DESIGN CRITERIA MANUAL

FOR

PUBLIC IMPROVEMENTS

Public Works Department | Engineering & Transportation Division

Revised May 2019

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INTRODUCTION

This manual documents the current criteria related to the design of public transportation, water, sanitary sewer, storm drainage and street lighting facilities in the City of Corvallis, particularly as they relate to new development.

The Comprehensive Plan establishes policies to guide development in the community. Those policies are implemented through the Land Development Code. The Code assigns administrative responsibility to the City Engineer to establish specific requirements for the construction of public improvements. This manual documents the design related criteria for public facilities that have been established by the City Engineer in fulfilling the requirements of the Land Development Code.

This manual is intended to supplement and be compatible with several other related documents, manuals and guides including:

- Land Development Code
- Transportation System Plan
- Standard Construction Specifications
- Off-Street Parking and Access Standards
- Procedures Manual for Public Improvements by Private Contract
- Stormwater Design Standards
- Erosion Prevention and Sediment Control Manual
- Traffic Impact Study Guide

Input provided by the Planning Division, Development Services Division, Fire Department and Public Works Department contributed to the content and format of this manual.

I. TRANSPORTATION

A. Street Classifications

1. Standards
   a. The following are design standards for new development in unconstrained areas. The City Engineer may approve variances to these standards based on special situations as allowed in the Transportation System Plan. Further variation may be allowed through the Land Development Code.

2. Arterial Highways
   a. Design requirements on State Highways are subject to review and approval through the Oregon Department of Transportation.

3. Arterial Streets
   a. Right of Way Width: 79 feet (3 lanes)
   b. Curb to Curb Width: 49 feet (11 foot travel lanes and 8 foot buffered bike lanes)
   c. Planting Strips: 9 feet wide, including curb
   d. Sidewalks: 6 feet wide, excluding curb if curbside
   e. Access Control: Yes, 150 feet minimum between driveways and/or intersections
   f. Parking Not typical

4. Collector Streets
   a. Right of Way Width: 68 feet (2 lanes)
   b. Curb to Curb Width: 38 feet (11 foot travel lanes and 8 foot buffered bike lanes)
   c. Planting Strips: 9 feet wide, including curb
   d. Sidewalks: 6 feet wide, excluding curb if curbside
   e. Access Control: Yes, 150 feet minimum between driveways and/or intersections
   f. Parking Not typical

5. Neighborhood Collector Streets
   a. Right of Way Width: 66 feet (2 lanes, no parking)
   b. Curb to Curb Width: 36 feet (10 foot travel lanes and 8 foot buffered bike lanes)
   c. Planting Strips: 9 feet wide, including curb
   d. Sidewalks: 6 feet wide, excluding curb if curbside
   e. Access Control: Yes, 150 feet minimum between driveways and/or intersections
   f. Parking: Optional, 8 feet wide

6. Local Connector Streets
   a. Right of Way Width: 56 feet (parking both sides)
   b. Curb to Curb Width: 34 feet (shared surface)
   c. Planting Strips: 6 feet wide, including curb
   d. Sidewalks: 5 feet wide; 6 feet wide if curbside, excluding curb
   e. Access Control: No
   f. Parking: Shared surface, both sides

A. Street Classifications (Continued)

7. Local Streets
   a. Right of Way Width: 50 feet (parking both sides)
   b. Curb to Curb Width: 28 feet (shared surface)
   c. Planting Strips: 6 feet wide, including curb
   d. Sidewalks: 5 feet wide; 6 feet wide if curbside, excluding curb
   e. Access Control: No
   f. Cul-de-sac bulb: 38 feet minimum radius to face of curb; 49 feet to back of walk
   g. Parking: Shared surface, both sides, including cul-de-sac bulb

8. Alleys
   a. Right of Way / Roadway Width (1 way): 12 feet minimum
   b. Right of Way / Roadway Width (2 way): 16 feet minimum for residential;
      20 feet minimum for non-residential

B. Extent of Improvements

1. Transportation System Plan
   a. Locations for new street construction must be consistent with long range system improvements identified in the Transportation System Plan.

2. Limits of Improvements
   a. Street improvements necessary to provide appropriate access to the site must occur prior to or concurrently with development.
   b. Street improvements must be extended to the edges of the property frontage and/or internal property lines so that improvements to City Standards may continue in an orderly fashion.
   c. Half-street improvements may be considered as allowed in the Land Development Code.

3. Retaining Walls
   a. Retaining walls are not typically allowed in the ROW. The City Engineer may approve retaining walls on a case by case basis.

4. Dedication of Additional Right-of-Way
   a. If necessary for future street improvements, the City may require the dedication of additional right-of-way at the time of development.

5. Requirements for Public Improvements
   a. New transportation infrastructure will be inspected, tested and accepted per the requirements in the Standard Construction Specifications and the Procedures Manual for Public Improvements by Private Contract.

C. Horizontal and Vertical Street Alignment

1. Minimum Horizontal Centerline Radii
   a. 500 feet on arterials
   b. 300 feet on collectors
   c. 100 feet on local streets

2. Vertical Curves
   a. Vertical curves must be designed in accordance with American Association of State Highway Transportation Officials (AASHTO) standards for the design speed of the proposed street.

3. Sight Distances
   a. Sight distances must be designed in accordance with AASHTO standards for the design speed of the proposed street.

4. Maximum Grades
   a. The maximum vertical centerline grade for arterials is 6 percent.
   b. The maximum vertical centerline grade for collectors is 10 percent.
   c. The maximum vertical centerline grade for local streets is 15 percent.
   d. The maximum cross-slope on a crowned pavement section is 3 percent.
   e. The maximum cross-slope on a shed pavement section is 5 percent, where allowed.

5. Minimum Grades
   a. The minimum longitudinal grade for drainage purposes is 0.4 percent.
   b. The minimum cross-slope for drainage purposes is 2 percent for asphalt concrete pavement.
   c. The minimum cross-slope for drainage purposes is 1 percent for Portland Cement Concrete pavements.

6. Access to Abutting Property
   a. Accesses to abutting properties are limited to a maximum of 15 percent vertical grade at any point along the length of the access.

D. Intersections

1. Alignment
   a. New streets must be in alignment with existing streets by continuing the centerline.
   b. Staggered street intersections are strongly discouraged. When staggered street alignments resulting in T-intersections are unavoidable, they must leave a minimum of 200 feet between the nearest edges of the two rights-of-way. The City Engineer may allow a minimum distance of 200 feet between the centerlines of two such streets on a case by case basis.

