

**SECTION - 500**  
**SANITARY SEWER**  
**SYSTEM**

## **500 – SANITARY SEWER SYSTEM**

### **500.00.00 – Scope**

This section shall include but not be limited to all items of work necessary for, and incidental to the planning, survey, design and construction of the sanitary sewage system owned and administered by The City of Cave Junction within dedicated City rights-of-ways or easements dedicated to The City. This section shall also apply to private sanitary sewage systems insofar as they may affect the sanitary sewer system through connection.

This work shall also include any appurtenances, such as curb, gutter sidewalk, pavement removal and replacement; trench excavation and backfill, providing and installing sanitary sewer pipe and fittings, connection to existing sanitary sewers; providing and installing manholes and cleanouts; and testing, of the new sanitary sewage system.

It shall be the responsibility of Applicants, Engineers or Contractors to visit the site of the proposed work and become fully acquainted with the conditions relating to the construction, so that they fully understand the facilities, restrictions, and difficulties involved in the construction work proposed under the Contract or development. They shall satisfy themselves as to the quantities involved, including materials, equipment, and labor.

It shall be the responsibility of the Applicant(s) or Engineer(s) to obtain the necessary permits and approvals from The City, State and Federal agencies prior to performing any construction activities within City limits.

### **510.00.00 – General**

The sanitary sewer system including all sewer mains, lateral piping, manholes and pumping stations are owned and administered by The City of Cave Junction. This section shall be limited to the City of Cave Junction, Public Works Department requirements that are coincidental to construction of sanitary sewer facilities within a City of Cave Junction right-of-way or dedicated easement. Generally, all technical aspects of design, construction, approvals, inspections and testing of sanitary sewers shall be under the authority of The City of Cave Junction or in conjunction other governing authority such as DEQ.

#### **510.10.02 – References**

DEQ current standards and requirements Oregon Administrative Rules (OAR)

and Oregon Revised Statutes (ORS) current standards and revisions, including plumbing codes as may apply to Sanitary Sewer Systems.

Oregon Department of Environmental Quality (DEQ) current standards and revisions as may apply to Public Sanitary Sewer Systems.

Oregon Health Department (OHD) current standards and revisions as may apply to Public Sanitary Sewer Systems and Public Water Systems.

City of Cave Junction Municipal Code (CJMC) as may apply to sewer facilities, but as limited by ownership and administration of said Sanitary Sewer Systems.

City of Cave Junction Public Works Standards and Specifications as may apply to any related and coincidental street, water system, and storm sewer construction.

## **520.00.00 – Design Standards**

### **520.10.00 – General**

It shall be the responsibility of the Engineer to coordinate the design of the sanitary sewer with any existing or proposed water system facilities, storm water systems, and streets including any appurtenances. The Engineer and/or Applicant shall be responsible to investigate the area of the project and obtain all required approvals and permits from Public Works Department, Josephine County, and State of Oregon with respect to construction of sanitary sewer systems. The Engineer may use information that has formerly been established by the City and is on file, including previous construction. The sanitary sewer system design shall be in conformance with The City of Cave Junction specifications and standards, including any applicable provisions of the Oregon Plumbing Code, Oregon DEQ, and Oregon OHD.

#### **520.10.01 – Minimum Design Requirements**

1. All requirements as set forth by The City of Cave Junction.
2. Sanitary sewers shall be located 10' north or 10' east of centerlines of streets.
3. Minimum depth of sewer lines in the street right-of-way shall be such that service connections will have a minimum cover of 3' at the property line.
4. Ductile iron pipe, or concrete embedding and encasement for backfill shall be required at all crossings of streams, natural drainages and irrigation canals.
5. Separation - Separation between water system facilities and sanitary sewer facilities shall be in accordance with current Oregon Health Division Rules for Public Water Systems, Chapter 333 except that in all cases where running parallel with each other, there shall be a 10' separation (centerline to centerline) between water and sewer facilities. See Section 600, Water System for additional requirements.

