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1 INTRODUCTION

The following Design Standards were developed by the City of Coos Bay's Public Works Department and established by Ordinance 479. This document is intended to facilitate the planning, design and implementation of public projects, private projects, and related facilities. The Design Standards are primarily intended for use by a Developer's Design Engineer for private projects. However, they will also be utilized by Design Consultants under contract with the City for preparation of public infrastructure designs.

The Design Standards cannot provide for all situations. They are intended to establish a consistent policy for implementing design of public improvements and related facilities, but do not substitute for competent work by design professionals. Engineers are expected to provide expertise and judgment from their respective disciplines. In addition to these standards, design consultants and engineers must comply with appropriate state and federal codes, safety regulations, environmental requirements and other applicable regulations. Note that this document refers to many other potentially applicable requirements, but references herein do not necessarily comprise a comprehensive list.

Design professionals are encouraged to read this document prior to the project planning phase so that potential compliance issues may be identified and resolved early. The City's unique terrain, geology, climate and historic context make project development to modern standards a challenging endeavor. The City recognizes these challenges and encourages designers to actively collaborate with the Public Works Department as new projects are planned, designed and constructed.

The Public Works Director or authorized designee has authority to periodically update and interpret the provisions of this document. Future modifications are intended to promote uniformity in the application of the Design Standards.

These standards are not intended to unreasonably limit any innovative or creative effort which could result in better quality. Public Works will evaluate any proposed departure from these standards based on the design exception process detailed in Chapter 2.

Other permits and standards may be applicable to specific projects. The design professional bears the responsibility to obtain necessary permits and to comply with all applicable standards related to specific projects.

2 GENERAL REQUIREMENTS

This chapter provides procedural requirements for both private and public works projects, from design through construction. Requirements for preparation, submittal and review of required documents are included, along with administrative procedures for design exceptions, design approval, construction coordination and final project acceptance by the City.

2.1 DEFINITIONS AND ABBREVIATIONS

AASHTO: American Association of State Highway and Transportation Officials.

ADA: Americans with Disabilities Act.

ADS. Advanced Drainage Systems, a manufacturer of storm water and sanitary sewer materials.

Alley: A narrow street through a block which affords only secondary means of access to abutting property at the rear or sides thereof.

All-Weather Surface: An improved roadway surface, with sufficient ballast and structural support to be used under all weather conditions. The uppermost layer of an all-weather surface may be concrete or asphalt pavement, or in some cases gravel.

Appurtenance: Equipment and/or accessories that are part of an operating system or subsystem.

APWA: American Public Works Association.

Arterial: A street that serves to interconnect and support the principal arterial highway system. These streets link major commercial, residential, industrial and institutional areas. Arterial streets are typically spaced about one mile apart to assure accessibility and reduce the incidence of traffic using collectors or local streets in lieu of a well-placed arterial street. Many of these routes connect to Cities surrounding Coos Bay.

ASCE: American Society of Civil Engineers.

Asphalt Institute: A United States based association of international petroleum asphalt producers, manufacturers and affiliated businesses.

ASTM: American Society for Testing and Materials.

Boardwalk: Elevated walkway located over land or on submersible land, primarily for pedestrian use similar to a sidewalk or trail, not otherwise covered by pier or wharf.

Building: A structure constructed for the support, shelter, or enclosure of persons, animals, or property of any kind.

Building Code: The Oregon Structural, Mechanical, Electrical, Plumbing and Residential Specialty Codes.

Building Permit: The document or certificate issued by the city of Coos Bay that sanctions adherence to all applicable building and development regulations and gives permission to the applicant to proceed with the actions for which the permit was requested.

City: The City of Coos Bay, Oregon.

Clearing: Any activity that removes vegetative cover while leaving the root system intact.

Clear-Vision Area: A triangular area on a lot at the intersection of two streets or a street and a railroad, two sides of which are lot lines measured from the corner intersection of the lot lines for a distance specified in these regulations. The third side of the triangle is a line across the corner of the lot joining the ends of the other two sides. Where the lot lines or intersections have rounded corners, the lot lines will be extended in a straight line to a point of intersection.

Collector: A street that provides both access and circulation within residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function and do not require as extensive control of access and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system.

Community Development Director: The duly appointed Community Development Director, chief land use regulatory officer, and designated authority responsible for enforcement of Title 17 of the City of Coos Bay Municipal Code.

Contractor: The person, partnership, firm or corporation licensed in Oregon contracting to do work under these Standards. The term shall also include the Contractor's agents, employees and subcontractors.

Cul de Sac: A local street having only one means of vehicular access to another street and terminating at its other end in a circular-shaped turnaround. This definition of cul-de-sac shall in no way be interpreted to include a dead-end street.

Curb Ramp: A short, depressed section of curb and sidewalk, normally placed at street intersections, designated to facilitate travel of persons with disabilities.

CWA: Clean Water Act, a federal law enacted in 1972 which establishes the structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.

Design Engineer: A Professional Engineer licensed by the OSBEELS.

DEQ: Oregon Department of Environmental Quality.

Detention Facility: A storm water basin or structure where excess storm water is stored or held temporarily and then slowly drains when water levels in the receiving piping system or channel recede. A detention facility is typically dry between storm events.

Developer: Any person, firm, or corporation undertaking the subdividing and/or development of any parcel of land; also known as the “applicant.”

Development: The placement, erection, or removal of any fill, solid material, or structure on land, in or under the water, discharge or disposal of any dredged material or of any liquid or solid waste; or the grading, removing, dredging, mining, or extraction of any materials, including mineral resources; the construction, reconstruction, removal, demolition or alteration of the size of any structure; or the removal or harvesting of vegetation. Development shall not be defined or interpreted to include activities related to or undertaken in conjunction with the cultivation, use, or subdivision of land for agricultural purposes or any improvement made in the interior of any structure.

Development Agreement: An agreement between the City and a private Developer as provided in ORS Chapter 94.

Drain: A structure intended to receive only storm waters, surface run-off, street wash waters and drainage.

Drain, Private: Privately owned drain that is not maintained by the City.

Drainage: The removal of surface water or groundwater from land by drains, grading, or other means. Drainage includes the control of runoff to minimize erosion and sedimentation during and after development and includes the means necessary for water supply preservation, prevention, or alleviation of flooding.

Drainage Basin: A geographic and hydrologic subunit of a watershed.

Driveway: That space specifically designated and reserved on the site for the movement of vehicles from one site to another or from a site to a public street.

Driveway Apron: A concrete section of depressed sidewalk constructed in the City right-of-way to provide a transition between the City street and a private driveway.

Dwelling Unit: One or more rooms which have cooking and toilet facilities and are designed for occupancy by one family only.

Easement: A right which one person has to use the land of another for a specific purpose.

Erosion: the detachment and movement of soil or rock fragments by water, wind, and/or gravity.

Excavation: Removal of topsoil, gravel, sand, rock or any other type of soil material. Also includes removal of roots.

Existing: Buildings, facilities or conditions, which are already in existence, constructed or officially authorized prior to the adoption of these Standards.

Fence: Any artificially constructed barrier or any material or combination of materials erected to enclose or screen areas of land.

Fill: Earth or any other approved substance or material.

Fill, Structural: Fill that is intended to support structures.

Fire Apparatus Access Road: A road that provides access for fire department vehicles and equipment from a fire station to a facility, building or portion thereof. This is a general term inclusive of all other terms such as fire lane, public street, private street, parking lot lane and access roadway.

Fire Code Official: The City's Fire Chief or other designated official who is charged with the administration and enforcement of the Oregon Fire Code.

Fire Lane: A road or passageway developed to allow the passage of fire apparatus. A fire lane is not necessarily intended for vehicular traffic other than fire apparatus.

GPM: Gallons per minute.

Grading: Any combination of excavation and/or fill activities.

Hammerhead: See cul de sac.

HDPE: High-density polyethylene.

Landscaping: Shall mean not only trees, grass, bushes, shrubs, flowers, and garden areas, but also the arrangement of fountains, patios, decks, street furniture, and ornamental concrete

or stonework areas and artificial turf or carpeting, but excluding artificial plants, shrubs, bushes, flowers, and materials in movable containers.

Local Street: A street that has the sole function of providing access to immediate adjacent land. Service to “through traffic movement” on local streets is deliberately discouraged by design.

Lot: a single unit of land legally created by a subdivision of land. A parcel of land used or which is capable of being used under the regulations of Title 17, lawfully created as such in accordance with the subdivision laws or ordinances in effect at the time of its creation. “Lot” shall also mean the individual leaseholds within an approved manufactured home park.

Luminaire: A complete street lighting unit, including lamps, sockets, wiring, poles, foundations and other parts needed to hold the lamp in place, and protect it.

MUTCD: Manual on Uniform Traffic Control Devices.

Natural Outlet: Any non-manmade discharge into a watercourse, pond, ditch, lake or other body of surface water.

NAVD: North American Vertical Datum. Refers to NAVD 88, the North American Vertical Datum of 1988, which is the vertical control datum established in 1991 by the National Geodetic Survey for surveying in the United States.

Neighborhood Routes: Streets that are usually long relative to local streets and provide connectivity to collectors or arterials. Because neighborhood routes have greater connectivity, they generally have more traffic than local streets and are used by residents in the area to get into and out of the neighborhood, but do not serve citywide/large area circulation. They are typically about a quarter to a half-mile in total length. Traffic from cul-de-sacs and other local streets may drain onto neighborhood routes to gain access to collectors or arterials.

NVGD: National Geodetic Vertical Datum. Refers to the Sea Level Datum of 1929, which was adjusted in 1947, and later renamed as the National Geodetic Vertical Datum of 1929 on May 10, 1973. NVGD was used by the National Geodetic Survey prior to 1991.

OAR: Oregon Administrative Rules.

ODOT: Oregon Department of Transportation.

OFC: Oregon Fire Code.

OPSC: Oregon Plumbing Specialty Code.

ORS: Oregon Revised Statutes.

OSBEELS: Oregon State Board of Examiners for Engineering and Land Surveying.

Owner: Means the owner of record of real property as shown on the tax rolls of the county, or person purchasing a piece of property under contract. For the purposes of these standards, in terms of violations and binding agreements between the county and the owner, “owner” shall also mean a leaseholder, tenant, or other person in possession or control of the premises or property at the time of agreement, violations of agreement, or the provisions of these standards. For the purpose of processing a permit per these standards, where such application for permit must be filed by an owner, the term “owner” also includes a governmental entity contemplating acquisition of a parcel which would require such permit.

Pathway: A travel corridor provided for non-motorized use. Pathways typically accommodate both bicycles and pedestrians.

Pier: A structure, usually of greater length than width and projecting from the shore into a body of water with direct access from land that can be either open deck or provided with a superstructure.

Planting Strip: A vegetated area located between the back of curb and sidewalk within the Walking Zone.

Public Works Director: The duly appointed Public Works Director of the City of Coos Bay.

Public Works: The divisions and personnel of the Public Works Department of the City of Coos Bay.

PVC: Polyvinyl Chloride.

Retention Facility: A basin, structure or pond which stores water on a permanent or semi-permanent basis. Water often remains in a retention basin indefinitely, with the exception of volume lost to evaporation or absorbed into soils. Retention facilities typically contain water between storms, as opposed to detention facilities which typically drain after the peak of the storm flow has passed and are usually dry between storms.

Right-of-Way: A street, alley, or other thoroughfare or easement, whether physically accessible or not, that has been permanently established or dedicated for the passage of persons or vehicles. Title to this land remains with the public or private agency until the need no longer exists.

Riprap: A layer, facing, or protective mound of stones randomly placed to prevent erosion, scour or sloughing of a structure or embankment; also, the materials so used.

Roadway: See Street.

ROW: See Right-of-Way.

Sanitary Sewer: See Sewer, Sanitary.

SDR: Standard Dimension Ratio.

Sedimentation: Deposition of soil moved by water or wind from its site of origin.

Sewer, Private: Privately owned sewer that is not maintained by the City. The private sewer lateral is defined as the portion that serves the property from the structure to the public line, including the connection.

Sewer, Sanitary: A pipe or conduit intended to carry liquid and water-carried wastes from residences, commercial buildings, industrial plants and institutions together with minor quantities of ground, storm and surface waters that are not intentionally admitted.