2. Intersection Angles
   a. Intersections must be designed at right angles.
   b. The intersection of two arterial or collector streets must have at least 100 feet of straight (tangent) alignment perpendicular to the intersection.
   c. The intersection of other streets must have at least 50 feet of straight (tangent) alignment perpendicular to the intersection.

3. Curb Radii
   a. All intersections must have a minimum corner radius of 20 feet.
   b. The intersections of collector and arterial streets must provide corner radii which can accommodate truck turning maneuvers given the lane widths and configuration of the intersection. The need for radiuses larger than 20 feet must also consider pedestrian crossing impacts.

4. Sight Distance
   a. Intersections must be located to provide the sight distance required by AASHTO design criteria.
   b. Grading of cut slopes adjacent to intersections and placement of franchise utility installations and mailbox facilities near intersections must provide the minimum vision clearance triangles as required by the Off-Street Parking and Access Standards.

5. Vertical Design
   a. Pavements in intersections must be designed with a minimum 1 percent grade for positive drainage of the intersection area.

6. ADA Compliance
   a. Grading and cross slopes for intersections must comply with minimum ADA requirements for street crossings (See Proposed Accessibility Guidelines for Pedestrian Facilities) as much as practicable.

E. Pavement Design

1. Pavement Design Criteria
   a. All projects constructing or reconstructing 1,500 square feet or more of street pavement must provide a pavement design produced by a Professional Engineer licensed in Oregon.
   b. Pavement design methodology must be per AASHTO's 1993 Guide for Design of Pavement Structures, or as approved by the City Engineer, but may not be less than the Minimum Pavement Section below.
   c. A soils analysis must be included in the design.
   d. Pavement design must have a minimum 20 year design life.
   e. The following design parameters are required minimums:

Street Classification	% Reliability	Minimum ESAL's	% Trucks
Local and Local Connector	80	100,000	3
Neighborhood Collector	85	250,000	5
Collector	90	1,000,000	6
Arterial	95	2,500,000	8
Arterial Highway	Designs must be reviewed and approved by ODOT		

   f. All pavement sections must incorporate woven or non-woven geo-textile fabric between the aggregate base and the sub-base per ODOT Standard Specification 02320, table 02320-4.
   g. Designs for all street classifications may not have an asphalt cement thickness greater than 6 inches without prior approval by the City Engineer.
   h. Exemption: Local residential streets may be constructed or reconstructed per the Minimum Pavement Section, unless the City Engineer determines that an engineered design is warranted. Typically, wet weather construction will require an engineered design.

2. Minimum Pavement Section
   a. The Minimum Pavement Section for all streets during dry weather construction is 4 inches of dense graded HMAC over 12 inches of aggregate base or 8 inches of PCC over 4 inches of aggregate base. All pavement sections must have woven or non-woven geo-textile fabric between the aggregate base and the sub-base. In no case will a pavement design less than the Minimum Pavement Section be allowed.
   b. All projects constructing or reconstructing less than 1,500 square feet of street pavement must match the existing pavement section or use the Minimum Pavement Section, whichever is more.

3. Alleys
   a. Alleys serving residential and commercial zones must be constructed with 8 inches of PCC over 4 inches of aggregate base with woven or non-woven geo-textile fabric between the aggregate base and the sub-base.
   b. Alleys serving industrial zones must be PCC and designed, consistent with the above procedures, by a Professional Engineer licensed in Oregon. The section may not be less than 8 inches of PCC over 4 inches of aggregate base with woven or non-woven geo-textile fabric between the aggregate base and the sub-base.

F. Sidewalks

1. Timing of Construction
   a. Sidewalks along arterial, collector and neighborhood collector streets must be constructed concurrently with public improvements.
   b. Construction of sidewalks along local, local connector and cul-de-sac streets may be deferred until site development as allowed in the LDC.
   c. Sidewalks in common areas (not in individual ownership) must be constructed concurrently with the construction of other public improvements.
   d. In special cases, sidewalks may be required concurrently with street and other public improvements.

2. Standards
   a. Paving Section: 4.0 inches PCC
      2.0 inches ¾"-0 aggregate base
   b. Sidewalk cross slopes must be 1.5% +/- 0.5%. In no case may cross slopes exceed 2 percent.

3. Widths
   a. Sidewalks on local or local connectors must be 5 feet wide; 6 feet wide, excluding curb, if curbside.
   b. Sidewalks on all other streets must be 6 feet wide, excluding curb, if curbside.

4. ADA ramps
   a. ADA ramps must be constructed in compliance with federal requirements, as much as practicable, even if that means out of direction travel for pedestrians in order to achieve compliance.
   b. Ramps must be provided at all corners of street intersections and at other sidewalk connections that do not occur in close proximity to an intersection.
   c. The minimum ramp width is 4 feet, although, 5 feet is preferred.
   d. Wings on each side of the ramp must be a minimum of 3 feet in width unless existing conditions prevent this.
   e. The minimum landing size is 4 foot by 4 foot.
   f. No part of the cross slope may exceed 2%.

5. Mailbox and Utility Pole Transitions
   a. Where mailbox clusters are located in sidewalks, the transition around them must maintain the existing sidewalk width.
   b. The minimum sidewalk width around a utility pole must meet minimum ADA standards.
   c. A public access easement must be provided if the width through the transition area does not remain within the public right-of-way.
   d. Mailbox cluster locations must be coordinated with the City and the Post Office to assure safe, surfaced access to both sides of the cluster.

F. Sidewalks (Continued)

6. Driveway Approaches
   a. Single family and duplex residences must have a minimum approach section of:
      6.0 inches PCC
      2.0 inches aggregate base
   b. Driveways for uses other than single family and duplex residences must have a minimum approach section of:
      8.0 inches PCC
      2.0 inches aggregate base
   c. An increased driveway approach section may be required for driveways serving high volumes of truck traffic.
   d. Curb rolls on each side of standard driveway cuts must be a minimum of 3 feet in width.

7. Transitions
   a. Where sidewalks make a permanent transition in alignment, reverse curves are typically used. The minimum inside curve radius is 8 feet.
   b. Temporary transitions, to where the new alignment will continue in the future, must be built in the new alignment up to the property line and a 45 degree infill sidewalk must be constructed between the new and old alignments. A sidewalk closed sign on an ODOT multi-mailbox hooped support may also be required.

