

# **CHAPTER 1**

## **GENERAL**

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# CHAPTER 1

## GENERAL DESIGN STANDARDS

### 1.00 Purpose

The purpose of these Design Standards is to provide a consistent policy under which certain physical aspects of infrastructure management will be implemented. Most of the elements contained in this document are Public Works oriented and most are related to the development or platting process; however, it is intended that they apply to both public and private work designated herein.

These Standards cannot provide for all situations. They are intended to assist but not to substitute for competent work by design professionals. It is expected that engineers will bring to each project the best of skills from their respective disciplines.

The standards have the objective of developing an infrastructure management system which will be consistent with the Keizer Development Code and other applicable codes utilized by the City in the development of its infrastructure system.

### 1.01 Applicability

These Standards shall govern all construction and upgrading of all public and private facilities where applicable in the City and applicable work within its service areas.

- a. In General, design and construction of applicable public and private improvements and permanent facilities within the City shall be conform to these standards for the following types of development:
  1. Design of public facility improvements that will be maintained by the City of Keizer Department of Public Works;
  2. All partitions and subdivisions;
  3. All commercial and industrial developments;
  4. All multi-family residential developments;
  5. Construction or reconstruction of public roadways and temporary detours;
  6. Additional situations identified in subsequent Chapters of this Standard.

1.02 Shortened Designation.

These City Design Standards shall be cited routinely in the text as the “Standards.”

1.03 General Terms and Abbreviations.

Whenever, in these Standards, the words “directed,” “required,” “permitted,” “ordered,” “designated,” or words of like importance are used, they shall be understood to mean the direction, requirement, permission, or order of designation of the Director of Public Works. Similarly, the words “approved,” “acceptable,” or “satisfactory,” shall mean approved by, acceptable to, or satisfactory to the Director of Public Works.

1.04 Revisions to These Standards

It is anticipated that revisions to these Standards will be made from time to time. The date appearing on the title page is the date of the latest revision. Users should apply the latest published issue to the work contemplated.

1.05 References

These Design Standards are intended to be consistent with the most currently adopted provisions of:

- a. Keizer Development Code
- b. Keizer Area Comprehensive Plan
- c. City of Keizer Standard Construction Specifications (current edition)
- d. Keizer Area Storm Drain Master Plan
- e. Keizer Area Water Master Plan
- f. City of Keizer Transportation System Plan (TSP)
- g. Salem - Keizer Area Transportation Study (SKATS)
- h. City of Salem Sanitary Sewer Design Standards
- i. Oregon Statewide Planning Goals and Guidelines
- j. Oregon Administrative Rules Chapter 340 Division 52

1.06 Definitions And Terms

*The following Definitions and Terms are provided for the sole interpretation and use of these Design Standards.*

Alley— a public easement or right-of-way intended to provide secondary access measuring not more than 20-feet and not less than 10-feet in width, which intersects with a public street.

Arterial Street— a major facility for moving large volumes of intra-area traffic and for moving traffic to and from the freeway/expressway system.

Approved Point of Discharge— the identified receiving body of water, ditch, storm drain, or other facility with adequate capacity identified as the location where a storm drainage facility shall connect by the City.

As-Built Plans— plans signed and dated by the project engineer indicating that the plans have been reviewed and revised, if necessary, to accurately show all as-built construction details.

Backflow— backflow is the flow of water or other fluids in a direction opposite to the normal flow. (See back-siphonage.)

Backflow Prevention Assembly— means an assembly that has been investigated and approved by the State of Oregon Department of Human Services - Public Health Division - Drinking Water Program for preventing backflow.

Back-siphonage— back-siphonage is the flowing back of used, contaminated, or polluted water from a plumbing fixture or vessel into a water supply pipe due to a negative or reduced pressure in such pipe.

Bike Lanes— a designated travel-way for bicyclists, which is established within the roadway directly adjacent to the outside vehicular lane or on the shoulder.

Bike Path— a designated travel—way for bicyclists, which is completely separated from the vehicular travel lanes and is within independent right-of-ways.