Shall: A requirement.

Should: A requirement, unless it can be shown that to comply with the requirement would be unreasonable, impractical, or unfeasible. Economic hardship alone shall not be justification for noncompliance with the requirement, but may be considered in conjunction with other reasons for noncompliance.

Sidewalk: That portion of a transition strip improved for pedestrian traffic in accordance with standards fixed by the review authority.

Standard Details: City of Coos Bay Engineering Division standard detail drawings.

Storm Drain: A conduit intended to carry only storm waters, surface run-off, street wash waters and drainage.

Storm Sewer: See Storm Drain.

Stormwater: That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, channels or pipes into a defined surface water channel, or a constructed infiltration facility.

Street: All roads, streets, highways, freeways, easements, and public rights-of-way used for or designed for vehicular access or use including private roads but not including private driveways.

Street, Private: A thoroughfare that is privately built and maintained which affords a primary means of vehicular access.

Surveyor: A Professional Land Surveyor licensed by the OSBEELS.

Swale: A shallow drainage conveyance with relatively gentle side slopes, generally with flow depths less than one foot.

TSP: The City of Coos Bay Transportation System Plan.

Uni-Bell: The Uni-Bell PVC Pipe Association.

Utilities: Overhead or underground facilities such as towers, lines for communication and power transmission, sanitary sewers, storm drains, water lines, drains, gas lines, and other similar pipes, wires conduits, vaults, etc.

Vehicular Zone: The portion of a City street from face of curb to face of curb. The vehicular zone includes travel lanes for motorized vehicles and bicycles, and may also include median and parking areas.

Walking Zone: The portion of a City street behind the face of curb that provides sidewalk, roadside landscaping, and other amenities for pedestrian travel.

Wharf: A structure at the shoreline, having a platform built alongside and parallel to a body of water that may have an open deck or a superstructure.

2.2 CODE COMPLIANCE AND PERMITTING

Private developments and public facilities must comply with all City codes, plans and permits.

Developers are also responsible for obtaining any necessary state and federal permits that may be required for construction/development near wetland areas, streams or other waterways, or if hazardous materials are present on the property. The appropriate agencies should be contacted to determine if state or federal permitting regulations apply. These agencies can include but are not limit to the following:

Oregon Department of State Lands

Oregon Department of Environmental Quality

US Army Corps of Engineers

US Environmental Protection Agency

Oregon Department of Transportation

National Marine Fisheries Services

Oregon Department of Fish and Wildlife

U.S. Fish and Wildlife Services

Oregon Department of Forestry

Oregon State Historic Preservation Office

2.3 CONSTRUCTION STANDARDS

The City has adopted requirements set forth in these standards and the 2015 Oregon Standard Specifications for Construction (or latest edition). Designers shall refer to the attached standard details when preparing design plans or permit applications for infrastructure sanitary sewer, storm drainage, and transportation related infrastructure both public and private.

2.4 DESIGN SUBMITTAL REQUIREMENTS

Legible plans shall be submitted to Public Works for review. A scale of no less than one inch equals forty feet (1"=40') shall be used. Other scales may be used only with the approval of Public Works. Plans must be submitted in digital format (i.e. pdf), unless otherwise specified.

Franchised utilities shall be exempt from utilizing an Oregon professional engineer for plan preparation if they have their own qualified staff.

2.4.1 General Plan Requirements

The following general items shall be shown on all plan sets submitted:

- a. Vicinity Map: On first sheet of plan set.
- b. Index of Plan Sheets: On first sheet of plan set.
- c. Title Block: Including project name, Design Professional, file number, sheet number, date and revision block, Oregon Registered Professional's Stamp and Signature.
- d. North Arrow: On each sheet, as applicable.
- e. Elevations shall be referenced to the NAVD 88 datum, with benchmarks identified on the plans.

2.4.2 Utility Information

Subsurface utilities shall be depicted on design drawings per ASCE/CI 38-02 Quality Level C. Refer to ASCE Standard Guidelines for the Collection and Depiction of Existing Subsurface Utilities.

2.4.3 Street Plans

Street plans shall have both plan and profile views on the same sheet. Typical section, signing, and striping information is also required.

Plan views shall contain the following information:

- a. Right-of-way, property lines, and easements (existing and construction).
- b. Section, township and range.
- c. Street centerline with 100-ft stationing.
- d. Horizontal alignment data for centerline, curb returns, cul-de-sacs, and curve radii, including tangent bearings.
- e. Curb/gutter elevations at intersections and cul-de-sacs.
- f. Location of existing and proposed underground and overhead utilities, roadways, driveways, sidewalks, structures, watercourses, survey monuments, fences and vegetation within the right-of-way and outside right-of-way, if affected by construction.
- g. Storm drainage facilities with station and offset referenced to street centerline.
- h. Existing contours and spot elevations, cut/fill limits. A minimum contour interval of 2 feet is required.
- i. Sidewalk ramp locations.

Profile views shall show the following information:

- j. Proposed street centerline profile (bold) with tangent grades, vertical curve data (including k value, length and beginning and ending stations and elevations) and high/low points.
- k. Original ground at centerline.
- l. Proposed (bold) and existing storm drainage facilities with information on type, inverts, rim/grate elevations, slopes, pipe material, and trench backfill.
- m. Existing utility crossings.
- n. Continuation of profile 200 feet beyond project limits if street is being reconstructed or if it may be extended in the future.

Typical cross-sections shall show the following information:

- o. Dimensions of traffic lanes, shoulders, gutters, sidewalks, swales, depths of planting strips, easements, right-of-way, etc. per the City's adopted TSP.
- p. Cross slope of all elements, such as pavement, sidewalks, planting strips, etc.
- q. A separate full-width roadway typical section, for each street or portion of the street that differs significantly. Station ranges shall be provided for each typical section.

The following signing and striping information shall be provided:

- r. Locations of all public and privately maintained signs to be installed, including sign details and/or MUTCD sign designation number, where applicable.
- s. Location and dimensions of all pavement markings.
- t. For simple projects, signing and striping information may be combined on the plan views, provided that information is legible and does not overcrowd the sheet. For collector facilities and local access streets that may intersect with City collector routes or State highway facilities, separate signing and striping plans may be required by Public Works.

2.4.4 Sanitary Sewer and Storm Drain Plans

Sanitary sewer and storm drain plans shall have plan and profile views. Profiles shall be to the same horizontal scale on the same sheet and drawn immediately below the corresponding plan view to a typical vertical scale of 1" = 5' with stationing increasing from left to right. In areas of significant elevation change, a vertical scale of 1" = 10' may be used. Public Works approval is required for any other proposed vertical scale.

Sanitary sewer and/or storm drain plans may be combined into a single set of utility plans, provided that information is legible. Utility design information may also be incorporated into street plans, provided that all required information can be provided legibly and without overcrowding the sheet.

Plan views shall contain the following information:

- a. Right-of-way, property lines, and easements (existing and construction).
- b. Pipe centerline with stationing and reference to street stationing where appropriate.
- c. Pipe material, length, invert elevation and slope.
- d. Location of existing (screened or light) and proposed (bold) underground and overhead utilities, roadways, driveways, sidewalks, structures, watercourses, survey monuments, fences and vegetation within the right-of-way and outside right-of-way, if affected by construction.
- e. Existing (screened or light) and proposed (bold) contours and spot elevations. A minimum contour interval of 2 feet is required.

Profile views shall show the following information:

- f. Pipe invert profile with grades.
- g. Existing (screened or light) and proposed (bold) ground at centerline.
- h. Existing (screened or light) and proposed manholes, catch basins, field drains and inlets, with information on type, inverts, rim elevations, slopes, materials, and trench backfill.

- i. Existing (screened or light) and proposed (bold) water, storm drain, sanitary sewer, gas, power, cable and other utility crossings. Show separation requirements where appropriate.
- j. Continuation of profile 200 feet beyond project limits if sanitary sewer, water or storm drain may be extended in the future.

2.4.5 Storm Water Management System Plans

Structural detention and retention facility plans must show:

- a. Facility dimensions and setbacks from property lines and structures
- b. Profile view of facility, including typical cross-sections with dimensions.
- c. All storm water piping associated with the facility, including pipe materials, sizes, slopes, and invert elevations at every bend or connection.
- d. Additional detail as determined by Public Works, depending on individual site conditions.

For projects that include vegetated storm water management facilities, catch basin pre-treatment inserts or storm water retention/detention facilities, a plan outlining the scope of activities, schedule and responsible parties for periodic inspection and maintenance of those facilities shall be included with the construction submittal. This plan shall cover vegetation management, structural repairs, sediment removal/disposal and other activities necessary for the continued long-term function of the storm water facilities.

2.4.6 Additional Storm Water Design Documentation

Storm water documentation prepared in accordance with the ODOT Hydraulics Manual shall be submitted, including but not limited to a hydraulics report, bridge and culvert studies, supporting data, and other storm water design documentation, as applicable.

2.5 PHASED PROJECT SUBMITTALS

For large developments intended to be implemented in phases over multiple years, a phased design submittal process will be considered by Public Works on a case by case basis. Public Works prefers that ultimate traffic volumes, water usage, sanitary sewer flows and storm water runoff be estimated for the entire project prior to approval of a phased approach. Design of each phase should accommodate the ultimate build-out condition and each phase should be able to stand alone, so that the required infrastructure for each phase is fully functional.

2.6 DESIGN EXCEPTIONS

A documented design exception is required for any design or construction deviation from these City design standards. Exceptions may be granted by Public Works upon evidence that such adjustments are in the public interest. Requirements for safety, function, fire protection, transit needs, appearance and maintainability based upon sound engineering and technical judgment must be fully met.

2.6.1 Design Exception Submittal Requirements

Design exception requests must be submitted in writing and shall include the following:

- a. Complete description of the desired modification.
- b. Identified sections of the Design Standards that are relevant to the proposed alternative.
- c. Reason for the request.
- d. Comparison between the specification/design standard and the modification addressing the performance, particularly in regard to public safety. Document nationally accepted design standards, such as AASHTO and ASTM, where applicable.
- e. Additional design exception considerations specific to individual topics are provided in the applicable chapter of these Design Standards.
- f. It is the responsibility of the applicant to provide sufficient, clear and accurate supporting information.

Public Works will review the design exception request and will allow a modification if one or more of the following requirements is met:

- g. The specification or design standard does not apply in the particular application.
- h. Topography, right-of-way or other conditions specific to the site impose an unusual circumstance not typical of other sites in Coos Bay and an equivalent alternative, which can accomplish the same design objective while not adversely affecting public safety, is available.

The designated Public Works personnel will approve the application as is, approve with changes, or deny with an explanation.

2.6.2 Appeal Process

If the applicant is unsatisfied with the designated Public Works personnel's decision, the appeal process is as follows:

- a. Written request addressed to the Public Works Director;
- b. If not resolved at Public Works Director level, a written appeal shall be submitted to the City Manager
- c. If not resolved at the City Manager level, the applicant shall submit a written appeal to the City Council.

2.7 CONSTRUCTION INSPECTION

For infrastructure intended to be accepted by the City for public use, operations and maintenance, the Developer is responsible for providing inspection of construction methods, materials, installation, etc. using qualified inspectors to ensure compliance/conformance with the design professional's plans and specifications.

The following requirements apply during construction:

- a. Materials submittals are required and must be accepted by the design professional prior to construction of any facilities which are intended to be accepted by the City for public use. Refer to the Oregon 2015 Standard Specifications for Construction and City Supplemental General Conditions for material submittal requirements.
- b. The developer's inspector will need to observe the following construction work:
 - i. Installation of new storm drains and sanitary sewer systems.
 - ii. Connections to existing storm and sanitary sewers.
 - iii. Forms for concrete curb, gutter and sidewalk
 - iv. Roadway subgrade, crushed rock base course and asphalt paving
- c. Subgrade and base rock compaction tests shall be performed by an independent testing laboratory during construction, and results provided to Public Works.
- d. Pilings require inspection by a licensed professional engineer.

Copies of all inspection reports and results, reviewed and approved by the design professional, shall be provided to Public Works upon completion of construction work.

Furthermore, applicant is required to adhere to all additional inspections/requirements/conditions as described in the project's approved permits.

