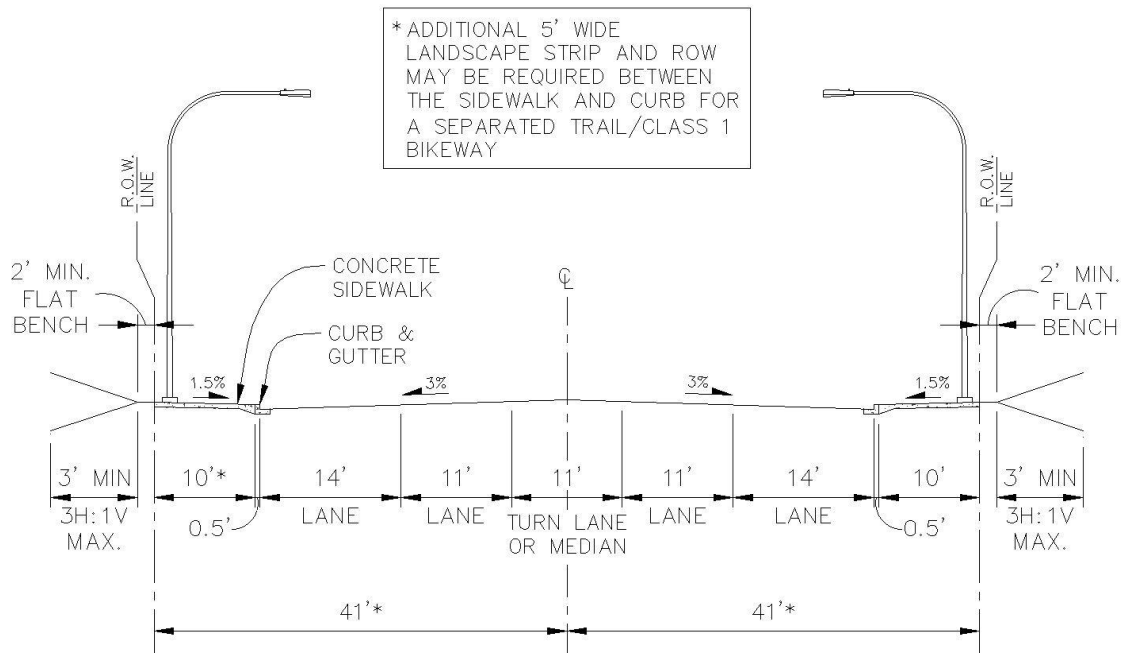
The following section contains descriptions of the street classifications used in the City and typical cross-sections for each street classification. Under certain circumstances, typically to mitigate operational or a safety conditions, the City Engineer may require variations from the typical cross-sections. Examples of these variations include, but are not limited to acceleration and deceleration lanes, right and left turn pockets/lanes, and modified lane widths. Where required, left turn pockets shall be a minimum of 11 feet wide with right turn pockets a minimum of 14 feet wide.

Roadway travel width is measured from the face of curb to the face of curb. Sidewalk width excludes the width of the curb where present. Non-motorized facilities such as sidewalks and bikeways shall be incorporated into the roadway cross sections per the CTP and as determined by the City Engineer to be needed to comply with the City's Complete Streets Policy (See ACC Chapter 12.06).

10.03.06.A Principal Arterial

Principal Arterials are designed to move traffic between locations within the region and to access the freeways. Design emphasis is placed on providing movement of inter-city rather than intra-city traffic. Direct access to multi-family, commercial and industrial land uses is permitted, but managed to improve safety and reduce congestion. Direct access to single family residential land uses is not allowed unless there is no other access point available. Parking is generally not allowed on principal arterials except in certain areas of the Downtown Urban Center (See **Figure 10-14**) and other areas where parking is not prohibited due to specific circumstances. Auburn Way South is a principal arterial that, from the State Route 18 interchange to the southeastern City limits, is also State Route 164 and subject to both City and Washington State Department of Transportation (WSDOT) requirements.

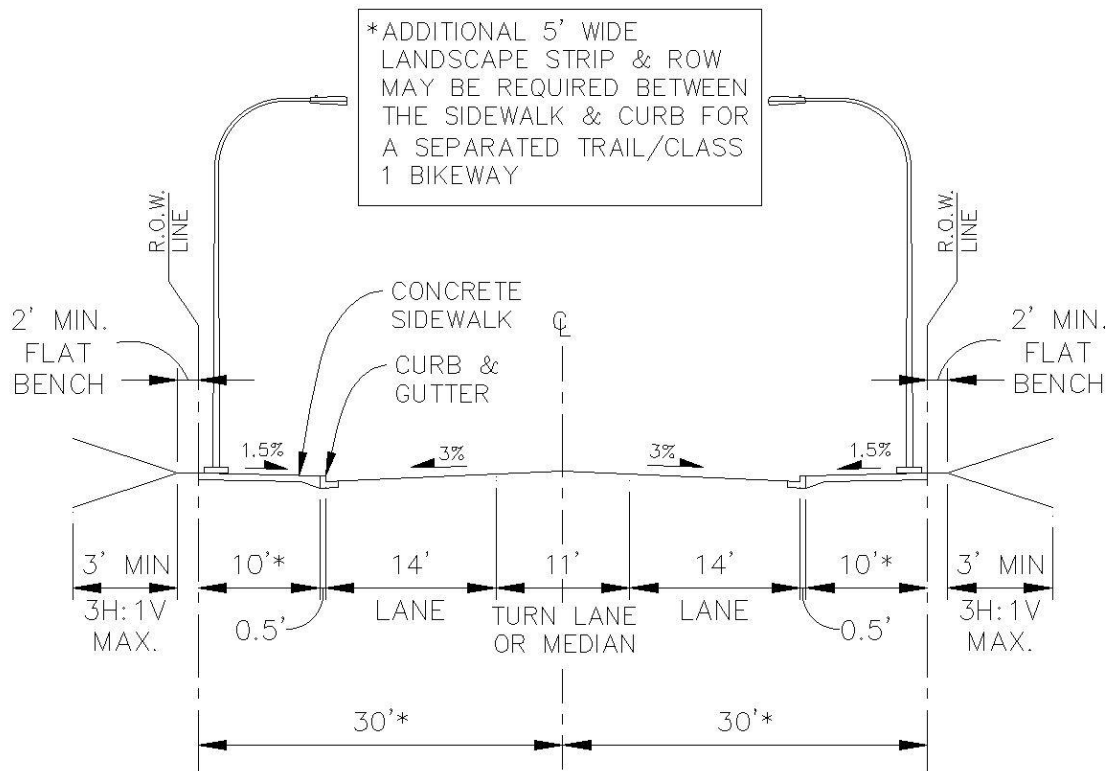
Figure 10-2 Principal Arterial Typical Cross Section



10.03.06.B Minor Arterial

Minor Arterials interconnect and augment principal arterials and provide service to trips of moderate length at a somewhat lower level of travel mobility than principal arterials. Relative to principal arterials, the minor arterial street system consists of facilities that place more emphasis on land access than the higher system and offers a lower level of traffic mobility. Minor Arterials may serve secondary traffic generators such as community business centers, athletic fields, neighborhood shopping centers, major parks, multifamily residential areas, medical centers, large church complexes, hospitals, and traffic from neighborhood to neighborhood within the City. Parking is generally not allowed on principal arterials except in certain areas of the Downtown Urban Center (See **Figure 10-14**) and other areas where parking is not prohibited due to specific circumstances.

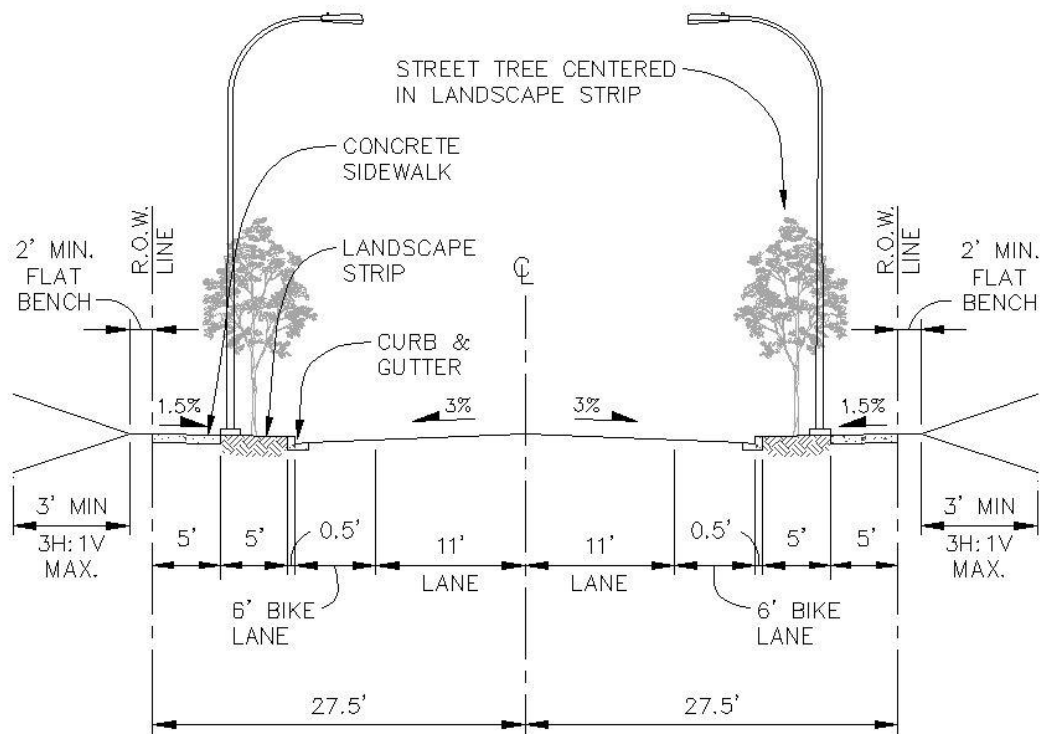
Figure 10-3 Minor Arterial Typical Cross Section



10.03.06.C Residential Collector

Residential collectors are used to connect local residential streets to arterial streets. Traffic using residential collectors is typically generated by single and multi-family residential neighborhoods, light commercial areas, neighborhood parks, and institutional use (schools, churches, community centers). Residential collectors are not intended to serve truck traffic or traffic between arterials. As residential collectors are intended to provide vital links in the City's non-motorized transportation network, they include bike lanes and sidewalks. The current standard configuration for residential collectors does not allow for parking on either side of the roadway. Direct access to residential collector streets from single family residential uses is discouraged but is allowed where no other access is available. Residential collector streets typically require a center left turn lane at an approach to an intersection with another collector or an arterial street. A center turn lane and/or median may be required on residential collectors in other circumstances as determined to be applicable by the City Engineer.

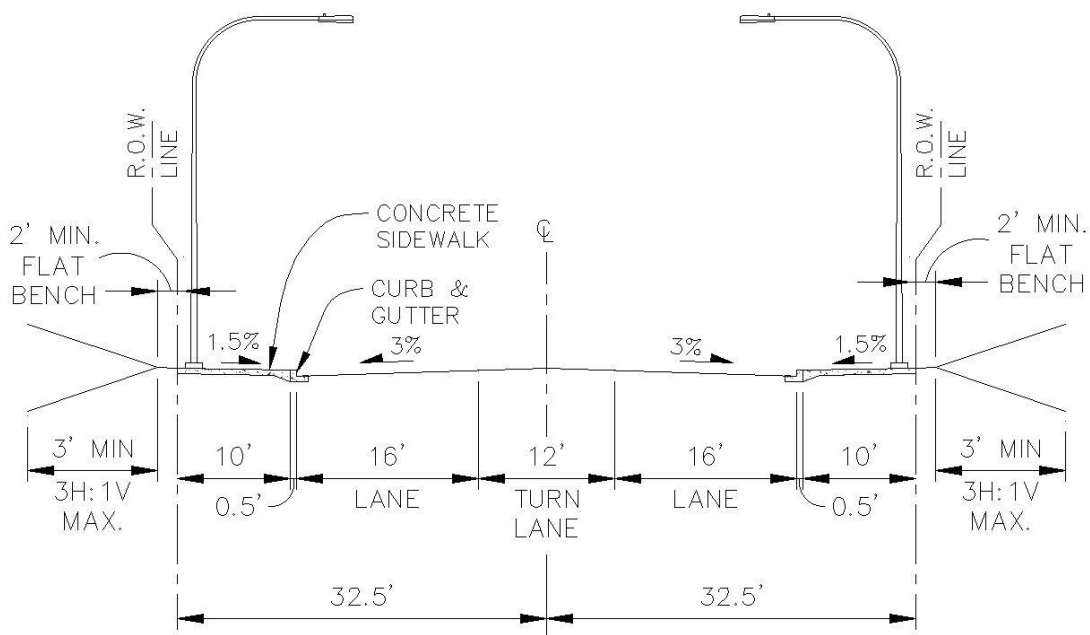
Figure 10-4 Residential Collector Cross Section



10.03.06.D Non-Residential Collector

Non-residential collectors are used to connect local non-residential streets to arterial streets. Traffic using residential collectors is typically generated by industrial and heavy commercial land uses and therefore, are intended to serve truck traffic. Non-residential collectors are not intended to carry vehicular traffic between arterials. The current standard configuration for non-residential collectors does not allow for parking on either side of the roadway. However, there are many examples of existing non-residential collector streets built to previous standards that allow parking on one or both sides of the street. Non-residential collector streets have wide lanes to help facilitate turning movements for trucks.

Figure 10-5 Non-Residential Collector Cross Section



10.03.06.E Local Residential

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. Local residential streets provide non-motorized connections from residential dwelling units via sidewalks and the roadway. The current standard configuration for local streets allows for parking on one side of the roadway. Local streets are not striped with lane markings except as directed by the City Engineer.

