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2010 PUBLIC WORKS STANDARDS & SPECIFICATIONS
SPECIAL PROVISIONS as of 1-1-16

Check City website for most current version.

IMPORTANT NOTE: These instructions are based off double sided printing.

Instructions on how to update previously printed versions:

1. Print PDF with replacement pages double sided.
2. Insert pages as follows:
 - Table of Contents
 - Reprint entire section
 - Development Provisions
 - Reprint entire section
 - Design Standards
 - Reprint entire section
 - General Conditions
 - Reprint entire section
 - Standard Specifications
 - Division I Trenches
 - ❖ No updates
 - Division II Streets
 - ❖ Replace pages 5 – 6
 - ❖ Replace pages 9 – 18
 - ❖ Replace pages 31 – 32
 - ❖ Replace page 35 – 44
 - ❖ Replace page 49 – 52

- Division III Sewers
 - ❖ Replace page 13 – 18
- Divisions IV Water
 - ❖ Replace page 13 – 20
- Division V Structures
 - ❖ No updates

3. Print PDF with replacement drawing pages double sided.

4. Insert pages as follows:

- Standard Drawings with changes or that have been added
 - Replace Table of Contents
 - Section 1: Trenches
 - ❖ Replace drawings 1-1 and 1-2
 - Section 2: Streets
 - ❖ Replace drawings 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-11, 2-12, 2-13, 2-14, 2-15, 2-16, 2-19, 2-20, 2-23, 2-24, 2-25, 2-26, 2-27, 2-28, 2-29, 2-30
 - Section 3: Sanitary and Storm Sewers
 - ❖ Replace drawings 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-13, 3-14, 3-15, 3-16
 - Section 4: Water
 - ❖ Replace drawings 4-1, 4-2, 4-5, 4-6, 4-9, 4-10, 4-11, 4-12, 4-13, 4-14, 4-21, 4-22

CITY OF REDMOND, OREGON

2010 STANDARD SPECIFICATIONS

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CITY OF REDMOND, OREGON

2010 STANDARDS AND SPECIFICATIONS

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01 INTRODUCTION

01.1.00 General

The following provisions are minimum development and construction standards for the City of Redmond and are intended as a supplement to the Oregon Standard Specifications for Construction. Where the term Design Engineer occurs in this document, it shall mean a professional engineering firm retained by the City or Developer/Owner to provide design, construction management, or some other service necessary for the construction of the proposed public facility or site drainage facility. This document shall apply to both private development and publicly bid contracts where applicable.

01.2.00 Public Work Improvements

This document is intended to set minimum standards for public work improvements within the Urban Growth Boundary of the City of Redmond.

The City of Redmond, Public Works Department Standards and Specifications will be incorporated in and made a part of any contract for the design and construction of a municipal project. The portions of this specification relating to design, easements, materials, and workmanship shall be adhered to for private developments where improvements will become part of municipally owned and operated systems. These Standards and Specifications will be updated periodically and, as such, all persons should assure they are working with the most current set of Standards and Specifications.

Minimum general standards shall be as set forth in the current ***City of Redmond Public Works Standard and Specifications for Construction***.

02 RULES

No project or construction work that requires City Engineering or Public Works inspection shall commence until the appropriate agreements have been signed and performance bonds submitted, final construction plans approved, preconstruction meeting held, all associated fees and deposits have been paid and 'Notice to Proceed' issued.

The Owner/Developer, or agent, will be responsible for any faulty material and workmanship for one year from the date of the formal acceptance of the sewer, street, water, storm drainage or other public facility installation. Final Acceptance of a project, or any portion of a project, shall be in writing from the City Engineer, and shall state any special conditions required for acceptance by the City.

The Owner/Developer, or agent, shall comply with all terms and conditions of applicable governmental rules and regulations pertaining to the work.

The design and construction of all proposed facilities shall be in conformance with the City of Redmond Public Works Standards and Specifications, and all standards and specifications referenced therein.

Workmanship and materials not conforming to these Standards and Specifications will be deemed a violation of City code and any associated agreement, and may result in an immediate suspension of the Contractor's activities. When an authorized representative of

the City Engineer suspends the Contractor's activities, all work shall cease on the subject project until the violation is corrected to the satisfaction of the City Engineer.

03 PUBLIC FACILITY REQUIREMENT

To provide for orderly and efficient urban development and extension of public facilities, public streets, alleys and public utilities shall be extended along public right-of-way or City easements for the full length of all portions of property frontage being developed or as otherwise determined through the land use approval process. Public facilities shall be extended from the point of connection "to and through" to the far boundary of subject property. All public facility extensions and/or improvements shall conform to the City of Redmond; Public Works Standards and Specifications, Public Facilities Plan, Transportation System Plan, Water System Plan and Wastewater System Plan where applicable. All new service or fire hydrant connections to City water and/or sewer systems shall require a public water and/or sewer main line to be located or extended in public right-of-way or City easements along property frontage where applicable. This "to and through" public facility requirement shall be fulfilled except where it is not practical to extend a street or utility because of topography or by boundary and/or land use restrictions prohibiting development (e.g. UGB, public lands, etc.) as determined by the City. When it is not practical to extend a street or public utility, the property owner or developer will be required to provide a cash payment equal to the value of the improvements.

04 PLANS & SPECIFICATIONS

04.1.00 General

Plans and specifications for public streets, alleys, storm drainage, sewer, or water facilities must be submitted by the person or firm proposing the work to the City of Redmond Engineering Department for approval before construction is started. The Contractor shall not start work until he/she has plans signed and approved by the City Engineer and Director of Public Works and project security/performance bond is submitted. A copy of any construction requirements or development conditions levied by any public agency, such as City of Redmond Community Development Department Staff Reports, shall be attached to plans submitted for review. Support documentation such as fire flow analysis and storm drainage calculations/reports shall be submitted as well. Without the above document submittal, the Engineering Department will be unable to adequately review the plans, and will return the plans without review.

Final plans addressing review comments are to be submitted by the Owner, or the Design Engineer, to the City of Redmond Engineering Department for approval. The final design shall be prepared, sealed, and signed by a Registered Professional Engineer licensed in the State of Oregon, in accordance with state law.

04.2.00 Review Plan

Two copies of the design plans showing the proposed facilities shall be submitted to the City of Redmond Engineering Department for review. One 'redline' copy of the preliminary plan will be returned indicating any modifications required.

Any final design plans for facilities requiring postal delivery service shall have on the cover

sheet the signature of an appropriate official of the United States Postal Service indicating that the design is approved by the United States Postal Service. A copy of the negotiated and signed Mode of Postal Delivery form shall be attached to the final plan.

Any final design plans having fire hydrants or facilities for the suppression of fires, shall have on the cover sheet the signature of an authorized official of Redmond Fire and Rescue indicating that the design is approved by Redmond Fire and Rescue. Plans requiring approved fire flows as determined by Redmond Fire and Rescue or Land Use action will not be accepted for review unless documentation in the form of a fire flow analysis verifying compliance is attached to the submittal. The fire flow analysis shall be stamped and signed by a Registered Professional Engineer, licensed in the State of Oregon.

Any final design plans having storm drainage facilities will not be accepted for review unless a storm drainage report stamped and signed by a Registered Professional Engineer, licensed in the State of Oregon is attached to the submittal.

The final design plans shall have on the cover sheet the signature of an authorized representative of all affected agencies, utilities, fiber optic and/or service providers including but not limited to; Pacific Power and Light, Central Electric Cooperative, Qwest, Bend Broadband, Cascade Natural Gas and Central Oregon Irrigation District indicating design review and approval. When required, the developer will be responsible to submit drawings and required fees to Oregon State Health Department (for water facilities) and to the Oregon Department of Environmental Quality (for pressure sewer systems and UIC storm drainage facilities) for review and approval.

Upon request of the Design Engineer, a meeting to review City 'redline' comments will be scheduled. Re-submitted plans shall be accompanied by any and all Department comments including the 'redline' copy to facilitate further review.

04.3.00 Final Plan

After all revisions have been made to the reviewed plans, and the corrected plans have been approved by the Engineering Department, then two sets of the final plan set shall be submitted on mylar reproducible media for signatures. The final plan sets shall be stamped and signed by a registered professional engineer employed or retained by the Design Engineer. Documentation of any required State Health Department or Department of Environmental Quality agency submittal and approval must accompany final plan submittal. No changes will be made by the City to the mylar reproducible copies sealed and signed by the Design Engineer. The City Engineer's signature will indicate that the design is approved. Other affected agencies/persons, such as the United States Postal Service, Redmond Fire and Rescue, Central Oregon Irrigation District, ODOT, etc., will indicate their approval by signature. The final signatory is the Public Works Director, which will indicate that all Engineering fees have been paid. The Owner or the Design Engineer shall provide the City with one complete signed set of mylar reproducible (or equal) drawings and four sets of printed, blueline, or photocopied drawings. Cloudy, dark, or otherwise illegible drawings are not acceptable. The information shall also be submitted to the City in AutoCAD format (compatible with version 2004 or later) on a CD, DVD or

transmitted by email as appropriate. All fonts, shape files, external references, images and other items necessary for a complete drawing shall be packaged with the electronic file.

Final plan approval is effective for the duration of the associated land use approval period and/or improvement agreement schedule of work. Extension of final plan approval may be granted at the discretion of the City Engineer and will be subject to fee retainage and adherence to the most current City of Redmond Standards and Specifications and Fee Schedule. However, unless an extension is granted the final plan approval shall be declared void, and the final plans must be resubmitted to the City for review and approval if either of the following occur:

- 1) Construction has not been initiated within eighteen (18) months of the final plan approval date.
- 2) The inspection portion of the Engineering fee is refunded back to the Owner/Developer prior to project acceptance.
- 3) Land use approval and/or improvement agreement expire prior construction completion or City acceptance.

04.4.00 Engineering Fees

Engineering fees for City inspection and plan review of public improvements are required as established by the City of Redmond Fee Schedule and must be paid before the construction plans can be approved and signed by the Public Works Director. The plan review portion of this fee is for services already provided and is non-refundable. The inspection portion of this fee is based on project valuation and is non-refundable. A cost estimate shall be submitted by the Design Engineer for review by the Engineering Department to determine project valuation.

04.5.00 Pre-Construction Meeting

A pre-construction meeting will be held after Engineering fees are paid, the plans have been approved and signed, and before construction can begin. Items to be covered are outlined in Section 12 of the Development Provisions. Following the pre-construction meeting, the City Engineering Department will issue a 'Notice to Proceed'. The 'Notice to Proceed' is the document which authorizes construction to begin, and inspection services to commence.

04.6.00 Plan Revisions

No design changes or revisions to final plans signed by the City Engineer and Public Works Director will be considered effective without the following:

- 1) The City Engineer shall verify and approve any changes, modifications, or revisions. For design changes affecting the scope of work, additional Engineering 'Change Order' review fees established by the City of Redmond Fee Schedule must be paid before the approved revised plans can be signed by the City Engineer. Each revised plan sheet shall have a 'Change Order' approval signature block added and shall be approved and signed by the City Engineer. For minor revisions that do not affect the design content, such as changing the location of water or sewer services,

revisions can be approved by the Inspector in the field and noted on the As-Built drawings. Revising the location of a fire hydrant, line valve, vault, manhole, catch basin, or similar structure changes the design content, and such change must be submitted for review and approval to the City Engineer.

- 2) Within two working days after City Engineer approval, four copies of the revised plans sheets and two copies of the new original mylar drawings sheets sealed by the Design Engineer with the revisions noted in the Revision Box shall be submitted to the Engineering Department for distribution.
- 3) Upon completion of the project, the Design Engineer shall submit AutoCad change order drawings with design changes that required new or substantially altered drawings for approved design changes, with the revisions noted in the Revision Box. These AutoCad change order drawings shall reflect as-built conditions known to the Design Engineer.