2.8 AS-BUILT DOCUMENTS FOR PRIVATELY CONSTRUCTED PUBLIC IMPROVEMENTS (PERTAINS TO CITY OWNED AND MAINTAINED INFRASTRUCTURE)

Upon construction completion, the following documents shall be submitted to Public Works:

- a. As-built drawings showing actual constructed locations and elevations of all street facilities, pipes, manholes and laterals. Said drawings shall be submitted along with an AutoCAD compatible file on CD or USB drive.
- b. Copies of all inspection reports and results, reviewed and approved by the design professional
- c. Written certification from the Developer's design professional confirming that the project was constructed in accordance with approved plans and specifications.

2.9 FINAL PROJECT ACCEPTANCE FOR PRIVATELY CONSTRUCTED PUBLIC IMPROVEMENTS

Following receipt of as-built documents and completion of any outstanding “punch list” items for infrastructure intended for acceptance by the City, Public Works will forward a project acceptance and street adoption recommendation to the Coos Bay City Council. The City will not assume maintenance responsibility for constructed facilities prior to Council acceptance.

3 TRANSPORTATION FACILITIES

This chapter provides information for the design of street improvements as well as non-motorized facilities and transit infrastructure. Transportation design plans are reviewed and approved by the Public Works. Design criteria for storm water facilities serving transportation corridors are discussed in Chapter 5.

Applicants for development and redevelopment projects that are expected to create 20 or more residential units (e.g. single family residential lots, apartment/condo units) or 20,000 square feet or more of commercial/industrial space shall evaluate the project's transportation system impacts in a transportation impact analysis (TIA). Such evaluations shall be prepared by a professional transportation engineer and paid for by the applicant. The TIA shall evaluate the access, circulation and other transportation requirements. The scope of TIA shall be established by Public Works to address issues related to a specific development proposal. See Appendix B for TIA requirements.

Projects that are below the thresholds above may also be required to provide traffic analysis when, in the opinion of the Public Works Director, a capacity problem and/or safety concern is caused and/or is adversely impacted by the development. The Public Works Department staff shall determine the scope of this special analysis.

Trip ends shall be defined by the Institute of Transportation Engineers (ITE), Trip Generation Manual, latest Edition, or trip generation studies of comparable uses prepared by an engineer and approved by the Public Works Department staff. "Trip ends" are trips that either begin or end at the proposed land use.

Level of Service (LOS); the level of service standard to determine what is acceptable or unacceptable traffic flow on streets shall be based on a volume-to-capacity ratio. City streets shall maintain a LOS of "D" during the p.m. peak hour of the day. However, the developer will be responsible for making appropriate safety improvements should warrants for turn lanes, traffic signals, and/or other traffic safety improvements be met.

Mitigation; where a development causes traffic impacts that bring a road below acceptable levels of service, or impacts a road that is already operating below acceptable levels of service, or impacts a road that has a documented safety problem, the TIA shall identify traffic impacts

attributable to the development and appropriate mitigation measures. The developer may be required to implement mitigation measures as a condition of approval.

Traffic Signals; traffic signals may be required with development when traffic signal warrants are met, in conformance with the Highway Capacity Manual and the Manual of Uniform Traffic Control Devices.

This chapter is intended to be consistent with and a supplement to the following policies and standards:

AASHTO	American Association of State and Transportation Officials
ADA	Americans with Disabilities Act
APWA	American Public Works Association
ASTM	American Society for Testing and Materials
MUTCD	Manual on Uniform Traffic Control Devices
OAR	Oregon Administrative Rules
ODOT	Oregon Department of Transportation
OFC	Oregon Fire Code
TSP	Coos Bay Transportation System Plan
	Coos Bay Development Code (Coos Bay Municipal Code, Chapter 17)
CBMC	Coos Bay Municipal Code
	Coos Bay Comprehensive Plan

Where conflict exists between these Design Standards and the above referenced documents, the most stringent requirements shall take precedence.

3.1 CITY STREETS

3.1.1 Street Classifications

The City has adopted the following functional classification of streets based on the context of the surrounding land use:

- a. Principal Arterial (State Highway under ODOT jurisdiction)

- b. Arterial Street
- c. Collector Street
- d. Neighborhood Route
- e. Local Street

Refer to the City's Transportation System Plan (TSP) for a map showing the City's functional classification street designations.

Public Works will determine the classification of any new streets which are not indicated in the TSP prior to design.

3.1.2 Vehicular Zone

3.1.2.1 Vehicular Zone Cross Section

The vehicular zone width is defined as the horizontal distance from face of curb to face of curb, measured perpendicular to the centerline. The vehicular zone includes paved travel lanes for motorized vehicles and bicycles, and may also include median spaces and paved areas for on-street parking. The width of the vehicular zone shall be sufficient to allow for the safe passage of normal multi-modal traffic and emergency vehicles.

Required lane widths and configuration are shown in the standard details. Streets should be centered within the right-of-way; however, design exceptions may be considered due to topography or other physical constraints. The City's design exception process in Section 2.6 will apply.

Table 3-1. Lane Widths and Configuration in the Vehicular Zone

Type of Street	Min RoW Width	Minimum Paving Width Curb-to-Curb					Max Grade
		Vehicle Travel Lane	Median or Center Turn Lane	On-Street Parking	Bike Lane (a)	Sidewalk Curb (b)	
Arterial/Collector							
5-lane (c)	100'	12'/11'	14'	-	2 @ 6'(g)	2 @ 6'/5'	8%
3-lane (c)	76'	12'	14' (Optional)	-	2 @ 6'(g)	2 @ 6'/5'	8%
2-lane	50'	12'	-	-	2 @ 6'(g)	2 @ 6'/5'	8%

*CITY OF COOS BAY
ENGINEERING DESIGN STANDARDS*

28' Standard Residential	50	10'		1 @ 8'		2 @ 5'	
36' Neighborhood Residential	50'	10'	-	2 @ 8'	-	2 @ 5'	16%
40' Standard Commercial/Industrial	60'	12'	-	2 @ 8'	-	2 @ 5'	16%
Dead End (d)	50'	10'	-	2 @ 8'	-	2 @ 5'	16%
Cul-de-Sac (e)	50'	10'	-	(d)	-	1 @ 5' (f)	16% (d)
Alley							
1-way	20'	12'	-	-	-	-	-
2-way	20'	16'	-	-	-	-	-

(a) New construction: six feet; reconstruction: five feet.

(b) Wider sidewalks may be required in commercial areas.

(c) The minimum right-of-way width includes the option of two six-foot-wide landscape strips for arterials or two four-foot-wide strips for local commercial/industrial.

(d) A dead end must be less than 400 feet in length and terminate with a circular or hammerhead turnaround with a maximum grade of eight percent.

(e) No parking is permitted at the end of a cul-de-sac which must have adequate space for emergency equipment turnaround, usually a 45-foot unobstructed radius.

(f) At the end of the cul-de-sac, a five-foot sidewalk is required along the perimeter adjacent to the development.

(g) Bike lanes allowed to be reduced to 5 feet in width if the project is reconstruction.

Design Speed

The design speeds listed in Table 3-2 have been selected for the various street classifications. Posted speed may differ and will be designated by Public Works or ODOT. Designers shall use the design speed to select horizontal and vertical alignments.

Table 3-2. Design Speed

City TSP Street Classification	Design Speed (mph)
Residential Local Street	25
Collector	35
Commercial/Industrial Local Street	25
Arterial	40

3.1.2.2 Pavement Section

The minimum allowable section is as shown on Standard Details.

The pavement section may vary depending on soil conditions. Minimum asphalt section shall be 4 inches. If, in the opinion of Public Works, soil subgrade conditions are potentially unsuitable, soil testing and pavement design will be required. The Design Engineer will have the responsibility for obtaining traffic data necessary for pavement design. The ODOT Pavement Design Guide and the Asphalt Institute method are acceptable pavement design references. Concrete streets shall be designed using the guidelines and requirements of the Oregon Department of Transportation and ASTM International Standards. The creation of new, or the replacement of existing, concrete streets shall be at the discretion and approval of Public Works.

At a minimum, asphalt thickness shall consist of two 2-inch lifts or, in the case of existing streets, match the existing thickness of thicker pavements. Lifts shall not exceed 3 inches. Refer to standard details for further notes and subgrade requirements.

3.1.2.3 Crown

A minimum crown slope of two percent (2%) shall be provided. A standard center crown section is recommended, but a super elevated section and/or an offset crown or a curb crown (shed) configuration may be permitted with approval of Public Works. Maximum crown slope shall be four percent (4%). An inverted crown section is typically not allowed, but may be considered for alleys with Public Works approval.

3.1.2.4 Vertical Clearance

Vertical, unobstructed clearance over the traveled roadway width must be a minimum of 14 feet.

3.1.2.5 On-Street Parking

On-street parking shall be provided as required in Table 3-1. The minimum dimension of a standard parallel on-street parking stall is 8 feet wide all areas, by 20 feet long. Disabled on-street parking stalls may be required and must meet current ADA standards.

Where parking is restricted on one or both sides of the street, no-parking signs shall be installed by the Developer. A minimum of three (3) no-parking signs, equally spaced, are required per block. The City will maintain no-parking signs after the street is accepted by City Council.

3.1.2.6 Signing and Striping

Street signing and pavement markings shall be designed in accordance with the current MUTCD. Where required, the Developer shall install signing and striping. The City will maintain signing and striping after acceptance of the street by City Council. A sign and striping plan prepared by a qualified engineer and approved by Public Works is required for any new sign or pavement marking on existing facilities.

3.1.3 Walking Zone

The walking zone is defined as the portion of a City street behind the face of curb that provides sidewalk, roadside landscaping, and other pedestrian travel amenities.

3.1.3.1 Walking Zone Cross Section

Improvements required within the walking zone are shown in Table 3-3. Walking zone improvements are required on both sides of the street except for infill developments of three units or less, where walking zone improvements may be omitted from one side of the street with Public Works approval. Sidewalk and landscaped areas within the walking zone shall have a maximum cross-slope of two percent (2%), draining towards the street. New sidewalks shall meet all ADA requirements.

Table 3-3. Required Walking Zone Improvements and Widths

Street Classification	Curb/Edge Width (Measured from Face of Curb)	Planting Strip Configuration and Width	Sidewalk Width	Minimum Total Walking Zone Width
28' Standard Residential and 36' Neighborhood Residential	0.5' with 1' hardscaped edge area behind curb	optional	4.5'	6'
40' Standard Commercial/Industrial	0.5' with 1' hardscaped edge area behind curb	4' Planting Strip	4.5'	10'
Collector	0.5' with 1' hardscaped edge area behind curb	optional	4.5'	7'
Arterial 2-lane	0.5' with 1' hardscaped edge area behind curb		5.5'	7'
Arterial 3 or 5 lane	0.5' with 1' hardscaped edge area behind curb	6' Planting Strip	5.5'	13'

3.1.3.2 Curb, Gutter and Edge Area

Standard curb is required on both sides of streets within the City of Coos Bay. Rolled curb is not allowed unless approved through the design exception process described in Section 2.6.

3.1.3.3 Sidewalk

Sidewalks are required on both sides of the street. Sidewalks shall be constructed of concrete. Curb ramps meeting ADA requirements are required at all intersections and commercial driveways.

Placement of utility poles, hydrants and other obstructions should avoid sidewalk areas. Any sidewalk obstruction requires the prior approval of Public Works and a minimum unobstructed clear passage width of 36 inches must be maintained around any obstruction.

The standard sidewalk longitudinal grade and cross slope shall comply with current ADA standards. The back of sidewalk grade shall be maintained parallel to the gutter grade at driveways. In some locations where the elevation of the adjacent property is much lower than the street, a dip in the sidewalk may be permitted. In this case, the driveway shall have the standard ½ inch lip and slope at a two percent (2% maximum) grade towards the street. The transition from the driveway back to the normal sidewalk grade shall be in accordance with ADA slope requirements.

3.1.3.4 Grading Adjacent to Sidewalks

Section 6 of these Standards applies to grading activities. Slopes behind the sidewalk shall start one foot (1') beyond the edge of the sidewalk or curb and shall not be steeper than 1.5:1 (horizontal: vertical) in a cut condition and 2:1 for a fill condition with cohesive soils. Sand or other non-cohesive soils shall be sloped no steeper than 3:1. It is the owner's responsibility to grade responsibly and the owner is ultimately responsible for any damage to a public sidewalk.