Figure 10-6 Local Residential Cross Section

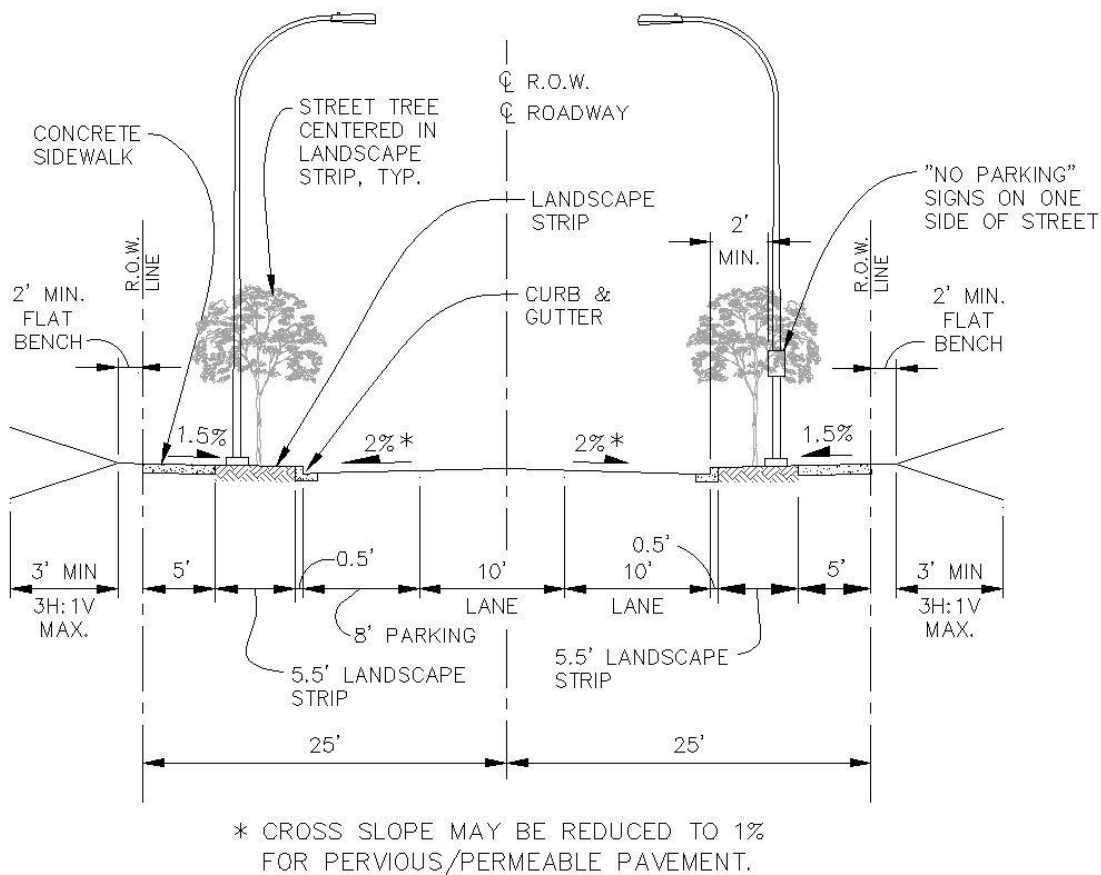
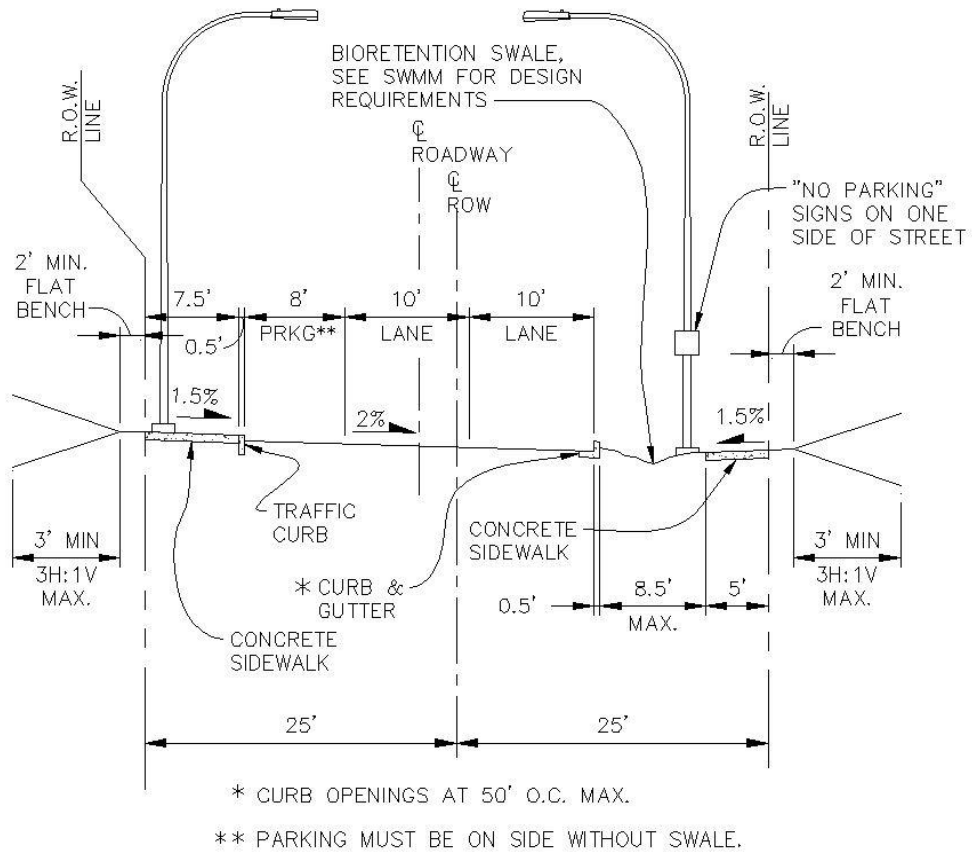


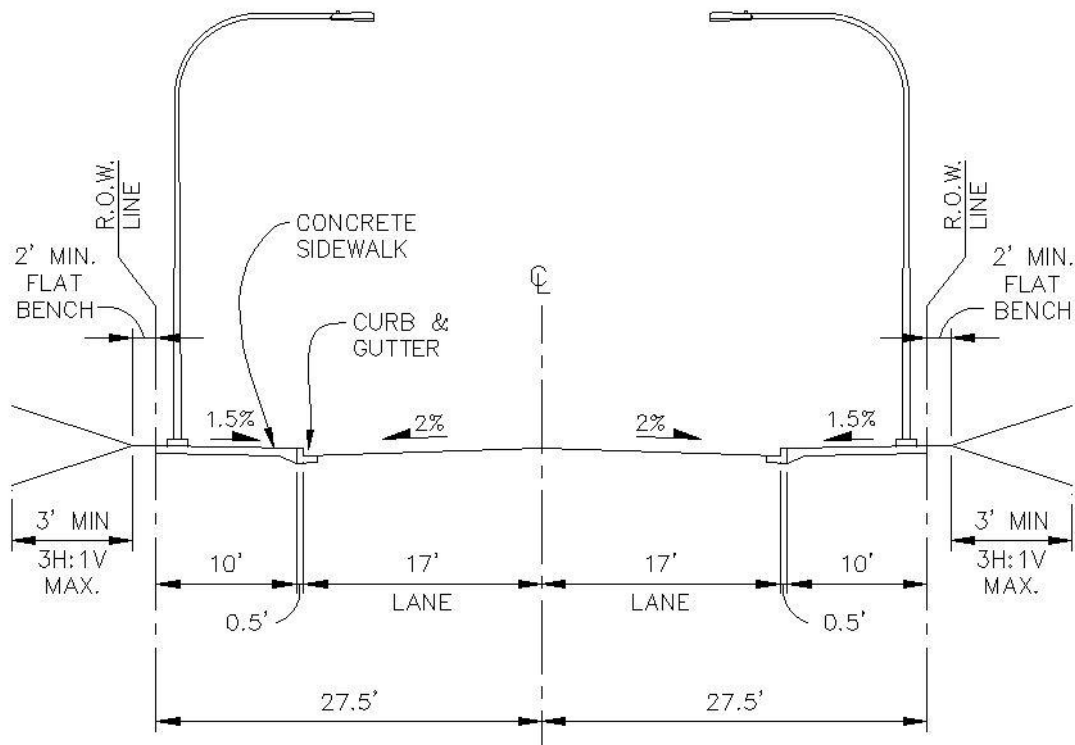
Figure 10-6A Local Residential Cross Section – Alternate w/ Bioretention Swale



10.03.06.F Local Non-Residential

Local non-residential streets provide access to abutting heavy commercial and industrial land uses and are designed to conduct traffic between those uses and higher order streets. A local non-residential street usually carries no through traffic and includes a small network of short interconnected streets and cul-de-sacs. The wide lanes of local non-residential streets are intended to serve the turning movements of truck traffic. Parking is typically not allowed on local non-residential streets and the street is marked with a centerline.

Figure 10-7 Local Non-Residential Cross Section



10.03.06.G Rustic Streets

Rustic streets serve the City's residential conservancy zoning designation. For additional information regarding the context of these roads, see the CTP. Rustic collectors are a type of residential collector street. Rustic residential streets are a type of local residential streets.

Figure 10-8 Rustic Collector Cross Section

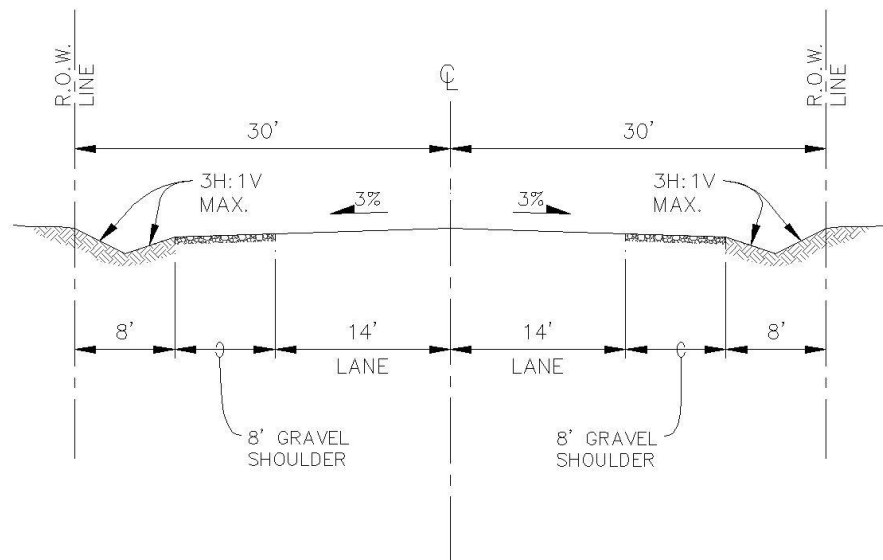
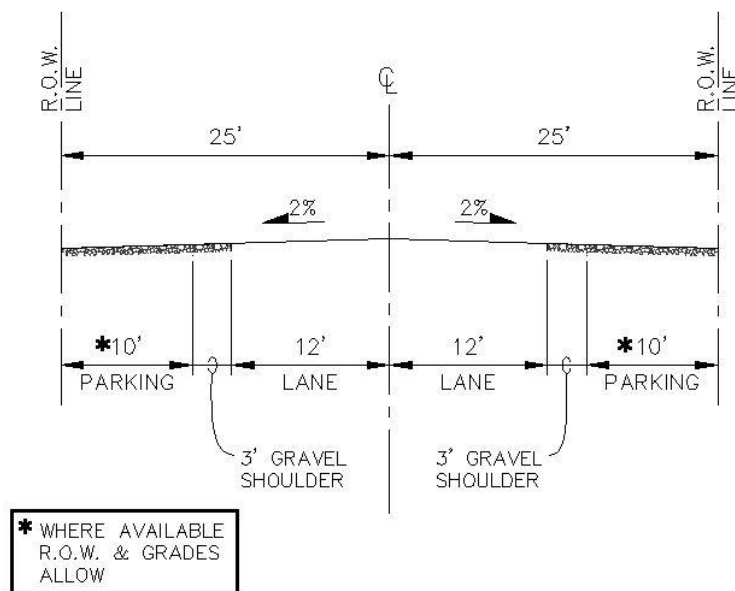


Figure 10-9 Rustic Residential Cross Section



10.03.07 Alleys

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 City 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 the following requirements:

- A. Minimum width of 20 feet of asphalt pavement.
- B. Curb and gutter, sidewalk, lighting, and landscaping are not required along alleys.
- C. Alleys may be paved with either a crown at centerline with asphalt wedge curbs on both sides to control drainage or be sloped to one side with an asphalt wedge curb on one side to control drainage. When necessary, storm drainage conveyance systems shall be installed along the alley to address storm drainage runoff from the paved surface.
- D. Alleys shall connect to City streets via a commercial driveway apron. Alleys serving alley loaded lots 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.

10.03.08 Private Streets

The City Engineer will determine on a case-by-case basis whether or not a private street will be allowed. Private streets are generally discouraged and will only be considered for approval by the City Engineer under the following circumstances:

- A. The street does not provide a current or future planned connection between public roadways.
- B. The street does not provide current or future access to properties other than those whom would own the private street.
- C. The street would not result in land locking present or planned parcels.
- D. The street would only serve a single planned single family residential short subdivision, apartment, townhome, condominium, industrial, or commercial development project. Private streets are not allowed for residential subdivisions not meeting the definition of "Short Subdivision" per ACC 17.04.330.
- E. The street would connect directly to a public street.

Roadway geometrics of private streets will be in conformance with the street standards that most closely reflect their intended use, with a minimum of 36 feet of pavement width or 28 feet of pavement width with a marked fire lane on one side.

Private streets shall be located within permanently established tracts or easements. A capable, legally responsible owner or homeowners' association shall be established to maintain private streets. A plat or short plat with private streets requires an executed recorded Private Street Maintenance Agreement and a Storm Water Easement and Maintenance Agreement that obligate the future property owners to maintain the infrastructure indefinitely.