G. Curb Cuts

1. Standards
   a. All driveways and accesses (curb cuts) must be paved within the ROW.
   b. Where standard curb and gutter exists, the pavement must be removed with a vertical cut a minimum of 2 feet beyond the gutter edge and replaced.
   c. Where straight curb exists, the pavement must be removed with a vertical cut a minimum of 2 feet beyond the gutter edge and replaced.
   d. Where there are striped bike lanes, the pavement must be removed with a vertical cut at the curb side edge of the bike lane stripe [so the striping is not damaged] and replaced. If bike lane markings are obliterated or damaged, they must be replaced with like material as existed prior to the work.
   e. Specialty curb cutting equipment may be allowed instead of vertical cuts and pavement removal depending on site conditions.

2. Number Permitted
   a. The number of access points to a single development must be minimized.
   b. A single development site will not be allowed more than one access to any arterial or collector street.
   c. The City Engineer may grant exceptions to the number of access points as described in the LDC.

3. Location
   a. No driveway will be allowed within 15 feet of the end of any curb return.
   b. No driveway will be allowed within 5 feet of any property line.
   c. Shared driveways, however, may cross property lines.
   d. All driveway approaches must conform to applicable vision clearance requirements from the Off-Street Parking and Access Standards.

4. Width
   a. Driveways for single family and duplex development may be from 12 to 20 feet wide. Exceptions due to steep slopes may be allowed as described in the LDC.
   b. Commercial access driveways may be up to 24 feet wide. Exceptions to the maximum width may be approved by the City Engineer.
   c. Any drive required for fire service access must have a minimum width of 20 feet.

5. Commercial Approaches
   a. Commercial approaches will be required for all driveways and alleys accessing arterial or collector streets.
   b. Commercial approaches will also be required for parking lots providing more than 10 parking spaces.
   c. Commercial approaches are not required for single family lots or residential parking lots providing 10 or fewer parking spaces regardless of street classification.

H. Private Streets

1. Where Allowed
   a. Access to any development site must be from a public street improved to City standards, except as allowed by the LDC.
   b. Permanent signage must be provided identifying that the street is private.

2. Standards
   a. Private residential streets, including the Minimum Pavement Section, must be constructed to City standards.

3. Timing of Construction
   a. Private streets or drives must be constructed concurrently with installation of public improvements.

I. Multi-Use Paths

1. Where Required
   a. Standards in this section are for public masterplan facilities and do not apply to private facilities with public access, such as walkways, constructed to meet LDC block perimeter requirements.
   b. Locations for new multi-use paths must be consistent with long range system improvements identified in the Transportation System Plan.
   c. The Parks and Recreation Master Plan provides locations and design standards for trails.

2. Design
   a. Multi-use paths must have a minimum 12 foot wide paved surface. When located outside the ROW, multi-use paths must also have 1 foot wide aggregate shoulders. The City Engineer may consider reductions to the paved surface width, down to 8 feet.
   b. The pavement section is 6 inches of PCC over 4 inches of ¾-0" aggregate base with woven or non-woven geo-textile fabric between the aggregate base and the sub-base. The City Engineer may consider equivalent asphalt cement designs on a case by case basis.
   c. Where a multi-use path is also used for vehicle access, the pavement section must be 8 inches of PCC over 4 inches of ¾-0" aggregate base with woven or non-woven geo-textile fabric between the aggregate base and the sub-base.
   d. Multi-use paths constructed of PCC must have 'green cut' joints. Tooled joints will not be allowed.
   e. Cross slopes must be 1.5% +/- 0.5%. In no case will cross slopes exceed 2 percent.
   f. Shoulders must be 4 inches of ¾-0" compacted aggregate base over woven or non-woven geotextile fabric. Where used for maintenance vehicle access, the shoulder must be a minimum of 12 inches.
   g. The longitudinal slope for multi-use paths adjacent to streets must match the street slope. Where multi-use paths are not adjacent to streets, the maximum longitudinal slope may not exceed 15%.
   h. Minimum centerline curve radius must be 15 feet.
   i. For multi-use paths with curves that have limited sight distance, solid centerline striping must be installed on both approaches to the curve.

3. ADA Design and Compliance
   a. Multi-use path designs must comply with minimum ADA requirements for shared use paths (See Proposed Accessibility Guidelines for Pedestrian Facilities) as much as practicable.

4. Timing of Improvements
   a. Public multi-use paths and trails must be constructed concurrently with installation of public improvements.

J. Traffic Studies

1. When Required
   a. A traffic study may be required for proposed developments to assess transportation impacts and provide consistency with the Comprehensive Plan, Land Development Code and Transportation System Plan criteria.
   b. The Traffic Impact Study Guide (TIS Guide) describes the requirements and thresholds for when traffic studies are required.

2. Requirements of a Study
   a. The cost of traffic studies will be fully borne by the developer.
   b. Traffic studies, as defined in the TIS Guide, must be prepared by a Professional Engineer licensed in Oregon.
   c. Guidelines established by the Institute of Transportation Engineers must be employed to collect and analyze information and prepare conclusions.
   d. The format of traffic studies must be as described in the TIS Guide.

K. Traffic Signals

1. When Required
   a. Where the results of a traffic study prepared in conjunction with a proposed development indicate that signal warrants established by the Federal Highway Administration's Manual on Uniform Traffic Control Devices (Current edition) will be met, a signal may be required concurrently with the development of the site.
   b. For a phased development which will not initially require a traffic signal, but may need one in the future, the developer may be required to participate in the cost of that signal prior to its installation.
   c. The City will review all developer requests for signal installations to determine if the signal is necessary and appropriate for the proposed location.

2. Funding
   a. The developer will be responsible for the full cost of traffic signals which are required as a direct result of a particular development.
   b. Where some combination of existing and future background traffic and traffic generated by a development create the need for a traffic signal, the cost for the signal may be shared by the City and the developer.

3. Construction
   a. The City's Engineering Division typically designs and constructs all SDC funded traffic signals within City Limits.
   b. Private design and construction of traffic signals may be considered on a case by case basis.

II. WATER

A. Extent of Improvements

1. Water Distribution System Facility Plan
   a. Locations for new water main construction must be consistent with long range system improvements identified in the Water Distribution System Facility Plan.

2. Limits of Improvements
   a. Water system improvements necessary to provide adequate fire and domestic service to the site must be constructed prior to or concurrently with development.
   b. Water system improvements must be extended through the development site to the edges of the property frontage and/or internal property lines so that future extensions may continue in an orderly fashion.