If a grading plan is required, the design professional's recommendations may replace the above slope requirements with the approval of Public Works.

A pedestrian guardrail or barrier shall be installed when the slope within 2 feet of the back of a sidewalk exceeds 2:1 for a height of 30-inches or greater. Protection for pedestrians is recommended when slopes are vertical and exceed 18 inches in height. Pedestrian guardrail shall meet or exceed the minimum requirements of the current edition of ODOT Standards.

3.1.4 Horizontal Alignment of Streets

The centerline of street improvements shall coincide with the centerline of the public right-of-way unless approved by Public Works.

Minimum centerline curve radius shall be as follows:

Table 3-4. Minimum Horizontal Curve Radius

<u>Design Speed (mph)</u>	<u>Minimum Curve Radius (ft)</u>	<u>Horizontal</u>
25	200	
30	300	
35	480	

Centerline radii of curves shall not be less than 200 feet on collectors, or 100 feet on local streets, and shall be designed to an even 10 feet.

Super-elevation may be allowed for the purpose of reducing minimum required radius providing that it can be shown that there are no adverse impacts on access to adjacent property, storm drainage and intersections.

Sufficient sight distance must be provided to allow drivers time to avoid obstacles, other vehicles or people in their path. Sight distance shall be considered in horizontal alignment design. Stopping sight distances shall be provided in accordance with the following table:

Table 3-5. Stopping Sight Distance

<u>Design Speed (mph)</u>	<u>Required Stopping Sight Distance (ft)</u>
25	155
30	200
35	250
Adapted from AASHTO Table 3-1	

3.1.5 Vertical Alignment of Streets

Minimum longitudinal grade of streets shall be one percent (1%). Maximum street grades are shown in the following table:

Table 3-6. Maximum Street Grades

Street Classification	Maximum Grade (%)
Residential Local	12
Collector	10
Commercial/Industrial Local	10
Arterial	8

Vertical curves shall be provided at changes of grade exceeding two percent (2%) and shall provide the stopping sight distance required in Table 3-5. The grade of the through street at intersections shall be maintained through the intersection. Intersecting streets shall match the curb flow line of the through street and be provided with a landing area. The landing shall extend 25 feet from the pavement edge of the through street and have a grade of five percent

(5%) or less. Alternative geometry may be necessary at intersections on steep slopes and should be coordinated with Public Works.

Streets shall be graded to provide adequate storm water drainage in accordance with Section 3.1.11 and Chapter 5 to minimize standing water. Special care should be taken in the design of vertical curves to avoid long flat grades at the crest or sag of curves.

Curb or gutter grade information shall be provided in design plans for curb returns at intersections and for cul-de-sacs.

Due to the challenging topography in parts of the City, consideration will be given to exceeding vertical alignment standards providing that it can be shown that there will be no adverse impacts on traffic safety and emergency vehicle access. Requests for modification of standards shall be submitted in accordance with the design exception process provided in Section 2.6. Design exception requests shall include numeric and graphical sight distance analyses showing existing topographic features that are proposed to remain after development of the street, as well as any future features anticipated. Road grade design exceptions require approval of both Public Works and the City's Fire Code Official.

3.1.6 Roadway Intersections

3.1.6.1 Intersection Geometry

The interior angle between centerlines at intersecting streets shall be kept as near to ninety degrees (90°) as possible and in no case shall it be less than seventy-five degrees (75°). As far as practical, all streets other than minor streets shall be in alignment with existing streets by continuations of the centerlines thereof. Staggered street alignment resulting in "T" intersections shall wherever practical leave a minimum distance of 200 feet between the centerlines of streets having approximately the same direction and otherwise the centerlines of intersecting streets shall be spaced at least 150 feet apart.

Horizontal point of curvature (PC) must be located a minimum of 25 feet from the right-of-way of intersecting streets.

An arterial or collector street intersecting with another street shall have at least 100 feet of tangent adjacent to the intersection unless topography requires a lesser distance. Other streets, except alleys, shall have at least 50 feet of tangent adjacent to the intersection.

The curb radius at the intersection of two streets shall be as shown in Table 3-7, unless otherwise approved by Public Works.

Table 3-7. Design Curb Radius

Approach/Entering Street at Intersection 	No Parking or Bicycle Lane	With Bicycle Lane	With Parking Lane	Both Parking and Bicycle Lane
Exiting Street 	Design Curb Radius (ft)			
No Parking or Bicycle Lane	30	25	20	10
With Bicycle Lane	25	12	8	5
With Parking Lane	20	8	5	5
Both Parking and Bicycle Lane	10	5	5	5

The intersection of more than two streets at any one point is not allowed.

Bulbed-out intersections for improved pedestrian crossings may be required at intersections specified by Public Works. Additional traffic calming measures may be required by Public Works.

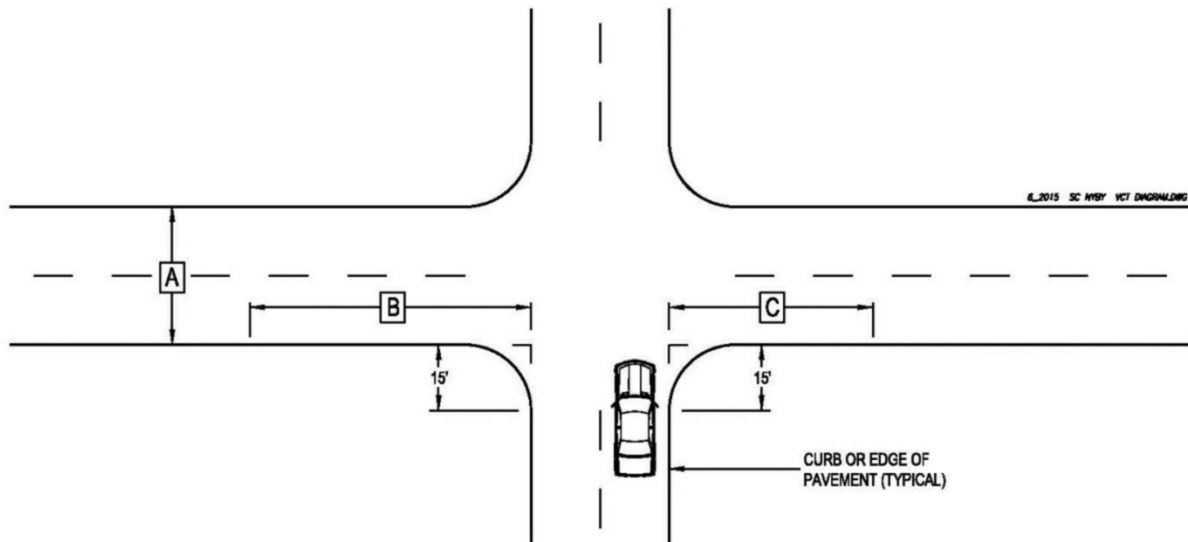
3.1.6.2 Clear-Vision Area

It is intended to ensure that all intersections and nonresidential driveways shall have an unobstructed sight distance along any approach not protected by a traffic signal. A vision clearance triangle shall be created sufficient to avoid vehicle conflicts for all approaching or departing vehicles traveling at or less than the maximum speed limit. Right-turning vehicles shall not be considered protected by a traffic signal.

The required vision clearance triangle shall be a sight distance as specified in Chapter 9, Intersections, of the American Association of State Highway and Transportation Officials (AASHTO) Edition of “A Policy on Geometric Design of Highways and Streets” in the minimum dimensions listed in Table 3-8, ‘Vision Clearance Triangle – Minimum Dimensions’ (Also see Standard Detail T-19 for an example). At signalized intersections, Dimension B shall be as provided in Table 3-8, and Dimension C shall be 50 feet. The minimum standard in Table 3-8 may be increased by Public Works for locations where it has been determined by an engineering report that the minimum standards listed do not provide a safe sight distance.

TABLE 3-8 VISION CLEARANCE TRIANGLE – MINIMUM DIMENSIONS

MPH	STREET WIDTH	VISION CLEARANCE TRIANGLE DISTANCE (FEET)	
	A	B	C
25	30	140	95
	36	125	90
	40	115	85
	48	165	85
	56	145	80
30	30	170	115
	36	155	110
	40	145	105
	48	200	105
	56	180	100
35	30	205	135
	36	185	130
	40	175	125
	48	240	125
	56	215	120
40	30	235	160
	36	215	150
	40	205	145
	48	275	145
	56	250	135



Requirements for the establishment of a vision clearance triangle are as follows. Between a height of two feet and 10 feet, as measured from the edge of the adjoining roadway, a required vision clearance triangle shall be free of all structures, fences, vegetation, signs, retaining walls, cut slopes and any other sight obstruction, which either individually or collectively obscure an area in excess of 18 inches in width. Legally parked vehicles shall not be considered sight obstructions in the vision clearance triangle.

Exceptions to this requirement may be granted by Public Works if an item proposed to be located within the vision clearance triangle is determined not to constitute a sight obstruction; however, no exceptions may be granted within the first 50 feet of the vision clearance triangle as measured along distances B or C as set forth in Table 3-8.

3.1.7 Illumination and Signalization

Public Works will consider factors such as traffic, crash data, and roadway characteristics to support lighting installation decisions. AASHTO provides the threshold or minimum conditions of when to consider lighting. Refer to the ODOT *Lighting Policy and Guidelines*.

Due to limited resources, the City will not install, pay for power, or maintain new street lights in existing improved right-of-way. The City may consider paying for power and maintenance of new street lights installed in dedicated street right-of-way as part of the acceptance of new subdivision infrastructure. Where specialty light fixtures are desired, financial responsibility for monthly power and maintenance costs shall be determined prior to design approval.

Signals shall be designed by a Professional Engineer in accordance with the *ODOT Traffic Signal Design Manual*.

3.1.8 Access to City Streets

Proposed driveway or private street access to a City street requires a permit from the City. State highway access requires a permit from ODOT.

3.1.8.1 Driveway Access

Driveways/access shall meet the requirements of Title 17 of the *Coos Bay Municipal Code*. Driveways greater than 150 feet in length shall meet the design requirements for Private Streets provided in Section 3.2.

Maximum and minimum driveway dimensions are detailed in Table 3-9.

Table 3-9. Driveway Apron Width

Property Frontage	Minimum width (ft)	Maximum width for single driveway (ft)	Maximum width for each of two driveways (ft)
Less than 50 feet	12	20	N/A
50 to 75 feet	12	25	20
More than 75 feet	12	30	20
<i>Widths in this table do not include sloped wings.</i>			

Design and construction of the driveway apron shall conform to attached details. Driveways shall meet applicable ADA guidelines.

Requests for additional or wider driveways other than those allowed above must be approved through the design exception process (see Section 2.6).

Restrictions may be imposed on additional driveways, such as limited turn movements, shared access between uses, closure of existing driveways or other access management actions.

The following will be considered for requests to install additional residential driveways on Local Streets

Residentially zoned lots having a single family residential use (does not apply to non-conforming uses, e.g. commercial use on residential zoned property) accessing a paved local street (per the Transportation System Plan). The intent of this policy is to allow Public Works staff to consider permitting a second driveway access to a single family residence with a lot having adequate frontage to meet sight visibility standards and to maintain space for on-street parking. Multiple driveways associated with unpaved streets shall be handled on a case by case basis.

For consideration of a second driveway access to a single family residential lot:

- Lot must be residentially zoned.
- Lot must have an existing single family residential use,
- Second driveway access must be at least 5' (measured flair edge to property line) from lot property line,
- Not more than 50% (not including the flairs for the second driveway) of any side of any residential lot may be used for driveway accesses,
- At least 20 (measured flair edge to flair edge or property line) continuous feet of non-driveway access area must remain on any one side of any residential lot after construction of a second driveway for on street parking,
- Adequate sight distance shall be required and it shall be measured where the driveway access meets the sidewalk or paved street (as appropriate),
- Second driveway must be paved.
- Second driveway access, which must be a minimum of 10' in width, with 5' wide flair on each side of the driveway, must be at least 20' from the existing driveway.