Bike Route— a designated travel-way for bicyclists, which is shared with vehicular traffic. The roadway is designated with signs for bicycling (no pavement markings for the bike route or delineation of parking spaces is used).

City— the City of Keizer, Oregon.

Collector Street— a facility that allows traffic within an area or neighborhood to connect to the arterial system.

Construction Drawings— the Project Engineer's detailed drawings containing

final design information and calculations submitted to the City of Keizer Public Works Department for review and approval after planning approval has been granted.

Creek— any and all surface water routes generally consisting of a channel having a bed, banks, and/or sides in which surface waters flow in draining from higher to lower land, both perennial and intermittent; the channel, banks, and intervening artificial components.

Cross Connection— a cross connection is any connection or arrangement, physical or otherwise, between a potable water supply system and any plumbing fixture or any tank, receptacle, equipment or device, through which it may be possible for non-potable, used, unclean, polluted and contaminated water, or other substances, to enter into any part of such potable water system under any condition.

Cul-de-sac— a dead-end street having a circular turnaround area at its terminus.

Curb Line— the line indicating the edge of the vehicular roadway within the overall right-of-way.

Cut Sheets— sheets of tabulated data, indicating stationing, structures, fittings, angle points, beginning of curve, points on curve, end of curves, slopes, staking offset, various elevations, offset cuts, and depths.

Designated Arterial or Collector Street— a street designated as a major or minor arterial or collector under the Functional Classifications as found in Chapter 3 of the Keizer Transportation System Plan (TSP).

Detention Facilities—facilities designed to hold water for a period of time to withhold the release of storm water to a specified maximum Release Rate that was present prior to the construction of a development or similar activity with impervious surfaces.

Director— City of Keizer Director of Public Works, or duly appointed representative.

Double Check Valve Assembly— an assembly composed of two single, independently acting, check valves, including tightly closing shut-off valves located at each end of the assembly and fitted with properly located test ports.

Double Detector Check Valve Assembly— a line-sized approved double check valve assembly with a parallel meter and meter-sized approved double check valve assembly. The purpose of this assembly is to provide double check valve protection for the distribution system and at the same time provide partial metering of the fire system showing any system leakage or unauthorized use of

water up to 3.0-gpm flow.

Dwelling Unit— a facility designed for permanent or semi-permanent occupancy and provided with minimum kitchen, sleeping, and sanitary facilities for one family.

Easement (Public)— areas along the line of all public utilities that are outside of dedicated roads or rights-of-way. Easements shall be prepared on City forms granting rights to the City.

Fire Protection Service— a connection to the public water main intended only for the extinguishing of fires and the flushing necessary for its proper maintenance. All fire services shall have a double detector check valve assembly.

French Drain or Leach Line— a covered underground excavated trench filled with uniformly graded round drainage rock and perforated pipe surrounded by drainage filter fabric, wherein the sides and bottom of the trench are porous, permitting the seepage of stormwater into the ground.

Half-street Improvement— construction of a 50% portion of the ultimate or master planned width of a street, usually in conjunction with a development project, where the remaining portion of the street will be provided when the opposing property is developed.

Impervious Areas/Surfaces— those hard surface areas on a parcel of land or retarding saturation of water into the ground, and causing storm water to run off in greater quantities or at an increased rate of flow from that present under natural conditions pre-existent to development. Common impervious surfaces include, but are not limited to rooftops, concrete or asphalt sidewalks, walkways, patio areas, driveways, parking lots or storage areas and graveled, oiled, macadam or other surfaces which similarly impact the natural saturation or runoff patterns which existed prior to development.

Irrigation Service— a metered connection intended for seasonal use and delivering water that is not discharged to the sanitary sewer.

Local Sewer— any public sewer eight (8) inches in diameter or less.

Local or Residential Street— a street or road not designated as a collector or arterial which primarily provides direct access to abutting land and offers the lowest level of traffic mobility. Through-traffic movement is deliberately discouraged.