10.03.09 Downtown Urban Center Standards

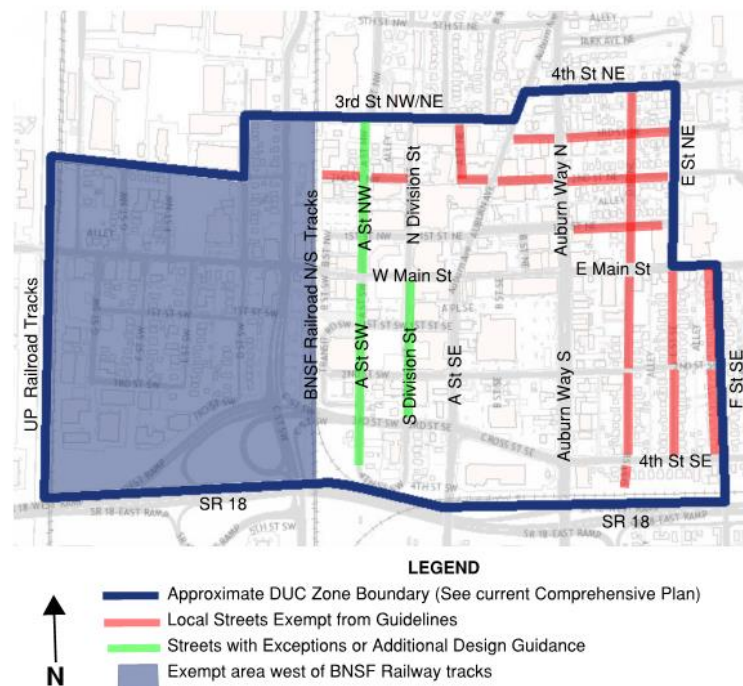
Streets in the downtown urban center (DUC) zone, as defined in the Comprehensive Plan zoning map, require sidewalks, street lights, street corners, crosswalks, and traffic signals that differ from other streets. In 2007, the City Council passed Resolution 4271 that approved and adopted for inclusion into the Engineering Design Standards the Auburn Sidewalk Design Guidelines (Guidelines). Since then, the Guidelines have been revised in consultation with the Downtown Redevelopment Committee (formerly a committee of City Council members) and at various Council Study Sessions. The Guidelines are included in the sections referenced below and are no longer a separate document:

- A. Sidewalks, Street Trees, Driveway Transitions, and Street Corners (See **Section 10.09.01 and Section 10.12**)
- B. Crosswalks (See **Section 10.09.06**)
- C. Street Lighting (See **Section 10.16.03**)
- D. Traffic Signals (See **Section 10.21.12**)

Where the DUC zone boundaries are shown along or within a street, the Guidelines apply to both sides of the street and extend to the curb returns of the exempt street. **Figure 10-10** illustrates the DUC zone and the applicability of the Guidelines within it. All local streets, except N. Division Street and B Street NW, are exempt from the Guidelines. South Division Street from 3rd Street SE/SW through W Main St, also referred to as the “Promenade” and incorporates specialized sidewalks and pedestrian crosswalks that vary from the Guidelines.

Additionally, in the DUC zone, street cross sections generally have one travel lane in each direction and parking on both sides of the street, regardless of the street classification.

Figure 10-10 Downtown Sidewalk Design Guidelines Applicability Map



10.04 Road Design Geometrics

10.04.01 Sight Distance

Minimum sight distance requirements are to be determined using the current edition of AASHTO's "A Policy on Geometric Design of Highway Streets". Roadway geometry shall be designed such that sight lines are unobstructed and within right-of-way, tract, or sight distance easement. Where AASHTO provides guidance for both a "desirable" sight distance and a "minimum" sight distance, the "desirable" sight distance shall be the City's required sight distance. Sight distance calculations supporting the roadway design geometrics shall be included in the plans.

10.04.02 Posted and Design Speeds

Posted speeds for new arterial and collector roadways shall be determined by the City Engineer and Comprehensive Transportation Plan policies. Posted speeds for new non-arterial or collector roadways and the design speeds for all existing roadways shall be per **Table 10-3**.

Table 10-3 Existing Road Design Speeds

	Arterial and Collector Streets	Local and Rustic Residential	Local Non-Residential	Shared Driveway Access Roads and Alleys
Posted Speed (mph)	Varies	25	30	Not Posted
Design Speed (mph)	Posted + 10 mph or 85 th percentile per a speed study conducted within 1-year, whichever is greater.	30	35	15
Reduced Design Speed (mph)*	N/A	20	25	N/A

* Reduced design speed may be used within 150 feet of the following:

- 1) Permanent dead end
- 2) Permanent cul-de-sac
- 3) End of road @ T-Intersection
- 4) On stop controlled approach to local/local Intersection
- 5) On approaches to local/local intersection with a traffic circle (design speed justification documentation required)

10.04.03 Curves

Design calculations supporting the design of roadway curves shall be included in the plans.

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.

Sections of straight roadway must be designed between curves to avoid quick left-right transitions that could potentially lead to loss of vehicular control. Where reverse curves are superelevated, tangents between curves shall be of sufficient length to accommodate

transitions into and out of the superelevated sections per AASHTO.

Vertical curves are required where a change in vertical alignment equals or exceeds a 1% algebraic grade difference. Crest vertical curves shall be designed to provide the required minimum stopping sight distance for the streets design speed. Sag vertical curve lengths shall be designed to provide headlight sight distance equal to or greater than the design speed stopping sight distance. All vertical curves must be symmetrical, parabolic, and meet AASHTO standards.

10.04.04 Vertical Grades

Table 10-4 Vertical Grades by Roadway Type

	Arterial	Collector & Local Non-Residential	Local Residential & Rustic Residential	Shared Driveway Access Roads & Alleys
Maximum Vertical Grade	6%	8%	8% (may be increased to 10% without deviation where all other geometric design requirements are met)	10% (may be increased to 12% without deviation in access roads without existing or planned public utilities)
Minimum Vertical Grade	0.5%	0.5%	0.5%	0.5%

Deviations to the maximum allowed vertical street grades of arterial and collector roadways shall generally not be granted unless it can be demonstrated that, and the City Engineer determines that, the public benefits significantly outweigh any potential detriments.

Deviations will only be considered for up to an 8% maximum grade for arterials and a 10% maximum grade for collector streets. If approved, deviations for roadway grades above 8% may trigger the additional following design considerations, as determined to be necessary by the City Engineer:

- A. Increased travel lane widths
- B. Enhanced Paving Section
- C. Incorporation of Separated Multi-use trail
- D. Incorporation of Median Islands
- E. Enhanced Intersection/Signal Improvements

10.04.05 Cross Slopes

Cross slopes shall be as shown in the typical cross sections except roads with vertical grades of greater than 6% where cross slopes may be increased up to 3% and cross slopes of roadways constructed with pervious/permeable pavement may be reduced to 1%. Superelevation design shall be per AASHTO.

Intersections shall be designed to drain away from the higher classification street. Grades shall match at the center of intersections for equal classification streets. At intersections of differing classification streets, the crown shall be carried through the intersection for the higher classification.

10.04.06 Intersection Landings

The intersection landing approach is a defined segment of the street before the intersection and is measured back from the point of tangency of the curb radius on each approach to the intersection. Minimum requirements for intersection landings are shown in **Table 10-5**. Minimum requirements for driveway landings, which include landings for shared driveway access roads and alleys, are included in **Section 10.08.05**.

Table 10-5 Intersection Landing Requirements

	Arterial	Non-Arterial Roadways	Shared Driveway Access Roads & Alleys
Minimum Landing Approach Length (ft)	30	20	12
Maximum Landing Approach Grade	3%	5%	5%

10.04.07 Curb and Right-of-Way Radius

Table 10-6 lists minimum required curb and right-of-way radii. Intersections serving transit routes require analysis to determine if increased radii is needed. The analysis will demonstrate that busses may execute a right turn at 9 mph without crossing lanes or encroaching onto the adjacent curb. The design vehicle will be the largest bus expected currently or planned to be utilized at the intersection. The City 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. At intersections with two different street classifications, the highest classification for curb radii shall be used except at intersections with local residential streets where the lowest order street shall be used.

Table 10-6 Minimum Curb and ROW Radii

Roadway	Minimum Intersection ROW Radii (ft)	Minimum Intersection Curb Radii (ft)
Principal Arterial	29.5	40
Minor Arterial	24.5	35
Residential Collector	14.5	25
Non-Residential Collector	19.5	30
Rustic Collector	17	30
Local Residential	9	20
Local Non-Residential	19.5	30
Rustic Residential	7	20

10.05 Pavement Design

Pavement design of public streets is based on the street classification per the CTP, subgrade conditions, and whether or not the street is on a transit or freight route. Pavement design of private streets will be in conformance with the street standards that most closely reflect their intended use. Roadway paving shall be asphalt except where cement concrete is approved by

the City Engineer.

10.05.01 Simplified Asphalt Pavement Design

The simplified pavement design approach described in this section may be utilized as a simplified approach to determine the required pavement section except for the following streets for which pavement sections must be designed per the current AASHTO design procedure:

- A. Principal arterials
- B. Designated transit and freight routes per the CTP
- C. Streets where subgrade California Bearing Ratio (CBR) values are less than 3

This simplified approach has been developed so that extensive data and computer analysis is not necessary for developing pavement designs for most projects. The approach requires determination of the street's subgrade conditions and street classification which are then utilized to determine the required pavement design section. The California Bearing Ratio (CBR) shall be used to classify existing subgrade soils as poor, medium, good, or excellent.

The subgrade under the proposed street shall be evaluated by an independent testing laboratory or geotechnical firm to determine the CBR of the subgrade. The proposed roadway shall have a minimum of one test for every 1,000 feet of road and/or for every obvious change in subgrade material. With approval from the City Engineer, or designee, other information such as soils testing data from adjacent projects and field observations may be utilized instead of testing where, in the opinion of the City Engineer or designee, the information provides sufficient data to classify the soil type.

Table 10-7 Simplified Asphalt Pavement Section Design Chart

Street Type	Soil Type			
	Poor (CBR 3-5)	Medium (CBR 6-10)	Good (CBR 11-20)	Excellent (CBR >20)
Unpaved Utility Access Roads	2" CSTC 12" Base Course Geotextile Fabric	2" CSTC 8" Base Course	2" CSTC 8" Base Course	2" CSTC 8" Base Course
Alleys, Access Roads, Locals	6" HMA CL 1/2" 11.5" CSBC Geotextile Fabric	6" HMA CL 1/2" 7.5" CSBC	6" HMA CL 1/2" 4" CSBC	5" HMA CL 1/2" 4" CSBC
Collectors	7" HMA CL 1/2" 14" CSBC Geotextile Fabric	7" HMA CL 1/2" 9" CSBC	7" HMA CL 1/2" 6" CSBC	7" HMA CL 1/2" 4" CSBC
Minor Arterials	9" HMA CL 1/2" 18.5" CSBC Geotextile Fabric	9" HMA CL 1/2" 11" CSBC	7" HMA CL 1/2" 9.5" CSBC	7" HMA CL 1/2" 6" CSBC

10.05.02 AASHTO Asphalt Pavement Design

Engineered pavement designs may be utilized regardless of whether or not the simplified approach is applicable. Engineered pavement designs shall follow the latest "AASHTO Guide for Design of Pavement Structures" for flexible pavements except that the minimum asphalt pavement thicknesses shall apply:

Table 10-8 AASHTO Pavement Design Minimum Require Asphalt Pavement Thickness

Street Type	Minimum Asphalt Pavement Thickness
Local, Alley, Access Road/Tract	5"
Collectors and Arterials	7"

The subgrade under the proposed street shall be evaluated by an independent testing laboratory or geotechnical firm to determine the CBR and/or Resilient Modulus (M_r) of the subgrade for the pavement design. The proposed roadway shall have a minimum of one test for every 1,000 feet of road and/or for every obvious change in subgrade material. Documentation for these required tests shall be included in the Pavement Design Report.

For projects where a traffic analysis report was not required, to determine the amount of traffic for which a street is to be designed, contact the City to obtain the most recent street classification and traffic counts. Traffic counts are done assuming there is a 50/50 split in the direction of traffic. 100% of the 50/50 split must be assumed in the design lane, regardless of the number of lanes in each direction.

The existing traffic levels shall then be inflated to match the projected traffic at the end of the roadways design life (in most cases a twenty-year design life will be used). The annual rate of growth is 1.5% for residential streets and 3.5% for commercial/industrial streets and arterials streets. The minimum pavement section shall be as determined by the pavement design using the AASHTO pavement design approach with a 20-year service life except as limited by **Table 10-8**. The Reliability Level factors used in pavement design shall be in accordance with the following table:

Table 10-9 Pavement Design – Reliability Factors

Functional Classification	Required Level of Reliability	
	Urban	Rural
Principal Arterials	95	90
Minor Arterials	90	
Collectors	90	
Local	85	

10.05.03 Pavement Design Report

All pavement designs (whether per the AASHTO method or per the simplified approach) shall be documented in a Pavement Design Memorandum stamped and signed by a Professional Engineer and may be included in the project Geotechnical Report where applicable.

The report shall include a narrative of the site conditions, geotechnical boring logs, testing results, calculations, the pavement analysis, and applicable background information for review and approval. The report must contain all calculations regarding the pavement design, including spreadsheets, all variables and assumptions, as well as geotechnical engineering information on the subgrade soils.

10.05.04 Permeable Pavements

Pervious Cement and Asphalt Concrete Pavement must be designed by a professional engineer. The design shall be documented by a report that includes relevant calculations, data collection, and assumptions. The report must provide evidence that the permeable surfaces are designed to have at least a 30-year service life given the anticipated vehicle counts and vehicle classifications. The minimum pavement design section shall be as follows:

- A. 6-inch-thick wearing course of porous asphalt or pervious concrete; over
- B. 6-inch reservoir course (Permeable Ballast per Section 9-03.9(2) of the Construction Standards); over

- C. Geotextile (Non-Woven, Moderate Survivability per Section 9-33.2(1) of the Construction Standards); over
- D. Where treatment is required, and native subsoils do not meet water quality design criteria per the SWMM: 18-inch runoff treatment layer with specifications per the SWMM.

Permeable pavements shall be designed and constructed per the SWMM and the Construction Standards.

Pervious cement and porous asphalt concrete pavement within the public right-of-way shall not be utilized for storm water management of runoff from areas outside the public right-of-way.