6. Crossings – Crossings of water and sanitary sewer lines shall be in accordance with current Oregon Health Division Rules for Public Water Systems, Chapter 333 except that where sewer lines cross water lines, a minimum clearance of 1.5' will be required between the pipes. In cases where vertical separation of pipes may not be obtained, concrete encasement and/or support of the pipe shall be made. See Section 600, Water System for additional requirements.
7. Existing Utilities – See Section 540.10.01
8. Approvals – All construction requires approval by the PWD prior to issuance of a Public Works Permit for Construction within a City right-of-way or easement, whether existing or proposed as part of residential or commercial development. Plans for sanitary sewer design and construction submitted for acceptance by the PWD, shall be first approved by City Engineer and if applicable, Oregon DEQ. Plans will be then be reviewed for acceptance by the PWD to assure that no conflicts with other City facilities are present and that plans will accommodate future development. All requirements for sanitary sewer design and construction shall met City and state Specifications and Standards.

## **520.20.00 – Quality Assurance**

### **520.20.01 – Construction Staking**

Construction staking for the sanitary sewer system shall normally be accomplished after clearing and grubbing has been completed and the street section has been excavated (cored out). Staking and hubs will be required that define the location, offset distances, pipe diameter, depth of cut and invert elevations of the sanitary sewer pipe and structures.

### **520.20.02 – Inspection**

Inspection of sanitary sewer construction by Public Works Department will be limited to the following:

1. Backfill operations above the pipe zone, including density testing of layers in the variable and upper zones above the pipe zone.
2. Trench resurfacing including but not limited to, grading, pavement and/or concrete replacement.

Inspections shall be conducted by Public Works Department personnel during normal business hours of 8:00 AM to 5:00 PM. Inspections must be requested by the Contractor 24 hours in advance of the required inspection. Requests for Public Works inspection may be made through the PWD at (541) 592-4529. Arrangements for inspections during weekends and holidays must be made at least 48 hours in advance. The City will inspect all aspects of sanitary sewer construction including but not limited to the following:

1. Alignment, grade, bedding, and pipe jointing.
2. Installation of pipe zone material.
3. Testing and videotaping of sanitary sewer pipe installation.
4. Testing and Certification of manholes.

The City inspector may be contacted at 541-592-4529. Also see Section 550.00.00, Testing.

## **530.00.00 – Sanitary Sewer System Materials**

### ***530.00.01 – General***

All sanitary sewer piping materials including pipe zone materials shall be those specified and required by The PWD. Section 900, Construction Materials describes and specifies the materials commonly used in trench backfill phases (above the pipe zone) of City of Cave Junction, Department of public works projects.

### **530.10.00 – Trench Bedding and Backfill**

#### ***530.10.01 – Excess Excavated Trench Materials***

Unless otherwise established by test borings or test excavation that “rock” exists at the locations of sanitary sewer lines, laterals or service connections, it shall be assumed that all excavation will be unclassified excavation, and the Contractor shall remove all materials encountered. Excess excavated materials shall be disposed of as set forth in Section 330, of these Standard Specifications.

#### ***530.10.02 – Trench Backfill Materials(Excluding Pipe Zone)***

1. New Street construction – Per City of Cave Junction requirements
2. Existing Paved Streets and Shoulders – All sanitary sewer mains and lateral lines installed, repaired or modified within the street section including sidewalks or adjacent shoulders shall be back filled according to Standard Detail T-1. Extending 3' down from finished grade (upper zone), uncompressible 1 sack sand / Cement slurry mixture as described in Section 945.00.00, Cement-Sand Slurry, shall be used. Variable zone, pipe zone shall be per City of Cave Junction standards. Paving materials shall meet the requirements of Section 925.00.00, Hot Mix Asphaltic Concrete Paving (HMAC). Also refer to Section 350.20.00, Street Cutting Including Curbs, Gutters and Sidewalks. Trenches within the shoulder but not under any portion of the paved street section shall be back filled with ¾"-0 crushed rock meeting the

requirements of Section 910.11.00, Trench Backfill and Bedding Aggregate.

3. Areas other than Rights of Way – Backfill for sanitary sewer mains and lateral lines outside the street Rights of Way shall be back filled and compacted per City Specifications and Standards requirements.

## **530.20.00 – Structures**

### **530.20.01 – Manholes**

Manholes shall be constructed in accordance with The City specifications and standards.

## **540.00.00 – Construction and Workmanship**

### **540.10.00 – Trench Excavation, General**

It is the intent of these Standard Specifications that the progress of the work shall progress in a systematic and efficient manner so that as little inconvenience as possible to the public will result during the course of construction.