04.7.00 Final Plat

A final subdivision or partition plat showing complete information shall be submitted to the Community Development Department for routing. Prior to plat signature by the Director of Public Works, the following conditions must be met: the County Surveyor has signed the plat; required improvements to public facilities have been constructed, accepted, bonded, or guaranteed per the Development Code and any associated land use approval; cash contributions for public improvements in lieu of construction have been paid; warranty agreement and warranty bond provided for completed public improvements; documentation submitted to verify the abandonment of any private water and sewer systems per County and/or State requirements; certification of all earth fill areas located outside of public right-of-way/easement by a license professional engineer; public or City easements dedicated on the plat are consistent with current City easement agreement template provisions; all related public or City easements conveyed separate from the plat have been signed and recorded; All other conditions of land use approval that relate to Public Works or Engineering Departments have been met; and any fees or assessments associated with the plat and required by the land-use process, reimbursement/improvement districts, or cost sharing agreements have been paid. The final plat (or easements and/or right-of-way dedication in lieu of) shall be recorded upon completion and City acceptance of any associated required public improvements where in the determination of the City Engineer said final plat left unrecorded may adversely impact existing and/or active public infrastructure or traveled way or constructed City master plan public facility.

05 AGREEMENTS

Improvement agreements are required by the City for public improvements not completed but bonded/secured for plat approval or for public improvements to be constructed within existing public right-of-way or upon existing public facilities. All agreements shall be signed and related performance bond/surety received by the City, prior to commencing construction on the associated facility. These agreements are generally prepared by the City's Community Development Department and specify improvement cost and construction completion date. It is the responsibility of the Owner, or her/his agent, to

coordinate with the City offices to assure all agreements and bonds/sureties have been completed and executed prior to start of construction.

06 INSURANCE

The person or firm doing the work (Contractor) shall maintain Construction Public Liability Insurance during the life of the Project. The coverage shall be maintained in the amount of the City's tort liability limits set by the Oregon Legislature (ORS 30.270) for bodily injury liability and property damage applying to her/his own work and that of any subcontractor performing work under the Agreement.

All contractors performing work on public improvements must be registered with the Construction Contractors Board or licensed with the State Landscape Contractor Board.

All contractors and subcontractors working on a public works project with a value over \$100,000 must file a \$30,000 "public works bond" with the Construction Contractor's Board. General Contractors must verify that subcontractors have filed a public works bond before permitting a subcontractor to start work on a project.

The City of Redmond shall be indemnified and held harmless from any liability of any kind resulting from or in connection with activities associated with the project. The City of Redmond shall be named as an additional insured, and a certificate of insurance with ten day cancellation notice shall be filed with the City of Redmond Recorder's office prior to start of construction.

07 EASEMENTS AND PERMITS

When portions of a public facility, utility or structure will be located on private property, permanent easements for location, maintenance, and operation shall be provided. Easements shall provide for the use of property for construction purposes to the extent indicated on the easements. Current City easement agreement templates shall be used unless otherwise authorized by the City Attorney, Public Works Director and City Engineer.

All City Easements conveyed separately from the final plat shall require the following to be submitted to the Engineering Department:

- 1) Exhibit 'A' - property/parcel legal description.
- 2) Exhibit 'B' - easement map.
- 3) Exhibit 'C' - easement legal description.
- 4) Current property title report or equivalent ownership verification.
- 5) City recording fee as established by the City of Redmond Fee Schedule.

All exhibits shall be letter size (8.5x11) and stamped by a registered professional engineer (PE) or land surveyor (PLS) if prepared by the PE or PLS. Copies of these easements (including a copy of the easement in relation to the site plan) will be made available to the City for review prior to construction. Easements shall be recorded prior to City Engineer's acceptance of the public facility. Easements that impact property located beyond an established or approved development boundary, plat or site plan shall be recorded prior to construction. Easements for public facilities identified in City Transportation, Water or

Wastewater System Plans shall be recorded prior to construction unless otherwise approved by the City Engineer. The City accepts no liability for actions of the Contractor not in conformance with written easements.

08 PERFORMANCE AND PAYMENT BOND

Public Contracts: ORS 279C.380 If the contract is for a publicly bid improvement, the successful bidder shall execute and deliver to the City of Redmond a good and sufficient bond, to be approved by the City, in a sum equal to the contract amount for the faithful performance of the contract. In lieu of a surety bond, the City may permit the Contractor to submit a cashier's check or certified check payable to the City of Redmond in an amount equal to one hundred (100) percent of the contract amount.

Private Contracts: A performance bond or surety, cash deposit or other approved security shall be provided by the Developer as project security for all work proposed in existing public right-of-way, or upon existing City facilities. The approved project security shall be in the amount of one hundred twenty (120) percent of the estimated public improvement cost. The performance bond/surety shall be submitted with the current City approved performance bond form. A City approved improvement agreement that specifies construction schedule and completion date shall accompany said performance bond.

09 WARRANTY

Upon acceptance of the construction by the City of Redmond Engineering Department, a minimum one (1) year warranty agreement on materials and workmanship shall be initiated between the City of Redmond and the Owner/Developer within thirty (30) days from date of acceptance. The warranty agreement shall include a bond, cash deposit or other approved security, with a minimum value of ten (10) percent of the Developer's final public improvement construction costs. The warranty agreement and security shall guarantee replacement and repair of any defective materials or workmanship which become apparent during the warranty period. The warranty agreement will be held by the City for the duration of the warranty period or until all warranty issues have been resolved. A final warranty inspection of the project will be conducted by the City during the last month of the warranty period. A closed circuit television (CCTV) video inspection of gravity sanitary and storm sewer systems will also be conducted by the City during the warranty period. Upon expiration of the warranty period and resolution of all warranty issues, the warranty agreement and security will be released and returned to the Owner/Developer.

10 PUBLIC NOTIFICATION

Any construction activity that impedes or interrupts any existing public service shall require that the public be notified of that interruption at least 24 hours prior to such impediment or interruption. Public notification shall be made by direct contact with owners/residents or door hangers/flyers distributed to properties adjacent to impact. Notice to City to be posted on City website, newspaper, radio public service messages and/or variable message sign placement. Notification shall also include, but not be limited to, emergency services, local school district, post office, garbage collection, and any other affected public agency. Each notification shall be the responsibility of the Contractor performing the work and shall be

coordinated with the City Engineering Department to assure adequate notification. Failure to adequately notify the public will result in an immediate suspension of the Contractor's construction activities.

11 INTERGOVERNMENTAL JURISDICTION

Public improvements often times fall within the jurisdiction of several governmental agencies, i.e., Deschutes County, Central Oregon Irrigation District, Oregon Department of Transportation, Oregon Department of Environmental Quality, etc. When multiple jurisdictions are involved, it is the responsibility of the Owner, Developer, or agent, to coordinate with and gain the appropriate approval from the governmental agency having jurisdiction over that portion of the work.

It shall be the responsibility of the construction Contractor to verify approvals and/or permits with agencies prior to commencing work. Failure to verify approval will result in project work being suspended until approval and/or permit is obtained.

12 PRE-CONSTRUCTION MEETING

A pre-construction meeting shall be held following approval of final plans and prior to issuance of the 'Notice to Proceed' for construction. Before the meeting can be held, agreements must be signed, project security/performance bonds submitted and the Engineering Department must have one original mylar reproducible drawings set and four complete photocopied or blueline drawing sets of the signed construction plans. Items to be discussed at the meeting include, but are not limited to:

- 1) Initiating construction
- 2) Contractor's work schedule in writing
- 3) Inspector assignment
- 4) Traffic Control/Public Notification
- 5) Subcontractors and suppliers
- 6) Materials furnished (i.e. type, brand, submittal requirements, etc.)
- 7) Safety requirements
- 8) Sampling and testing program
- 9) Regulatory agency requirements and approvals
- 10) Easement and right-of-way requirements.
- 11) Project Closeout and City acceptance
- 12) Warranty requirements and inspection

For projects including work that will impede or affect vehicular traffic on established streets, the Contractor shall submit a construction schedule and Traffic Control Plan (TCP) specifically for that work for review by the City Engineer. Work which impedes traffic flow shall not proceed until the schedule and TCP is approved by the City.

No inspections shall be performed until a pre-construction meeting has been held with the City of Redmond Engineering Department. At the meeting, a City Inspector will be assigned to the project and **all** communications, changes, and field decisions will be coordinated through the Inspector. If the Inspector is not informed of a change or field decision, and the change has not been approved by the appropriate authority, then the

change is not allowed and the facility must be constructed as shown on the approved plans.

13 UTILITIES

The construction drawings shall show the location of all existing and proposed utilities (i.e. electric, phone, cable, fiber optic, gas, irrigation, etc.). The Owner/Developer shall provide and have constructed all City maintained facilities associated with the proposed development, including but not limited to, sewer and water systems, storm drainage, streets, street and traffic control signs, street lights, bikeways, pathways and appurtenant facilities. The Owner is responsible for the coordination of this work with any other agencies, individuals, and utility companies including, but limited to, Central Electric Cooperative, Pacific Power, Qwest Corporation, Quantum Communications, Cascade Gas, or other utility providers or agencies that may be affected by the construction.

14 INSPECTIONS

Authorized Representatives of the City Engineer will be appointed as inspectors for all phases of the work. Inspections will be performed at the expense of the Owner or Developer for whom the work is being constructed, to assure that the public facilities installation or street construction conform to City Standards and Specifications. Engineering services shall be provided by the Owner/Developer. Contractors may call for the City Inspector, or Engineering Representative, to inspect the work when deemed necessary.

The inspections listed below in 14.2.00 through 14.5.00 will be established at the Pre-Construction Conference based on the project requirements. Inspections requiring 24 or 72 hour advanced notice and approvals to be obtained before proceeding with dependent work will be outlined. Listed below the numbered inspections are general performance standards that the Inspector will observe.

14.1.00 ADVANCED NOTIFICATION FOR INSPECTION

The City will provide periodic, ongoing inspections on an as-needed basis. The Contractor shall be responsible for notifying the City Engineer's office at least 24 hours in advance of required inspections. Closed circuit television (CCTV) video inspections require a 72 hour advance notice by the Contractor. The City will not be responsible for performing inspections without sufficient notice, nor will the City be responsible for any cost incurred for delay caused by insufficient notification.

No inspections will be performed without the associated 24 or 72 hour notification. Any work performed without a required inspection will be subject to removal and inspection, or acceptance, at the City Inspector's discretion.

14.2.00 STREET INSPECTION

14.2.01 Traffic Control

- a. Temporary signs, barricades, delineators, and cones are in accordance

with the approved Traffic Control Plan and MUTCD.

14.2.02 Excavation

- a. Construction staking meets requirements.
- b. Construction area cleared and grubbed to mineral soil.
- c. Fill construction and material meets standards and specifications.
- d. Erosion control in place, stormwater facilities protected.

14.2.03 Subgrade

- a. All underground utility work is complete, inspected, and approved.
- b. All fill and backfill compacted to 95% of maximum density, and tested.
- c. Subgrade is graded uniform and free of irregularities and within tolerances.

14.2.04 Curb

- a. Construction staking meets requirements.
- b. Subgrade has been approved.
- c. Drop curb areas have been located.
- d. Driveways, alleyways, access approaches, ADA ramps are staked and graded.

14.2.05 Curb Backfill

- a. Construction staking is in place.
- b. Finished curb matches staking.
- c. Curb backfill material meets specification.
- d. Finished surface is level, uniform, and free from irregularities.

14.2.06 Sidewalks

- a. Curb backfill is in place and compacted.
- b. Water meter & meter boxes set to grade per City Specifications.
- c. Fire hydrants set to grade.