10.05.05 Pavement Surface Restoration and Preservation

Restoration of pavement disturbed by trenching or other activities shall be per **Chapter 9**. When the total surface restoration area exceeds 1,000 SF feet, pavement core sample(s) are required to be collected in the required restoration area to determine the existing pavement thickness. The City Engineer, or designee, may waive or reduce the coring requirement where other information is available to determine the existing pavement thickness. This information could include, but is not limited to, as-built records, coring samples from other work at the same location, or observations made by the City during construction work at the same location. Where the existing pavement to be removed and replaced does not meet current City standards, the City Engineer, or designee, may determine that pavement replacement to meet City Standards is required. Minimum pavement restoration and widening width is 2 feet.

10.06 Roadside Design

10.06.01 Roadway Edge

Roadway edges shall be per the typical sections included in **Section 10.03.06**. Concrete curb and gutter shall be constructed per WSDOT Standard Plan F-10.12. Curbs that are not along stormwater flow paths shall be constructed as cement concrete traffic curb per WSDOT Standard Plan F-10.12. Rustic roads within the City may be designed with a gravel shoulder (minimum of 3 inches Crushed Surfacing Top Coarse (CSTC) over 8 inches of Gravel Base. Drainage inlets and grates along curbs shall be constructed per WSDOT Standard Plan F-10.16. Roadway edges without curbs shall include a marked fog line per **WSDOT Standard Plan M-20.10-04**.

10.06.02 Clear Zone – Lateral Separation from Fixed Objects

The following standards provide guidance for the required separation distance from roadway vehicle travel ways and fixed objects for many, but not all, roadways in Auburn. The following standards apply to all new or replaced facilities and do not obligate the City to retrofit or replace existing facilities for the sole purpose of meeting the standards below.

The City has adopted 4 feet as the minimum lateral separation from the edge of motor vehicular travel way to fixed objects for streets with vertical curbs within the urban environment. Utility and traffic signal poles along streets with vertical curbs within the urban environment, as defined in Chapter 10 of the AASHTO Roadside Design Guide require minimum 6 feet lateral separation from edge of motorized vehicular travel way. For the purpose of determining lateral separation, the distance from the edge of vehicular travel way on streets with on-street parking or bike lanes is measured from the edge of the parking area or bike lane along the motor vehicle travel way.

Under many conditions, additional lateral separation shall be required to provide adequate clear zone per the AASHTO Roadside Design Guide. These conditions include, but are not limited

to: streets without vertical curbs, horizontal curves, proximity to driveways, high design speeds (in excess of 45 mph), merge locations, crash history, roadways that are not built per existing City standards, and other conditions as deemed applicable by the City Engineer. Reduced minimum lateral separation along roadways with design speeds of 35 mph or less is allowed for street trees centered within landscape strips and for mailboxes. Minimum lateral separation from the face of curb to any roadside object (regardless if fixed or non-fixed) is 2 feet.

10.06.03 Traffic Barriers

Evaluation of roadside conditions, including embankments, for traffic barriers, including guardrail installations, shall be in accordance with the WSDOT Design Manual.

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

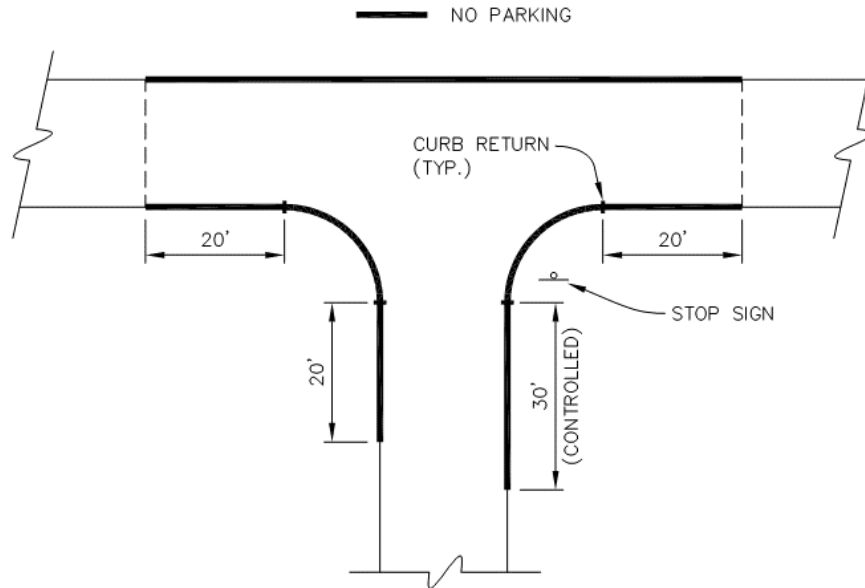
10.07 On-Street Parking

On-street parking is generally not allowed on arterial, collector, and local non-residential streets. For Local Residential streets where parking is allowed on one side only and there are landscape strips present on both sides of the road, the parking shall be placed on the side of the street that can accommodate the most parking. Pavement parking space demarcations shall not be used except as directed by the City Engineer.

Parking is not allowed at any of the following locations. Signage, curb, and pavement markings are not required to establish these restrictions except as determined otherwise by the City Engineer, or designee, or as specified otherwise below:

- A. Within fire lanes. Fire lanes shall require pavement marking and/or signage.
- B. Within 20 feet of an uncontrolled intersection measured from the point of tangency on the entering curb radius.
- C. Within 30 feet of a stop, yield or signal controlled intersection measured from the point of tangency on the entering curb radius.
- D. Within any intersection. For “T” intersections, the no parking limits shall apply to both sides of the through street (top of the “T”). See **Figure 10-11** below.

Figure 10-11 - T-Intersection Parking Restrictions



- E. In front of or within 15 feet of each side of a fire hydrant.
- F. In front of or within 5 feet of each side of a driveway.
- G. Where mid-block crosswalks are installed, no parking shall be allowed on either side of the street within 50 feet in advance of the nearest edge of the crosswalk and within 20 feet past the furthest edge of the crosswalk. In no case shall the advance parking restriction for crosswalks be less than the minimum stopping sight distance of the roadway.

Additional parking restriction may be required depending upon roadway geometrics, adjacent land use, and the proximity to bridges and railroads.

No parking signage shall be per **City of Auburn Standard Detail T-40**.

10.08 Driveways

Construction of driveway access to the public street right-of-way requires prior approval by the City Engineer, or designee. Connection between the driveway and street shall be with a driveway apron per **City of Auburn Standard Detail T-34 or T-35** except a driveway connection to a street that does not have curb/gutter and sidewalk may be with an apron constructed of the same material, thickness, and strength as the street with tapered corners that accommodate the largest vehicles anticipated to utilize the driveway apron.

Work that requires any portion of a driveway apron to be replaced triggers the requirement to upgrade/replace the entire driveway to meet ADA standards.

10.08.01 Number of Driveways

Regardless if a project includes one or multiples parcels, it is limited to one driveway access to a City street (including alleys) with the following exceptions:

- A. Single family residential subdivision projects are allowed one driveway access to each single family residential parcel when all of the driveway accesses for the project are to a local residential roadway, alley, or a shared access tract/driveway.
- B. Additional driveway(s) may be provided to satisfy International Fire Code Requirements IFC). These additional driveways are subject to the requirements of Emergency Vehicle Access Driveways per the IFC and these Engineering Design Standards. See **Section 10.08.10** for emergency vehicle access driveway requirements.

Subdivisions with a driveway access to a roadway classified higher than local residential or for non-single family residential projects shall be limited to a single access tract/driveway for the entire subdivision.

10.08.02 Driveway Classifications, Widths, and Spacing

Driveway spacing shall be per **City of Auburn Standard Detail T-04**. When the minimum spacing is not obtainable, to address safety concerns, or to mitigate impacts of traffic flow, the City Engineer, or designee, may determine that two contiguous parcels require a single driveway centered on the property line.

Driveway widths are measured across the driveway apron, excluding driveway wings/ramps. Spacing between driveways is measured from the limits the driveway apron wings/ramps.

Residential Driveway – A driveway serving one single family residential property or a duplex is a residential driveway. Residential driveway aprons width is 11 feet minimum and 18 feet maximum.

Commercial/Industrial Driveway - A driveway serving a commercial, industrial, or residential with 3 or more dwelling units (except accessory dwelling units) parcel is a commercial/industrial driveway. Commercial/Industrial driveway aprons shall be 24 feet wide except, the City may require commercial/industrial driveways along arterial roadways to be wider to accommodate the largest types of vehicles frequenting the parcel (design vehicle). These driveways shall be designed to accommodate design vehicle egress/ingress such that the design vehicle can make its turning movements without dragging outside the apron, does not swing into opposing traffic lanes, and can enter the driveway while another design vehicle is waiting at the driveway to exit. In these cases, design vehicle justification and turning templates are required.

Shared Driveways – A driveway serving two or more residential or commercial/industrial parcels is a shared driveway. See **City of Auburn Standard Detail T-31** and **Section 10.08.07**.

10.08.03 Driveway Lay Out

Driveways and on-site parking, other than that for single-family residences on local residential street or alleys, shall be designed such that vehicle-backing maneuvers will not occur onto the street. A properly designed driveway shall allow the largest typical vehicle that will use the driveway (i.e., tractor-trailers at large warehouses, delivery trucks at mini marts) to enter and exit the site without encroaching into opposing traffic lanes, including two-way left turn lanes.

When designing site layout and driveway access, internal circulation shall be such that on-site traffic will not backup the driveway impeding vehicles in the public street. The City may require

sites with internal traffic congestion to design driveways with long throat lengths to provide extra storage to avoid impacting City streets.

Per ACC 18.52.050, commercial and industrial driveways shall have at least a 40 foot throat from the street (not be intersected by parking aisle, parking space, or another access driveway for a minimum distance of 40 feet from the street right-of-way). The City Engineer may require additional throat distance or may allow less throat distance with the consideration of the following: classification and volumes of street from which access is being taken, total number of parking stalls, design vehicle for parking lot, size of parcel and parking area to which the driveway is providing access, and queueing analysis. If a gate is proposed across a driveway it shall be located a minimum distance of the largest vehicle accessing the site (excluding emergency vehicles), measured from the right-of-way line, unless there is adequate room for parking outside the travel lane(s) without blocking non-motorized facilities.

Driveways connecting non-single family residential development to non-local roadways shall accommodate waste management and other service vehicles serving the development such that the service vehicles do not stop on the roadway (they enter the site, perform services, and exit the site).

10.08.04 Driveway Locations

When a property has frontage on two or more streets (or alleys), the driveway will be located on the lowest classification of street (or alley).

Driveway accesses with any portion of the driveway (including wings) within the “Functional Intersection Boundary” shall be either prohibited or restricted. See **Table 10-10** and **Figures 10-12** and **10-13**. Single family residential driveways on local residential streets are exempt from functional intersection boundary requirements.

The functional intersection boundary is the portion of the street leading up to the intersection required to allow vehicle movements and storage. This is the area where drivers identify the situation, change lanes, come to a stop, and wait before proceeding through the intersection. The functional length of an intersection is measured from the point of curvature/point of tangency (PC/PT) of the curb return. Driveway restrictions include prohibiting either all left turn movements, left turns from, or left turns to the subject driveway.

The City Engineer may also impose driveway restrictions at other locations when a safety hazard is identified or to mitigate impacts to traffic flow along a classified street. Such restrictions shall be incorporated into the design of the driveway in a manner that strives to maintain existing access turning movements to other adjacent properties.

Table 10-10 Distance Requirements for Functional Intersection Boundaries

Posted Speed (mph)	Speed (ft./sec)	Reaction Time (sec)	Decision Distance (ft.) “d ₁ ”	Lane Change Distance (ft.) “d ₂ ”*	Braking Distance (ft.) “d ₃ ”	Storage Length (ft.) “d ₄ ”	Distance A (Approaching) (ft.)	Distance A (Departing) (ft.)	Distance B (ft.)
25	37	1.0	37	25	60	50	135	80	172
30	44	1.0	44	40	86	50	176	107	220
35	51	1.0	51	60	118	100	278	140	329
40	59	1.0	59	85	154	100	339	179	405
45	66	1.0	66	105	194	100	399	216	465

* For single lane approaches where a lane change is not possible, “d₂” should be omitted.