Major Street— any arterial or collector street identified in the Keizer TSP or SKATS Plan. Any residential street identified by the City carrying a high volume of traffic so that it functions as a collector or arterial street.

Manufacturer's Name— any manufacturer's name, specification, catalog number, or type used herein is specified by make and order to establish the standard requirements of the City. Other equivalent make will be considered for approval, providing they are comparable with this established standard.

Natural Grade— the grade of existing ground or land in an undisturbed state.

Natural Location— the location of those channels, swales, and other non-man made conveyance systems as defined by the first documented topographic contours existing for the subject property either from maps or photographs.

On-Site Detention— the storage of excess runoff on the development site prior to its entry into a public storm drain system and gradual release of the stored runoff after the peak of the runoff has passed.

Oregon Plumbing Specialty Code— the Uniform Plumbing Code adopted by the International Association of Plumbing and Mechanical Officials, current edition as revised by the State of Oregon.

Owner— the owner of record of real property as shown on the latest tax rolls or deed records of the county, and includes a person who furnishes evidence that he is purchasing a parcel of property under a written recorded or unrecorded land sale contract.

Parking Space— a designated space in a parking area for the parking of one motor vehicle.

Partition— the division of an area or tract of land into two or three parcels in one calendar year when such area or tract of land exists as a unit or contiguous units of land under single ownership at the beginning of such year.

Peak Discharge— the maximum storm water runoff rate, generally measured in cubic feet per second (cfs), determined for the design storm.

Plans— construction drawings, including site plans, plans and profiles, cross sections, detailed drawings, etc., or reproductions thereof, approved or to be approved by the City, which show the location, character, dimensions, and details for work to be done.

Potable Water— water that is satisfactory for drinking, culinary, and domestic purposes and meets the requirements of the health authority having jurisdiction.

Private Sewer Collection System— a privately owned and maintained sewer system installed to serve multiunit structures on single ownership properties, which cannot legally be further divided, such as apartments, mobile home parks, and schools or installed in commercial or industrial subdivisions. A single-family

residence with an unattached garage or shop with sanitary facilities is exempt from this definition.

Private Water System— a privately owned and maintained water distribution system serving an identified area or development through a master meter connection to the public water distribution system.

Private Storm Drain— a storm drain located outside of public Right-of-way owned and maintained by a private party.

Project Engineer— the Owner's, Developer's, or City's engineer, licensed by the State of Oregon as a Civil Engineer under whose direction final design, plans, profiles, and details for a project are prepared and submitted to the City for review and approval.

Public Sewer— any sanitary sewer in public Right-of-way or easement owned and maintained by the City.

Public Storm Drain— any storm drain in public Right-of-way or easement owned and maintained by the City.

Public Water Main— any water main in public Right-of-way or easement owned and maintained by the City.

Release Rate—the controlled rate of release of drainage, storm, and runoff water from property, storage pond, runoff detention pond, or other facility during and following a storm event.

Right-of-way—all land or interest therein which by agreement, conveyance, dedication, deed, process of law, or usage is reserved for or dedicated to the use of the general public, for infrastructure purposes, which the City has sole responsibility to maintain.

Retention Facilities—facilities designed to or which do hold water for a considerable length of time and then consume it by evaporation, plant transpiration, or infiltration into the soil.

Roadway—that entire portion of the right-of-way used or to be used for vehicle movement which exists between the curbs or proposed curb lines.

Sedimentation—disposition of eroded debris—soil sediment displaced by erosion and transported by water from a high elevation to an area of lower gradient where sediments are deposited as a result of slack water.

Sewage— the liquid and water borne waste derived from the ordinary living processes, free from industrial wastes, and of such character to permit satisfactory disposal, without special treatment into the public sewer or by means of private sewage disposal system.

Sidewalk— a public way deeded, dedicated, and designated for the use of non-motorized vehicles and pedestrians.

Standard Plans— the drawings of structures or devices commonly used on City work and referred to on the plans (see standard construction specifications).

Storm Drainage Facilities— pipes, ditches, detention basins, creeks, culvert bridges, etc., used singularly or in combination with each other for the purpose of conveying or storing runoff.