3. Requirements for Public Improvements
   a. New water infrastructure will be inspected, tested and accepted per the requirements in the Standard Construction Specifications and the Procedures Manual for Public Improvements by Private Contract.

B. Distribution Network

1. Service Levels
   a. The Corvallis water distribution system is comprised of three service levels.
   b. The first level system provides service to properties with elevations from 210 to 287 feet.
   c. The second level system provides service to properties with elevations from 287 to 407 feet.
   d. The third level system provides service to properties with elevations from 407 to 560 feet.
   e. Some exceptions to the elevations shown above exist in specific localized areas.

2. Looping
   a. Waterlines should be looped to eliminate dead-end runs, improve water quality and provide better service to properties.
   b. Where looping at the time of development is not necessary for service, dead-end mains may be installed, provided they are installed to property lines to allow for future extension to provide the loop.
   c. The valved interconnection of two different service levels will not be considered looping for redundancy purposes.

3. Valving
   a. Valving must be included in all new water main construction to provide redundancy in the system to allow uninterrupted service when breaks occur or repairs are needed.
   b. Dead-end runs, where allowed, must be valved to allow future construction of the main without interrupting service to existing properties.
   c. 8 inch and smaller valves on public mains must be resilient-seated gate valves.
   d. Valves larger than 8 inches on public mains must be resilient-seated butterfly valves.

4. Dead Ends
   a. Where dead-end mains are permitted, they must be terminated with an appropriate blow-off assembly.
   b. Blow-off assemblies must be constructed in accordance with the Standard Construction Specifications.

5. Live Taps
   a. Where a live tap is necessary, the City will perform the taps on lines up to 12-inches in diameter. Larger lines will need to be tapped by others.
   b. The owner/developer will reimburse the City for labor and materials necessary to perform live taps.
   c. Upon request by the owner/developer, the Public Works Department will provide cost estimates for performing live taps; however, such estimates are not binding.

C. Design Criteria

1. Water Distribution System Facility Plan
   a. Sizing for new water main construction must be consistent with long range system improvements identified in the Water Distribution System Facility Plan.

2. Pressure and Flow Criteria
   a. Maximum acceptable static pressure in water mains is 100 psi.
   b. Where the water main pressure exceeds 80 psi, pressure reducing valves are required for service lines on the private side of the meter.
   c. Minimum acceptable static pressure in water mains is 40 psi.
   d. Minimum acceptable flows at fire hydrants are as determined by the Oregon Fire Code.

3. Minimum Size
   a. The minimum size for a new water main is 8 inches.
   b. Smaller diameter lines may be considered for mains serving a subdivision with 12 or fewer lots where the waterline will not be extended in the future, as in a small cul-de-sac, unless a larger line is needed for fire flow demands.
   c. The minimum size for a new water service is 1 inch.

D. Waterline Alignment

1. Location Within Right-of-Way
   a. Generally, waterlines are located on the north and west side of streets.
   b. Waterlines should be located in a manner to avoid placement of valve boxes in the wheel path of motor vehicles or bicycles, when bike lanes are present.

2. Accessibility for Maintenance
   a. Water mains must be located to maximize accessibility for initial inspections and future maintenance activity.
   b. Alignments which utilize side and rear lot lines for water main installation are discouraged.
   c. Where side and rear lot line alignments are unavoidable, provision for initial and future maintenance vehicle access must be a consideration.
   d. Where water facilities are located outside the Right-of-Way, easements and vehicle access to valves must be provided.
   e. Vehicle access requirements will be determined with final engineering plans based on maintenance needs. Typically, a 12 foot wide vehicle access is required. At slopes greater than 12%, the access must be paved.

3. Maximum Deflection Criteria
   a. When push-on or mechanical joint pipe is to be laid on a curve, the amount of deflection allowed varies according to pipe diameter; these values are provided in the Standard Construction Specifications.
   b. Where pipe is intended to be laid straight, the deviation for each section of pipe may not exceed 0.2 feet for line and 0.1 feet for grade.

4. Air Release Valves
   a. Air release valves must be installed at all high points in new or relocated waterlines. Service taps may not be substituted for air release valves.

5. Depth of Cover
   a. The depth of cover for waterlines must range from a minimum of 36 inches to a maximum of 42 inches.

6. Proximity to Other Utilities
   a. Waterlines shall be horizontally separated from sanitary sewer lines by a minimum of 10 feet unless the waterline is above the sanitary sewer line by at least 18 inches (OAR Ch 333).
   b. When physical conditions render the above spacing impossible or impractical, the sanitary sewer pipe in the vicinity of the waterline crossing must be constructed of C900 PVC or ductile iron pipe, or concrete encased for a distance of 9 feet on each side of the crossing [see Standard Details].
   c. Waterlines must be horizontally separated from Utility Facilities other than sanitary sewer by a minimum of 7 feet.

7. Proximity to Franchise Utilities and other Utility Service Operators
   a. Waterlines must be horizontally separated from franchise utilities (telephone, power, natural gas, cable television) by a minimum of 7 feet.
   b. Under no circumstances will Utility Facilities be permitted to share a common trench with public waterlines.

E. Thrust Restraint and Fittings

1. Standards
   a. Joint restraint and anchorage and reaction (thrust) blocking must be provided in accordance with the Standard Construction Specifications.

2. Vertical Thrust Restraint
   a. A minimum depth of 3 feet must be maintained over water mains in order to provide adequate vertical thrust restraint.
   b. Vertical thrust restraint must be provided at all vertical bends so as to allow exposure of the fitting under pressure.

3. Soil Support
   a. Where water mains are constructed near trenches, open drainage ways or other channels, sufficient undisturbed soil must be maintained to provide soil support for thrust restraint.

4. Dead-ends
   a. Where dead-end lines are installed, thrust blocking must be constructed in a fashion which ensures adequate thrust restraint when the line is extended in the future.

5. Fittings
   a. Typically, bends should use mechanical joint fittings.
   b. Where valves attach to fittings, flange fittings may be used.
   c. Retainer glands must be used on all mechanical joint fittings.

F. Service Installations

1. Valving
   a. All service lines (domestic, irrigation, fire) must be valved at the main.
   b. Domestic service lines are typically valved with a corporation stop.

2. Services
   a. When property is subdivided or partitioned, each lot must be provided its own individual water service assembly.
   b. It is the responsibility of the owner/developer to provide each lot with an individual water service assembly.
   c. A domestic service assembly installation must include a meter box with an angle meter stop set to the appropriate grade.
   d. The minimum service line diameter to serve a ¾ inch meter is 1 inch.
   e. The minimum service line diameters to serve meters larger than 1 inch are those diameters corresponding directly to the meter size (i.e. 2 inch service line for 2 inch meter).