14.2.07 Drainage Structures

- a. Inlets are set as designated on the plans or at low point staked in field.
- b. Inlet grate frame is set to appropriate street grade and slope.
- c. In addition to mechanical compaction, pipe and catch basins backfill shall be proved by water jetting.
- d. Drain cross pipes are inspected per pipe construction and grouting requirements.
- e. Storm drainage facilities constructed per approved design (location, geometry, slope, soil depth, filtering, surfacing, etc.).
- f. Storm drainage facility performance tests in accordance with City Standards and Specifications.
- g. Storm sewer systems inspected according to City specifications.
- h. Sedimentation manholes are installed with correct fittings in accordance with City standards and specifications.

14.2.08 Base

- a. Base material meets specifications prior to placement (submit gradation, proctors)
- b. Subgrade is fine bladed to meet specified crown and curb exposure.
- c. Water valve boxes have been set to subgrade and can be raised to grade.
- d. All water compaction has been completed at least 48 hours previously.

14.2.09 Paving and AC Patching Preparation

- a. Base rock is tight, not segregated and free from ravelling or areas prone

- to ravelling.
- b. Base rock is watered, uniform to grade and slope, and free of irregularities.
- c. Water valves boxes are set to the top of the base.
- d. All manholes have been set and grouted to grade for at least 24 hours.
- e. Base has not been contaminated by dirt or other substances.
- f. Asphalt areas to be matched are cut square, straight, and uniform for AC patching.
- g. Tack coat applied to concrete and asphalt surfaces to be matched or overlaid.

14.2.10 Paving Operation

- a. Paving operation to be closely monitored by City Representatives.
- b. Water valve boxes are set to finish grade.
- c. All joints are raked and coarse stone removed from the pavement surface.
- d. The uncompacted A.C. shall be set 1/2" - 3/4" above drainage and manhole structures so that the roller will bridge such structure and no dimpling of the finished mat adjacent to the structure will occur.
- e. There shall be a minimum of at least four (4) passes of the breakdown roller to achieve proper compaction of the mat.
- f. Finish rolling shall continue until no roller marks remain.

14.2.11 Striping Layout

- a. The City Inspector to review and approve layout of striping prior to authorization to stripe.
- b. Pavement is clean, dry and air/surface temperatures are appropriate for striping

14.3.00 SANITARY & STORM SEWER INSPECTION

14.3.01 Before Construction

- a. Inspection of materials and storage area.
- b. Protection of existing systems.
- c. Assurance of proper traffic control.
- d. Utilities located and marked.
- e. Construction staking meets requirements.
- f. Bypass pumping equipment in place and installed according to approved plan.

14.3.02 Subgrade

- a. Subgrade of proposed road established.

14.3.03 Pipe Trench and Bedding

- a. Inspection immediately prior to pipe installation.
- b. No rock points in pipe zone.
- c. Bedding material is in conformance with specification.

14.3.04 Pipe Installation

- a. Services provided to each lot as shown on plans and cleanout or sampling manhole along with locate wire provided at property line.
- b. Pipe alignment is true.
- c. Compaction under pipe haunches.

- d. Fittings tight.
- e. Water grade pipe and couplers installed where required.

14.3.05 Pipe Backfill

- a. Compaction inspection and soil testing will be required during backfill operation in accordance with Section 101.3.04 of the Standards and Specifications

14.3.06 Manhole Invert

- a. Distance between manholes matches distance on construction plans.
- b. Inspection during base construction to assure compact subbase.
- c. Required fall between incoming and outflow pipe inverts.
- d. Rough channel has appropriate shape. Sidewalls come to top of uppermost pipe.

14.3.07 Completed Manhole

- a. Contractor shall demonstrate designed fall between manholes before proceeding with subsequent construction.
- b. All sewer main pipelines and manholes will be televised by the City.
- c. In addition to standard compaction methods, backfill around manhole shall be proved by water jetting.
- d. Barrel not cracked or spalled.
- e. Barrel joint and pipe connections grouted.
- f. Concrete encasement of external drop manhole.
- g. Invert channel grouted to smooth finish.
- h. Frame in place set to finish grade and grouted.

14.3.08 Sewer Testing

- a. Sewer is clear of all debris, prior to CCTV inspection
- b. All backfill is completed.
- c. Observation during air test.
- d. Observation during deflection test at 92% of i.d. required for both rigid and flexible pipe.
- e. All sewer mains will be inspected by closed circuit television (CCTV) video. Maximum allowable sag causing ponding of water is specified State regulations OAR 340-52 or ½ inch, whichever is more stringent.

14.3.09 Connection to Live Facilities

- a. Inspection during connection.
- b. No obstructions in line.
- c. Fittings tight.

14.4.00 WATER INSPECTION

14.4.01 Before Construction

- a. Inspection of material and storage area. Unless otherwise specified, all pipe shall be domestic Class 52, or Class 50, ductile iron pipe.
- b. Protection of existing systems.
- c. Proper traffic control in place.
- d. Utilities located and marked out and potholed as necessary to determine conflicts.
- e. Construction staking meets requirements.

- 14.4.02 Subgrade**
 - a. Subgrade of proposed road established with adequate control.
- 14.4.03 Pipe Trench and Bedding**
 - a. Inspection immediately prior to pipe installation.
 - b. No rock points in pipe zone.
 - c. Bedding material is in conformance with specifications.
- 14.4.04 Pipe Installation**
 - a. Pipe alignment is true.
 - b. Fittings tight.
 - c. Ductile iron Class 52 Tyton joints, mechanical joints, or approved equal.
- 14.4.05 Service Installation**
 - a. Services complete, continuous copper pipe, proper size, and provided to each lot.
 - b. Services set to finish grade per City Water Service and Installation Manual specifications.
 - c. Power, telephone, gas, and cable lines require a minimum five (5) foot separation from water and sewer services.
- 14.4.06 Fitting Location and Installation**
 - a. Fittings installed and torqued to specification.
 - b. Fittings witnessed for As-Builts before being covered
 - c. Joint restraints in place where required
- 14.4.07 Preparation and Pouring of Thrust Blocks**
 - a. Inspection of excavation and forms before pouring.
 - b. Forms placed at appropriate positions so blocks will be against undisturbed earth.
 - c. Reinforcement in place and secured when needed (deadmen)
 - d. Pipe and fittings wrapped with plastic as required.
- 14.4.08 Pipe Backfill**
 - a. Compaction inspection and testing will be required during backfill operation.
 - b. Backfill placed in maximum 8" (loose) lifts
- 14.4.09 Connection to Live Facilities**
 - a. Inspection and Water Division staff present during hot tap.
 - b. No obstructions in line.
 - c. Fittings and taps are tight and set plumb.
- 14.4.10 Setting of Valve Boxes**
 - a. Plumb, centered over nut, and bottom flange not resting on pipe.
- 14.4.11 Pressure Testing**
 - a. Testing completed according to Division IV Water Facilities, Leakage/Hydrostatic Testing & Disinfection Procedures
 - b. Thrust blocks have cured for five days minimum
- 14.4.12 Chlorination Testing and Flushing**
 - a. Completed according to Division IV, Water Facilities Disinfection Procedures
 - b. All services flushed to angle stop at meter connection
 - c. Tracing wire to be tested after pressure testing and chlorination flushing completed.
- 14.4.13 Flow Testing**

- a. Services checked, flow measured and noted.
- b. Hydrants checked, flow measured and static and residual pressures noted.

14.5.00 STRUCTURES

14.5.01 Before Construction

- a. Inspection of material and storage area.
- b. Protection of existing systems.
- c. Proper traffic control in place.
- d. Utilities located and marked.
- e. Construction staking meets requirements.

14.5.02 Excavation

- a. Excavation sufficient for structure.
- b. Bedding as specified for thickness, material, and compacted.

14.5.03 Foundation

- a. Reinforcing steel placed in accordance with approved shop drawings, plans and specifications.
- b. Form work in accordance with approved details, plans and specifications.

14.5.04 Form Work & Reinforcement

- a. Reinforcing steel placed in accordance with approved shop drawings, plans and specifications. Reinforcing steel supported as necessary to stay in position during pouring and finishing.
- b. Form work in accordance with approved details, plans and specifications.

14.5.05 Concrete Placement

- a. Air and soil temperature requirements within specified range.
- b. Concrete placed within 90 minutes of mixing.
- c. Interval between batches not to exceed 20 minutes.
- d. Concrete testing and sample cylinders prepared as required.
- e. Continuous placement, or cold joints, as shown on plans or as specified.
- f. Mechanical vibration of concrete.
- g. Laitance removed.
- h. Cure applied to exposed surfaces.
- i. Work protected from elements.

14.5.06 Form Removal & Concrete Finish

- a. Forms remain in place for required time.
- b. Wire and snap ties removed as per specifications.
- c. Open or honeycombed areas cut out and grouted.
- d. Surface finished per specifications.

14.5.07 Backfill

- a. Compaction inspection and testing will be required during backfill operation.

14.6.00 SUBDIVISION SITE GRADING

14.6.01 Grading

- a. Site graded to maintain or contain run off within development boundary

and per approved plan.

- b. Subgrade staked and constructed per approved design.
- c. All earth fill areas located outside of public right-of-way require certification by a licensed Registered Professional Engineer.
- d. Measures in place to prevent soil from washing off site, into storm facilities or irrigation canals.

14.6.02 Drainage Facilities

- a. Inlets, grates, and drain pipes are set to appropriate grade and slope as designated on the plans or at low points staked in field.
- b. Sedimentation manholes are installed with correct fittings in accordance with City and DEQ standards and specifications.
- c. Storm drainage facilities constructed per approved design (location, geometry, slope, soil depth, filtering, surfacing, etc.).
- d. Storm drainage facility performance tests in accordance with City Standards and Specifications.
- e. Drain pipes crossing public right-of-way are inspected per City Standards and Specifications for material, construction and grouting.

15 CONSTRUCTION STAKING See General Conditions 108.4

16 MATERIALS

Materials shall conform to the City of Redmond Standards and Specifications, or other specifications as set forth in the Contract Documents.

17 WATERING

Watering shall conform to Section 205 of these Standards and Specifications. Watering shall be performed at any hour of the day and on any day of the week that the City Engineer may determine necessary for proper performance or protection of the work, and for adequate alleviation of dust nuisance. The Contractor is responsible for the cost of watering. If the Contractor is unable or unwilling to water as directed, the City will water and charge the Owner or Developer.

17.1.00 TEMPORARY WATER

Water is available from hydrants via combination meter and backflow devices rented from City of Redmond Public Works. Contractor shall make arrangements and pay all costs for obtaining and transporting the water from the hydrants to the area of usage for the construction and testing of the facilities.

18 WORKMANSHIP

18.1.00 GENERAL

The work shall be done by responsible and qualified workers. Should the Inspector find any worker to be unqualified or unfit to perform assigned work on the project, or if the worker is repeatedly performing work not in conformance with the specifications, the

Contractor will be notified and directed to reassign the worker to tasks for which he is qualified or dismiss him for cause as determined by the Inspector.

18.2.00 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES

The Contractor shall notify the public and local service organizations, i.e. Police, Fire Department, hospital emergency services, school bus dispatchers, 24 hours in advance of any construction activity that may impede their daily activities and functions. For work in areas that will impede or obstruct traffic flow on established streets, the Contractor shall adhere to the construction schedule submitted at the Pre-Construction Meeting, or as subsequently revised. Paved surfaces of streets removed or damaged by trenching or other activities to an extent affecting the driving surface shall be restored with a hard, smooth surface within 48 hours of pavement removal or damage. Should the Contractor neglect to prosecute the work properly or in accordance with the approved schedule, in the opinion of the City Engineer, then the City of Redmond will notify the Contractor's Surety of the conditions, and after ten (10) days written notice, or without notice in the case of an emergency or imminent danger to the public, and without prejudice to any other right which the City of Redmond may have, take over that portion of the work which has been improperly executed and make good the deficiencies and assess the costs of such work to the Contractor.