Joint usage (shared) driveways may be considered where sufficient spacing is not available. This may be from a driveway connected to an adjoining property that has direct access to a public street or where the access straddles property lines. An access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the driveway. The easement agreement shall also address construction and maintenance responsibilities along with other items that may be worthy of consideration on a case-by-case basis.

For consideration of a joint usage (shared) driveway as a second driveway access to a single family residential lot:

- Lots must be residentially zoned.
- Lots must have a single family residential use,
- When new access is being constructed for a joint usage driveway, the access must be at least 20' (measured flair edge to flair edge) from any existing driveway,
- Not more than 50% (not including the flairs for second driveway) of any side of any residential lot may be used for driveway accesses,
- At least 20 (measured flair edge to flair edge or property line) continuous feet of non-driveway access area must remain on any one side of any residential lot after construction of a second driveway for on street parking,
- Minimum secondary driveway width is 10',
- Adequate sight distance shall be required and it shall be measured where the driveway access meets the sidewalk or paved street (as appropriate),
- Reciprocal easements must be recorded in the deed records of all properties involved in a shared driveway. All parties must sign the service driveway/access permit application.

The following will be considered for requests to install additional residential driveways on Collector and Arterial Streets

Residentially zoned lots having a single family residential use (does not apply to non-conforming uses, e.g. commercial use on residential zoned property) accessing a collector or an arterial street (per the Transportation System Plan). Generally, second driveway access from the same parcel onto a collector or an arterial street will be denied (However, a second driveway access may be considered for the purposes of constructing a circular driveway). The applicant's request for the additional access shall be accompanied by a site drawing indicating the dimensions, radius, distance between existing driveways and property lines, and other information necessary for staff to determine the feasibility and safety of the proposed driveway.

3.1.8.2 Access from Alleys and Private Streets

Alley and private street connections to the public street shall be designed in accordance with guidance to be provided by Public Works or attached standard details.

3.1.8.3 Controlled Access

Controlled or gated access is not permitted on public or private streets except as approved for emergency-only access or public utility access. Gated communities and gated neighborhoods may be considered on a case-by-case basis. Any proposed controlled access devices will be evaluated through the design exception process.

3.1.9 Cul-de-sacs

Dead-end streets over 150 ft in length shall terminate in an approved turnaround acceptable to the Fire Marshal and Public Works to provide adequate emergency vehicle access. The maximum length of a dead-end street shall be 400 feet unless approved through the design exception process (see Section 2.6). This length shall be measured from the centerline of the intersecting street along the centerline of the dead end street to the center of the turnaround.

No islands or other obstructions are allowed in the centers of cul-de-sacs.

The entire cul-de-sac or hammerhead must be contained within the public right-of-way and signed appropriately to restrict parking. Refer to Section 3.1.2.6 for information regarding sign installation responsibilities.

3.1.10 Alleys

Alleys must be a minimum of 20 feet wide with a 5-ft curb radius at the intersection of the public road. Alleys shall be constructed using the pavement section required for residential local streets.

3.1.11 Roadway Drainage

Storm water disposal from streets requires a collection and piping system. Roadway storm drain facilities shall be separate from the City's sanitary sewer lines. Discharge points for all roadway storm drains shall be approved by the Public Works. Refer to Chapter 5 for storm water system design standards.

Bioswales and other storm water infiltration systems shall be employed only in streets in areas designated by Public Works. Bioswales (where allowed) shall be designed in accordance with Chapter 14 Appendix B of the ODOT Hydraulics Manual. Landscaping of bioswales (where allowed) shall meet the standards provided in Section 3.5.

3.2 PRIVATELY-MAINTAINED STREETS

The City will not construct or add to its existing inventory of City maintained streets or access roads unless they meet all standards provided in Section 3.1. However, in cases where public street standards cannot be met, the Developer may elect, with concurrence by Public Works, to construct a privately-maintained access road to serve an infill development. Said privately-maintained access road shall be constructed on private property

Privately maintained streets and access roads may be developed exclusively within private property and the following conditions shall apply:

- a. The maximum number of dwelling units potentially served by the access road shall be three. Streets having the potential to serve more than three dwelling units must meet the requirements in Section 3.1.
- b. Sidewalks are not required.
- c. The street or access road surface must be constructed of an all-weather surface, as approved by the Public Works and City Fire Code Official.
- d. The first 25' linear feet of the intersection/access point to the City street shall be paved.
- e. Any new development on a private street shall have a fire suppression system approved by the City Fire Code Official.
- f. The traveled way of a private road shall be designated as a fire lane under the Oregon Fire Code. Private streets must have a minimum of 20 feet unobstructed width with 14 feet of vertical clearance.
- g. With the approval of the City Fire Code Official, the travel surface of the access road may be reduced to 16 feet if two or three dwelling units will be served, or 14 feet if only one dwelling unit will be served. The total length of any access road with a reduced pavement width must be 400 feet or less. Access roads in excess of 400 feet must have a paved surface at least 20 feet wide.
- h. A standard turnaround shall be required at any dead end. (See Section 3.1.9)

- i. A maximum profile grade of 12% is allowed.
- j. All runoff from new access roads must be controlled and directed to appropriate storm drains, or existing natural drainage channels. Connection to a natural drainage requires Public Works approval.
- k. Construction of privately-maintained improvements within existing public rights of way must not obstruct or reduce access to existing homes.
- l. The Developer shall arrange for future maintenance and repair of the access road, through a recorded road maintenance agreement or other legal mechanism to ensure perpetual maintenance. The maintenance agreement shall be binding upon all subsequent property owners and shall clearly specify that the City may remove any road improvements as needed to construct, repair or maintain City utilities in the right-of-way or easements. Restoration or repair of any roadway damage caused by City utility work will be the responsibility of the parties to the maintenance agreement.
- m. Street improvements constructed in the public right-of-way shall be positioned to allow for future widening, if additional development is anticipated.
- n. Developers shall install their own signs in accordance with the MUTCD and City Standards, including a street identification sign at all intersections. Public Works approval is required when installing signs at intersections with public roads. Once installed, the City will assume maintenance responsibility for traffic control signs and devices and street name signs located at the intersection with a City street. The City will not furnish, install or maintain other signs for private streets.

3.3 NON-MOTORIZED FACILITIES

3.3.1 Sidewalks

Sidewalks in City street corridors shall be designed in accordance with Section 3.1.3.

3.3.2 Bicycle Facilities

Bicycle facilities in City street corridors shall be designed in accordance with Section 3.1.2.1.

3.3.3 Multi-Use Pathways

Multi-use pathways within the City are intended for non-motorized use by bicycles and pedestrians. As land is developed, publicly accessible multi-use pathways may be required by the City's Community Development Department to facilitate non-motorized circulation and connectivity. ADA requirements apply to these facilities. Design of new multi-use pathways shall include logical connections to existing or planned pedestrian and bicycle facilities in street corridors.

General requirements for multi-use pathways are provided in Table 3-10. For additional design guidance, refer to the AASHTO Guide for the Development of Bicycle Facilities, and the Oregon Bicycle and Pedestrian Design Guide.

Table 3-10. Multi-Use Pathway Design Elements

Pathway Element	Requirements
Surfacing	Stable, firm and slip resistant. Asphalt or concrete are preferred. Other materials require Public Works approval.
Maximum Longitudinal Slope	5%
Maximum Cross Slope	2%
Clear Width	10' minimum; 12' preferred; in areas of significant walking or biking demand the clear width should be 16'.

3.3.4 Public Stairways

New pedestrian facilities and alterations to existing pedestrian facilities within the public right-of-way shall conform to ADA Standards. Due to the City's topographical setting however, hillside conditions may constrain modification or addition of pedestrian features in full and strict compliance with minimum ADA standards. In cases where ADA compliance is technically infeasible, stairway access for pedestrians may be considered by the Public Works. Where allowed, public stairways shall conform to ADA requirements for general site and building elements.

3.3.5 Street Crossings

Developers are required to provide enhanced street crossings on roadways with high traffic volumes and/or speeds in areas with nearby transit stops, residential uses, schools, parks, shopping and employment destinations. These crossings shall include treatments such as marked crosswalks, high visibility crossings, and/or curb extensions as determined by the Public Works.

3.4 TRANSIT FACILITIES

Developers shall provide documented coordination with Coos County Area Transit, the local transit provider, with regard for design of street and other transportation facilities that are located within 100 feet of existing or planned transit routes and stops. ADA-accessible transit stop improvements, pedestrian connections to transit stop locations and furnishings such as shelters, benches, bicycle racks and/or other amenities may be required by the Public Works.

3.5 LANDSCAPING WITHIN THE RIGHT-OF-WAY

In addition to the guidelines in this section, landscaping within the right-of-way must meet the requirements of Coos Bay Municipal Code.

3.5.1 General Requirements

Landscaping within the right-of-way may be a requirement of a development or installed at the request of property owners. If landscaping is a requirement of a development, it may only be removed if it is replaced elsewhere and approved by the Community Development Director and Public Works.

Landscaping within the right-of-way must be maintained by the adjacent property owner. Irrigation in the right-of-way must comply with the OPSC and also be maintained by the adjacent property owner.

3.5.2 Clearance

Landscaping within the right-of-way must meet the Clear-Vision Area requirements found in section 3.1.6.2. Vegetation must be maintained so all branches and foliage are removed to a height of 7 feet above the sidewalk and 14 feet above the roadway.

3.5.3 Street Tree Installation and Types

Street tree installation and types shall be in conformance with Coos Bay Municipal Code 8.30 and the City's Urban Forestry Plan.

3.6 TRANSPORTATION FACILITY CONSTRUCTION AND MAINTENANCE RESPONSIBILITIES

Developers are responsible for constructing, signing and striping new street facilities and improving existing roadways as required for developments such as subdivisions and commercial buildings. Maintenance of roadway improvements within dedicated right-of-way is the responsibility of the Developer (or designated private parties) until formal acceptance of the roadway by City Council. Any non-standard roadway within the right-of-way that is not accepted by the City Council must be maintained by the Developer (or designated private parties) in perpetuity or until the roadway is improved and accepted by City Council. Maintenance responsibility needs to be documented, recorded and a copy provided to the City prior to any final inspections or occupancy of the associated development.

Transportation facilities within the vehicular zone of street corridors that are located within the public right-of-way and that are formally accepted by City Council are maintained by the City. This includes pavement, gutter, signing, striping and signalization. State highways are maintained by ODOT.

Transportation facilities within the walking zone of street corridors are maintained by adjacent property owners.

Private roads and alleys must be maintained in perpetuity by the Developer, adjacent property owners, homeowners association or other designated party. A maintenance agreement shall be submitted to the City with any new development project.

Table 3-11. Maintenance Responsibilities

Facility	Location	Accepted by City Council?	Maintenance Responsibility
Standard street vehicular zone improvements	Public Right-of-way (ROW)	Yes	City
Standard street walking zone improvements	Public ROW	Yes	Private ¹
Sub-standard street, private street or alley	Public ROW	No	Private ¹
Multi-use pathway	Public ROW, easement or tract	TBD ²	TBD ²
State highway	State ROW	N/A	ODOT
¹ Adjacent property owners for sidewalk, owners of properties served by the sub-standard street, private street or alley, or other designated parties. ² To be determined prior to design approval			

3.7 FORMAL ACCEPTANCE OF TRANSPORTATION FACILITIES

Approval of the final plat or map shall not constitute an offer by the applicant or acceptance by the city of any public improvements or monumentation. Upon completion of the improvements and post-monumentation, the applicant shall submit all items identified in Coos Bay Municipal Code Chapter 17. The following minimum record drawings shall be submitted to Public Works:

- (1) One copy of street and sanitary/storm sewer plan profiles.
- (2) One mylar of the certified post-monumentation plan.

Public Works Department staff shall review the material and indicate approval of the post-monumentation by signing the affidavit on the final plat or map.

Only improvements that have been constructed in accordance with City standard specifications (latest edition of Oregon Standard Specifications for Construction) and inspected and approved by Public Works shall be recommended for Council acceptance by Public Works (also see Section 2.9). Upon City Council passing a resolution confirming acceptance of the public improvements, the City will provide a formal letter of acceptance. The City will not maintain or repair any facilities until they have been formally accepted.