3. Meters
   a. Where sidewalks are setback, meter boxes must be installed in the park strip adjacent to the sidewalk within a 12 inch concrete collar. When insufficient park strip width exists, meters may be placed on private property within a 12 inch concrete collar.
   b. Multiple meter boxes must be banked together.
   c. Meters larger than 2 inches in size must be installed in a vault.
   d. The City will provide and install meters smaller than 2 inches with all costs billed to the party requesting the installation.
   e. The owner/developer will provide and install all meters 2 inches and larger.

G. Building Fire Service

1. Separation
   a. Fire and domestic needs are to be served with separate service lines, except where allowed by the Oregon Fire Code. If separate lines are allowed, a valve must be installed before the fire service double check detector assembly so that domestic use can be maintained when fire service is off.
   b. Fire and domestic lines may share a common vault if a minimum of 36 inches of horizontal separation between the lines is provided.

2. Installation
   a. The maximum distance from a fire hydrant to the building fire department connection (FDC) is 150 feet.
   b. A double check valve is required on all fire service lines.

3. Backflow Prevention
   a. All building fire service lines must be provided with a backflow device approved by the Development Services Division.
   b. Backflow devices must be located in vaults near the property or easement line, to minimize the potential for stagnant water lines, rather than in the building.

H. Fire Hydrants

1. Location
   a. The locations of new or relocated hydrants must be approved by the Fire Department.
   b. Hydrants must be located in areas which meet the minimum standards for Fire Department Access Roads. Those standards may be found in the Oregon Fire Code, as adopted by the City of Corvallis.
   c. All new hydrants will be publicly owned and maintained and located within street right-of-way or an easement granted by the property owner.

2. Service
   a. All fire hydrants must be served by a 6 inch line.
   b. Hydrant lines must be valved at the hydrant tee on the main with a 6 inch resilient-seated gate valve.
   c. If a service is located on a hydrant leg, an additional valve may be required to isolate the hydrant.

I. Acceptable Materials

1. Specifications
   a. Detailed information regarding waterline materials is contained in the Standard Construction Specifications.
   b. The information below is intended to briefly list the materials approved for use in the construction of public waterlines.
   c. All ductile iron pipe must be poly-encased per AWWA standards for method A, wet trench installation.

2. Mains
   a. All public water mains must be constructed of cement-lined ductile iron pipe in conformance with APWA C151 Classes 50 through 56.
   b. The minimum thickness for all pipe sizes will be Class 52.
   c. When there are deep trenches or corrosive soils, higher thickness classes may be required.

3. Service Lines
   a. Service lines must be constructed of seamless copper tubing, Type K, soft; or
   b. Cross-linked polyethylene copper tube size (CTS) pipe. Tracer wire is required with non-conductive pipe.

4. Fittings Allowed
   a. Ductile iron
   b. Lead free cast bronze
   c. Lead free Brass/Bronze; tighten to stop compression preferred, flared allowed.

5. Valves Allowed
   a. Lead free bronze-body gate valves (<2 inches)
   b. Resilient-seated epoxy coated gate valves (2 to 8 inches and tapping valves)
   c. Resilient-seated epoxy coated butterfly valves (>8 inches)

III. SANITARY SEWER

A. Extent of Improvements

1. Wastewater Utility Master Plan
   a. Locations for new sanitary sewer main construction must be consistent with long range system improvements identified in the Wastewater Utility Master Plan.

2. Limits of Improvements
   a. Sanitary sewer system improvements necessary to provide adequate service to the site must be constructed prior to or concurrently with development.
   b. Sanitary sewer system improvements must be extended through the development site to the edges of the property frontage and/or internal property lines so that future extensions can continue in an orderly fashion without disruption to the development site.

3. Requirements for Public Improvements
   a. New sanitary sewer infrastructure will be inspected, tested and accepted per the requirements in the Standard Construction Specifications and the Procedures Manual for Public Improvements by Private Contract.

B. Design Criteria

1. Department of Environmental Quality
   a. City design standards are based upon DEQ criteria [OAR Ch 340-52 Appendix A] for sanitary sewer design, construction and testing.

2. Wastewater Utility Master Plan
   a. Sizing for new sanitary sewer main construction must be consistent with long range system improvements identified in the Wastewater Utility Master Plan (WWMP).
   b. Sanitary sewer generation rates and inflow and infiltration rates will be calculated per the tables below [from 1998 WWMP, updated to current zoning designations].

Unit Flow Rates	
Type	Rate
Sanitary sewer generation, wet season, dry weather	193 gallons/capita per day--peak rate
Inflow & infiltration, wet season, wet weather	4,000 gallons/acre per day--peak for 5-year, 24-hour event

2.14 population per equivalent dwelling unit assumed for Master Planning purposes

Land Use Densities	
Land Use	Dwelling Units per Acre
Res-Low	4.0
Res-Medium	9.0
Res-High	16.0
Commercial (SA)	4.4
Ind-Limited	8.7
Ind-Intensive	7.4

Zoning Densities	
Zone	Dwelling Units per Acre
Residential	
RS-1	2.0
RS-3.5, RS-5, RS-6	4.0
RS-9	9.0
RS-12	16.0
RS-20, MUR	25.0
Commercial / Office	
P-AO, CB, CBF, RF, MUGC	4.4
NC, MUCS	16.0
Industrial	
RTC	4.4
LI-O, LI	8.4
GI, II	8.7
MUT, MUE	25.0
Other	
OSU	private
AG-OS	-
C-OS	4.4

3. Capacity
   a. When designing sanitary sewers, the capacity required must be based upon the area to be served and the Comprehensive Plan designation within that area.
   b. Sufficient capacity must be designed into the system to account for the future growth potential of the area served as identified in the WWMP.

4. Sizing
   a. The minimum size for public sanitary sewer mains is 8 inches in diameter.
   b. With prior approval of the City Engineer, 6 inch diameter lines may be installed for the upper sections of lateral sanitary sewers which will not be extended further, provided that the length of the 6 inch line does not exceed 200 feet.

B. Design Criteria (Continued)

5. <u>Grades</u>
   a. All sanitary sewers must be designed at a grade which will produce a mean velocity, when flowing full or half-full, of at least 2 feet per second. Velocity must be calculated based on the design flow for the site and future demand.
   b. Minimum grades for common inside pipe diameters are as follows. A roughness coefficient "n" of 0.013 must be used, regardless of pipe material, to account for pipe degradation over time.