At locations where the Contractor's operations could potentially cause damage resulting in considerable expense, loss, and inconvenience to the City or public utility, and when adjacent to or near railway, telegraph, telephone, television, power, oil, gas, water irrigation systems, or other private or municipal systems, the Contractor's working operations shall be suspended until all arrangements necessary for the protection thereof have been made by the Contractor.

The Contractor shall notify by the one call number **1-800-332-2344**, at least 48 hours in advance, all utility offices affected by the construction operations. The Contractor shall not expose any marked out underground utility without first notifying the affected agency and being granted permission to do so. The Contractor is responsible for locating and exposing, if necessary, all existing underground utilities in advance of the trenching operation.

The Contractor is responsible for protecting all power and telephone poles and overhead cables from damage. If interfering power poles, telephone poles, guy wires, or anchors are encountered, the Contractor shall notify the utility owner at least 48 hours in advance of construction operations to permit the necessary arrangements with the affected utility company for protection or relocation of the interfering structure. The Contractor shall be solely and directly responsible to the owner and operators of such utilities/properties for any damage, injury, expense, loss or inconvenience, delay, suits, actions, or claims of any kind brought because of injuries or damage which result from performing the contract work.

The Contractor shall immediately notify the proper authority in the event of interruption to domestic water, sanitary sewer, storm sewer or other utility service resulting from

accidental breakage, or as a result of being exposed or unsupported. All repair or replacement of existing water or sewer pipe must conform to City's Standards and Specifications. If an existing water or sewer pipe is damaged to any extent, the City's Water and/or Wastewater Divisions must be immediately notified. The damaged pipe must remain exposed until inspected by a City representative. Repairs will be made upon approval by the City Inspector. All repairs or replacements will be inspected by a City Inspector prior to backfill. Repaired or replaced sewer lines will be inspected by closed circuit television (CCTV) video by the City after the trench is backfilled and prior to City acceptance. Contractor will be charged for CCTV service per the City of Redmond Fee Schedule. The Contractor shall cooperate with the affected agency to restore services as promptly as possible, and shall bear all costs of repair for the utility. In no case shall interruption of any water, sanitary sewer or utility service be allowed outside normal working hours unless prior approval is granted by the City Engineer or City Public Works Director.

Neither the City, the utility owner, nor its officers or agents, shall be responsible to the Contractor for damages resulting from the location of any underground utilities being other than that shown on the plans, or for the existence of underground utilities not shown on the plans or properly marked out on the site.

Should the Contractor encounter any utility service lines that interfere with trenching or conflict with the proposed work, the Contractor may obtain prior approval of the utility owner and governing authority to cut the service, dig through, and cause the service to be restored or relocated with similar and equal materials at the Contractor's expense.

18.3.00 FIELD RELOCATIONS

During the progress of construction, it is expected that minor relocations of the proposed work may be necessary. Such relocations shall be made only by direction of the Design Engineer, or representative, with the approval of the City Engineer. Unforeseen obstructions encountered as a result of such relocations will not be cause for claiming additional compensation by the Contractor to any greater extent than would have been the case had the obstructions been encountered at the original location.

18.4.00 BARRICADES, GUARDS, AND SAFETY PROVISIONS

Adequate barricades, construction signs, warning lights, and guards, as required, shall be placed and maintained during the progress of the work to protect persons and vehicles from injury and to avoid property damage until the area is determined safe for normal public use.

Rules and regulations of the local, State, and Federal authorities regarding safety provisions shall be adhered to. The Contractor shall be solely responsible for directing and implementing all safety provisions on the Project site, and for all accidents caused by inadequate or insufficient safety provisions. The City of Redmond, City Engineer, Inspectors, or other agents of the City, shall not be held responsible for directing, implementing, or enforcing any safety regulations.

18.5.00 PAVEMENT REMOVAL AND REPLACEMENT

All bituminous and concrete pavements shall be cut with a saw or other approved device prior to asphalt patching or concrete replacement, such that the patching material abuts a smooth, uniform, vertical face of at least twice the depth of the maximum particle size in the patching medium. Uneven pavement edges shall be trimmed smooth before patching the pavement.

The width of the pavement cut for trenching shall be at least 12" wider on either side than the width of the finished backfilled trench at the ground surface. Pavement materials removed during excavation shall be kept separate from native backfill material and removed from the site. Pavement shall not be used for backfill or embankment material.

Where existing paved roadways are cut, trench backfill shall be Class B backfill as defined in the City of Redmond Standards and Specifications, Division I, and shall be placed as specified. The pavement section will be replaced to a standard equal to or better than the existing street section, except that in no case shall it be less than the current standard for that classification of street. Base material must meet current City of Redmond Standard and Specifications.

18.6.00 OBSTRUCTIONS

Obstructions to the construction such as tree roots, stumps, abandoned pilings and concrete structures, logs, rubbish, and debris of all types are to be removed from the project site as part of clearing and grubbing operations, or as incidental work, and no additional compensation will be made for the amount or type of clearing required.

The City Engineer may, if requested, approve minor changes in the alignment or location of facilities to avoid major obstructions if such alignment changes can be made within the permanent easement or right-of-way, and without adversely affecting the intended function of the facility.

18.7.00 INTERFERING STRUCTURES, ROADWAYS OR DRIVEWAYS

The Contractor shall replace and/or repair any damage done by the Contractor's forces during construction to landscaping, fences, buildings, billboards, irrigation lines, roadways, cultivated fields, drainage crossings, driveways and any other private or public properties at Contractor's own expense and without additional compensation from the Owner. The Contractor shall replace or repair these structures to a condition as good or better than their pre-construction condition. Pre-construction videotapes or photographs taken by the City will be used to determine the pre-construction conditions of properties adjacent to the work. In the absence of pre-construction photographs, the property shall be restored to original, like new conditions.

18.8.00 BLASTING

Where rock material is encountered which requires systematic drilling and blasting for

removal, the Contractor shall furnish all necessary approved blasting certifications and licenses, tools, equipment, and materials required to perform the work. The Contractor shall comply with all Federal, State, and local laws that apply to the storage, handling, placement, and firing of all explosives.

The Contractor shall furnish additional insurance coverage as required by the City or any agency in addition to the basic coverage required by these specifications.

No blasting shall be permitted adjacent to any portion of exposed work or structures unless proper precautions are taken to assure that damage to adjacent property will not occur. All blasting shall be covered with blasting mats or other approved type of protective cover to prevent the scattering of rock fragments or other material to outside the excavation area and limits of the construction. The Contractor shall be responsible for any and all damage or injury resulting from the use or handling of explosives, and accidental or premature explosion that may occur in connection with Contractors' use of explosives.

Proper notification and ample warning shall be provided to all persons within the danger zone. Contractor's personnel shall be stationed at strategic locations a safe distance from the blasting zone to prevent persons and vehicles from entering the blasting area. Electrical blasting caps shall not be connected to the electrical source until the area is cleared of all personnel and the proper warning signals have been sounded.

Where blasting is proposed in the proximity of private property or residences that may be affected by vibrations, shaking, or seismic shocks, the Contractor shall be responsible to perform pre-blast surveys of all structures to determine the condition of walls, ceilings, floor slabs, or other surfaces in which cracking or movement may be induced by the blasting operations. All existing conditions shall be thoroughly documented and recorded by means of photographs and/or video recordings to establish pre-blast conditions and existing damage. Following the blasting operations, the Contractor shall perform a follow up survey of those affected properties to determine if any shifting, cracking, settlement, or other damage was induced by the blasting. Contractor shall promptly repair or replace any damaged structures to a condition equal to or better than that found in the pre-blast survey. The City will be indemnified and held harmless from any liability for damage or injury caused by the Contractor's blasting operations.

Public utilities (utilities) located within the blast area must be identified and notified 72 hours prior to blasting. Contractor shall perform pre-blast survey and inspections of identified utilities including closed circuit television (CCTV) video inspection of sanitary and storm sewer lines. Utilities damaged from blasting activities shall be repaired and/or restored at the expense of the Contractor.

18.9.00 SHORING AND SHEATHING

The Contractor shall be solely responsible to determine the means necessary to maintain safe working conditions and protect adjacent property and structure from damages during excavation operations. The Contractor shall comply with all Federal, State, and local laws, rules, and regulations governing shoring, sheathing, structure support, and support of

excavations.

18.10.00 LOCATION OF EXCAVATED MATERIALS

The Contractor shall stockpile excavated material so as not to block any public streets, traveled roadways or paths, public or private. Roadways shall be kept open to two way traffic unless otherwise approved by the City Engineer and the City of Redmond Public Works Department. The Contractor shall store or dispose of excavated materials only in designated areas as approved by the Engineer. Utmost care shall be taken to prevent erosion, spillage or damage to property adjacent to the project. Contractor shall implement erosion control measures and shall immediately clean up any spilled or spoiled material on streets or paved roadways, and contain storm water runoff from stockpiles to prevent silt and dirt from entering catch basins, storm drains, drywells, or other drainage structures. Refer to Central Oregon Stormwater Manual, Chapter 9, for erosion control measures.

18.11.00 SITE RESTORATION AND CLEANUP

At all times during the work, the premises of the site shall be kept clean and orderly, and upon completion of the work the project shall be free of debris, rubbish or excess materials of any kind.

During construction, stockpile excavated trench materials so as to prevent potential damage to adjacent lawns, grassed areas, gardens, shrubbery or fences, whether these are on private property, City, State or County property or rights-of-way. Remove all excavated materials from grassed and planted areas; and restore these surfaces to a condition equal to their pre-construction condition and free from all rocks, gravel, boulders or other foreign material. Replace topsoil, raked and graded, to conform to the original contours. All existing drainage ditches and culverts shall be opened and graded and natural drainage restored. Restore or replace broken or damaged culverts to their original condition and location. Upon completion of pipe laying and backfilling operations in any section, hand rake and drag all former grassed and/or planted areas leaving all disturbed areas free from rocks, gravel, clay or any other foreign material. The finished surface shall conform to the original surface and shall be free draining, free from holes, rough spots or other surface features detrimental to a seeded area.

18.12.00 STREET CLEANING

Clean all dirt, gravel, debris, or other material generated by the construction operations from all streets, alleys and roads at the conclusion of each day's operation. Contractor shall not stockpile construction materials in streets, sidewalks, alleyways, nor on other paved areas, except during working hours when operations are being conducted in the immediate area. If Contractor fails to provide cleanup within 24 hours of being so directed by the City Inspector, the City, or an agent retained by the City, may complete the cleanup and the cost plus 10% shall be billed to the Contractor to be paid prior to project acceptance by the City.

18.13.00 EROSION and SEDIMENT CONTROL

Contractor shall take measures to prevent erosion or sediment run off from work site as required by the Central Oregon Stormwater Manual.

19 TESTING

Testing shall conform to the City of Redmond Standards and Specifications, and shall be performed by a certified/independent testing laboratory approved by the City Engineer.

Testing criteria shall meet the requirements as established in each Division of these Standards. Gravity sanitary or storm sewer mains shall be air tested or hydrostatically tested pursuant to A.P.W.A Standards by the Contractor and in accordance with City of Redmond Procedures set forth in Division III. All gravity sanitary and storm sewer lines shall be closed circuit television (CCTV) video inspected. Pressure sewer lines shall be hydrostatically tested pursuant to A.P.W.A Standards by the Contractor and in accordance with City of Redmond Procedures set forth in Division III. Storm drainage facility tests shall be performed in accordance with City Standards as set forth in the Central Oregon Stormwater Manual. Waterlines shall be hydrostatically tested pursuant to A.W.W.A. Standards and in accordance with City of Redmond Procedures set forth in Division IV. Street compaction and asphalt testing shall be in accordance with these Standards and current Oregon Department of Transportation Standard Specifications.

The City Engineer may require additional testing of any portion of the work performed. When additional testing is required by City Engineer, the City shall pay all costs for initial tests demonstrating satisfactory performance. Non-passing tests and subsequent re-testing shall be paid for by the Contractor.