**No work within a City right of way or easement shall commence until the Applicant has applied for and received a Public Works Department “Construction Permit” or unless during emergencies has been authorized by the PWD to conduct such work.**

Prior to beginning work the Applicant or Contractor shall notify the PWD and dispatch center of the address, periods of work, road closures and detours and other operations critical to public safety. Applicant shall obtain all utility locates in accordance with OAR 952-001-0010 through 952-001-0100. Call **1-800-332-2344, or dial 811.**

Except by permission of the Public Works Department, at no time shall the trenching equipment be farther than 200' ahead of each pipe laying crew.

Backfill of the trench shall be accomplished so that no section of approved pipe shall be left open longer than 48 – hours unless otherwise authorized by the Public Works Department. Backfill and cleanup shall be completed as each section of pipe has been inspected, tested, and approved.

All trench excavation operations shall be conducted in a safe manner in accordance with OSHA requirements as administered by the State of Oregon.

The Contractor shall promptly repair and re-grade all existing drainage ditches, natural drainage courses and all other drainage facilities, including culverts, damaged or removed during the construction.

The Contractor shall give prompt consideration for reopening street, roads and driveways to the public after the pipe has been installed. No traffic-way shall be closed while work is suspended over weekends or holidays. Closures during workdays shall be as brief as practicable.

The Contractor shall be required to provide the necessary trained personnel and signing to control traffic for the duration of the project in accordance with MUTCD and "Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less", 2006 edition. Where private accesses are to be closed, the property owner(s) shall be notified by the Contractor at least 24-hours in advance of the closure. Access for fire and emergency equipment shall be maintained at all times. Also see Section 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks.

#### **540.10.01 – Pavement Removal and Replacement (Street Cuts)**

Where new sanitary sewer lines cross existing pavements, the Contractor shall pre-saw the lines of the pavement or concrete to the full depth of the pavement before attempting to remove the paving or curbs and gutters.

All work shall be done in accordance with Sections 350.20.00, Street Cutting Including Curbs, Gutters and Sidewalks. Paving and concrete materials shall meet the requirements defined Section 930.00.00, Portland Cement Concrete (PCC) and 925.00.00, Hot Mix Asphaltic Concrete Paving (HMAC)

Where the contractor discovers existing water, sewer and utilities lines during his excavation he shall promptly notify the Public Works Department. In accordance with other applicable sections of these Standard Specifications the Contractor at his expense shall be required to support, repair or cause to be repaired, and protect the pipe or utility. If the pipe or utility is not damaged, a "warning mound" of sand shall be placed immediately above the facility to a depth of 6" and marked with a heavy duty, highly visible plastic strip laid across the full width of the trench before backfilling with the specified materials. Such plastic strip shall meet the requirements of 960.00.00, Miscellaneous Materials.

After backfill has been placed and compacted as required, contractor shall utilize a "T-Cut" method on the existing asphalt, in which the asphalt is cut again a minimum of 6" wider than the existing trench wall, on both sides, including any undermined areas. Exposed road bed will then be satisfactorily compacted, as determined by the Public Works Department, or their representative, prior to paving the trench.

#### **540.10.02 – Rock Excavation**

When using explosives for rock excavation, the Contractor shall follow all the rules and requirements of Sections 340.11.01, Use of Explosives, and 340.11.02, Repair of Damage.

### **540.10.03 – Shoring, Sheet piling and Bracing**

In trenches excavated in sand, gravel, or sandy or silty soil, or wherever necessary to prevent caving or trench side failures, the Contractor shall adequately shore, sheet, and brace the trench walls. Where sheet piling and bracing are used, trench widths shall be increased accordingly.

Trench support shall remain in place until the pipe has been placed, inspected, tested, and repaired if necessary; and until the backfill in the pipe zone has been placed and compacted as specified to a minimum of 6" above the top of the pipe.

All cages, sheet piling, shoring and bracing or alternative excavation methods shall conform to the requirements of OSHA as administered by the State of Oregon or other appropriate authority having jurisdiction over such matters.

### **540.10.04 – Excavated Materials**

Where approved excavated materials may be used in the backfill above the pipe zone, for pipes outside the street right-of-way. The excavated materials shall be piled along the trench side in a manner that will not endanger the work, obliterate construction staking and/or obstruct traffic ways, sidewalks and driveways.