Storm Drainage Master Plan— a document adopted by Keizer’s City Council that describes Keizer’s existing and planned Trunk Drainage System. The planned drainage system is based on runoff projected for Keizer based on Keizer’s full development under the adopted Comprehensive Plan.

Streets or Roads— any public highway, road, street, avenue, alley, way, easement, or right-of-way used or to be used for vehicle movement.

Structures— those structures designated on the standard plans as catch basins, manholes, etc. Detailed drawings of structures or devices commonly used in City work and mentioned in these Standards are included in the standard construction specifications.

Subdivision— the division of an area or tract of land into four or more lots within a calendar year for the purpose of transfer of ownership or building development, whether immediate or future, when such parcel exists as a unit or contiguous units under a single ownership as shown on the tax roll for the year proceeding the division of property.

Terrace— a relatively level step constructed in the face of a grade surface for drainage, erosion control, and maintenance purposes.

Three-quarter Street Improvement— construction of a 75% portion of the ultimate or master planned width of a street, usually in conjunction with a development project, where the remaining portion of the street will be provided when the opposing property is developed.

Transition and Taper— lanes for acceleration or deceleration of turning vehicles is provided on high speed roads in order to improve traffic flow conditions. Tapers are so designed that an entering vehicle can accelerate to the speed of through traffic before it begins the actual merging maneuver, and that a diverging vehicle need not begin to decelerate until it has completely left the through lane.

Trunk Drainage System—the trunk drainage system is that portion of the drainage system of the City that receives waters from an adjacent land area in excess of 20-acres. The trunk drainage system may consist of watercourses or man-made facilities such as pipes, ditches, and culverts. The trunk drainage system is the primary conveyance system for drainage waters and is described and mapped in full in the Stormwater Management Plan or supporting' document.

Trunk Sewer— any public sewer greater than 8-inches in diameter and identified for construction on in the “City of Keizer Sanitary Sewer Master Plan”.

Turnaround Area— a paved area of a sufficient size and configuration that a motor vehicle having a curb-to-curb turning radius of 30-feet or less my maneuver around to head in the opposite direction without having to move in reverse more than once.

Turnpike Street— any public street, road, or right-of-way that has been paved for vehicular movement and doesn't have curbs, sidewalks, or storm drainage facilities.

Water Distribution System—distribution main pipelines, pumping stations, valves, and ancillary equipment used to transmit water from the supply source to the service line.

Water Supply System— The supply system of a building or premises consisting of the building supply pipe, the water-distributing pipes, and the necessary connecting pipes, fittings, control valves, and all appurtenances carrying or supplying potable water in or adjacent to the building premises.

Water Service Line— the line or pipe connecting from the City water main to the water meter.

Wetlands— lands adjacent to watercourses or isolated therefrom which may normally or periodically be inundated by the waters from the watercourse or the drainage waters from the drainage basin in which it is located. These include swamps, bogs, sinks, marshes, and lakes, all of which are considered to be part of the watercourse and drainage system of the City and shall include the headwater areas where the watercourse first surfaces. They may be, but are not necessarily, characterized by special soils such as peat, muck, and mud.

1.07 Engineering Policy

The engineering policy of the City of Keizer requires strict compliance with Oregon Revised Statute 672 for professional engineers:

All engineering plans, reports, or documents shall be prepared by a registered professional Civil Engineer, or by a subordinate employee under his/her direction, and shall be signed by the engineer and stamped with his/her seal to indicate his/her responsibility for them. It shall be the project engineer's responsibility to review any proposed infrastructure improvement, prior to design or engineering work, to determine any special requirements or whether the proposal is permissible. A "Preliminary Review" and/or a "Plans Approved for Construction" stamp of the City, on the plans does not in any way relieve the project engineer of his/her responsibility to meet all requirements of the City or obligation to protect the life, health, and property of the public. The plans, reports, or documents shall be revised or supplemented at any time it is determined that the full requirements of the City have not been met.