Prior to final acceptance for maintenance, the Owner/Developer may be required to provide verification testing of any facility that shows evidence of being stressed beyond design limits or capacity.

20 SANITARY and STORM SEWER CLEAN-UP

Final Sewer Cleaning: During construction, take all measures to prevent debris from entering sewer system. Prior to final acceptance of the sanitary and storm sewer system by the Engineer, pressure and gravity sewers must be clean. Remove all accumulated construction debris, rocks, gravel, sand, silt, and other foreign material from the sewer system at or near the closest downstream manhole or port.

Upon the Engineer's final manhole-to-manhole inspection of the sewer system, if any foreign matter is still present in the system, the pipe must be re-cleaned at the expense of the Contractor.

21 AS BUILT DRAWINGS

All final record 'As Built' drawings shall be prepared by the City of Redmond Engineering Department. Any change which would appear on 'As Built' drawings should be immediately

brought to the attention of the Inspector at the time the Contractor or Design Engineer discovers such discrepancy. The Contractor shall provide the City with a detailed set of 'As Built' drawings upon completion of construction to include, but not limited to, the following;

All street improvements shall require detailed witnesses of all property corners and 'As-Built' conditions of all underground utilities.

All sewer facilities shall require detailed 'As-Built' of all sewer mains, manholes, service laterals, cleanouts and pressure system.

All water facilities shall require detailed witnesses of all valves, tees, crosses, bends, couplings, fittings, hydrants, and 'As-Built' of waterline alignment and profile.

All storm drainage facilities shall require detailed 'As Built' of all storm sewer pipes, fittings, structures, manholes, drywells, swales, etc.

22 FINAL ACCEPTANCE

Final acceptance shall be determined as the date on which the City Engineer formally accepts, in writing, the constructed public improvements for ownership and maintenance by the City of Redmond.

Final acceptance will follow the Engineering Department's final inspection and approval of construction and will involve the completion of the following items (as applicable):

1. Release of Liens or claims.
2. Easement Dedication.
3. Right-of-way Dedication.
4. Recorded Plat or Partition.
5. Warranty agreement for materials and workmanship, including warranty bond.
6. Verification Performance Tests (if required).
7. Resolution of material and workmanship issues, i.e. final punch list.
8. Contractor's As-Built plans.
9. Electronic copies of approved design changes from Design Engineer.
10. Street light and postal box installed or provider contract paid.
11. Curb ramp and hydrant pads installed.
12. Sidewalks adjacent to existing developed lots (existing residence, etc.).
13. Private water, sewer and storm drainage system abandonment documentation (water wells, underground injection facilities, drill holes, septic tanks, etc.).
14. Certification of all fill areas located outside of public right-of-way/easement by a license professional engineer.
15. Survey monument and/or property corner restoration and documentation as required by ORS 209.

23 SITE GRADING and DRAINAGE

23.1.00 General

This document is intended to set minimum standards for site grading and drainage on private property within the Urban Growth Boundary of the City of Redmond.

All storm drainage from private property (site) shall be maintained and/or contained on site and shall not drain onto public streets, alleys, irrigation canals or neighboring properties. Storm water runoff from private property shall not impact public right-of-way or public drainage systems unless otherwise approved by the Public Works Director, City Engineer or as determined through the land use approval process. All earth fill areas located outside of public right-of-way require certification by a licensed Registered Professional Engineer.

23.2.00 Plans and Specifications

A comprehensive site grading and drainage plan prepared by a licensed Registered Professional Engineer shall be required for development of private property that proposes five thousand (5,000) or more square feet of new roof, pavement, compacted gravel, concrete or other impervious surface improvements. For design parameters and drawing requirements, see Section II (B.) and Section III of the Design Standards and the Central Oregon Stormwater Manual where applicable for storm drainage facilities on private property. In addition to Sections II and III, the following information shall be required on the plans:

- 1) Parking and driveway approach finish grades and slopes.
- 2) Roof drain conveyance.
- 3) Sizing and testing data for underground injection or infiltration systems.
- 4) Swale cross sections with 3:1 max. slope, topsoil/sand layer, geotextile filtering layer and surface treatment.
- 5) 100 year/24 hour storm event containment and outfall.

Where less than 5,000 s.f. (but more than 500 s.f.) of new impervious surface areas are proposed, a site plan shall be required that demonstrates on-site drainage will be maintained on site, any proposed retention area or storm drainage facility has design capacity for the required 50 year/24 hour storm event runoff volume (2 inch rainfall) and any necessary erosion control measures will be taken.

Underground Injection Control Devices (drywells, etc.) shall be Rule Authorized or permitted by Oregon Dept. of Environmental Quality (DEQ) and a copy of DEQ approval shall be submitted to the City prior to construction.

Two review plan sets shall be submitted to the City of Redmond Community Development Department as part of a building permit application for review by the Engineering Department and Wastewater Division. After all revisions have been made to the reviewed plans, and the corrected plans have been approved by the Engineering Department, then two sets of the final plan set shall be submitted to the Community Development Department.

The Engineering Department will indicate plan approval with 'City of Redmond Engineering Approval' stamp on the appropriate site grading and drainage plan sheets.

23.3.00 Subdivision Site Grading

Mass site grading and drainage plans required as part of subdivision land use approval shall be reviewed, approved, constructed, inspected and accepted through the public improvement construction process described in Sections 04 – 22. Design parameters and drawings requirements are as described in Section 23.2.00 above.

23.4.00 Grading Fees

Engineering fees for City inspection and plan review of site grading and drainage improvements are required as established by the City of Redmond Fee Schedule and must be paid before the City can issue the associated building permit and before grading construction can begin. This grading fee is non-refundable.

23.5.00 Grading Inspection

The City Engineering Inspector shall be notified twenty four (24) hours prior to start of grading construction. Any work performed without a required inspection will be subject to removal and inspection at the City Inspector's discretion.

23.5.01 Grading

- a. Site graded to maintain or contain run off on site or as approved.
- b. Subgrade and curb staked and constructed per approved design.
- c. Driveway approach constructed per approved plans and City standards.

23.5.02 Drainage Facilities

- a. Inlets, grates, and drain pipes are set to appropriate grade and slope as designated on the plans or at low points staked in field.
- b. Sedimentation manholes are installed with correct fittings in accordance with City and DEQ standards and specifications.
- c. Storm drainage facilities constructed per approved design (location, geometry, slope, soil depth, filtering, surfacing, etc.).
- d. Storm drainage facility performance tests in accordance with City Standards and Specifications.

23.6.00 Final Grading Acceptance

The City Engineering Department will indicate acceptance of site grading and drainage improvements with Engineering approval of the associated final building occupancy permit. All necessary private drainage easements shall be recorded prior to acceptance.

CITY OF REDMOND, OREGON

2010 STANDARD SPECIFICATIONS

DESIGN STANDARDS

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I. GENERAL

These are the minimum design standards for the City of Redmond. The following standards shall be adhered to unless an exception is granted in writing by the City Engineer. Exceptions will be granted based upon a design that is the functional equivalent of the design parameters listed herein. Street standards are generally in conformance with the American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets” 2004 Edition. This document is referred to as AASHTO throughout these standards.

II. DESIGN PARAMETERS

A. STREET

1. General

Materials and procedures for street improvements shall conform to the City of Redmond Specifications, Ordinances of the City of Redmond and Oregon Standard Specifications for Construction. Street width, alignment and placement shall meet the requirements of the City of Redmond Development Code. Street widths are shown in Table 1, Section 8.2710 of the Development Code (reproduced below) and in Standard Drawing 2-1. Street intersections shall be as near right angles as possible except where topography requires a lesser angle, but in no case shall the acute angle be less than 60°.

Table 1 - City of Redmond Right of Way and Roadway Design and Cross-Section Standards

Functional Class	Width (ft)		Right of Way*	Travel Lanes	Sidewalks	Bike Lanes**	Parking**
	Pavement standard	Pavement (minimum)*					
Residential Alley	16 ft		20 ft	n/a	none	shared	none
Commercial Alley	20 ft		20 ft	n/a	none	shared	none
Local Residential	36 ft		60 ft	2***	5 ft.	shared	both sides (unstriped)
	28 ft*		60 ft	2***	5 ft.	shared	one side (unstriped)
	24 ft*		60 ft	2***	5 ft.	shared	none
Local Industrial	40 ft	38 ft	60 ft	2***	5 ft.	shared	optional (unstriped)
Industrial Collector	40 ft	38 ft	80 ft	2	5 ft.	6 ft.	none
Minor Collector	40 ft	36 ft****	60 ft	2	5 ft.	shared	both sides (8 ft)
Major Collector	36-50 ft	36 ft****	80 ft	2	5 ft.	6 ft.	none
Minor Arterial (3-lane)	50 ft	48 ft	100 ft	3	7 ft.	6 ft.	none
Minor Arterial (5-lane)	74 ft	72 ft	100 ft	5	7 ft.	6 ft.	none

Notes:

*May be constructed only in conjunction with the creation of covenants, conditions and restrictions (CCR’s) and the establishment of a homeowners association (HOA) for the development. The CCR’s shall provide that the primary responsibility for parking enforcement shall be the HOA, with the City of Redmond also being acknowledged in the CCR’s as a beneficiary for such parking enforcement as a violation of the land use decision and/or city code .

** In certain cases, bike lanes may be reduced to 5 ft, parking may be reduced to 7 ft, and travel lanes to 11 ft at the discretion of the City Engineer

*** Unstriped travel lanes

**** 36 ft in existing built-out areas

***** All streets less than 28 feet wide shall be no longer than 300 feet in length, unless such streets include at least one (1) parking bay per lot, located along each lot frontage for the entire length of such street, up to the maximum block length. Streets 300 feet or less in length shall not have any direct driveway access. In no case shall any street less than 28 feet wide intersect with any other street less than 28 feet wide.

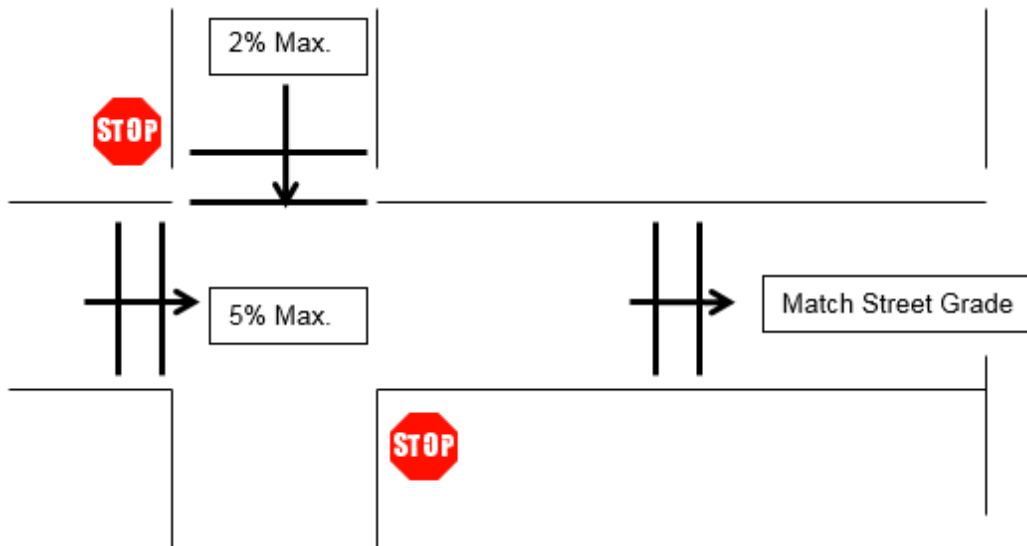
2. Slope

Minimum longitudinal slope for drainage control at the gutter line for all streets is 1.0%. A minimum slope of 0.5% may be allowed by the City Engineer where 1% is not practical. A written request is required justifying the need for a variation and describing what will be done to insure that constructed street grades are not less than design and storm drainage requirements are met.