12 inches	=	0.22%	
10 inches	=	0.28%	
8 inches	=	0.40%	(0.60% preferred)
6 inches	=	0.60%	

   c. Slopes greater than the minimum are desirable.
   d. The maximum grade for sanitary sewers is 20 percent.

6. <u>Separation</u>
   a. In no instance will new combined sanitary and storm sewer lines be permitted.

C. Service Connections

1. Laterals
   a. Individual lots must be served by a single sanitary sewer lateral.
   b. Two or more dwelling units on an individual lot must be served by a single 6 inch (minimum) sanitary sewer lateral.

2. Cleanouts
   a. A cleanout is required for each sanitary sewer lateral. Laterals up to 6 inches in size must have a two-way cleanout; laterals larger than 6 inches may have a tee.
   b. Cleanouts must be installed in sidewalks. If an exception is approved to install a cleanout outside of the sidewalk, it must have a 12 inch concrete collar around it.
   c. Cleanouts are typically located 12 inches from the property line.

3. Connections to the main
   a. Lateral connections up to 6 inches in size may use a saddle or manufactured fitting, including inserta-tee, or approved equal, to connect to the sanitary sewer main.
   b. Lateral connections greater than 6 inches must be connected to a manhole.

4. Connections to Existing Laterals
   a. Connections to existing laterals, where allowed, may be made with flexible couplings that have stainless steel shear bands, such as, Fernco Strong Back couplings.

D. Sanitary Sewer Alignment

1. Location Within Right-of-Way
   a. Generally, sanitary sewer lines are located on the south and east side of streets.
   b. Sanitary sewer lines should be located in a manner to avoid placement of manhole lids in the wheel path of motor vehicles or bicycles, when bike lanes are present.

2. Depth of Cover
   a. The minimum depth of cover for sanitary sewer lines is 3 feet.
   b. The depth of services at the property line must be such that the private service lines may be installed at a minimum slope of 2 percent to the structure.

3. Proximity to Other Utilities
   a. Sanitary sewer lines shall be horizontally separated from waterlines by a minimum of 10 feet unless the sewer line is 18 inches or more below the waterline.
   b. When physical conditions render the above spacing impossible or impractical, the sanitary sewer pipe in the vicinity of the waterline crossing must be constructed of C900 PVC or ductile iron pipe, or concrete encased for a distance of 9 feet on each side of the crossing.
   c. Sanitary sewer lines shall be horizontally separated from all other utilities or Utility Facilities by a minimum of 7 feet.

4. Accessibility for Maintenance
   a. Sanitary sewer mains must be located to maximize accessibility for initial inspections and future maintenance activity.
   b. Alignments which utilize side and rear lot lines for sanitary sewer main installation are discouraged.
   c. Where side and rear lot line alignments are unavoidable, provision for initial and future maintenance vehicle access must be a consideration.
   d. Where sanitary sewer facilities are located outside the Right-of-Way, easements and vehicle access to manholes must be provided.
   e. Vehicle access requirements will be determined with final engineering plans based on maintenance needs. Typically, a 12 foot wide vehicle access is required. At slopes greater than 12%, the access must be paved.

E. Manholes

1. Where Required
   a. Manholes will be required at all changes in grade, pipe size or alignment of the main.
   b. Manhole intervals may not exceed 450 feet.

2. Standards
   a. Manholes must be constructed according to the Standard Construction Specifications.

3. Outside Drop Manholes
   a. An outside drop will be required when there are more than 2 feet of difference between the flow line in and the flow line out through a manhole.

4. Cleanouts
   a. Cleanouts are not acceptable as substitutes for manholes.
   b. Although not recommended, cleanouts may be permitted, with prior approval from the City Engineer, at the upper ends of sanitary sewer lines less than 200 feet in length which will not be extended further.

5. Marker Posts
   a. Marker posts are required for all manholes and cleanouts located outside of public street rights-of-way.
   b. Marker posts must be installed according to the Standard Construction Specifications.

F. Acceptable Materials

1. Specifications
   a. Detailed information regarding sanitary sewer line materials is contained in the Standard Construction Specifications.
   b. The information below is intended to briefly list the materials approved for use in the construction of public sanitary sewer lines.

2. Mains
   a. Concrete pipe (non-reinforced) may be used for mains 15 inches or less in diameter
   b. Concrete pipe (reinforced)
   c. Concrete pipe (cast in place)
   d. Polyvinyl Chloride (PVC)
   e. Ductile iron (cement lined)
   f. High-density Polyethylene (HDPE)
   g. Other materials may be considered on a case by case basis.

3. Fittings
   a. Fittings on all pipe other than concrete pipe, and on concrete pipe less than 21 inches in diameter, must be of the same material and class as the pipe and must be shop fabricated.
   b. Fittings on concrete pipe 18 inches or larger may be field or shop fabricated.
   c. Connections to existing pipes must be made with shop fabricated fittings.

IV. STORM DRAINAGE

A. Extent of Improvements

1. Storm Water Master Plan
   a. Locations for new storm sewer main construction must be consistent with long range system improvements identified in the Storm Water Master Plan.

2. Limits of Improvements
   a. Storm drainage system improvements necessary to provide adequate service to the site must be constructed prior to or concurrently with development.
   b. Storm drainage system improvements must be extended through the development site to the edges of the property frontage and/or internal property lines so that future extensions can continue in an orderly fashion without disruption to the development site.

3. Requirements for Public Improvements
   a. New storm drainage infrastructure will be inspected, tested and accepted per the requirements in the Standard Construction Specifications and the Procedures Manual for Public Improvements by Private Contract.

B. Design Criteria

1. Storm Water Design Standards
   a. Design of private and public detention and water quality facilities and conveyance systems must be per the requirements of the Stormwater Design Standards.

2. Storm Water Master Plan
   a. Sizing for new storm sewer main construction must be consistent with long range system improvements identified in the Storm Water Master Plan.

3. Capacity
   a. When designing storm sewer mains, the capacity required will be determined using the Rational Method for a 10 year storm event.
   b. When designing storm sewers, the capacity required will be based upon the area to be served and the Comprehensive Plan designation within that area.
   c. Sufficient capacity must be designed into the system to account for the future growth potential of the area served as identified in the Storm Water Master Plan.

4. Sizing
   a. The minimum size pipe for public storm sewer mains is 12 inches.
   b. The minimum size pipe from catch basins to mains is 10 inches.