Figure 10-12 Functional Length Diagram of an Intersection with Right and/or Left-Turn Lane

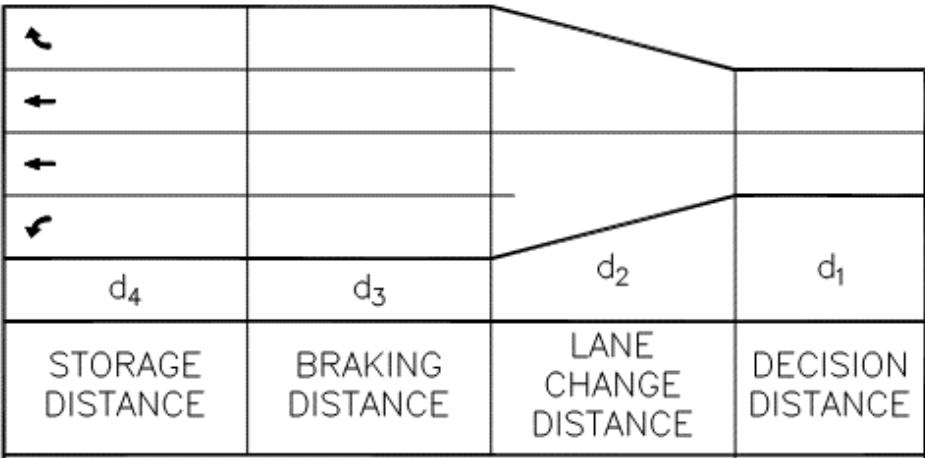
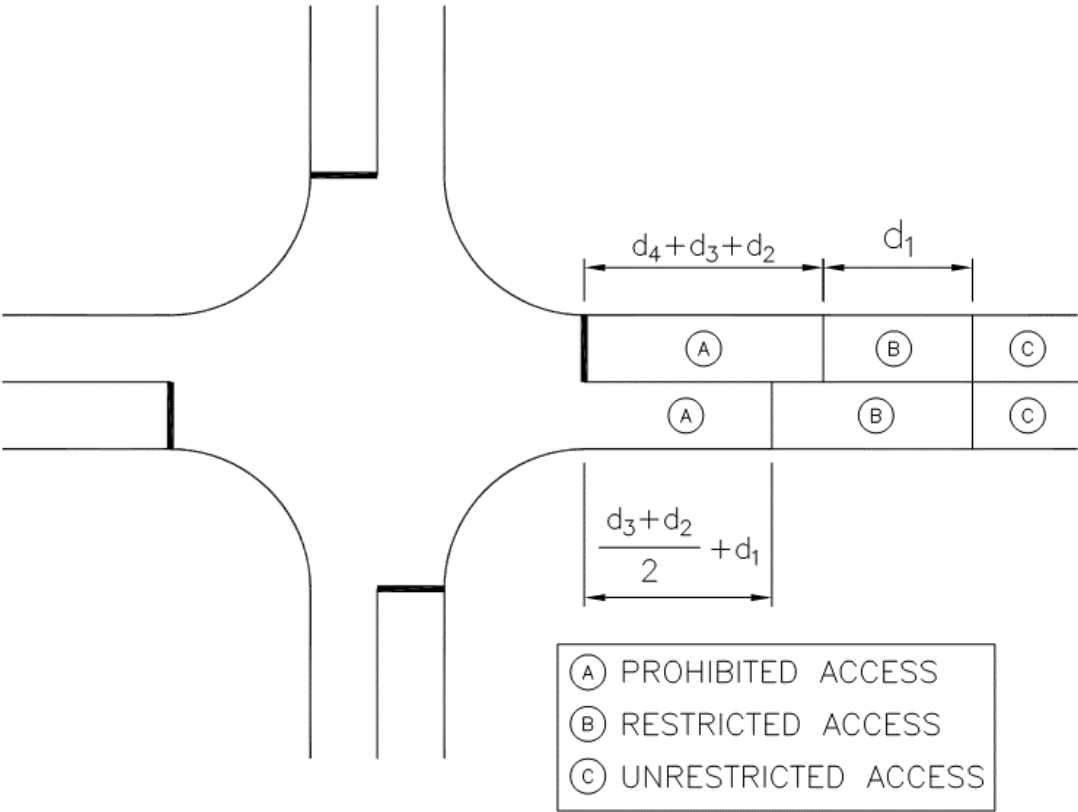


Figure 10-13 Functional Intersection Boundary Restricted Access Diagram



10.08.05 Driveway Alignment (Horizontal and Vertical)

The angle between the centerline of a driveway approach and the edge of a street travel way shall not be less than 85 degrees or greater than 95 degrees unless a “pork chop” or other

access control device is allowed. Where the edge of the roadway is curved, such as in cul-de-sacs, the angle will be measured from the tangential line to the travel way edge at the intersection of the driveway approach centerline.

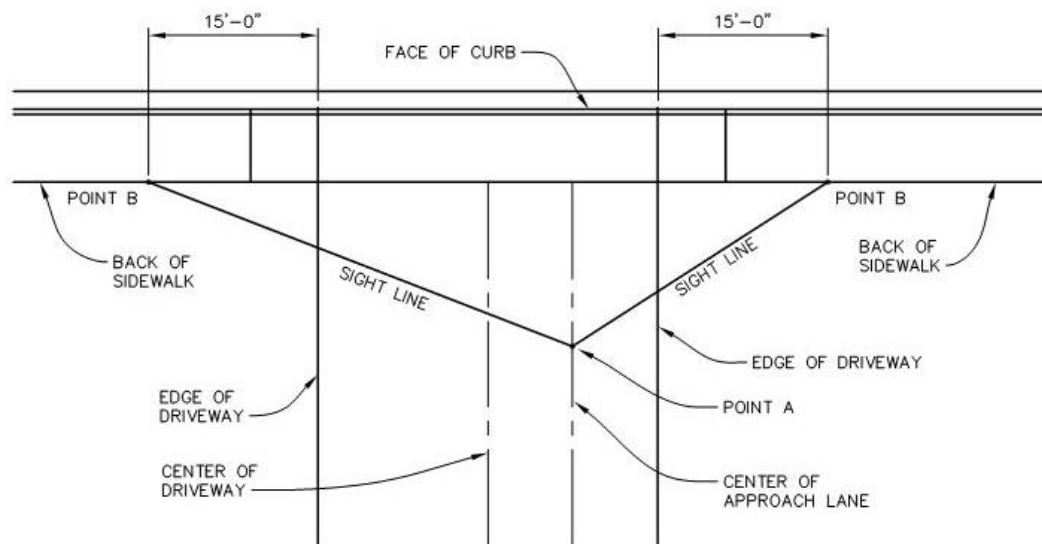
The vertical grade behind the driveway apron shall not exceed 5% for a distance of 12 feet beyond back of sidewalk or right of way line except for the alternate driveway type per **City of Auburn Standard Detail T-35** where the 5 foot driveway ramp grade may be up to 10%. Driveways shall be designed to preclude vehicles from dragging when entering or exiting the site.

10.08.06 Driveway Sight Distance

Minimum sight distance requirements for driveways are to be determined using the current edition of the WSDOT Design Manual M 22.01.22 (Chapter 1340). Easements may be required to meet sight distance requirements.

The minimum sight distance for pedestrian safety shall be as shown in **Figure 10-14** and determined as follows: The driver of an exiting vehicle shall be able to view a one-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 feet behind the back of the sidewalk.

Figure 10-14 - Pedestrian Sight Distance



10.08.07 Shared Driveway Access Roads

Residential shared driveway access roads may serve a maximum of 6 residential units except where a proposed single family residential unit, to be located on an existing lot, would exceed this threshold. Shared driveway access roads are privately owned and shall be maintained by the property owners who use them to access their property or as otherwise stipulated in the tract easement dedication documents or private agreements. Maintenance of shared driveway access roads shall not be the responsibility of the City.

Shared driveway access roads shall include storm drainage facilities in accordance with these standards. Shared driveway access roads shall have only a single connection to the

public/private roadway, except where an additional gated access exclusively for emergency vehicles and/or maintenance vehicles may be allowed.

The following requirements apply to shared driveway access roads except that one or more of the requirements may be waived by the City Engineer, or designee, for development of a single-family residence on an existing platted lot that only has access to an existing shared driveway where inclusion of the requirement would require additional property rights beyond the applicant's control, modification of existing building(s) and structure(s), impacts to critical areas, or other reason as deemed acceptable by the City Engineer:

- A. **Easement/Tract Width:** Set within dedicated and recorded easement or tract with a minimum width of 22 feet for access roads serving 2 or less residential units, 26.5 feet for access roads serving 3 or more residential units, 35 feet for access roads serving commercial use(s), and 41 feet for access roads serving industrial use(s).
- B. **Pavement Width:** Minimum asphalt pavement width of 20 feet for access roads serving residential unit(s), 24 feet for access roads serving commercial uses, and 30 feet for access roads serving industrial uses.
- C. **Turnaround:** All access road ends that are 150 feet or more from the connection to the public/private roadway connection shall include turnarounds. If a hammerhead configuration is utilized for the turnaround, it shall be designed per Figure D103.1 in Appendix D of the International Fire Code or equivalent as determined to be acceptable by the City Engineer, or designee. If a cul-de-sac is utilized for the turnaround, it shall be designed per the City of Auburn Design Standards. The turnaround area must be paved and lie entirely within the access tract or easement.
- D. **Length:** Maximum length of 600 feet as measured along the centerline of the access road to the centerline of the street to which the access road connects. Where an access road has multiple centerlines (due to a "T" or other discontinuous configuration, the total length is measured along all centerlines of the access road).
- E. **Grades/Curves:** Geometrics per **Section 10.04**.
- F. **Sidewalks:** Shared driveway access roads that serve 2 or less residential units or provide emergency access only do not require sidewalk along the access road. Access roads serving 3 or more residential units require sidewalk, curb and gutter along one side of the access road. Access roads serving commercial or industrial property(s) require sidewalk, curb and gutter along both sides of the access road. The minimum sidewalk width shall be 5 feet (not including curb) and shall be separated from the vehicular egress/ingress with curb and gutter. Where sidewalks are required and the residential units are along only one side of the access road, the sidewalk shall be placed on the side of the road with the residential units.
- G. **Signage:** Identified as a fire lane with pavement markings and/or signage per ACC 10.36.175(E) such that a minimum clear width of 20 feet, free of parked vehicles or other obstructions, is provided. Signed as private drives inclusive of all addresses being served off the access road per **City of Auburn Standard Detail T-26**.
- H. Edges of access roads without curb/gutter and sidewalk will have an asphalt wedge curb per **City of Auburn Standard Detail T-41**, along the edge(s) to which the roadway drains, if any. Wedge curb may be excluded/modified as required to accommodate drainage facilities serving the access road. Where

curb, gutter, and sidewalk are present along the shared access road, driveway connections to property(s) from the shared access road shall be by residential driveway apron.

- I. Driveway connections to property(s) on the access tract are configured such that vehicles backing out of the driveway are able to turn around without entering another property.

10.08.08 Controlled Driveways

Where a driveway connection meets a signal warrant that cannot be addressed without a signal or roundabout, the City Engineer may allow signalized or roundabout access to a public street from a private access. In such situations, dedication to the City of any right-of-way necessary for maintaining and operating the intersection will be required. Additional mitigation measures may be required to ensure safe and efficient access to the public street. The private leg of the intersection within the right-of-way shall be designed to the applicable public street standard as determined by the City Engineer.

10.08.09 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 City Engineer, or designee:

- A. Median Islands
- B. Mountable Curbs
- C. Pork Chops
- D. Signage (turn restriction signage must be placed in the right-of-way)

10.08.10 Emergency Vehicle Access Driveways

Local street networks with over 30 dwelling units that do not have more than one street connection to a collector or arterial roadway are required to have a second access from the local street network to a collector or arterial via an emergency access driveway. The emergency vehicle access must be gated and restricted to emergency vehicles only with a Knox lock. Non-motorized access may also be provided at the emergency vehicle access. Emergency access roadways shall meet the requirements for shared access driveways.

10.09 Sidewalks

Streets shall include sidewalks as shown on the typical sections in **Section 10.03** and as designated in the CTP. The City Engineer may determine that sidewalk widths that differ from the typical sections and CTP are required.

Sidewalks with landscape strips shall be per **City of Auburn Standard Detail T-13**.

Sidewalks without landscape strips shall be per **City of Auburn Standard Detail T-15**.

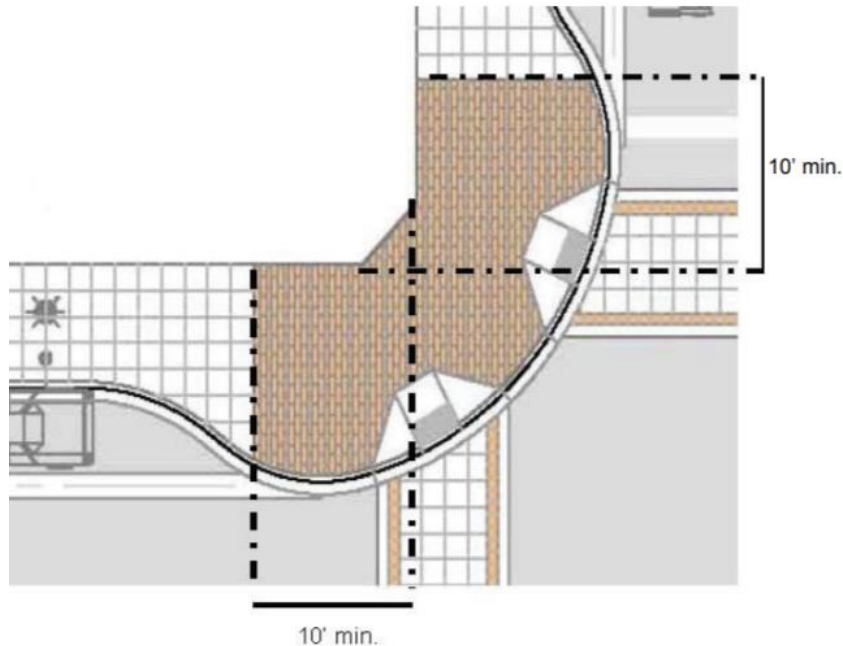
Pervious sidewalks shall be per **City of Auburn Standard Detail T-14**.

10.09.01 Downtown Sidewalks

The following requirements apply to sidewalks subject to DUC zone guidelines:

- A. Shall be per **City of Auburn Standard Detail T-15** and will also include a 2-foot x 2-foot square scoring pattern with a light broom finish with minimal scoring depth to allow for easy cleaning.
- B. Shall be a minimum of 10 feet in width except sidewalks along A Street NE/NW may be 7 1/2 feet wide at some locations, as determined by the City Engineer.
- C. Shall include a single row of bricks to be used at transition points such as driveways per in **City of Auburn Standard Detail T-44**.
- D. Shall include street trees per **City of Auburn Standard Detail T-06**. Where the tree planter area encroaches upon the minimum pedestrian clearance width, a tree grate shall be required per **City of Auburn Standard Detail T-30**. Pervious concrete sidewalks shall not be allowed where tree grates are required.
- E. Shall include decorative street corners as follows:
 - i. Corner bulbs shall be integrated into corners where on-street parking is allowed, dependent upon the adjacent street geometry, presence of bus routes or other large vehicle use, as determined by the City Engineer.
 - ii. All street corners where a corner bulb is required or where both legs of the street corner have sidewalks that are at least 10-feet wide shall be constructed of brick pavers in a rectangular pattern as shown in the figure below. The specific type of brick pavers shall be approved by the City, including shape, size, and color. The brick pavers shall be set on a concrete base.
 - iii. The bulb-out layout and limits shall generally be as depicted in **Figure 10-15**. The City Engineer, or designee, shall determine specific design parameters for bulb-outs on a case-by-case basis.
 - iv. Construction of a new or replaced curb ramp on a street corner that does not meet the DUC zone standards shall require the street corner to be re-built in its entirety to meet the DUC zone standards.