Maximum street grades are as follows (see also Standard Drawing 2-1):

Arterials, Major and Industrial Collectors	6%
Minor Collectors, Industrial Streets	8%
Local Street	10%

Maximum street grade may be increased up to 2 percent with City Engineer's approval. Note that Draft Public Rights of Way Accessibility Guidelines (PROWAG) specify maximum cross slopes of pedestrian street crossings which will control the longitudinal grade of the street at intersections. In accordance with PROWAG Section 302.6, the maximum cross slope of the pedestrian crossing for stop or yield controlled streets shall be 2 percent. For streets without stop or yield control, the maximum cross slope is 5 percent (R302.6.1). Cross slopes of midblock pedestrian street crossings are permitted to match the grade of the street (R302.6.2).



To insure that cross slopes are not exceeded during sidewalk ramp construction, maximum slope through intersections shall be 2% in accordance with Standard Drawing 2-27. Detailed slope and elevation information shall be provided for sidewalk ramps and curb returns and shall conform to Draft Public Rights of Way Accessibility Guidelines (PROWAG) published by the Department of Justice. Note that the minimum continuous and unobstructed clear width of a pedestrian access route shall be four feet (PROWAG R302.3). The maximum cross slope of the walkway shall be two percent (PROWAG R302.6). Pedestrian access routes running parallel to a street may run at the same grade as the street, but cannot exceed the street grade (PROWAG R302.5). Options for ramp layout at intersections are provided in the standard drawings. Slopes and widths of landings, wings and other components must comply with Section R304 of PROWAG. It is recommended that design slopes be set lower than the PROWAG maximum to allow for discrepancies during construction.

3. Sight Distance

All streets shall be designed to the following values for adequate safe stopping sight distance at the design speed, according to AASHTO, Table 3-1

15 MPH	80'
20 MPH	115'
25 MPH	155'
30 MPH	200'
35 MPH	250'
40 MPH	305'
45 MPH	360'
50 MPH	425'

4. Vertical Curves

The minimum centerline vertical curve length shall be as determined by AASHTO formulas given below. In general, minimum curve lengths shall be no less than three times the design speed of the roadway. For example, the minimum curve length for a local street designed for 25 mph shall be 75 feet.

The minimum lengths of vertical curves shall be calculated from the following relationships.

	<u>CREST CURVES</u>	<u>SAG CURVES</u>
S > L	$L = 2S - \frac{2158}{A}$	$L = 2S - \frac{400 + 3.5 S}{A}$
S < L	$L = \frac{AS^2}{2158}$	$L = \frac{AS^2}{400 + 3.5 S}$

WHERE: A = Algebraic difference in grades, percent
 S = Design sight distance, feet
 L = Length of Vertical curve, feet.

Based on AASHTO Equations 3-43 and 3-44 for eye height=3.5 feet and object height=2.0 feet

Careful consideration shall be required when K values exceed 167 as this will create flat sections at high and low points of the curve that may not drain well.

$$K=L/A$$

L = Length of vertical curve
 A = Total change in grade, %

5. Horizontal Curves

The minimum horizontal curve radius shall be designed using AASHTO's side friction factor method for low-speed urban streets and superelevation distribution method 2. Minimum curve radius for various design speeds and cross slopes are shown in the following table:

Street Classification	Design Speed	Crown	Superelevation		
	(mph)		-0.02	0.02	0.03
Major Arterial	45	1039	794	750	711
Minor Arterial	40	762	593	561	533
Collector	35	510	408	389	371
Industrial	35	510	408	389	371
Local	25	198	167	(b)	(b)

Notes:

- (a) From Table 3-16, A Policy on Geometric Design of Highways and Streets, AASHTO 2004.
- (b) Superelevation permitted only with approval of City Engineer
- (c) The use of superelevation above 0.04 ft./ft. will require approval of the City Engineer.
- (d) Refer to AASHTO Table 3-16 for minimum radius for superelevation rate higher than 0.04 ft/ft and other design speeds.

6. Superelevation Rate

Superelevation is to be used only as a design element to enhance drivability of horizontal curves on arterial and collector streets. The use of superelevation for other purposes, or on local streets, will require the approval of the City Engineer, will be handled on a case by case basis and will not exceed 2%. The maximum design superelevation for collectors and arterials shall generally be 0.040 ft/ft and minimum superelevation shall be 0.020 ft/ft. Plans incorporating superelevation shall show left and right gutter on the profile and the scale shall be such that these can be distinguished.

7. Superelevation Runoff

The designer must be concerned with three profiles in the development of a superelevated section: left gutter, centerline and right gutter. Superelevation shall be obtained by rotating two of these profiles around the third stable profile, usually the centerline, which reflects the overall design.

Particular attention must be paid to the impact on drainage characteristics resulting from superelevation. No more than 25% of a transition section may be placed on the horizontal curve. No transition section shall be less than 100' in length. The minimum transition section lengths shall be determined in accordance with the AASHTO Policy on Geometric Design of Highways and Streets 2004 Edition, Chapter 3 Transition Design Controls. AASHTO Exhibit 3-32 provides runoff length for various design speeds, number of lanes and superelevation rates. Select examples are provided in the table below for a road section with two 12 foot lanes and a superelevation rate of 4 percent (AASHTO Exhibit 3-32).

DESIGN SPEED	MIN. LENGTH
50 mph	96'
45 mph	89'
40 mph	83'
35 mph	77'
30 mph	73'
25 mph	69'

8. Reverse Curves

On all streets having a design speed of greater than 30 mph there shall be a minimum 100' tangent section between reverse horizontal curves. Reverse curve signing shall be shown on the plans.

9. Compound Horizontal Curves

Compound horizontal curves should be avoided on streets having a design speed of greater than 30 mph. If a compound curve is necessary, the ratio of the flatter radius to the sharper radius should not exceed the following:

31 - 49 mph design speed	2 : 1
50 + mph design speed	1.5 : 1

Where the ratio exceeds these limits, a suitable length of spiral or a circular arc of intermediate radius shall be inserted between the two curves.

10. Road Crown

Collector and arterial streets shall be designed with either a crowned or a superelevated section through curves. A shed section on collector and arterial streets is not acceptable. On other classes of streets with design speeds less than 30 mph, shed sections are permissible. Shed section cross slope shall not be greater than 2%. Slopes less than 2% require approval by the City Engineer. Where a non-standard street width is designed, the crown shall be based on a 2% side slope.

11. Offset Intersection

Minimum distance between offset intersections shall be 165 feet, measured from center line to centerline of the intersection.

12. All Weather Service Road Standard

All weather service roads shall meet requirements of Standard Drawing 2-5.

13. Curb Radius

The minimum curb radius shall be as follows:

Arterial - Arterial	35'
Local-Local	15'
Local-Collector	20'
Local-Arterial	25'
Collector-Collector	25'
Collector-Arterial	35'
Industrial	35' *

*(35' radius with parking eliminated within 40' of intersection measured from curb return)

When evaluating curb radius, designers should consider the location of sidewalk ramps and attempt to line up crosswalks with sidewalks to maintain a straight walking path across

intersections. A reduced curb radius may be allowed in areas with high pedestrian traffic to improve crosswalk alignment and visibility. Curb radius less than standard must be approved by the City Engineer.

Where a radius larger than 35' is desired, a 3-centered symmetric compound curve shall be used. Three-centered symmetric compound curves shall be designed only on right-of-way sufficiently large to accommodate 12' minimum between curb face and the property line. The radii of the 3-centered symmetric compound curve shall be 120'-40'-120'. The offset of the 40' radius shall be determined by the design vehicle as follows:

<u>Design Vehicle</u>	<u>Offset</u>
SU	2'
BUS	3'
WB-40	4'
WB-50	5'

14. Street Striping

Street striping shall be designed in accordance with the current ODOT Traffic Line Manual. See Standard Drawing 2-1 for striping requirements by road classification.

15. Street Signs

Street signage must conform with the latest edition of the Manual on Uniform Traffic Control Devices. Sign posts shall meet requirements of Standard Drawings 2-24 to 2-26. The Contractor shall verify the correctness of all street sign legends and names immediately prior to installation.

16. Cluster Postal Delivery Boxes

Cluster box locations shall be shown on the plans. US Postal Service must agree on location and type of delivery boxes. Cluster Postal Delivery Boxes should be constructed on residential streets in an area that minimizes impact on abutting properties.

Accessibility: Cluster mailboxes shall meet accessibility requirements in the Americans with Disabilities Act (ADA) and Public Right of Way Accessibility Guidelines (PROWAG):

- a. Provide a 72 inch wide concrete pad adjacent to cluster mailboxes with turning space that conforms to Section 304 of the 2010 ADA Standards for Accessible Design.
- b. Provide a pedestrian access route to adjacent sidewalk complying with PROWAG Section R301.
- c. Provide a pedestrian access route to on street parking complying with PROWAG Section R301 within 25 feet of the mailbox.

Cluster Postal Delivery Boxes desired along arterial or collector streets should be constructed off public right of way on common ground dedicated to that purpose and provided with appropriate driveway access. Cluster Postal Delivery Boxes shall not be constructed on arterial street right of way. Cluster Postal Delivery Boxes may be constructed on collector street right of way provided that a turnout meeting the following requirements is constructed.

- a. The center of the turnout shall be located in the center of a tangent section of the Collector. This tangent section shall have a length of not less than two times the stopping sight distance for the design speed.
- b. The required right of way width shall be increased to provide for the parking bay.
- c. The bay shall not be located less than the design stopping sight distance from any intersection.
- d. The bay of the turnout shall be a minimum of 40' in length and not less than 10' in depth.
- e. Tapered approach sections into the bay shall be not less than 10:1.
- f. Curb radius in the bay shall be not less than 50' radius.
- g. There shall be adequate stopping sight distance on either end of the turnouts into the parking bay.
- h. The bay shall be signed with the following:
10 Minute Parking
No U-turns (MUTCD # R3-4a or R3-4 with R3-4p)

17. Street Lights

Street lights shall be shown on the plans and provided at the following locations:

- Intersections
- Cul de sac bulbs if over 200 feet from the intersection
- Mid-block for blocks longer than 400 feet from center of intersection to center of intersection
- High-use driveways and other locations designated by the City Engineer.

Poles and fixtures shall conform to the power provider standards. Standard cobra head fixtures shall be used unless decorative design is approved by the City Engineer or required for downtown areas.

18. Asphalt Concrete Pavement

Asphalt concrete pavement depth, classification and asphalt binder shall be as follows for various road classifications:

- Arterials: Five inches (two lifts-3 inch base, 2 inch top) of level 3, ½" dense-graded mix with PG 70 -28 asphalt binder in top lift, PG 64 -28 asphalt binder bottom lift on 5th St., 6th St., S. Canal Blvd and other arterials designated by the City Engineer. Same requirements for all other arterials except the asphalt binder shall be PG 64 -28 in both lifts.
- Collectors: Four inches (two lifts) of level 3, ½" dense-graded mix with PG 64 -28 asphalt binder on collectors with more than 1 million anticipated equivalent single axle loads over the 20-year design life. For collectors with less than 1 million equivalent single axle loads, use level 2 mix.
- Local: Three inches (one lift) of level 2, ½" dense-graded mix with PG 64 -28 asphalt binder.

19. Dead End Streets and Alleys

A turnaround must be provided on all dead end streets, alleys and all weather access roads. Cul de sac requirements for public streets are provided in Standard Drawing 2-4. Through alleys are encouraged, but where they cannot be provided and the alley is a required emergency access, either a standard cul de sac or alternate turnaround meeting the requirements of the Oregon Fire Code must be provided. Dead end alleys not required for emergency access shall have a hammerhead turnaround, but it is not required to meet Oregon Fire Code requirements.