1.08 Approval Of Alternate Materials Or Methods

Any alternate material or method not explicitly approved herein will be considered for approval on the basis of the objectives set forth in each section of these Design Standards. Persons seeking such approvals shall make application in writing. Approval of any major deviation from these Standards will (normally) be in written form. Approval of minor matters will be made in writing if requested.

Any alternate must meet or exceed the minimum requirements set in these Standards.

The written application is to include, but is not limited to, the manufacturer's specifications and testing results, cut sheets, design drawings, calculations, and other pertinent information.

Any deviations or special problems shall be reviewed on a case-by-case basis and approved by the City. When requested by the City, full design calculations shall be submitted for review with the request for approval.

1.09 Plan Submittal

Construction plans shall normally be submitted in triplicate to the City for review. Submitted plans shall include specifications, test data, quantities, calculations, percolation data and soils reports as required, design recommendations, easement and right-of-way descriptions, ties to a City Bench Mark, and other material as requested by the City.

Once the plans are approved and the construction permit issued, the project engineer shall be responsible for providing all surveying services necessary to stake the project and prepare the as-built drawings when the project is complete.

**The following shall be included with a plan submittal:**

- a. Three (3) complete sets of Construction Drawings prepared by a registered Civil Engineer in the State of Oregon in accordance with these Design Standards.
- b. A copy of the development Conditions of Approval or applicable planning action, and a copy of the Project Engineer's notes from the Pre-Design Meeting.
- c. A detailed engineers estimate.
- d. Payment of the required Plan Check Fee.
- e. Drainage and detention calculations.
- f. Site soil percolation data, if required.
- g. A preliminary power plan from the electric utility.
- h. Written evidence of plan submittal to additional reviewing agencies including:
  1. City of Salem for Sanitary Sewers
  2. Department of Environmental Quality
  3. Division of State Lands
  4. Franchise Utility Companies

1.10 Construction Plans

**a. General**

Complete plans and specifications for all proposed improvements including any necessary dedications and easements shall be submitted to the Department of Public Works for review and approval. Construction drawings must receive approval prior to permit issuance and start of construction.

Construction Drawings shall normally include detailed design for facilities applicable to the proposed project including, but not limited to:

1. Title Sheet
2. Site Plan
3. Proposed Sanitary Sewer Improvements

4. Proposed Water System Improvements
5. Proposed Street and Storm Drainage Improvements
6. Site Grading and Drainage Plan
7. Erosion Control Plan
8. Detail Sheet

b. **Plan Preparation**

1. Dimensions—Construction plans shall be clearly and legibly submitted on paper 24 x 36 inches.
2. Scale—Horizontal scale shall normally be 1"=20' or 1"=50'; vertical scale shall normally be 1"=5'.

1.11 Cover Sheet Requirements

One Cover Sheet may be used when constructing more than one facility (sewer, street, storm drain, water, etc.).

The Cover Sheet shall be prepared in accordance with the following requirements:

- a. Name and Address of the Current Property Owner and the Developer.
- b. The total acreage including streets directly served, proposed number of lots (if applicable), and a brief description of the proposed construction;
- c. Index of sheets.
- d. Complete legend of symbols used.
- e. Vicinity Map with North Arrow and a scale of approximately 1" = 1000'.
- f. Title Block located in lower right hand corner or right edge of paper with scale, date, drawing number, the engineer's name, address and official stamp, and where applicable, the owner/developer's name and address.
- g. Description of permanent bench mark(s) used for horizontal and vertical control.
- h. General and special notes relating to engineering design and construction methodology.
- i. A statement stating that all construction shall be in accordance with City of Keizer Design Standards and Standard Construction Specifications.

### 1.12 Site Plan Requirements

The Site Plan may be incorporated into the Cover Sheet if space is available, and all requirements for the Cover Sheet and Site Plan can be met.