Figure 10-15 Downtown Street Corner Illustration



10.09.02 Meandering Sidewalks

The City Engineer may approve meandering sidewalks along a corridor when the sidewalk, landscaping, lighting, signing, right-of-way, and other surface features are integrated into the design of the improvements. Additional right-of-way (or an easement) may be required to accommodate the meander of the sidewalk and other surface features.

10.09.03 Accessibility

All sidewalk cross slopes shall be designed to 1.5% and not exceed 2%. Sidewalk grade shall not exceed the grade of the adjacent street centerline, except at driveways and curb ramps. All sidewalks shall maintain a minimum walking zone of 5 feet in width, free of all obstructions including utilities, signage, street trees, furniture or other elements, permanent or temporary.

Sidewalks require a minimum overhead clearance from trees, street signs, and vegetation of 7-feet and a minimum overhead clearance of 10-feet from all other objects.

10.09.04 Curb Ramps

See WSDOT Standard Plans F-40.12, F-40.15 & F-40.16.

Curb ramps shall be provided at all intersections and pedestrian crossings having vertical curb sections. Every curb ramp shall have at least one receiving ramp. Existing curbed radius return access points also require curb ramps. All curb ramps shall have detectable warning patterns formed with manufactured truncated domes in accordance with WSDOT Standard Plan F-45.10. Truncated dome color shall be yellow except in the downtown urban core area where truncated dome color shall be brick red. Pervious cement concrete ramps and landings shall not be allowed.

For any deficient element that does not meet ADA requirements, designers shall document the deficiency via a Maximum Extent Feasible (MEF) document stamped and signed by a

professional engineer. The MEF document will be reviewed for acceptance by the City. MEF's shall also be documented on the Plans with a notation indicating the deficiency and that the curb ramp was designed to the MEF per **Chapter 3, Appendix C** of these standards.

Trenching work and the associated patching and surface restoration that traverse crosswalks/pedestrian pathways (crossings) shall not trigger the requirement to replace curb ramps that do not meet current ADA standards at the crossing, unless, the cumulative width of surface restoration at the crossing for all work associated with the project equals or exceeds 50% of the crossing width, as measured from curb face or pavement edge at the pedestrian pathway entry into the vehicle travel way to curb face or pavement edge at the pedestrian pathway departure from the vehicle travel way. This distance is measured through medians, islands, and other pedestrian refuge areas. If the cumulative width of all surface restoration at a crossing equals or exceeds 50% of the crossing width, then the curb ramp(s) that intercept the impacted crosswalk that do not meet current ADA standards must be upgraded/replaced, including signal push-button replacement/relocation where applicable per **Section 10.21.12** of these Standards.

Whenever any portion of a curb ramp or intersection corner without a curb ramp is replaced or upgraded for any reason, the entire curb ramp or a new curb ramp is required to meet ADA standards and installation of curb ramp(s) on the receiving end(s) is required if not already present.

10.09.05 Crosswalks

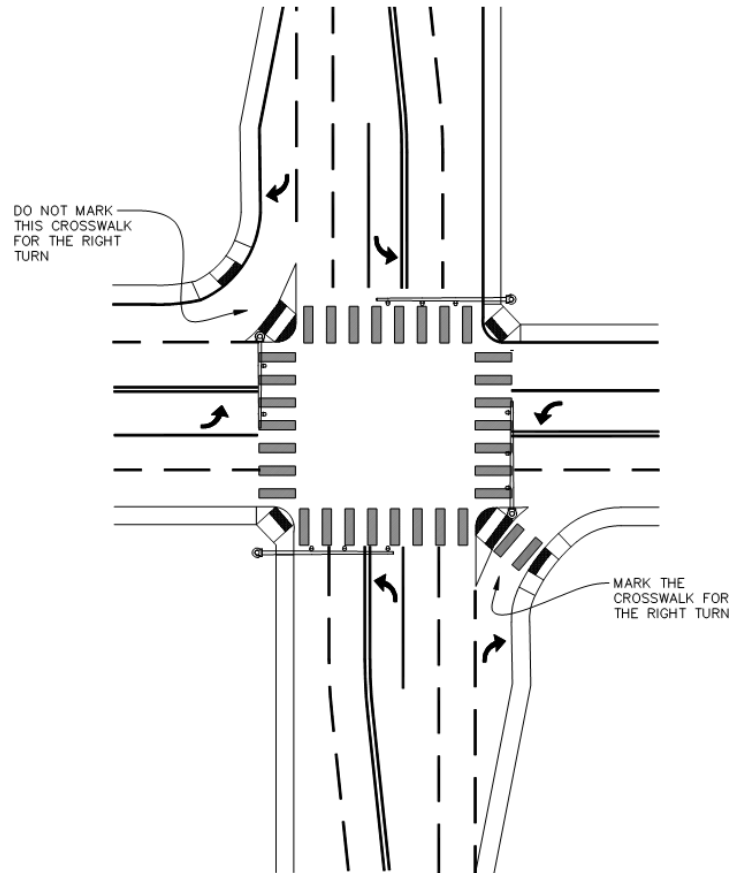
Per RCW 46.04.160, crosswalks exist at all roadway intersections, whether marked or unmarked, and regardless of whether there are sidewalks at the intersection. Crosswalks also exist at non-intersection locations where they have been established with crosswalk markings (such as a midblock crossing). For the purposes of these standards, intersections are as defined in Chapter 1 of these standards.

Marked crosswalks shall be per WSDOT Standard Plan M-15.10 except where DUC zone standards apply marked crosswalk shall be per **Section 10.09.06**.

Crosswalks will be marked at the following intersection locations, except where pedestrian facilities are NOT present:

A. Traffic signal and stop controlled intersections as shown in the figure below:

Figure 10-16 Marked Crosswalks at Signalized Intersections



- B. Yield controlled approaches to roundabouts.
- C. Stop controlled approaches at intersections within the Downtown Urban Center.
- D. Stop controlled approaches to Arterial Streets (Principal or Minor Arterials).
- E. Stop controlled approaches at the intersection of two or more arterial and/or collector Streets.
- F. Stop controlled approaches of Local Streets to Non-Residential Collector Streets.

Crosswalks at non-intersection locations, and intersection locations not listed above, are by-default not marked and when they are marked require enhancement(s) that reduce traffic speeds, shorten crossing distance, increase driver awareness of the crossing, and/or provide active warning of pedestrian presence. Selection of appropriate enhancements requires analysis and documentation by a professional engineer. Enhancements may include, but are not limited to, signage, rapid rectangular flashing beacon(s), and/or bulb-outs.

Permanently closed crosswalks across arterial and collector streets shall have signage indicating that pedestrian crossing is prohibited (**No Pedestrian Crossing Sign, MUTCD R9-3**). A supplementary plaque with arrow (**Use Crosswalk Plaque w/Arrow MUTCD R9-3bP**) will be included with the no pedestrian crossing sign where the closed crosswalk is at an intersection where one crosswalk is closed, and the adjacent crosswalk is open and at locations where an open crosswalk exists only in one direction from the closed crosswalk.

10.09.06 Downtown Crosswalks

Marked crosswalks subject to DUC zone standards shall be per **City of Auburn Standard Detail T-43**.

An existing marked crosswalk that does not meet the requirements of the Guidelines shall be re-built in its entirety to meet the requirements of the Guidelines with the any of the following construction activities:

- A. On an arterial street, full depth pavement re-construction across half or more of the crosswalk width.
- B. On a non-arterial street, surface pavement restoration across half or more of the crosswalk width.

The crosswalk width is measured from face of curb or pavement edge at the pedestrian pathway entry into the vehicle travel way to curb face or pavement edge at the pedestrian pathway departure from the vehicle travel way. This distance is measured through medians, islands, and other pedestrian refuge areas.

10.10 Bikeways

See **City of Auburn Standard Detail T-17** and WSDOT Standard Plan M-9.50.

Bikeways shall be incorporated into street and trail networks in accordance with the CTP and the typical sections in **Section 10.03**.

Bikeways shall be designed in accordance with AASHTO's current "Guide for the Development of Bicycle Facilities", the MUTCD, this section, and applicable City of Auburn standard details.

The City of Auburn's bicycle network consists of various classification bikeways. Typically, these bikeways are shared with other transportation modes, although they may be provided exclusively for bicycle use. Bikeways are categorized as follows: Class I, II, or III Bikeways.

10.10.01 Class I Bikeway

Class I Bikeways are facilities shared with other non-motorized modes and are physically separated from motorized vehicle roadways. For the purposes of this section, Class I Bikeway design standards are for bicycle facilities that generally parallel a roadway with minimal crossflow by motor vehicles. When required, Class I Bikeways shall be designed for two-way traffic. Class I Bikeways that are part of the City's Future Trails and Bicycle Network shall be public and shall be located within public right-of-way, tracts or easements.

Class I Bikeways shall be either asphalt or cement concrete, at the discretion of the City Engineer or designee. Asphalt bikeways shall have a minimum pavement section of 2 inches of CL ½" asphalt concrete pavement over 6 inches of Crushed Surfacing Base Course (CSBC). Cement concrete bikeways shall be per **City of Auburn Detail T-13**. When the California Bearing Ratio (CBR) of the existing soil is 5 or less, an additional 6 inches of gravel base shall be required. When the trail is also utilized as a vehicular service road, the pavement design shall be the Access Road classification on **Table 10-5**. Class I Bikeways shall be a minimum width of 10 feet and be separated from the vehicular travel way by a landscape strip or other

physical buffer with a minimum 5 foot width.

Where Class I Bikeways are intersected by driveways appropriate signing and pavement markings shall be provided consistent with requirements for midblock crossings.

10.10.02 Class II Bikeway

Class II Bikeways, or “Bike Lanes,” are incorporated within the roadway section adjacent to vehicle travel lanes. Bike lanes are exclusive one-way bicycle facilities delineated by pavement markings and signage. Bicycle traffic is carried in the same direction as the adjacent motorized vehicle traffic.

Bike lanes shall have a minimum width of 6 feet as measured from nearest edge of the travel way to face of curb, edge of pavement, or edge of parking lane. Bike lanes shall have the same pavement section as the adjacent roadway. Buffering from the vehicle travel ways may be required as determined by the City Engineer.

10.10.03 Class III Bikeway

Class III Bikeways, or “Shared Lanes,” are facilities shared by bicyclists and motorized vehicles. Class III Bikeways may or may not be delineated with shared use pavement markings and signage as determined by the City Engineer. Generally, lower-speed/lower-volume streets are adequate for bicycle travel, so additional signing and pavement markings for bicycle use are unnecessary.

10.11 Landscape Strips

Landscape strips are required per the typical sections in **Section 10.03**. Landscape strips are also included as part of separated trails/Class I Bikeways. Landscape strips shall be located between the back of the curb and the sidewalk. Landscape strips shall meet the following requirements:

- A. 5 foot minimum width.
- B. Minimum 8 inch deep amended soils as bedding over minimum 4 inch layer of scarified/tilled base soils all free of rocks, construction debris, slurry, and other construction material.
- C. Graded towards the curb at approximately 1.5%. Other grades may be allowed where it can be demonstrated to not cause drainage or maintenance issues.
- D. Planted with grass or shrubs, vegetation groundcover, and street trees. Shrubs and vegetative groundcover must be low maintenance, minimal debris dropping, and not present a tripping hazard to pedestrians. Landscape strips shall not include gravel, rocks, or other aggregate. Artificial turf may be placed in landscape strips subject to the following requirements:
 - i. Must have lifelike individual blades of grass that emulate natural turf in look and color (green).
 - ii. Indoor or outdoor plastic or nylon carpeting is not allowed.
 - iii. Pile height must be at least 1.5 inches and have a face weight of 50 ounces per square yard.
 - iv. A minimum eight-year manufacturer’s warranty that protects against color fading and decreased pile height is required.
 - v. Must not utilize rubber infill.

- vi. Must be free of tears, bulges, wrinkles, ripples, and frayed edges.
 - vii. Must be anchored.
 - viii. Must be installed with the grain pointing in a single direction.
 - ix. Edges must be trimmed to fit against all regular and irregular edges to resemble a natural look.
 - x. Must be a minimum water permeability of thirty inches per hour per square yard after installation.
- E. Driveways, lighting, fire hydrants, junction boxes, water meters and other appurtenances shall be configured such that no landscape strip has a net landscaped surface area (landscape strip area minus areas occupied by non-landscape features) of less than 50 SF and no portion of a landscaped surface within a landscape strip has a width less than 2 feet.

Landscape strips along local residential streets may be constructed as bioretention swales to provide low impact development (LID) surface water management. Bioretention swales in the public right-of-way shall be designed to collect, treat, and infiltrate runoff from the public right-of-way. If, after runoff from the public right-of-way has been accounted for, additional capacity remains in the bioretention swale, the bioretention swale may be utilized to treat and infiltrate runoff from adjacent private single family residential property(s) with a maintenance agreement between the City and property(s) draining to the swale that requires those property(s) to maintain the swale in perpetuity. The bioretention swale shall be designed and constructed in accordance with the SWMM. Street trees shall not be placed in landscape strips constructed as bioretention swales. Instead, required street trees shall be placed on adjacent private properties and/or tracts.

10.12 Street Trees

See **City of Auburn Standard Detail T-06**.

Street trees are required for local residential streets, residential collector streets, and streets within the DUC zone (except along Auburn Way).

10.12.01 Species Selection, Placement, and Spacing

Where street trees are required, they shall be installed at a spacing of 40 feet on center or no closer than 1-1/2 times the mature diameter of the tree canopy, whichever is greater. Street trees shall be placed such that the center of the tree trunk is at 2-1/2 feet from the back of the adjacent curb or centered in the landscape strip, whichever is greater. Selection of tree species, placement, and spacing requires consideration of the following:

- A. **Sight Lines:** Trees shall be placed so that they do not obstruct the view of any street intersection, driveway, or visibility of any traffic control device or sign. Sight distance triangles may be required to analyze and confirm visibility at street intersections is not blocked by tree(s).
- B. **Planting Next to a Building:** Where a building is placed close to the sidewalk, the mature size of a tree should be considered when selecting species. Trees with a pyramidal, columnar, or oval shaped canopy are preferable; a tree with a round head is generally unsuitable in this situation.
- C. **Overhead Wires:** When trees must be planted directly under or when the mature canopy is within 12 feet of overhead utility lines, species with a mature maximum height of 25 feet or less must be selected.