20. Pavement Taper

When street transitions to a different pavement width, the edge of the pavement shall be tapered as follows:

Travel Lane Transition: 1: Design speed. Example: for a street with 25 mile per hour design speed, length of transition equal 25 feet for every foot of width difference.
Other than Travel Lane: 1:10

21. Driveway Spacing from Intersections

The distance from the right of way to the nearest edge of a driveway shall be in accordance with Development Code Section 8.3035(9) which includes the following table:

Roadway Classification	Minimum Access Driveway Spacing	Minimum Access Clearance Corner	Intersection Spacing
Local Street	No Restrictions	30 feet	165 feet
Minor Collector	80 feet	80 feet	330 feet
Major Collector	165 feet	165 feet	330 feet
Minor Arterial	330 feet	330 feet	¼ mile
Major Arterial	ODOT Standards	ODOT Standards	ODOT Standards

Refer to Development Code for additional details and the most current standards.

B. Stormwater

1. General

Stormwater systems in the public right of way and private property shall be designed in accordance with the latest version of the Central Oregon Stormwater Manual and City of Redmond Special Provisions listed in this section.

2. Special Provisions to Central Oregon Stormwater Manual (August 2010 Update)

- a. **Design Storm** The design storm to be used in the City of Redmond for flow control shall have a recurrence interval of 50 years (as opposed to the 25-year design storm required in Chapter 7 of the Central Oregon Stormwater Manual). Pre-development condition is defined as the condition of the site before any proposed development activities. For example; a proposed retail center may be constructed on a site that has an existing house, gravel driveway and lawn. The pre-development runoff coefficient calculations can take into account existing structures and driveways. Runoff rates and volumes from the proposed retail center site cannot exceed the rates and volumes for the house, driveway and lawn for the 50-year storm event. The flow must be discharged in a location similar to what existed before the retail development and the routing for the 100-year flow must be demonstrated.
- b. **IDF Curves** IDF curves developed for Redmond in September 2008 by MGS Engineering Consultants, Inc. shall be used for Rational Method as provided in the Central Oregon Stormwater Manual Appendix 5C. These curves and supporting data are provided in the table and graph at the end of this section.
- c. **Public/Private Stormwater Separation** Stormwater from private property shall be maintained on site whenever possible. When steeper topography (6 percent slope or greater) on single family or duplex residential developments (R1, R2, R3 and R4 Zones) makes on-site retainage difficult or impossible, that portion of the runoff from private property that cannot be maintained on site may be allowed to flow into the public right of way and controlled with a single stormwater system. City Engineer approval is required. Stormwater runoff from multi-family (R-5 Zone), commercial and industrial developments as well as private streets must be controlled in separate stormwater facilities on site and not combined with the stormwater system for the right of way. In all cases, designers must account for all stormwater that could flow to the public system when determining the drainage area and not limit the calculations to just the right of way area.
- d. **Preferred BMP** Sediment manholes are a preferred best management practice and should be located immediately upgradient from drywells when used in a treatment train.
- e. **Swale Lining** For swales that are not irrigated, a rock lining is required. Swales shall be lined with geotextile below 10 inches of 3" to 4" crushed rock. Irrigation is required for vegetated swales.
- f. **Loading Docks** Loading dock drainage must be collected in a blind sump or discharged to the public sanitary sewer. For discharge to the public sanitary sewer, the back 3' of the dock must be hydraulically isolated from stormwater intrusion, and have the isolated portion drain to an oil/water separator followed by a shutoff valve prior to discharge to the public system.
- g. **Proximity to City Water Supply Well** Drywells may not be placed within the 2-year time of travel zone or within a 500 foot radius from City or community water supply wells.
- h. **Drywell Detail** The slotted cover shown in Figure 7-7 Note 6 is not permitted. Refer to

Standard Drawing 3-8. For drywells outside of paved areas, a 5 foot by 5 foot concrete pad, 6 inches thick is required around the manhole frame and cover.

- i. **Drill Holes** Drill hole construction for stormwater disposal is not permitted without written approval of the Public Works Director.
- j. **Drywell Spacing** Minimum spacing between drywells shall be 20 feet.

3. Storm Sewer Design

- a. Storm sewers shall generally conform to the same specifications as sanitary sewers (see Section II C).
- b. Flanking inlets at sags will not be required provided that the primary inlet is shown to be adequate to capture the design flow.
- c. Double-sized catch basins are normally required for inlets (Standard Drawing 3-10). A single catch basin is acceptable for the collection of water where special situations apply.
- d. Curb inlet catch basins shall be installed in arterial and major collector streets to provide better bicycle routes.
- e. Inlets shall be provided at intersections of collectors and arterials. Inlets should be provided at intersections of local streets. These inlets shall be so arranged that water is not directed through the intersection or in certain cases, around a curb return.
- f. Inlets should be provided to avoid ice formation on the roadway.
- g. Valley gutter intersections may be allowed with approval of the City Engineer in situations such as intersections of short cul-de-sacs with local streets.
- h. Storm pipe will cover to finish grade greater than 30 inches shall be:
 - PVC meeting the requirements of ASTM D3034 (for pipes less than 18 inches in diameter) or F679 (for pipes 18 inch diameter and larger) –or-
 - Polypropylene with smooth interior, annual exterior corrugations and gasketed integral bell and spigot joints meeting the requirements of ASTM F2736 for diameters of 12 to 30 inches. –or-
 - Polypropylene with smooth interior and exterior, inner annual corrugations and gasketed integral bell and spigot joints meeting the requirements of ASTM F2764 for diameters of 30 to 60 inches.

Storm pipe with cover to finish grade less than 30 inches shall be PVC meeting the requirements of AWWA C900 or C905.

4. Storm Facility Testing

Stormwater facility testing requirements shall be shown on the plans. Testing requirements vary depending on the type of facility and whether infiltration is accounted for in the design.

- a. **Information to show on plans:** For each drainage facility, provide runoff area in square feet, runoff coefficient used for calculations, peak runoff rate to the facility in cubic feet per second and gallons per minute and total runoff volume to the facility in cubic feet and gallons. For facilities with designs that account for infiltration, also provide the maximum required storage volume and design storage volume in cubic feet and gallons.
- b. **Testing Procedures:** There are three parts to the testing procedure; confirmation of storage volume, infiltration rate and ability to drain within 72 hours. Test methods vary by the type of facility and basis for design as follows:
 - 1) **Drywells:**
 - i. **Storage Volume:** Confirm the storage volume by tracking the quantity of drain

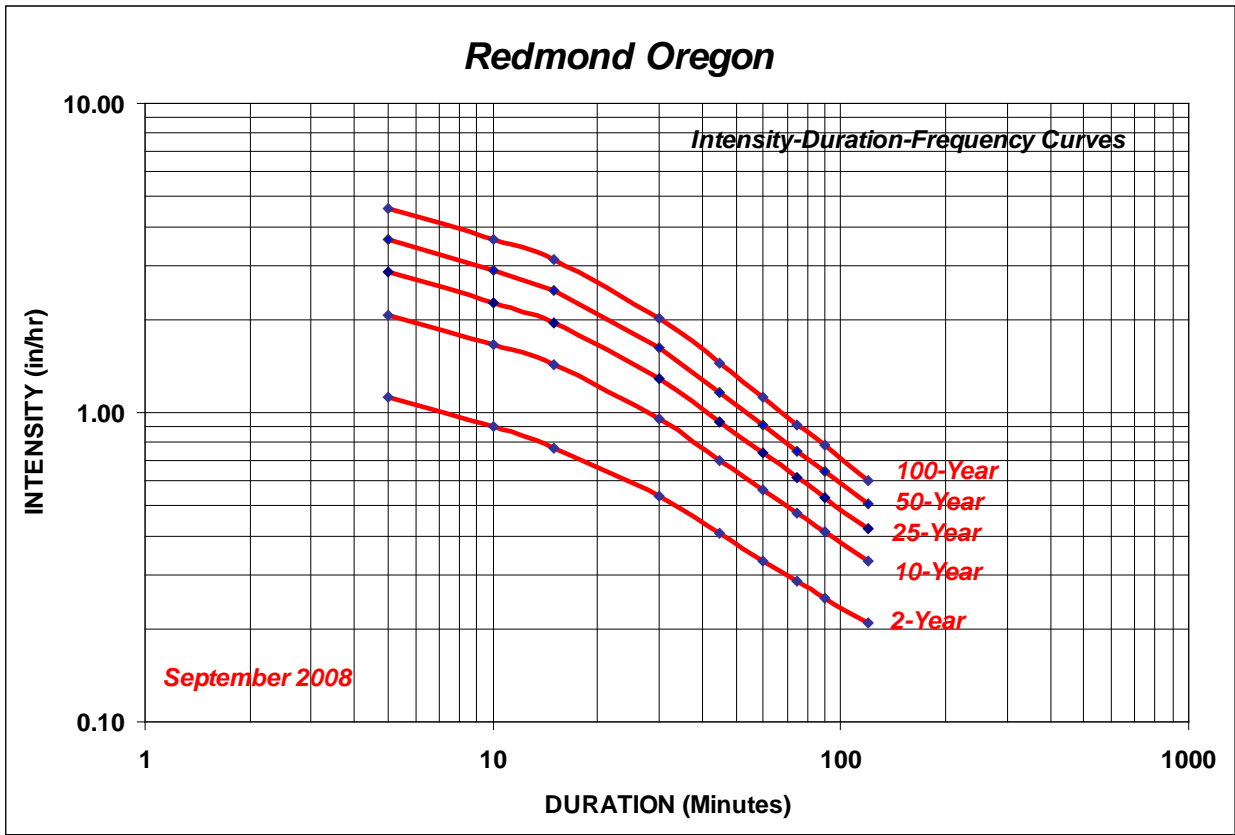
rock used with load tickets and measuring the diameter and depth of the drywell. Calculate interior volume of the drywell from the base to the bottom of the lowest pipe. Calculate the storage volume in the drain rock using a void ratio of 35 percent unless a different void ratio is provided by a materials testing lab.

- ii. **Infiltration Rate:** For drywells with a convenient hydrant, fill the drywell with water from a metered source and adjust the flow rate to maintain the level of water at the top of the barrel section or the base of the inlet pipes (whichever is lower). Measure and record the flow rate at 10 minute intervals. Maintain the flow rate necessary to keep the drywell at the top of the barrel section or pipe invert for one hour. After the one hour period, turn off the water supply and record the depth to the water surface every 10 minutes for one hour. If the drywell cannot be filled, measure the depth to the water surface and record depth and flow rate at 10 minute intervals. Stop filling after 60 minutes and measure and record the depth to the water surface every 10 minutes for one hour. If a hydrant is not readily available, a water truck is required. Place four water truck loads (3,500 to 4,000 gallons each) in the drywell within a 2-hour period. After the water has been placed, let the drywell drain and record the depth to the water surface every 10 minutes for one hour.
- iii. **72-hour Drainage:** Check 72 hours after stopping the flow to see if the drywell has emptied.

2) Ponds, swales and infiltration galleries:

- i. **Storage Volume:** For ponds, swales and other surface facilities, confirm the storage volume with as-built measurements and calculations provided by the project surveyor. For infiltration galleries, track the quantity of drain rock used with load tickets. Calculate the storage volume in the drain rock using a void ratio of 35 percent unless a different void ratio is provided by a materials testing lab.
- ii. **Infiltration Rate:** For infiltration swales and ponds in general and for infiltration galleries constructed with filter soil placed above the drain rock, measure the infiltration rate at the surface after the filter soil is placed. If the infiltration gallery is designed so that runoff enters directly into the drain rock with filter soil below, measure the infiltration rate of the soil prior to placing the drain rock. Use the single-ring infiltrometer test (Appendix D of the Central Oregon Stormwater Manual) or other test recommended by a Geotechnical Engineer.
- iii. **72-hour Drainage:** Use the Swale Flood Test described in Appendix 4E of the Central Oregon Stormwater Manual. For sloped swales and swales with check dams, introduce flow at the high end and allow it to overtop each check dam until it pools to a depth of 6 inches in the low end. Check 72 hours after stopping the flow to see if the facility has emptied. Use standpipe to monitor water level in infiltration galleries.