4 SANITARY SEWERS

This chapter provides information for the design of public sanitary sewers. Public sanitary sewer design plans are reviewed and approved by the Engineering Division.

Private sanitary sewers constructed on private property must be designed according to the Oregon Plumbing Specialty Code.

The following sanitary sewer design standards have been developed with the goals of proper sizing for current and future flows, correct installation for long life, ease of access for maintenance and repair while taking into account construction costs.

Compliance with these standards does not relieve the Design Professional of the responsibility to apply conservative and sound professional judgment. These are minimum standards and are intended to assist, but not substitute for competent work by design professionals. The City may at its sole discretion due to special conditions and/or environmental constraints, require more stringent requirements than would normally be required under these standards.

This chapter is intended to be consistent with and a supplement to the following documents:

APWA	American Public Works Association
ASTM	American Society for Testing and Materials
OAR	Oregon Administrative Rules
CBMC	City of Coos Bay Municipal Code
OPSC	Oregon Plumbing Specialty Code
DEQ	Oregon Department of Environmental Quality Water Quality Program Rules ¹

Where conflict exists between these Design Standards and the above referenced documents, the most stringent requirements shall take precedence.

4.1 DESIGN FLOWS

The entire basin to be served by a sanitary sewer must be taken into account when developing design flows for new or replacement sanitary sewers.

¹ Oregon Department of Environmental Quality, *Water Quality Program Rules – Division 052*
<http://www.deq.state.or.us/regulations/rules.htm>

Flow calculations prepared by a Professional Engineer are required for all lines serving 10 or more residences and all commercial or industrial facilities with flows in excess of 3,600 gallons per day (gpd). Engineer prepared calculations for lesser thresholds may be required by Public Works staff based on known existing conditions in the downstream collection system.

4.2 SANITARY SEWER PIPES

4.2.1 Sanitary Sewer Pipe Material

The standard pipe material to be used for gravity sanitary sewers is green PVC meeting the requirements of ASTM D3034 SDR35. High-density polyethylene (HDPE) pipe with fused joints is also acceptable. All HDPE pipe shall be de-beaded. Minimum wall thickness class of HDPE pipe is SDR 26. Other pipe materials may be considered where appropriate and must be approved by Public Works. Tracer wire shall be a minimum 18-gauge minimum, solid copper wire with green 30 MIL thick HDPE insulation rated for direct burial, and shall be installed with all sanitary sewer pipes. Use waterproof splice at all connections.

Sanitary and storm sewer lines must have warning tape. The tape shall be 6 inches wide, 4 MIL thick, APWA green, and reading "Caution Sewer Line Buried Below".

4.2.2 Sanitary Sewer Pipe Size

Sanitary sewers shall be sized to adequately handle the expected flows. The minimum sanitary sewer diameter is 8 inches. For dead-end lines up to a maximum length of 250 feet, that have no possibility of future extension and serve less than 6 houses or have limited flow, 6 inch lines will be allowed providing that they can be shown to have sufficient capacity and flow velocity. Manholes will be required at upstream end for maintenance purposes.

4.2.3 Sanitary Sewer Pipe Slope

Sanitary sewers shall be sloped to provide a minimum velocity of 2 feet per second (fps) for the average daily flow using a Manning's roughness coefficient of 0.013 or greater. In no case, unless approved by Public Works, shall the slope be less than shown in Table 4-1.

Table 4-1. Minimum Pipe Slopes

Pipe Diameter (inches)	Minimum Slope (%)
6	0.75
8	0.40
10	0.40
12	0.40

Slopes shown are an absolute minimum. Calculations shall be provided to show that minimum flow velocity requirements can be met. Sizing pipes larger than needed for the anticipated flow to allow installation at a reduced slope is not acceptable. Sanitary sewer diameters may not be reduced in a downstream direction even if steeper slopes allow a smaller diameter pipe to have sufficient capacity for the design flow.

Flow velocities greater than 15 fps under daily peak flows should be avoided. A velocity over 15 fps in sanitary sewer pipes requires special consideration for pipe scour control (and manhole scour, see Section 4.3.4). Pipe restraints or anchors may be required for pipe slopes in excess of 20%.

4.2.4 Sanitary Sewer Depth

Sanitary sewers shall be installed with a minimum of 36 inches of cover from the top of the pipe to the finish surface. The depth should be sufficient to provide for access by gravity from all adjacent properties in the area whether proposed or existing. Sanitary sewer main depth shall be designed to avoid conflict with other existing and proposed utilities as provided in Section 4.4.2. Conflicts between sanitary sewer laterals and other utilities must also be taken into account in the design. All design must be in conformance with OAR 333-061-0050.

4.2.5 Sanitary Sewer Laterals

Sanitary sewer laterals shall meet the requirements of the Oregon Plumbing Specialty Code.

4.3 MANHOLES AND CLEANOUTS

4.3.1 Location

Manholes shall be installed at the following locations:

- a. All changes of pipe size, direction, alignment and grade
- b. At the upstream end of the pipe
- c. Maximum spacing of 300 feet
- d. Each intersection or junction of sanitary sewer mains
- e. Any intersection of a service or private sewer of 8 inches or larger
- f. Manholes shall not be placed in the wheel path

Manhole placement within the street right-of-way should allow easy access without blocking both traffic lanes. Manhole covers shall not be located in the normal wheel path for the street nor within a crosswalk. Place manholes to avoid surface runoff or storm water ponding.

4.3.2 Standard Manhole

Manholes shall be 48 inches in diameter for main sizes up to 24 inches. For line sizes in excess of 24 inches, the Design Engineer shall submit manhole designs. A minimum 0.1 foot drop

inverts across the manhole is required where the angle between the upstream and downstream pipe is less than 90 degrees. Provide at least a 0.2 foot drop in inverts where the outlet pipe is 90 degrees from the inlet pipe, or where manholes larger than 48 inches have been approved for use by the Public Works. Designs for connections to existing manholes shall show the location of the cover and ladder and the elevations of all pipe inverts, channels, ledge and rim. When different size pipes enter/exit a manhole, the elevation of the crowns of the pipe shall match.

Flat top manholes should be used when there is less than 6 feet from the pipe invert to the top of the manhole.

4.3.3 Drop Manhole

The maximum permitted channelized drop across a manhole is 24 inches. For drops in excess of 24 inches, a drop manhole is required. Inside drops are only permitted when adequate room is available within the manhole and when site conditions make an outside drop extremely difficult to construct. Only one inside drop is permitted in each manhole. Inside drops require approval by the Public Works.

4.3.4 Manhole Scour Protection

Internal manhole scour protection, such as HDPE flat plate (1/4 inch thick), epoxy coating or energy dissipation mechanisms shall be provided whenever entering flows exceed 15 feet per second. Scour protection treatments require approval by the Engineering Division.

4.3.5 Connections to Existing Manholes

When connecting new lines to existing manholes, the manhole wall must be core drilled cleanly, and grouted or otherwise sealed to prevent groundwater inflow and infiltration.

4.4 SANITARY SEWER ALIGNMENT

Sanitary sewer lines shall have a straight alignment with a constant grade between manholes. Curved alignment will not be allowed unless there are no reasonable alternatives and must be approved by Public Works. Sanitary sewer alignment shall be in a street right-of-way whenever possible.

4.4.1 Sanitary Sewer Easements

The minimum easement width for installations of storm and sewer with depths of cover of 5-feet or less (measured at the top of pipe) is 15 feet. The minimum easement width will be increased by 10-feet for each additional 5-feet of cover over 5-feet (rounded up). Easements shall be centered over the utility.

If due to topographic constraints the sanitary sewer must run along the alignment of a property line, adequate access must be provided. A minimum 15-foot wide sanitary sewer easement is required for access and an adequate surface is required for physical access. The sanitary sewer alignment must be graded to permit travel by utility trucks and backhoes. The sanitary sewer alignment should be offset from the property line to avoid conflicts with survey monuments. The easement description must hold the City harmless for any damage to or removal of fences, retaining walls, trees or other improvements constructed in the easement area. Easements need to be shown on the final plat or recorded easement document prior to City acceptance.

Sewers in easements will be allowed only after all reasonable attempts to place the mains in the right-of-way have been exhausted. All sewers shall be centered in the easements.

4.4.2 Clearance from Other Utilities

Separation of parallel water and sanitary sewer lines shall meet the requirements of OAR 333-061-0050.

Adequate separation is required from other utilities. All clearances listed in Table 4-2 below are from edge of pipe to edge of pipe:

Table 4-2. Minimum Horizontal Clearance from Sanitary Sewer

Utility	Min. Distance (ft)
Cable TV	5
Gas	10
Power	10
Storm	5
Telephone, Fiber Optic	10

Table 4-3. Minimum Vertical Clearance from Sanitary Sewer

Utility	Min. Distance (ft)
Cable TV	2
Gas	2
Power	2
Storm	2
Telephone, Fiber Optic	2

4.5 SANITARY SEWER CONNECTIONS

In accordance with the Coos Bay Municipal Code, each residential, commercial or industrial building is required to have a separate connection to the public sanitary sewer. Exceptions are allowed per CBMC Section 13.15.170.

4.5.1 Connection of Sanitary Sewer Laterals

Connection of sanitary sewer laterals to the public sanitary sewer main must conform to the standard details. The cost of new lateral connections or extensions is the responsibility of the property owner.

City responsibility for sanitary sewer maintenance is limited to public sanitary sewer mains. Sanitary sewer laterals from the point of connection, including the connection at the sanitary sewer main, back to the building are the responsibility of the property owner.

4.5.2 Connection of New Sanitary Sewer Mains

Connections of new sanitary sewer mains to existing pipes must be done with a manhole. There is a possibility of surcharging in some existing sanitary sewer lines, particularly the interceptor. This must be taken into account when designing new connections and measures such as storage or backflow prevention constructed to avoid problems.

4.5.3 Pre-Treatment Requirements for Sanitary Sewer Connections

Coos Bay Municipal Code Chapter 13.15 prohibits the introduction of mastics, oil, grease or petroleum products into the public sanitary sewer by any user connected to the sanitary sewer system. Industrial, commercial and/or retail operations, regardless of size, that generate petroleum/animal/vegetable fats, oils or grease (FOG) waste, must pre-treat wastewater prior to discharging to the public sanitary sewer. Pre-treatment systems are reviewed and approved by the State of Oregon Plumbing Official. Ongoing maintenance and repair of pretreatment systems to ensure proper function is the responsibility of the property owner.

4.6 WASTEWATER PUMP STATIONS

Pump stations will be evaluated on a case-by-case basis by Public Works. Pump station design plans require DEQ approval in addition to City approval.

Wastewater pump stations must be designed by an Oregon Registered Professional Engineer and must meet DEQ standards for design and construction of wastewater pump stations. Operation and maintenance manuals meeting DEQ guidelines must also be provided. Contact Public Works for additional specifications on pump station controls and appurtenances required by the City.

4.7 SANITARY SEWER SYSTEM TESTING

All new sanitary sewer pipes and manholes must be tested for water tightness prior to City acceptance, using a DEQ-approved method. (Refer to Appendix A of OAR 340 052.)

In addition, new sewer pipes must be thoroughly flushed and inspected by video, after trench backfilling is complete and prior to City acceptance. This includes video confirmation that the line is free from sags, irregular joints and connections, obstructions, restrictions or other anomalies that may cause solids to accumulate.

Pump station inspection and testing shall be performed to manufacturer's specifications in the presence of Public Works personnel or designated representative. Testing documentation must be provided to Public Works for approval prior to City acceptance.

5 STORM WATER MANAGEMENT SYSTEMS

5.1 GENERAL GUIDELINES

Plans for temporary and permanent storm water management shall be provided for every street improvement and land development proposal that disturbs 1000 square feet or more.

In addition to adhering to the standards provided below, storm water designs should identify the potential overland flow path in the event the storm water infrastructure becomes plugged or fails, and provide safeguards to minimize property damage.

Runoff from streets and other impervious surfaces may not be directed to a natural drainage channel, without prior approval of Public Works. If approved, runoff directed to natural drainage channels shall be pre-treated using a pollution control structure or biofiltration method. Riprap or other energy dissipation facilities may be required at storm water discharge points to prevent erosion. It is the responsibility of the owner to obtain all necessary regulatory permits.