The Site Plan shall be prepared in accordance with the following requirements:

- a. The Site Plan shall be a plan view summary of existing conditions and proposed improvements prepared at a scale not greater than 1" = 100'. The Site Plan shall identify the boundaries of all properties to be served by the proposed improvements and impacted properties adjacent to and within 250-feet of those served.
- b. North arrow and scale.
- c. Boundaries, including bearings and distances, of all subject property or area to be served by the proposed improvements, and all properties adjacent to and within 250-feet of the subject property.
- d. Existing ground elevations, or contours, in accordance with Development Code Requirements.
- e. Existing and Proposed Street Names.
- f. Proposed lots including lot numbers, bearings and distances of proposed property lines, and lot areas in square feet.
- g. Existing and proposed rights-of-way, edge of pavement, curbs, water mains, storm drains, sanitary sewers, overhead or underground franchise utilities
- h. Existing topographic features including natural or artificial watercourses, streams, swales, railroad grades, culverts, and other related features.
- i. Existing buildings or structures with owners name and address.
- j. Existing Floodplains and Floodways as shown on the applicable Flood Insurance Rate Map (FIRM), and other floodways and floodplains recognized by the City of Keizer or prepared by the Engineer.

1.13 Preliminary Site Drainage and Grading Plan

A Preliminary Site Drainage and Grading Plan for the subject area and adjoining areas within 100 ft. of the perimeter of the subject property are required to be submitted in accordance with the City of Keizer Development Code for review with a development application. Preliminary Site Drainage and Grading Plans shall include the following:

- a. Flow lines of surface water onto and off the site.
- b. Estimates of existing runoff patterns from subject property onto adjacent properties, and estimates of existing runoff from adjacent properties onto subject property.
- c. Existing contours at 1-foot intervals.
- d. Existing and proposed drainage channels, including drainage swales, ditches, berms, and proposed storm drains. Connections to existing storm drainage system should be identified.
- e. Location of storm water detention facilities.
- f. Well locations, both public and private.
- g. The City Engineer shall have the flexibility to make changes to the Preliminary Site Drainage and Grading Plan at the time of final detailed plan approval.

*These Preliminary Site Drainage and Grading Plan requirements are intended to supplement those of the City of Keizer Development Code. Any discrepancies between these Design Standards and the Development Code as they relate to the Preliminary Site Drainage and Grading Plan shall be resolved by the City.*

1.14 Benchmarks

All surveying for a development or street project shall be tied to an approved benchmark listed at the Marion County Surveyors Office. The benchmark used for vertical control shall be identified on the plans along with its elevation.

All projects consisting of the connection of a new public or private street, or private access easement shall provide a new brass disk benchmark of which the elevation is surveyed, stamped, and dated on the disk.

If the new benchmark is located in the street is shall be placed in an approved monument box.

1.15 As-Built Plans

Following completion of construction and approval by the City, 3 sets of As-Built Drawings shall be submitted for preliminary review. Drawings shall describe any and all revisions to the previously approved construction drawings.

If the first As-Built submittal is acceptable, the Project Engineer shall submit 3 additional copies of the As-Built drawings and an AutoCAD<sup>®</sup> drawing file of the final drawings for entry into the City's infrastructure mapping system.

If the As-Built submittal is not acceptable, the Project Engineer will make necessary changes required by the City and re-submit the As-Built drawings for review.

Final As-Built drawings shall be reviewed and approved by the City prior to Acceptance of public facilities by the City and start of the Maintenance Period.

1.16 Final Acceptance

After completion of the work by the Developer and/or General Contractor listed on the Construction Permit, the City will make a final walk-through which may generate a punch list of required corrections or additional work that must be completed on the project.

After completed improvements are reviewed for conformance with the approved Construction Drawings and all required corrections or additions are completed the City will issue a letter of Final Acceptance of Public Facilities to the Developer.

1.17 Maintenance of Public Facilities

A Maintenance Bond in the amount of 40% of the actual cost of public infrastructure improvements will be required. The Maintenance Bond will be for a period of 1-year from the date of Final Acceptance by the City. The Maintenance Bond shall be provided by the General Contractor or Developer of a development or project in the name of the City of Keizer.

*Alternate guarantee provisions in lieu of a Maintenance Bond will be reviewed on a case-by-case basis by the City.*