5. Grades
   a. All storm sewers must be designed at a grade which will produce a mean velocity, when flowing full or half-full, of at least 2 feet per second. Velocity must be calculated based on the design flow for the site and future demand.

6. Separation
   a. In no instance will new combined sanitary and storm sewer lines be permitted.

7. Outfalls
   a. Outfalls must be constructed above the ordinary high water elevation for the drainage way or creek they are draining to.
   b. Backwater effects from drainage ways, creeks, detention or stormwater quality facilities must be minimized. Generally, there should be no backwater effects from a 10-year storm.

C. Storm Drain Alignment

1. Location Within Right-of-Way
   a. Generally, storm sewer lines are located in the center of streets.
   b. Storm sewer lines should be located in a manner to avoid placement of manhole lids in the wheel path of motor vehicles or bicycles, when bike lanes are present.

2. Proximity to Other Utilities
   a. Storm sewer lines must be horizontally separated from other utilities or Utility Facilities by a minimum of 7 feet.
   b. Where less than 12 inches of vertical clearance is provided between a storm sewer line and another utility main or Utility Facility at a crossing, the lower pipe must be protected with a concrete collar [see Standard Details].

3. Accessibility for Maintenance
   a. Storm sewer mains must be located to maximize accessibility for initial inspections and future maintenance activity.
   b. Alignments which utilize side and rear lot lines for storm sewer main installations are discouraged.
   c. Where side and rear lot line alignments are unavoidable, provision for initial and future maintenance vehicle access must be a consideration.
   d. Where storm sewer facilities are located outside the Right-of-Way, easements and vehicle access to manholes must be provided.
   e. Vehicle access requirements will be determined with final engineering plans based on maintenance needs. Typically, a 12 foot wide vehicle access is required. At slopes greater than 12%, the access must be paved.

D. Manholes

1. Where Required
   a. Manholes will be required at all changes in grade, pipe size or alignment of the main.
   b. Manhole intervals must not exceed 450 feet.

2. Standards
   a. Manholes must be constructed according to the Standard Construction Specifications.

3. Cleanouts
   a. Cleanouts are not acceptable as substitutes for manholes.

4. Marker Posts
   a. Marker posts are required for all manholes and cleanouts located outside of public street rights-of-way.
   b. Marker posts must be installed according to the Standard Construction Specifications.

E. Catch Basins

1. Standards
   a. The City's standard catch basin is a curb inlet, which must be used for all new construction.
   b. For redevelopment, curb inlets must replace gutter inlets unless site constraints make replacement impractical.
   c. When redevelopment requires replacement or relocation of ADA ramps, gutter inlets will not be allowed to remain within the curb cut of the new ramp.
   d. Catch basins must be constructed according to the Standard Construction Specifications.
   e. Depth of catch basins must not exceed 5 feet unless there are conflicts with other utilities. Deeper catch basins may require a larger size.

2. Spacing
   a. Catch basins must be spaced to capture street and roof drain runoff for a 10 year, 24 hour storm event, however, in no case will spacing between catch basins exceed 400 feet.
   b. On steep grades, intermediate catch basins may be required due to the higher runoff velocity.

3. Connections
   a. Private storm sewer connections to catch basins are typically not allowed, but, may be considered depending on site conditions.
   b. Connection of private roof drains to catch basins may be considered on a case by case basis depending on site constraints.
   c. In line catch basins are typically not allowed.

4. Connections to Existing Laterals
   a. Connections to existing laterals, where allowed, may be made with flexible couplings that have stainless steel shear bands, such as, Fernco Strong Back couplings.

F. Weepholes

1. Timing of Installation
   a. Weepholes must be installed with curb installations for new street construction.

2. Standards
   a. Weepholes must be schedule 40 PVC, 3 inches in diameter.
   b. A 3 inch PVC drain pipe must be used to form the weephole and a 3 inch PVC coupling must be installed at the back of the curb for future connection from roof and footing drains.
   c. When curbside sidewalks are constructed, the weepholes must be extended underneath the sidewalk with a coupling installed at the back of the sidewalk.
   d. Weepholes must be used for roof drainage unless site conditions prevent this.

3. Location
   a. Weepholes should be installed no further than 10 feet from property lines, at each property line fronting a street.
   b. Weepholes must be located at curb joints where possible. In no case will a weephole be located less than 4 feet from a curb joint if the weephole must be offset from the joint.

G. Acceptable Materials

1. Specifications
   a. Detailed information regarding storm sewer line materials is contained in the Standard Construction Specifications.
   b. The information below is intended to briefly list the materials approved for use in the construction of public storm sewer lines.

2. Mains
   a. Concrete pipe (non-reinforced) may be used for mains 15 inches or less in diameter
   b. Concrete pipe (reinforced)
   c. Concrete pipe (cast in place)
   d. Polyvinyl Chloride (PVC)
   e. Ductile iron (cement lined)
   f. High-density Polyethylene (HDPE)
   g. Other materials may be considered on a case by case basis.

3. Fittings
   a. Fittings on all pipe other than concrete pipe, and on concrete pipe less than 21 inches in diameter, must be of the same material and class as the pipe and must be shop fabricated.
   b. Fittings on concrete pipe 21 inches or larger may be field or shop fabricated.
   c. Connections to existing pipes must be made with shop fabricated fittings.

V. STREET LIGHTS

A. Extent of Improvements

1. Requirements for Public Improvements
   a. New street lighting infrastructure will be inspected, tested and accepted per the requirements in the Standard Construction Specifications and the Procedures Manual for Public Improvements by Private Contract.

2. Design
   a. Street lighting system designs must be prepared by a Supervising Electrician or Professional Engineer, licensed in the State of Oregon.
   b. Street lighting system circuitry must be designed in compliance with current NEC standards.

3. Installation & Maintenance
   a. All costs associated with the design and installation of the street lighting system on public streets will be borne by the developer.

4. Timing
   a. Street lighting systems must be constructed concurrently with installation of public improvements.

5. Spacing
   a. Typical spacing between street lights is 200 to 300 feet. Changes to the typical spacing may be considered depending on site conditions, however, the maximum spacing may not exceed 300 feet.
   b. A minimum of 10 feet must be maintained between any part of a light and pole assembly and any power lines.