5.2 STORM WATER DESIGN DOCUMENTATION

Hydraulic and hydrologic reports and other storm water design documentation documents shall be prepared in accordance with this section.

5.3 TEMPORARY STORM WATER AND EROSION CONTROL

Management of storm water during construction shall adhere to the Oregon Department of Environmental Quality's Construction Stormwater Best Management Practices Manual.

A plan for temporary slope stability and erosion control, along with a plan for permanent slope stability, erosion control and plant establishment, is required as part of the construction submittal. A site design permit must be obtained from Public Works before any site work, including clearing and grubbing, begins.

A geological study, prepared by an Oregon licensed geotechnical engineer, engineering geologist, or geologist, is required to be submitted to and approved by Public Works prior to grading and/or proposed new development on slopes exceeding 25%. The study shall address overall slope stability, before, during, and after disturbance and/or development. Geological recommendations shall include methods for maintaining slope stability and managing storm water during construction. All geological recommendations shall be incorporated in the applicant or Developer's grading permit application, and approved by the geologist or

engineer upon completion of construction. It is the responsibility of the owner to obtain all other necessary regulatory permits.

5.4 PERMANENT STORM WATER MANAGEMENT SYSTEMS

5.4.1 Flow Calculations and Sizing Methodology

Runoff calculations and pipe sizing performed by a registered engineer are required, and should be based on anticipated build-out. All future anticipated impervious surfaces in the development such as streets, walkways, driveways, roofs, patios, etc. should be accommodated when designing storm water improvements.

Hydrologic calculations for drainage basins/watersheds less than 200 acres shall utilize the Rational Method. Hydrologic calculations for drainage basins/watersheds greater than 200 acres shall utilize the Unit Hydrograph Method. Storm drain design shall utilize a 25-year, 24-hour duration return interval. Design for storm drain improvements for state highways (improvements associated with state highways must have ODOT approvals) or arterial roads shall utilize the 50-year, 24-hour duration return interval. In cases where roadway overtopping is likely, a 100-year, 24-hour return interval shall be utilized for design. Refer to the City of Coos Bay Stormwater Master Plan and the ODOT Hydraulics Manual for calculating peak flows utilizing the Rational Method and Unity Hydrograph Method. Selection of methodology is at the discretion of the Design Engineer. Calculations should be confirmed using a second analysis method, also selected at the discretion of the designer.

5.4.2 Inlets, Catch Basins and Storm Water Pre-Treatment

Inlets and catch basins in the public right-of-way shall be constructed per standard details. Inlets and catch basins on private property shall comply with Plumbing Code requirements.

Pre-treatment of storm water destined for conveyance in a public storm drain system is recommended. Pre-treatment may be accomplished through the use of biofiltration swales, catch basin inserts, or other methods approved by Public Works which are designed to remove oil and grease, trash, debris, sediment, and other pollutants associated with development. Any catch basin inserts proposed for use on public facilities or located within public right of way will require approval of Public Works.

5.4.3 Storm Drain Manholes

Manhole design shall conform to the following:

A. Storm drain manholes shall be provided at least every 500 feet, at each change in pipe grade or alignment, and at each junction of two or more lines. Manhole lids shall have a

minimum of six inches of clearance from the edge of curbs and shall not be in wheel paths of the traveled way.

B. All manholes shall be a minimum of 48 inches in diameter.

C. Inside drop and water quality manholes shall be at least 60 inches in diameter with at least 42 inches of clear space.

D. Storm drain manholes shall meet the requirements of attached standard details. Channelization is required in storm drain manholes.

5.4.4 Storm Drain Pipes

The City allows the use of the following materials for storm drain piping:

- a. Pipe meeting ASTM D3034 SDR 35 specifications
- b. High-density polyethylene (HDPE) pipe with fused joints. Joints shall be de-beaded.
- c. Dual wall corrugated HDPE pipe with smooth interior wall (for example, ADS N-12 piping for diameters of 24" and less; and ADS SaniTite for diameters of 30" and larger.)

Storm drain piping shall otherwise meet the requirements of Section 4.2, except that the minimum storm drain pipe size shall be 8 inches.

Green locate wire and tracer tape shall be installed as shown in standard details.

5.4.5 Connection of Private Drains to the Public Storm Drain

Private drains may be connected directly to the public storm water system, if approved by Public Works. Public storm drain pipes 6-inch diameter and larger, shall be connected at a nearby manhole or catch basin rather than directly to public storm water pipelines. All connection points shall be approved by Public Works.

For private developments adjacent to Residential Streets, small private drains for individual lots may be piped under the sidewalk and through the curb, for discharge to the street gutter, provided that there is 2 inches of freeboard from the water surface elevation (25-year, 24-hour storm event) to the top of curb AND 8 feet of the traveled way is dry. For highways and arterials, drainage under the sidewalk will be allowed on a case by case basis. Owner is responsible for any damage that occurs to sidewalk as a result of the drain. Gutter discharge points shall be approved by the Public Works. Discharge points cannot adversely impact adjacent neighbors or cause flooding/ponding within the public right of way. The owner may be required to employ low impact development devices to capture runoff and reduce the volume and duration of runoff that enters into the gutter as a result of the private development. Public Works may require connection to the public storm water system where gutter discharge has the potential for detrimental effects.

5.4.6 Retention and Detention Facilities

Proposed improvements cannot adversely impact downstream drainages. If there are adverse impacts, the downstream system shall be mitigated or the increase in volume and durations onsite shall be mitigated.

5.4.6.1 Detention Flow Control Structures

Structural detention facilities such as tanks, vaults and oversized pipes shall be designed to prevent surcharge of downstream piping systems during storm events.

The following criteria apply to detention basins:

- a. When required, on-site stormwater detention facilities shall be designed to capture runoff so the post-development runoff rates from the site do not exceed the predevelopment conditions, based upon a 2-year through 25-year, 24-hour return storm. Volume and duration of pre-development conditions will be considered.
- b. Detention basin shall have an emergency spillway designed to pass the 100-year storm event.
- c. In soils where groundwater may induce flotation and buoyancy, measures shall be taken to counteract these forces with concrete ballast, earth backfill, concrete anchors, or other counteractive measures. Calculations demonstrating stability shall be submitted to Public Works.

Flow control structures must be approved by Public Works and must meet the following design criteria:

- d. Refer to the ODOT Hydraulics Manual for orifice and weir flow control equations.
- e. Weir must be accessible (e.g. for backhoe, dump truck, and personnel) for maintenance.
- f. The control structure shall be designed to pass the 100-year storm event as overflow (emergency spillway), without causing flooding of the contributing drainage area.

5.4.7 Operation and Maintenance Plans

A plan outlining the scope of activities, schedule and responsible parties for periodic inspection and maintenance of permanent storm water facilities shall be prepared and included with the construction submittal. This plan shall cover vegetation management, structural repairs, sediment removal and other activities necessary for the continued long-term function of the storm water facilities.

5.4.8 Storm Drain System Testing

All new storm drain pipes and manholes must be tested for water tightness prior to City acceptance using a water exfiltration test procedure.

In addition, new storm drain pipes must be thoroughly flushed and inspected by video, after trench backfilling is complete and prior to City acceptance. This includes video confirmation that the line is free from sags, irregular joints and connections, obstructions, restrictions or other anomalies that may cause solids to accumulate.

6 SITE GRADING AND EROSION CONTROL

6.1 PURPOSE

- a. The purpose of this section is to protect existing public and private improvements against damage that may occur as a result of grading activities on private properties within the City of Coos Bay. In addition, minimum erosion control measures are identified which are intended to prevent or minimize sediment discharge from sites where grading is planned.
- b. Depending on the location and nature of the work, permits may also be required. This can include but is not limited to the Oregon Department of Environmental Quality (DEQ), Oregon Division of State Lands (DSL), the Army Corps of Engineers, the Oregon Department of Fish and Wildlife (ODFW), or US Fish and Wildlife. If such permits are required, the applicant shall provide evidence to the City that a permit has been obtained prior to any clearing, grading, or excavation activities.

6.2 SITE DEVELOPMENT PERMITS

- a. Site Development Permit is required for all proposed grading (excavation or fill) activity within the City of Coos Bay, including but not limited to lot leveling, slope grading, site drainage, retaining wall excavation and fill, and other grading activities associated with site development.
- b. Site Development Permits are not required for sites on which excavation is limited to footing or foundation excavations and utility trenches. These items shall be covered under the Building Permit. This does not exempt these activities from installing the appropriate temporary sediment and erosion control measure during the construction activity.
- c. Site Development Permits, when required, shall be obtained from the City of Coos Bay Public Works Department. The permit application form is available on the City's website or from the Public Works Department.
- d. A bond shall be required to ensure that the work is done to city standards. The bond will be forfeited if the work is not inspected and approved by Public Works.

6.2.1 Grading Plan

- a. Each application for a Site Development Permit shall be accompanied by a plan which clearly shows the nature and extent of the work proposed.
- b. A geological study prepared by an Oregon licensed geotechnical engineer or (depending upon the nature of the project) a certified engineering geologist is required to be submitted to and approved by Public Works prior to grading and/or proposed new development on slopes exceeding 25%. The study shall address overall slope stability, before, during, and after disturbance and/or development. Geological

- recommendations shall include methods for maintaining slope stability and managing storm water during construction. All geological recommendations shall be incorporated in the applicant or Developer's grading permit application, and approved by the engineer upon completion of construction. It is the responsibility of the owner to obtain all other necessary regulatory permits.
- c. Grading plans as described herein are intended for proposed grading, excavation, or fill projects on existing platted parcels within the City of Coos Bay. Grading plans for land division projects shall be included with plans submitted for development review as specified in Section 2 – General Requirements of these Engineering Design Standards.
 - d. The following items shall be included on each proposed grading plan:
 - 1. Name of the property owner and the person or firm that prepared the plan.
 - 2. Site address and map parcel number.
 - 3. Property lines and any easements on or across the property.
 - 4. Limits of clearing.
 - 5. Extents of proposed grading, including depth of cut and fill.
 - 6. Location of all existing and proposed buildings or structures and location of any buildings or structures within 15 feet of the proposed grading.
 - 7. Location of any existing or proposed retaining walls (label wall height).
 - 8. Location of any existing or proposed drainage courses or piping.
 - 9. Configuration of all proposed cut and fill slopes (i.e. 2H:1V).
 - 10. Existing and proposed topography with 2-foot contour intervals.

6.3 GRADING AND FILL REQUIREMENTS

- a. Fill slopes shall not exceed two feet horizontal to one-foot vertical (2:1) unless approved by a qualified Oregon licensed geotechnical engineer or (depending upon the nature of the project) a certified engineering geologist. The toe of fill slopes shall be setback from property boundaries at least one-half the height of the fill with a minimum of two (2) feet and a maximum of 20 feet. Where a fill slope is to be located near the property boundary, precautions shall be taken to protect the adjoining property from damage as a result of such grading. These precautions may include but are not limited to:
 - i. Additional setbacks.
 - ii. Provision for retaining or slough walls.
 - iii. Mechanical or chemical treatment of the fill slope surface to minimize erosion.
 - iv. Provisions for the control of runoff.
- b. Cut slopes shall be no steeper than two feet horizontal to one-foot vertical (2:1) unless a geological study prepared by an Oregon licensed geotechnical engineer or (depending upon the nature of the project) a certified engineering geologist is submitted which

justifies that a steeper slope can be safely constructed and will not create a hazard to adjoining public or private property. The top of cut slopes shall not be made nearer to a site boundary line than one-fifth the height of cut, with a minimum of two (2) feet and a maximum of ten (10) feet.

- c. Surface vegetation and topsoil must be grubbed to a depth of at least six inches (6") prior to placement of fill material. All existing vegetation must be removed from areas designated to receive fill prior to placement.
- d. Fill material shall be free of all rubbish, organic material, and other deleterious substances which could be detrimental to the stability of the fill.
- e. Fill shall be compacted to at least 90% of maximum density as determined by the ASTM D1557 (Modified Proctor) test method. Fill material shall be placed in lifts not exceeding 12 inches (12") compacted depth.
- f. A report prepared by an Oregon licensed geotechnical engineer, or (depending upon the nature of the project) a certified engineering geologist is required when fills in excess of 12 inches (12") are planned within future building areas. The specified fill material shall be placed and compacted in accordance with the recommendations of the report. Any required testing shall be as recommended in the report.
- g. Disturbed areas not scheduled for construction of buildings or other improvements shall be stabilized with permanent erosion control to prevent erosion once grading is complete. Stabilization shall be completed within 30 days of the date all grading is finished. Temporary stabilization measures may also be required prior to completion of the project if the City determines it is necessary due to windblown dust or erosion at the site.