- D. **Street Lighting:** Street and pedestrian lights should be placed between street trees. The trees shall be located at least half their mature canopy width or 20 feet from street lights, whichever is greater.
- E. **Underground Utilities:** Trees shall be planted to avoid impacts on underground utilities.
- F. **Clearance:** Trees shall be pruned as they grow to provide at least 8 feet vertical clearance above sidewalks and 14 feet of vertical clearance above roadway surfaces.

Table 10-11 provides a selection of acceptable species of trees. Many other trees are appropriate and alternative selections may be proposed if desired. Alternative plant choices must be evaluated and approved by the City Engineer, or designee. Needled evergreens and trees with mature heights of over 35 feet are not allowed.

- A. **Round:** These are generally wide spreading trees that need more space than other shapes.
- B. **Oval:** Taller than they are wide and cause less interference with traffic.
- C. **Columnar:** Useful in locations where there is little available room between the street and buildings, awnings, or other features. Branches of columnar trees tend to grow up rather than out. Many branch lower than other types of trees without causing problems with traffic or pedestrians.
- D. **Pyramid:** Also called cone, typically broad at the base of the canopy and are somewhat pointed at the top. Planted close together, pyramidal trees can screen unwanted views or create vistas. Lower branches sometimes droop with age and may have to be limbed up in later years to provide the needed clearance.
- E. **Vase:** (sometimes also called “v-shaped”) have canopies that are narrow toward the bottom and broad at the top. V-shaped trees may have arching branches that form a canopy over both street and sidewalk. They generally do not cause problems with overhead power lines or traffic.

Table 10-11 Street Trees

Common Name	Mature Height (ft.)	Mature Canopy Width (ft.)	Sidewalk Landscape Areas	Medians	Canopy Shape
Amur Maple 'Flame'	20	20	x		Round
Mt. St. Helens Plum 'Frankthrees'	20	20	x	x	Round
Rocky Mt Glow Maple 'Schmidt'	25+	15	x	x	Round
Flowering Plum 'Krauter Vesuvius'	30	15	x	x	Round
Pear 'Autumn Blaze'	30	25	x		Round
Pacific Sunset Maple 'Warrens Red'	30	25	x	x	Round
Serviceberry 'Princess Diana'	20	15	x		Round
Serviceberry 'Autumn brilliance'	20	15	x		Round
Queen Elizabeth Maple 'Evelyn'	35	30	x		Oval
Red Fox Katsura	30	16	x	x	Oval
Frans Fontain Hornbeam	35	15	x	x	Columnar
Cherry 'Columnarus'	35	15	x	x	Columnar
Cherry 'Spire'	30	10	x	x	Columnar
Pyramidal European Hornbeam 'Fastigiata'	35	25	x	x	Columnar
Red Obelisk	35	12	x	x	Columnar
"Marilee"	24	10	x	x	Pyramid
Pear 'Redspire'	35	25	x	x	Pyramid
Linden 'Redmond'	35	20	x	x	Pyramid
Chancelor Linden 'Chancole'	35	20	x	x	Pyramid
Flowering Cherry 'Amanogowa'	20	6	x	x	Vase
Flowering Cherry 'Akebono'	25	25	x		Vase

10.12.02 Root Direction Devices

Trees within sidewalks, landscape strips, and on public or private property that are within 10-feet of a street or sidewalk require root barrier devices to deflect tree roots downward into the soil. The root barrier will be placed on all sides of the tree root ball. For a tree outside the street cross section, the barriers may be omitted on the side of the tree root ball that is parallel and opposite to the street. Plan submissions shall indicate the location of root barriers and provide a specification sheet on the product to be used.

10.13 Ground Cover

Ground cover and shrubs plantings in landscape strips and medians shall adhere to the requirements of this section. Except street trees, landscape strips and median plantings shall have a mature height of less than 3 feet. **Table 10-9** provides several acceptable species of ground cover and shrubs. Many other types of plants may be appropriate and alternative selections may be proposed if desired. Alternative plant choices must be evaluated and approved by the City Engineer, or designee. The SWMM shall be utilized to select groundcover plantings within the wet areas of bioretention facilities.

Groundcover shall be planted from either four-inch pot with 12-inch spacing or one-gallon pot

with 18-inch spacing. Alternative spacing of particular species may be approved by the City Engineer, or designee, if documentation concerning the effectiveness of the groundcover is submitted with the landscape plan.

Table 10-12 Ground Cover

Common Name	Mature Height (ft.)	Can be utilized in: M (Medians), L (Landscape Strips)	Minimum Planting Area Width (ft.)
Kinnikinnick Bearberry	0.5 to 1	M, L	5' to 6'
California Wild Lilac	1.5	M	6' to 8'
Bearberry Cotoneaster	< 2	M	5 to 6'
Purple Leaf Winter Creeper	1.5	M	6' to 8'
Blue Chip Juniper/Hughes Juniper	1	M	6' to 8'
Siberian Carpet Cypress	1.5	M	7' to 8'
Evergreen Bramble	1	M	6'
Mother of Thyme	0.25	M	1
Otto Lyuken	3	M	6
Japanese Barberry	4	M	5
Wings of Gold	3 – 4	M	3
Periwinkle	0.5	M	1.5'

10.14 Irrigation Systems

Irrigation systems for landscape strips in the public right of way shall conform to ACC 12.12.236 and shall adhere to the standards specified in the City of Auburn Construction Standards.

10.15 Mailboxes

See **City of Auburn Standard Details T-07, T-08 & T-09.**

Locating and installing mailboxes in connection with the construction or reconstruction of a City street shall follow AASHTO and Post Office guidelines.

Mailboxes shall be located a minimum of 2 feet back from the face of curb on streets which have a curb. For streets without a curb, setbacks shall be determined using ASSHTO standards. When locating mailboxes, access, sight distance, parking, and landscaping requirements shall be taken into account. Final locations shall be detailed on the civil plans and approved by the serving Post Office and the City Engineer.

When mailboxes are located in the sidewalk, individually or in clusters, sidewalks shall be widened to provide a minimum 5 feet of clearance around the mailboxes. Widening of the sidewalk may require the dedication of additional right-of way or easement.

The owners or residents served by mailboxes will install and thereafter maintain their own individual, clustered, or separated mailboxes as instructed by the U.S. Postal Service.

10.16 Illumination

10.16.01 Street Lighting Design

Street lighting design shall be in conformance with the design criteria in the most recent edition of the IES Lighting Handbook (Illuminating Engineering Society of North America) and applicable WSDOT and City of Auburn Design and Construction Standards.

Table 10-13 provides minimum lighting design criteria, lamp attachment types, heights, davit arm lengths, and typical spacing for various roadway classifications in the City. The schedule is based on typical straight roadway sections with a staggered lighting configuration. Wider road sections, curves, intersections, cul-de-sacs, single sided lighting configurations require additional analysis to determine the spacing, height, and davit arm lengths required to achieve the required lighting levels.

Street light standards shall be staggered from one side of the roadway to the other, except where site constraints make single sided lighting more feasible and equally effective. Street lights on streets with median islands 8 feet in width and greater shall be located in the medians using dual davit arms to light the street on both sides of the median. The Applicant shall provide project specific lighting calculations that demonstrate minimum illumination levels will be met. Light level calculations shall be done ignoring any existing substandard luminaires (PSE lights on wood poles, etc.).

Special consideration shall be given to light levels at crosswalks, curves, conflict points and street ends. The locations of street lights shall take into consideration any obstacles which may screen or impede lighting levels such as street trees and awnings. Minimum separation between street trees and street lights shall be 20 feet or $\frac{1}{2}$ the mature tree canopy width, whichever is greater.

Marked crosswalks at traffic signal controlled intersections and sidewalks in the Downtown Urban Corridor (DUC) zone shall be lit to an average of 2-foot candles. All other marked crosswalks will be lit to a minimum of 1- $\frac{1}{2}$ times the required average light level per **Table 10-13**.

10.16.02 Luminaries

All City street lights shall be LED. Acceptable light fixtures/luminaries are shown on **City of Auburn Standard Detail T-37**. Use of other fixtures requires documentation showing they meet all applicable City standards and approved by the City Engineer, or designee.

Street and Pedestrian Luminaires shall operate on 240 Volt AC and all luminaires shall be full cutoff. All luminaires shall be provided with wattage labels for positive identification of Lamp (See **Table 10-10**). A maximum of 5% voltage drop across each circuit will be permitted.

All City Street lights must support dimming and have PCR7 photocell receptacle and utilize a Sensus wireless control node.

Table 10-13 Lighting Design Criteria

Street Classification	Lamp Attachment Type (See City of Auburn Standard Detail T-37)	Avg. Light Level (ft-candle)	Max. Uniformity Ratio	Min. Light Level (ft-candle)	Luminaire Mounting Height (ft)	Spacing* (ft)	Davit ** Arm Length (ft)
Principal Arterial	Type A	1.4	3 To 1	0.2	35**	190	12
Minor Arterial	Type B	0.9	3 To 1	0.2	35	190	12
Minor Arterial w/Center Turn Lane or Median	Type B	0.9	3 To 1	0.2	35	190	12
Non-Residential Collector	Type B	0.9	3 To 1	0.2	35	200	12
Residential Collector	Type D	0.6	3 To 1	0.2	30	175	14
Residential Collector w/Center Turn Lane or Median	Type D	0.6	3 To 1	0.2	30	175	14
Local Non-Residential	Type D	0.6	3 To 1	0.2	35	160	12
Rustic Roads*		N/A	N/A	N/A	N/A	N/A	N/A
Local Residential and Local Residential Alternate	Type F	0.4	6 To 1	0.1	30	185	8

* Lighting for rustic roads shall be at intersections only and meet the design criteria for Local Residential Roads.

** Davit arm lengths may change based on approved roadway cross section.

10.16.03 Light Poles

City street light poles shall be “cobra head” style per **City of Auburn Standard Detail T-19** except for streets within the DUC zone that shall be per **City of Auburn Standard Detail T-28 or T-39**. An alternate street light may be utilized along local residential streets per **City of Auburn Standard Detail T-29**.

Light Standards handholes shall be four inches by six inches nominal non-flush type in accordance with **City of Auburn Standard Detail T-19** with tamper resistant screws.

All light poles shall be placed on a foundation. Foundations for light standards shall conform to **City of Auburn Standard Details T-19, T-28, or T-29**.

Luminaire wiring, conduit, and pole placement within street cross sections that have curb, gutter, and sidewalks shall be per **City of Auburn Standard Detail T-18**.

10.16.04 Service Cabinet, Foundation, Conduit

See **City of Auburn Standard Detail T-21**.

All new luminaires shall be connected on an electrical circuit that is connected to a power source through a service cabinet. The service cabinet shall be within 50 feet of the Puget Sound Energy (PSE) point of service connection.

Service cabinets shall be installed within right-of-way, easement, or City property behind the sidewalk and at locations that do not impede maintenance access or sight distance. The cabinet shall be located in the center of the system so there are a near equal number of lights being

served on separate circuits from each side of the cabinet. The cabinet shall be labeled with "COA Lighting" and service site address.

The number of luminaires per service will be based upon the type of luminaire and the capacity of the service. Testing may be required to determine if additional luminaires may be added to an existing service.

Service cabinets shall be in conformance with the City of Auburn Engineering Construction Standards. All new luminaires shall have a 7 pin PCR7 receptacle and come with a Sensus VantagePoint wireless control node.

Street light conduit shall be per the City of Auburn Construction Standards.

10.17 Junction Boxes

See **City of Auburn Standard Detail T-20**.

Junction boxes shall be of the type specified on the plans and shall conform to the requirements of WSDOT Standard Plan J-40.10. All junction boxes shall be locking.

Type 1 junction boxes shall be located adjacent to the sidewalk within the landscaping strip, if provided, or adjacent to the back of sidewalk if there is not a landscape, or within the shoulder of a non-curbed roadway. Junction boxes remaining or placed within the sidewalk or walking paths shall have non-slide lids.

10.18 Survey Monuments

See **City of Auburn Standard Detail T-46**.

Survey monuments shall be placed or replaced in accordance with WAC 332-120 (Survey Monuments – Removal or Destruction), and RCW 58-09.120 and good practice in land surveying. Monuments are required along the centerline of improvement of all new or reconstructed streets. Monuments shall be placed at intersections, points of curvature (PC), and points of tangency (PT).

Unless approved otherwise by the City Engineer or designee, ground disturbing activities within 25 feet of an existing survey monument requires securing of a permit from the Department of Natural Resources in advance of those activities. All existing survey monuments that are disturbed, lost, or destroyed during construction shall be replaced by a registered land surveyor registered in the State of Washington at the expense of the responsible party. Any monuments set shall be permanently marked with the certificate number of the Professional Land Surveyor (PLS) setting it (which shall be the same PLS that prepares and certifies the associated monument recording information).

10.19 Bollards

See **City of Auburn Standard Detail T-03**.

When necessary to deny vehicle access to an easement, tract, or trail (except for maintenance vehicles) the point of access shall be closed by a line of bollards. These shall include one or more fixed bollards on each side of the traveled way and removable, locking bollards across the traveled way. Spacing shall provide one bollard on centerline of the trail and other bollards at a spacing of 3 feet on center. Where pedestrian access is intended, bollards shall include at least one space between them of 5 feet. Bollards are considered fixed roadside objects and shall meet separation requirements described in **Section 10.17**.

Emergency vehicle access roads shall not be blocked with bollards. Emergency vehicle access roads will be blocked with a gate and Knox-lock.

10.20 Bus Transit Facilities

Transit facilities in the City of Auburn will be coordinated with the relevant transit agency.

When determined appropriate by the City Engineer, or requested by a transit service agency, an applicant for new or expanded development is required to consult with King County METRO, Pierce Transit, Sound Transit, and/or the Muckleshoot Indian Tribal Transit to determine the practicality of how the site can be served by transit-oriented improvements such as bus pullout lanes, bus stops, or other appurtenances.