Fire hydrants under pressure, valve boxes, meter boxes, fire and police call boxes, and other utility controls shall not be obstructed, and shall remain accessible at all times.

Gutters shall be left clear or other satisfactory provisions shall be made for street drainage. Natural watercourses shall not be obstructed. If necessary, temporary channels or smaller pipes shall be installed at low water periods to route natural flows around the project area. When excavated materials will not be used for trench backfill, they shall promptly be removed and disposed of as set forth in Section 330.10.02, Disposal of Excess Excavated Soils, and Section 800, Erosion and Sediment Control, of these Standard Specifications.

### **540.10.05 – De-Watering**

Sewer trenches shall be de-watered at the direction of PWD and in accordance with the specifications and standards for sewer construction herein. The Contractor shall dispose of the water in a suitable manner without damage, erosion or sedimentation to adjacent property as further described in Section 800, Erosion and Sediment Control.

## **540.20.00 – Trench Backfill and Bedding**

### **540.20.01 – Trench Bedding**

Trench bedding shall be in compliance with City specifications and standards.

#### **540.20.02 – Pipe Zone Backfill**

Pipe zone requirements shall be as required by City specifications and standards.

#### **540.20.03 – Backfill above the Pipe Zone**

Within the street Right of Way, above the pipe zone, backfill conforming to the requirements of Section 910.11.00, Trench Backfill and Bedding Material and as illustrated by Standard Details T-1 thru T-6, Trench Section, shall be placed and compacted in lifts not exceeding 8" in depth. The PWD may authorize the installation of increased lift thickness where high frequency vibrators mounted on large excavators are used. In all cases, the backfilled trench sections shall be compacted to the following densities:

On new street sections from finish sub-grade elevation (*upper zone*) to the top of the variable zone or 6" above the top of pipe, whichever is less, the ¾"-0 crushed rock backfill above the pipe zone shall be compacted to a minimum of 95% of maximum density AASHTO T-99 (A). On existing streets the upper zone backfill section is measured as 3' from finished pavement to the top of the pipe zone since there usually is not a layer of sub-base material being placed.

From the top of the pipe zone to a level 3' below the top of sub-grade (variable zone), the ¾"-0 crushed rock backfill above the pipe zone shall be compacted to a minimum of 90% of maximum density AASHTO T-99 (A).

Under all existing paved street sections a 1 sack cement-sand slurry mix as conforming to Section 945.00.00, Cement-Sand Slurry shall be used as backfill in the upper zone as shown on Standard Detail T-1.

Outside the Street Right of Way – Unless otherwise directed backfill above the pipe zone shall be placed in lifts not exceeding 12" in depth and compacted to the following densities:

From the top of the pipe zone to finish grade, the backfill above the pipe zone shall be compacted to a minimum of 90% of maximum density. AASHTO T-99 (A) shall be used in accordance with the type of backfill material installed. The type of backfill material used may be approved select native material, ¾"-0 crushed rock or decomposed granite. Muck, vegetative material, or other incompetent materials shall not be installed.

#### **540.20.04 – Concrete Cap and Concrete Encasement**

Concrete caps and concrete encasements shall be installed per City standards and are subject to the approval of the City PWD.

#### **540.20.05 – Backfill for Manholes, Catch Basins, Inlet and Similar Structures**

Back fill for these applications shall be accomplished in the same manner with materials and to the same standards as backfill for pipe trenches.

### **540.30.00 – Installation of Sanitary Sewer Pipe and Fittings**

With the exception of 540.30.01, Distribution of Materials, all other aspects of sanitary sewer pipe installation shall be as required by City specifications and standards.

#### ***540.30.01 – Distribution of Materials***

Material shall be distributed on the job no faster than it can be used to good advantage. Pipe which cannot be physically lifted by workmen from the trucks hauling the pipe shall be unloaded by a forklift or other approved means.

No pipe of any size or type shall be dropped from the bed of the truck to the ground or otherwise mishandled. No more than one week's supply of pipe material shall be distributed to the site in advance of placement, unless approved by the Engineer. All piping materials, manholes, ring sections and other fittings shall be protected from breakage, contamination and weathering.

### **550.00.00 – Testing**

#### ***550.10.01 – Sanitary Sewer Testing Requirements***

The contractor shall be required to perform all testing of sanitary sewer pipe including testing and certification of manholes as required by City specifications and standards and Oregon DEQ.

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