6.4 OTHER REQUIREMENTS

- a. For sites located partially or entirely within a Special Flood Hazard Area as identified on the FEMA Flood Insurance Rate Maps, the project must meet the requirements of the Coos Bay Municipal Code 17.347 Flood Damage Prevention. An engineering evaluation to determine the impact of fill on floodwater elevation may be required.
- b. A biological evaluation may also be required to determine impact to endangered species and or their habitat.
- c. The disturbance of one or more acres requires application for a National Pollutant Discharge Elimination System (NPDES) General Permit 1200-C as administered by the Oregon Department of Environmental Quality (DEQ). The application form is available online or can be obtained from the local DEQ office. Issuance of a Site Development Permit from the City of Coos Bay does not meet or negate the requirement to obtain an NPDES General Permit 1200-C.

- d. Excavations exceeding 5,000 cubic yards within a 12-month period require an Operating Permit from the Oregon Department of Geology and Mineral Industries (DOGAMI). Application forms are available online or by contacting DOGAMI at (971) 673-1555.
- e. If the proposed grading includes import or export of materials, a heavy hauling permit may be required by the City of Coos Bay. Heavy hauling permits require bonding to insure against damage to existing infrastructure within the right-of-way (see Coos Bay Municipal Code 12.05). The amount of bonding required is based on the volume of import/export and will be determined by Public Works.

6.5 TEMPORARY EROSION AND SEDIMENT CONTROL POLICIES AND CRITERIA

6.5.1 General

Submission of an Erosion and Sediment Control Plan is required in conjunction with each Site Development Permit application. The best management practices (BMPs) listed below in Section 6.5.3 are the required minimum measures but may not be appropriate for every site. The City will review Erosion and Sediment Control Plans for completeness and compliance with requirements. However, it is the responsibility of the applicant to install proper and adequate sediment and erosion control measures such that the site is adequately stabilized and the downstream properties and receiving waters are protected for the duration of the construction.

6.5.2 Referenced Standards

For erosion control best management practices (BMPs) refer to the *Oregon Department of Environmental Quality Erosion and Sediment Control Manual*.

6.5.3 Required Best Management Practices (BMPs)

The BMPs listed below are required, where applicable, for grading projects within the City of Coos Bay. Additional measures may be required depending on project scope or as a condition of other required permits such as the NPDES General Permit 1200-C.

- a. Mark Clearing Limits – Clearing and grading of the site should be planned properly. It is important to clear only the areas needed, thus keeping exposed areas to a minimum. Clearing should be phased so that only those areas that are actively being worked are uncovered. Clearing limits shall be flagged prior to the initiation of clearing.
- b. Stabilized Construction Entrance – A stabilized construction entrance must be constructed prior to initiating grading. The stabilized construction entrance shall be the sole entrance or egress from the site. Do not install gravel on paved surfaces. Stabilized

construction entrances shall be installed and maintained in accordance with the requirements of Appendix F – Part SC-10 of the *DEQ Erosion and Sediment Control Manual*.

- c. **Protect Stockpiles and Staging Areas** – Soil and material stockpiles shall be situated so that the material does not erode into the street or adjoining properties. Excavated soil and material stockpiles should be located at least ten (10) feet behind the curb, such as in the backyard or side yard area. This practice will increase the distance eroded soil and stockpiled material must travel to reach the stormwater conveyance system. If applicable to the site, concentrated flows shall be diverted away from staging areas and stockpiles using BMP's from the DEQ Erosion and Sediment Control Manual. Soil and material stockpiles shall be covered when not in use (e.g. when not accessed for 48 hours or more) during the period of October 1st to May 31st. This requirement may be waived for soil and gravel stockpiles on flat (<5%) slopes if in the opinion of the City inspector, the risk of erosion is minimal.
- d. **Sediment Fence** – Install sediment fence along a level contour, with the last six (6) feet of fence turned up slope. Except for the ends, the difference in elevation between the highest and lowest points along the top of the sediment fence shall not exceed one-third the fence height. Sediment fence shall be installed and maintained in accordance with the requirements of Appendix F – Part SC-1 of the *DEQ Erosion and Sediment Control Manual*.
- e. **Storm Drain Inlet Protection** – Protect storm drain inlets immediately downstream from the site using BMP's from Appendix F – Part SC-8 of the *DEQ Erosion and Sediment Control Manual*.
- f. **Slope Protection and Temporary Cover** – Slope stabilization measures (for slopes 3:1 and steeper) must be initiated within 14 calendar days between June 1st and September 30th and within seven (7) days between October 1st and May 31st in portions of the site where grading activities have temporarily or permanently ceased. Slopes shall be stabilized using mulch, erosion control matting, or other methods as approved. Methods for slope protection shall be as recommended in Appendices E and F of the *DEQ Erosion and Sediment Control Manual*.
- g. **Establish Permanent Cover** – Prior to removal of erosion control and temporary slope protection measures, permanent cover must be established on the site. Permanent cover shall be installed within 30 days of the date all grading and other site work is finished. Permanent cover shall include seeding, vegetative plantings, and other methods as approved. Refer to Appendices E and F of the DEQ Erosion and Sediment Control Manual.

6.5.4 Inspection

Final Inspection – Final inspection of permanent cover is required for closeout of each Site Development Permit. A Final Inspection should be scheduled when the site is 75% stabilized.

APPENDIX A - STANDARD DETAILS

APPENDIX B – TRAFFIC IMPACT ANALYSIS REQUIREMENTS

Applicants for development and redevelopment projects expected to create 20 or more residential units (e.g. single family residential lots, apartment/condo units) or 20,000 square feet or more of commercial/industrial space shall evaluate the project's transportation system impacts in a transportation impact analysis (TIA). The TIA is used to determine a project's impacts to the City's transportation system. The City requires that the TIA be prepared by a licensed transportation engineer in the State of Oregon and follow the City's current TIA guidelines. The recommended general format is as follows and pertains to City of Coos Bay facilities. Oregon Department of Transportation (ODOT) facilities should be addressed with ODOT using ODOT criteria.

1. A TIA shall analyze the ultimate build out of the project.
2. Any intersection where the proposed development can be expected to contribute 25 or more trips during the analysis, peak hour shall be included in the study area and evaluated operationally to determine compliance with City performance standards.
3. Development trip generations shall utilize the most recent edition of the Institute of Transportation Engineers (ITE) *Trip Generation* to estimate daily and peak hour trips to/from the development. All assumptions and adjustments regarding pass-by, diverted link, and internal trips shall be calculated in accordance with ITE methodology and documented in the analysis.
4. Trip distributions into and out of the transportation system must either follow existing traffic patterns or use a current transportation model. If alternate splits are used to distribute development trips, then justification must be provided and approved by the City prior to submittal of the TIA.
5. Turning movement counts where signal modifications or signals are being proposed shall be a minimum of 12-hours long, with 15-minute breakdowns in the A.M. and P.M. peak hours, unless pre-approved for a lesser time. For all other intersections, counts shall be at least 2-hours long and taken during the A.M. and P.M. peak periods, with 15-minute breakdowns. Counts must be no longer than two years old to be applicable.
6. All traffic volumes shall be seasonally adjusted to represent peak conditions in accordance with ODOT's *Analysis Procedures Manual* (APM).

7. Level of service analyses shall follow operational procedures per the current *Highway Capacity Manual* (HCM). Ideal saturation flow rates greater than 1800 vehicles per hour per lane shall be justified by field measurements. Queue lengths reported in the analysis shall be 95th percentile lengths and rounded to the nearest 25' increment, in accordance with ODOT's APM. Actual peak hour factors shall be used for existing conditions and calculated for each intersection or approach depending upon the peaking characteristics of an intersection. For new intersections, default peak hour factors shall be used in accordance with ODOT's APM.
8. Intersection sight distance shall be evaluated at all site driveways and proposed new approaches in accordance with the American Association of State Highway and Transportation Officials (AASHTO) *Policy on Geometric Design* methodologies. Right and left turn lane criterion shall be evaluated at site driveways and proposed new approaches in accordance with ODOT's APM.
9. Stop-controlled intersections shall be evaluated for signal warrants per the *Manual on Uniform Traffic Control Devices* (MUTCD) if the level of service is determined to be below performance standards. Left and right turn lanes shall also be evaluated where failing facilities are identified and none are currently provided.
10. Analyses shall include existing, design, and future year (City's Transportation System Plan future year) scenarios. For phased developments, analyses shall be evaluated for each phase of development.
11. The TIA shall determine all improvements and/or mitigation measures necessary to meet City performance standards. For each phase of development, improvements shall be identified to accommodate additional traffic generated by this project.

The TIA format shall follow the City's Traffic Impact Analysis Guidelines provided on the following pages of this Appendix.

Traffic Impact Analysis Guidelines

STUDY AND REPORT FORMAT

1) Introduction and Summary

- a) Purpose of the report and study objectives
- b) Executive summary
 - (1) Site location and study area
 - (2) Development description
 - (3) Principal findings
 - (4) Conclusions
 - (5) Recommendations

2) Proposed Development

- a) Site location
- b) Land use and intensity
- c) Site plan (readable version shall be provided)
 - (1) Access geometrics
- d) Development phasing and timing

3) Study Area Conditions

- a) Study area
 - (1) Area of significant traffic impact
 - (2) Influence area
- b) Land use
 - (1) Existing land use
 - (2) Anticipated future development
- c) Site accessibility
 - (1) Existing and future area roadway system

4) Analysis of Existing Conditions

a) Physical characteristics

- (1) Roadway characteristics
- (2) Traffic control devices
- (3) Transit service
- (4) Pedestrian/bicycle facilities
- (5) Existing transportation demand management

b) Traffic volumes

- (1) Daily, morning, and afternoon peak periods (two hours), and others as required

c) Level of service

- (1) Morning peak hour, afternoon peak hour, and other as required

d) Safety

e) Data sources

5) Projected Traffic

a) Site traffic forecasting (each horizon year)

- (1) Trip generations
- (2) Mode split
- (3) Pass-by traffic (if applicable)
- (4) Trip distribution
- (5) Trip assignment

b) Non-site traffic forecasting (each horizon year)

- (1) Projections of non-site traffic by ODOT or other source. For larger developments and study areas, a more comprehensive method may be required which includes: trip generation, trip distribution, modal split and trip assignment.

c) Total traffic (each horizon year)

6) Traffic and Improvement Analysis

a) Site access

b) Level of service analysis

- (1) Without project including programmed improvements (each horizon year)
- (2) With project including programmed improvements (each horizon year)

c) Roadway improvements

- (1) Improvements programmed by the City of Coos Bay, ODOT or others to accommodate non-site traffic
- (2) Additional alternative improvements to accommodate site traffic

d) Traffic Safety

- (1) Sight distance
- (2) Acceleration/deceleration lanes, left-turn lanes
- (3) Adequacy of location and design of driveway or site access

e) Pedestrian considerations

f) Speed considerations

g) Traffic control needs

h) Traffic signal needs (base plus each year in five-year horizon)

i) Conformance with the City of Coos Bay Transportation System Plan

7) Conclusions

8) Recommendations

a) Site access

b) Roadway improvements

- (1) Phasing

c) Conformance with the City of Coos Bay Transportation System Plan

d) Other

9) Appendices

a) Traffic counts

- b) Capacity analyses worksheets
- c) Traffic signal needs studies
- d) Accident data and summaries

The traffic impact analysis shall be prepared under the supervision of a Professional Traffic Engineer or qualified Civil Engineer registered in the State of Oregon. The report shall be sealed and signed by the engineer.

The latest edition of the Institute of Transportation Engineers' "Trip Generation" shall be used for selecting trip generation rates.

All assumptions shall be discussed in the study narrative. All data sources shall be referenced and all supporting data will accompany the study.