Bus stops are located, designed and installed as part of a cooperative effort between the City and the operating transit agency. Bus stops are managed as part of a right of way use permit granted by the City to the operating transit agency. In general bus stop location and design decisions should follow the facility design guidelines of the operating transit agency.

10.20.01 Bus Stops Locations

In general bus stop location and design decisions should follow the facility design guidelines of the operating transit agency. The following are guidelines that indicate where bus stops are appropriate:

- A. Projected or existing passenger boardings demand warrant a stop.
- B. The stop is not at a location where traffic level of service standards are not being met or where the stop would cause traffic operations to drop below traffic level of service standards.
- C. The stop does not obstruct minimum required sight distances.
- D. The location meets the facility guidelines and fleet specifications of the operating transit agency.
- E. The stop is required to meet all applicable ADA requirements.

10.20.02 Bus Stops Features

In general bus stop location and design decisions should follow the facility design guidelines of the operating transit agency. The following are some guidelines that would indicate what type of treatment would be appropriate by type of bus stop.

- A. Shelters should be installed at bus stops with an existing or estimated 25 or more boarding per day.
- B. Benches should be installed at bus stops with an existing or estimated 15 or more boarding per day.
- C. Trash receptacles should be installed and maintained by the operating transit agency at all bus shelters. A sign should be placed indicating that the shelter stop is maintained by the operating transit agency and giving specific contact information to report problems with the stop including a phone number.
- D. At all bus stops experiencing 15 or more boarding per day trash receptacles may be placed by the City or adopt a spot group and should be maintained by the City or the adopt a stop group.
- E. Information schedules and schedule holders shall be placed at all inbound stops (stops where buses are headed toward a major Central Business District), at all transfer points and at heavily used outbound stops.

- F. Additional bus stop lighting should be provided at locations where lighting levels are determined to be less than 1 foot candle.

10.20.03 Bus Pullout Lanes

The City Engineer may determine that bus pullout lanes are required where bus queuing or staging is required. In making this determination, the City Engineer will consider the following:

- A. Traffic volumes, bus frequency, and ridership volumes.
- B. Traffic impacts of an in-lane stop vs a pullout.
- C. Posted speed limits.

Bus pullout locations shall meet the following requirements:

- A. Placement of bus pullouts shall be on the far side of signalized intersections and non-signalized intersections immediately following the intersection. Distance between pullouts should not be less than 1,000 feet.
- B. Pullouts should be constructed on both sides of a two-way street in a complementary pair.
- C. When locating a bus pullout consideration shall be given to existing access points and where passengers have access to sidewalks, crosswalks, ramps, or other pedestrian facilities. Consideration shall also be given to trip attractors, and activity centers.
- D. Bus pullouts shall be designed to provide for a bus leaving the pullout lane to enter traffic with minimum required entering sight distance per AASHTO.
- E. Bus pullouts shall be located along roadways meeting minimum stop sight distance requirements per AASHTO.

10.21 Traffic Control Facilities

Traffic control facilities are all signs, signals, markings, medians, curbing, and other features used to regulate, warn, or guide traffic. All traffic control devices shall meet the requirements of the MUTCD and the standards herein.

10.21.01 Median Islands

The City Engineer may determine that a median island is needed to provide the following:

- A. Manage/restrict access along a corridor.
- B. Provide a traffic calming element.
- C. Provide pedestrian refuge.
- D. Improve roadway aesthetics.
- E. Separate opposing travel lanes.

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:

- A. All edges shall require concrete curb per WSDOT Standard Plan F-10.12. Median edges towards which runoff flows shall include concrete curb and gutter per WSDOT Standard Plan F-10.12. The face of curb shall be offset at least 1 foot from the edge of adjacent travel way.

- B. Median ends shall include reverse curves of the curb lane with 20 foot minimum radii to accommodate turning vehicles and street sweeping.
- C. Minimum median width is 4 feet.
- D. Median landscaping is not allowed on medians less than 9 feet wide and shall conform to the requirements of **Sections 10.11, 10.12 and 10.13**. Landscaped medians shall include irrigation systems. Landscaped medians shall provide a 1 foot wide, 6-inch thick, concrete maintenance apron around the perimeter of the median behind the curb.
- E. Median hardscape shall be stamped concrete with colors and patterns as determined to be required by the City Engineer or designee.
- F. Street lights on streets with median islands 8 feet in width and greater shall be located in the medians using dual davit arms to light the street on both sides of the median.
- G. Medians with street lights and/or landscaping will be designed to allow maintenance of the lights or vegetation without requiring full closure of a travel direction(s).

10.21.02 Mountable Curbs

Mountable (also referred to as “C” Curbs), are curbs used for the restriction of turning movements and to aid in the channelizing of traffic. The City Engineer may determine that mountable curbs may be required in order to control access along a corridor within the restricted zones of any functional intersection boundary as defined in **Section 10.08.04**.

Mountable Curbs constructed to retrofit existing roadways shall be constructed per **City of Auburn Standard Detail T-32**. Mountable Curbs constructed on new roadway surfaces shall be cast-in-place curb per **City of Auburn Standard Detail T-47**. All Mountable Curb shall be painted to match the adjacent roadway striping (yellow or white) and shall be marked with raised pavement markers and flexible tubular delineators at the beginning and end sections as shown on **City of Auburn Standard Detail T-32**. Mountable curbs shall be designed to account for roadway drainage.

10.21.03 “Pork Chop” Islands

“Pork Chop” Islands are barrier islands used to restrict turning movements at driveways. The City Engineer may determine that a pork chop is required where left turns are restricted and other physical barriers such as median Islands or curbing is not feasible. When required, pork chops shall be accompanied by appropriate turn restriction signage in the right-of-way and pavement markings.

10.21.04 Signage

All signing shall be per the MUTCD and City of Auburn Engineering Construction Standards.

Applicants shall be responsible for providing and installing all traffic control signs, including but not limited to street name signs, regulatory signs, warning signs, barricades, and bicycle/pedestrian signs as required.

Sign posts shall be installed per **City of Auburn Standard Detail T-24**.

Mast arm mounted street name signs shall be per **City of Auburn Standard Detail T-25**.

Post mounted street name signs shall be per **City of Auburn Standard Detail T-26**.

10.21.05 Left Turn Lane Channelization

See WSDOT Standard Plans M-3.20 & M-3.40.

Single direction left-turn lane channelization shall include a minimum of 150 feet of full-width lane. The standard width of a left-turn lane will be 11 feet. Left-turn arrows per WSDOT Standard Plan M-24.40 shall be installed 25 feet behind the stop bar. Additional storage may be required for long vehicles, anticipated left-turn queues longer than the minimum storage, or to ensure that a left-turn lane is not blocked by an adjacent through queue. If storage length exceeds 150 feet, auxiliary turn arrows will be installed at 100 foot intervals. Deviation requests from the minimum left-turn lane storage requirements will need a traffic study submittal and approval by the City Engineer.

The installation of two-way left-turn lanes on City streets will be determined by the City Engineer based on street classifications and left turn requirements. The minimum width of a two-way left-turn lane shall be 11 feet. The delineation lines shall be Single Broken Yellow and a Single Solid Yellow along the opposing lanes per the MUTCD. Two-way traffic arrows shall be spaced every 250 feet along this lane with a minimum of one per block.

Left-turn lane at end of two-way left-turn lanes shall conform to WSDOT Standard Plan M-3.40.

Dual left turn lanes shall conform to WSDOT Standard Plan M-3.50.

10.21.06 Right Turn Lane Channelization

See WSDOT Standard Plan M-5.10

Right-turn lane pocket channelization shall include a minimum of 150 feet of full-width lane. The standard width of a right-turn lane will be 11 feet. Additional storage may be required for long vehicles, to accommodate anticipated right-turn queues longer than the minimum storage, or to ensure that a right-turn lane is not blocked by a through queue. Deviation requests from the minimum right-turn lane storage requirements will need a traffic study submittal and approval by the City Engineer. Right-turn arrows shall conform to WSDOT Standard Plan M-5.10.

“ONLY” lettering per WSDOT 80.10 is required where a through lane converts to a turn lane and other circumstances as determined by the City Engineer.

10.21.07 Lane Division

See WSDOT Standard Plan M-20.10 and **City of Auburn Standard Detail T-12.**

All pavement markings used to separate or channelize traffic shall conform to the referenced Standard Plans and to the City of Auburn Construction Standards.

Lane division pavement markings on Local Residential streets are not required, except as may be deemed necessary by the City Engineer.

10.21.08 Painted Islands

Painted islands will be allowed on a case-by-case basis with approval from the City Engineer. Pavement markings for painted islands shall meet the MUTCD requirements.

10.21.09 Other Pavement Markings

Railroad crossing marking shall be per the standard symbol shown on WSDOT Standard Plan M-11.10.

10.21.10 Construction Area Temporary Traffic Control

The contractor shall be responsible to provide and maintain all signs, barriers, warning lights, striping, and flag control required for maintaining public safety in construction areas. Traffic control shall be maintained at all times when construction is in progress on all streets, and access points in the construction area.

Construction activities will not be allowed in the public right of way without an approved traffic control plan. Contractor to refer to the Construction Standards for further details.

10.21.11 Roadway Barricades

Barricades shall conform to the standards described in the MUTCD.

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

Type III barricades may be used when streets are closed to traffic. Where provision must be made for access of equipment and authorized vehicles, the Type III barricades may be provided with movable sections that can be closed when work is not in progress, or with indirect openings that will discourage public entry. Where job site access is provided through the Type III barricades, the developer or contractor shall assure proper closure at the end of each working day.

Type III barricades shall be used at the end of a local access street terminating abruptly without cul-de-sac bulb or on temporarily stubbed off streets. Each such barricade shall be used together with an end-of-road marker. See **City of Auburn Standard Detail T-45**.

10.21.12 Traffic Signals

Traffic signals shall be designed and constructed in accordance with Sections 8-20, 9-29, and other applicable sections of the Construction Standards. Traffic signal facilities shall utilize video vehicular detection. Induction loops or other solution are only allowed where the City Engineer, or designee, has determined that video detection is not feasible. Wherever existing induction loops are damaged and require replacement, *the City Engineer may require their replacement with video detection. WSDOT Standard Plans shall be utilized except the following elements that shall be per City of Auburn Standard Details:*

Traffic Signal in the DUC Zone: **City of Auburn Standard Detail T-38**

Traffic Signal Controller and Foundation: **City of Auburn Standard Detail T-22**

Telecommunication and Luminaire Electrical Trench: **City of Auburn Standard Detail T-23**

The following definitions are referenced when determining what upgrades to pedestrian push-button and pedestrian signal head systems are triggered by development/construction activity:

- A. **Functionally Accessible:** For pedestrian pushbuttons and pedestrian signal heads to be considered accessible from a functionality standpoint, they must be of the brands, makes, and models that are specified by the current Engineering Construction Standards.
- B. **Location Accessible:** For pedestrian pushbuttons to be considered accessible from a location standpoint, they must be between 42 and 46 inches in height measured vertically from the centerline of the pushbutton and the adjacent level landing and the pushbutton must be 10 inches or less measured horizontally from the adjacent level landing.

In accordance with the City's adopted ADA Transition Plan, modification, or expansion of any portion of the electrical systems of a signalized intersection or enhanced crossing requires making all pedestrian pushbuttons and pedestrian signal heads at the intersection or crossing Functionally Accessible. Construction, modification, removal or replacement of any portion of any curb ramp at a signalized intersection or enhanced crossing requires making the pedestrian pushbutton serving the new, modified, or replaced ramp Location Accessible and making all of the pedestrian pushbuttons and pedestrian signal heads at the intersection or crossing Functionally Accessible.

10.21.13 Traffic Calming

The City Engineer may determine that traffic calming features are required on existing or new streets to address cut-through or speeding concerns. Potential traffic calming features include varying roadway sections, traffic circles, chicanes, medians, bulb-outs, raised intersections, and raised crosswalks. Speed cushions are not an acceptable traffic calming approach except when considered and installed as either: 1) Part of the City's Neighborhood Traffic Calming Program, or 2) With approval from the City Engineer, as mitigation on existing roadways where development activity creates the potential for cut-through and/or speeding traffic and the City Engineer determines that other traffic calming approaches would not be applicable or appropriate.

Where speed cushions are installed, they will be per **City of Auburn Standard Detail T-42**.

10.22 City Telecommunication Facilities

10.22.01 Preface

The design of City Telecommunications facilities, including intelligent transportation systems (ITS) and general communications fiber located within City right-of-way and easements shall be in conformance with these standards.

City telecommunications facilities shall be included in the Public Facility Extension Agreement (FAC) between the developer and the City when the Agreement includes street improvements per ACC 12.64A.

10.22.02 Design Criteria

The City has established the following minimum requirements to ensure the efficient construction of City telecommunication facilities with the least impact to City transportation and other utility infrastructure. The design of City telecommunications facilities shall also meet the requirements of **Chapter 9**.

Unless approved otherwise by the City Engineer, or designee, City telecommunications conduits and related facilities are required in conjunction with all street improvements constructing sidewalks, traffic signals, or traffic beacons and may be required with other improvements as determined by the City Engineer, or designee, in accordance with ACC 12.64A. When required, facilities shall extend the full length of the street improvement. Placement of the facilities shall accommodate connection with other existing or future telecommunication facilities within the corridor.

10.22.03 Conduits

City telecommunication conduits shall be 3-inch PVC Schedule 40 and shall have a minimum of 24 inches of cover and, except for street crossings, shall be located under the sidewalk per **City of Auburn Standard Detail T-23**. If no sidewalk is included in the scope of the required

street improvements, the conduit will be installed in the most feasible location within the street construction limits as directed by the City Engineer, or designee. Roadway crossings shall be minimized, and sweeps shall be long sweep 90-degree bends. Trace wire shall be placed within the conduit.

10.22.04 Splice Vaults and Pull Boxes

When required, splice vaults and pull boxes shall be per WSDOT Standard Plans J-90.21 and J-90.10, respectively, except that lid marking lettering shall be as specified in the Construction Standards and lids shall not be marked with WSDOT logos or text indicating WSDOT. Splice vaults shall be placed every 1,500 feet. Pull boxes shall be placed every 500 feet and at all intersections.