B. Location and Placement

1. Poles
   a. The standard placement of street light poles is at intersections, in the middle of long blocks, in dead-end streets, at "T" intersections and in long cul-de-sacs.
   b. Typically, one street light is required at local intersections and two street lights at collector or arterial intersections.
   c. Street light poles must be centered in the planting strip or placed a maximum of 30 inches from the curb face to the center of the pole.
   d. If no planting strip is available, poles must be placed directly behind the sidewalk in a Utility Easement. Street light poles may not be located in sidewalks without approval by the City Engineer.
   e. Poles must be placed a minimum of 5 feet from driveway aprons.
   f. Street trees may not be located within 20 feet of a street light pole.

2. Conduit
   a. Conduit is typically installed under the park strip, 1 foot from the front edge (closer to the street) of the sidewalk.
   b. The minimum burial depth is 30 inches.
   c. Provide one foot of vertical separation at crossings, such as between meter boxes and cleanouts.
   d. Conduit runs must be installed with as few degrees bend as possible. The sum of all bends in any single conduit run may not exceed 270 degrees.

3. Junction Boxes
   a. Junction boxes are typically located in the park strip adjacent to the sidewalk with a 12 inch concrete collar.
   b. Junction boxes may be placed in sidewalks only when necessary, such as, if the sidewalk is curbside.
   c. Junction boxes must be provided for each street light.
   d. Junction boxes are required at each side of street crossings.
   e. All splices must be located in a junction box.

4. Cabinets
   a. Cabinets are typically located in the park strip.
   b. Cabinets may not be located within the vision clearance area.
   c. Cabinets must be located as close as practicable to the power source.
   d. Cabinets must be placed on a 4-inch PCC pad. A minimum 2 foot by 2 foot pad must be provided in front of the access door.

5. Luminaires
   a. Luminaires must be mounted at a 45 degree angle into intersections.
   b. Luminaires must overhang approximately 10 percent of the curb-to-curb street width.
   c. Luminaires must have a minimum mounting height of 25 feet and a maximum mounting height of 27 feet.

C. Acceptable Materials

1. Specifications
   a. Detailed information regarding street lighting system materials is contained in the Standard Construction Specifications.
   b. The information below is intended to briefly list the materials approved for use in the construction of public street lighting systems.

2. Poles
   a. The City's standard installation requirement is a wood pole, however, metal, fiberglass or ornamental poles may also be used.
   b. Poles must be sized to accommodate mast arm lengths.

3. Conduit & Conductors
   a. Use NEC standards for conductors, size, fill and conduit run length between junction boxes.
   b. Minimum conduit size is 2 inches. Conduit runs between the street light and junction box may be 1-inch.
   c. Conduit must be schedule 40 pvc. Under roadways, conduit must be schedule 80 pvc. Metallic conduit is required for the first 10 feet on poles.
   d. Yellow #12 AWG conductor must be installed as a "tracer" wire for future locating of all empty streetlight conduits.
   e. Conduit bushing and duct seal must be provided at the end of each conduit.

4. Junction Boxes
   a. Junction boxes must be concrete with metal lids labeled, 'Illumination'.
   b. Where junction boxes are not in the sidewalk, they must have a 12 inch concrete collar around the entire box.

5. Cabinets
   a. Cabinets must be 16 gauge hot dipped galvanized, or
   b. 14 gauge 304 stainless steel, or
   c. Aluminum
   d. Cabinets must have a test switch which bypasses the photo electric cell.
   e. Photo cell must be mounted to the top of the light pole closest to the cabinet.

6. Luminaires
   a. Luminaires must be 50 watt LED for mid-block and end of street locations, and 75 watt LED for intersections and signalized pedestrian crossings. The City Traffic Engineer maintains a list of approved manufacturers and part numbers.

VI. GENERAL

A. Easements

1. Widths
   a. Easement widths must be twice the depth of the utility, but not less than 15 feet wide for one utility or 20 feet wide for side-by-side (not a common trench) utilities.
   b. For utilities requiring more than a 20 foot wide easement, the City Engineer may approve a lesser easement width on a case by case basis.
   c. Easements must be centered on the utility.

2. Forms
   a. All easements dedicated in conjunction with the construction of public improvements must be prepared by the owner/representative or their agent.
   b. Easements dedicated to the City of Corvallis must be submitted on a standard City easement form for public improvements, and must receive approval from the City Attorney. These forms can be obtained from the City.

B. Erosion Prevention and Sediment Control

1. Authority
   a. Chapter 9.03 of the Corvallis Municipal Code provides the authority to enforce the requirements within this section.

2. Requirements
   a. Erosion prevention and sediment control (EPSC) plans are required for any ground disturbing activity.
   b. EPSC plans must comply with the requirements of the Erosion Prevention and Sediment Control Manual.

3. Permits
   a. EPSC permits are issued by the Development Services Division.
   b. An EPSC permit, and plan, is required for any work with the potential for 2,000 square feet or more of ground disturbance.
   c. Ground disturbance of more than 5 acres requires a State (DEQ) 1200-C stormwater discharge permit in addition to a City EPSC permit.

4. Winterization
   a. The wet weather period is October 1 through April 30. Within this time frame, EPSC plans may require modification to account for wet weather conditions and/or work suspension.

APPENDIX

DEFINITIONS

For the purposes of this document, the following definitions are provided:

Buffered Bike Lane – On-street bicycle facility that features a separation between the bicycle facility and the travel way. Buffered lanes increase the distance between vehicles and cyclists by painting a buffer between the bike lane and parked or moving traffic.

Comprehensive Plan – The primary policy document which guides and controls land use within the City of Corvallis and the urban growth boundary.

Standard Construction Specifications – A document containing specifications and detail drawings which apply to the construction of all public facilities.

Detention – The temporary holding of storm water runoff with a controlled outflow to the storm drainage system.

Developer – Any person, including a governmental agency, undertaking any land development.

Drainageway Dedication – An area encompassing an open drainageway which is dedicated to the City to meet criteria identified in the Land Development Code.

Land Development Code – An ordinance which regulates land development in accordance with the Comprehensive Plan.

Phased Development – A development and the associated public improvements which are constructed in two or more separate time periods, generally as separate projects.

Public Improvements – Public facility improvements, including water, sanitary sewer, storm drainage, street lighting and transportation systems.

Redundancy – The use of valves and looped waterlines to provide an adequate level of water service in the event of line breaks, maintenance activity or fire demand.

Utility Facilities – Any physical component of a system or network, including but not limited to the poles, pipes, mains, conduits, ducts, cables, wires, transmitters, plant, antennas, equipment and other facilities, locate within, under or above the ROW, any portion of which is used or designed to be used to deliver, transmit or otherwise provide Utility Service.