RECURRENCE INTERVAL	PRECIPITATION INTENSITY (in/hr)								
	DURATION (minutes)								
	(Years)	5	10	15	30	45	60	75	90
0.5	0.60	0.48	0.41	0.30	0.23	0.19	0.17	0.15	0.13
2	1.12	0.90	0.77	0.54	0.41	0.33	0.28	0.25	0.21
5	1.60	1.28	1.10	0.75	0.56	0.45	0.38	0.34	0.27
10	2.07	1.65	1.42	0.96	0.70	0.56	0.47	0.41	0.33
25	2.84	2.26	1.95	1.29	0.94	0.74	0.61	0.53	0.42
50	3.61	2.87	2.48	1.62	1.17	0.91	0.75	0.65	0.51
100	4.57	3.62	3.14	2.03	1.44	1.12	0.92	0.78	0.61
500	7.77	6.12	5.35	3.35	2.34	1.78	1.43	1.20	0.90



Redmond Rainfall-Intensity-Duration-Frequency Curves prepared by MGS Engineering Consultants, Inc. September 2008
 NOTE: The 6-month rainfall intensity is 2/3 of the 2-year rainfall intensity

C. SEWER

1. General

Sewer/water line separation and construction is established by Oregon State Health Department Standards. Materials and procedures for sewer facilities shall conform to the City of Redmond Standards and Specifications, D.E.Q. Specifications, and APWA Standard Specifications.

Sewer facilities shall be installed in rights of way except in those situations where, in the determination of the City Engineer, drainage basins can not be served from the right of way. In those cases an easement will be required.

Engineering firms submitting sewer plans shall include a sewer profile. The profile will include the existing ground elevation, proposed street grade, pipe diameter, material and slope, manhole, station and invert elevations and trench backfill information.

2. Sewer Main

a. Design Parameters

- 1) **Location** Sewer mains should be located in accordance with the Department of Environmental Quality and OAR Chapter 340, Division 52. Sewer mains shall be located on roadway centerline on tangent sections and as close as practicable to this configuration on curves. Gravity sewer mains from manhole to manhole shall run in a straight alignment.
- 2) **Sewer Main Stub** Stub outs for the future continuation of the sewer shall terminate at a manhole unless approved by the City Engineer due to unusual circumstances. In phased subdivisions the sewer should be extended to the next adjacent manhole as shown on the master plan to minimize the number of manholes required.
- 3) **Depth** Minimum cover for all standard sewer lines except sewer services shall be 30".
- 4) **Minimum Diameter:** For gravity sewer, the minimum size shall be 8". Size of pressure lines will be determined by the design engineer.
- 5) **Minimum Velocity:** 2 fps for gravity sewers. 3 fps for pressure and inverted siphons
- 6) **Maximum Velocity:** Velocity shall not exceed 8 fps for pressure sewers.
- 7) **Minimum Grade (Gravity):** From DEQ design criteria:

Pipe I.D.	Slope (ft/100 ft)
6"	0.60
8"	0.40
10"	0.25
12"	0.19
15"	0.14
18"	0.11
21"	0.09
24"	0.08

8) Flow Calculation

- a. **Gravity** Flow calculations will be based on Manning's equation using an n value of 0.013

- b. **Pressure** Flow calculations will be based on the Hazen and Williams equation using the following values for C:

Concrete	120
Cast iron/steel	125
PVC	135

9) Flow Estimation

Domestic waste: 120 gallons per person per day
300 gallons per dwelling unit (DU)

Commercial and Industrial: 1000 gallons per acre per day

Schools: Elementary: 10 gallons per student per day
Middle: 15 gallons per student per day
High School: 20 gallons per student per day

Infiltration: Negligible

- 10) Peak Factor:** 3.0 for flows less than 1 MGD
2.5 for flows from 1 MGD to 10 MGD
2.0 for flows greater than 10 MGD

11) Manholes

Spacing: Not more than 400' apart

Design Fall: Not less than 0.1' without prior approval by City Engineer

External Drop Manhole: Required when fall greater than or equal to 18"

Dead-end lines: End with a manhole, cleanouts are not acceptable.

Diameter: Standard diameter for pipes up to and including 15-inch diameter is 48 inches. For 18-inch and larger pipes and for unusual pipe angles, 60 inch diameter or larger manholes are required to maintain structural integrity. Submit manhole design for pipes sizes 18 inches and larger.

12) Wet Wells

Operating Capacity: The minimum operating capacity of the wet well, from first pump on to pumps off, shall be not less than 5 minutes times one pump flow rate.

Emergency Capacity: The emergency capacity, from alarm on to an overflow condition, shall be determined on a case by case basis, but in no case shall be less than 30 minutes times the peak flow rate. This 30 minute response time shall generally apply to areas not adjacent to water courses and within 10 road miles of the treatment facility.

Pump Flow Rate: A single pump flow rate should sufficiently exceed the peak inflow rate to be effective.

Pump Cycle Times: Pump cycle time, from "pump off" to "pump on" shall not be less than 10 minutes at peak flow and shall take into consideration any line back-draining requirements.

Design Line Size and Volume Requirements

Given:

Q_i	=	Peak inflow rate
Q_p	=	Design pumping rate
V_w	=	Working capacity
V_b	=	Back drain volume
V_e	=	Emergency volume for response time

Wetwell shall be designed for the sum of V_w , V_b and V_e

Conditions:

Q_p	\gg	Q_i
		For 3" line: $66 \text{ gpm} < Q_p < 150 \text{ gpm}$
		For 4" line: $118 \text{ gpm} < Q_p < 270 \text{ gpm}$
		For 6" line: $265 \text{ gpm} < Q_p < 600 \text{ gpm}$
V_e	$>$	$(30)(Q_i)$ (minimum)
V_w	$>$	$(5)(Q_p)$
V_w	$>$	$(10)(Q_i) + V_b$

See Section 310 Sewage Lift Stations in the Standards and Specifications for additional design information and equipment specifications.

b. Waterline Crossings

When the sewer line is located above or less than 18" below a crossing waterline, the sewer line shall be constructed of pipe conforming to water pipe standards. AWWA C-900 pipe is acceptable. The minimum length of this strengthened sewer is 20'. It is intended that a section of the water class pipe be centered over the water main and connected to the sewer line with approved PVC couplings.

c. Detection Tape and Wire

Detection tape shall be installed on all non-metallic gravity sewer main. Detection tape shall be as manufactured by Allen Systems or an approved equal. One course of detection tape is required at the top of the pipe zone. Detection wire shall be installed on all pressure sewer mains, all gravity sewer mains laid on a curve and all service connections. The wire shall be a green clad 18 gauge direct bury copper, solid wire. The wire shall be attached to the top of the pipe.

d. Materials

Materials shall conform to the Standard Specifications of the City of Redmond.

e. Construction

Construction shall conform to the City of Redmond Standard Specifications and applicable Standard Drawings. Prior to installing a sewer facility in an unimproved street, the street must be brought to sub-grade to ensure that adequate bury, depth of cover, and utility separation is acquired. In the event the street is to be improved at a later date, the street shall be properly

staked to the approved design prior to the commencement of sewer line construction.

3. Sewer Services

All single family residential sewer service laterals shall be a minimum of four (4) inches in diameter and have a clean out at the property line.

All new duplex and multi-family service laterals shall be a minimum of six inches in diameter, except when higher flows require a larger line size. However, existing 4-inch service laterals with clean out may be used to serve duplex or multi-family lots with approval of City Engineer, unless flow rates are greater than the capacity of the existing line.

Commercial and industrial service laterals shall be a minimum of six inches in diameter. However, existing four (4) inch service laterals with clean out may be used, with approval of the City Engineer. Separate and independent building sewers shall be provided for buildings on separate lots or parcels. Sewer services shall be extended at minimum grade or steeper as required to provide gravity service to each building. Sewer services shall not have less than 24" of cover at the property line, 30" minimum cover in street, and shall be located as required to provide gravity service to each lot or parcel.

Pressure sewer services shall be designed by a competent professional. The pump curve with the operating point indicated shall be submitted to the City of Redmond Engineering Division so it may be ascertained that the proposed installation will not conflict with the operation of the City system. Pressure mains shall be a minimum of 3 inches in diameter and all check valves, gate valves will have the capacity to pass a 3 inch ball. It is considered prudent to specify the service line one size larger than the pump outlet.

4. Sanitary Sewer Manholes

Manholes shall be located as shown on the design plans or as directed by the City Engineer, or representative, in a manner to provide complete accessibility and to minimize the possibility of damage from vehicles or injury to pedestrians.

Location of the center of manholes in a vehicle wheel track is not acceptable. Location of the center of manholes within 5 feet of the curb line is not acceptable. Location of manholes outside of paved areas is not generally acceptable. If manholes can not be located in the pavement, then a six inch thick concrete pad 5 foot square centered on the manhole cover must be provided. Pipe stub-outs in manholes for 4" service connections generally will not be allowed, except for manholes at end of line. Service line crown elevation shall match main line crown. Internal drop manholes will not be acceptable for drops equal to or greater than 18 inches. A channel is required from service line connections to the main channel in the manhole base.

Angle between inlet and outlet lines of sewer manholes less than 90° shall be avoided, but if necessary, the invert of the inlet line shall be at or above the crown of the outlet line, but not to exceed 18 inches. Channel construction must allow access for City's closed circuit television camera.

5. Cleanouts

Cleanouts may not be substituted for manholes on sewer mains.

6. Access to Sewer Facilities

Where manholes lie outside of the paved right of way, an access road, with dedicated right of way or easement, shall be constructed to provide all weather access to the manhole. This access road shall meet all weather service road standards (See Standard Drawing 2-5) or be paved. Support facilities such as, but not limited, to drainage structures, vehicular turnaround with 38 foot turning radius, or a pad-lockable gate may be required on any manhole location outside of the paved right of way. An exception to the requirement for an access road will be made when no manholes are located in the easement area.

7. Sampling Manholes

A sanitary sewer sampling manhole located at a point accessible at all hours to City personnel is required for each commercial, industrial, or institutional user's service lateral. The sampling manhole shall be constructed upgradient from any discharge into the public sewer system. The manhole shall conform to Standard Drawing 3-6. The sampling manhole shall be constructed, owned and maintained by the property owner. The manhole may be located at the sewer connection within public right of way. Privately owned sampling manholes within public right of way are subject to revocable right of way approval [City Code 4.337(1)]. At the option of the property owner, the sampling manhole may be located on private property within an easement that provides unobstructed access to City personnel. If manholes cannot be located in the pavement, then a six inch thick concrete pad 5 foot square centered on the manhole cover must be provided.

D. WATER

Materials and procedures for water facilities shall conform to the Standard Specifications of the City of Redmond, Oregon Health Division Administrative Rules, and AWWA standards. Water facilities shall be installed in public rights of way except in those situations where, in the determination of the City Engineer, service areas and/or pressure levels will be better served by an alternate design. In those cases an easement will be required.

1. Main Line

a. Minimum Size

The minimum size for mainline shall be 8 inches except in industrially zoned areas where the minimum main size is 12 inches. Lines must be sized to provide the following required fire flows:

Residential	1,500 gpm
Commercial	2,500 gpm
Industrial	3,500 gpm

All main lines shall end with a fire hydrant for maintenance purposes. Hydrant lines may be 6" if total length is less than 400 feet. Hydrant runs longer than 400 feet will require 8" line. A fire flow analysis will be required to determine the size for lines longer than 400 feet.

b. Required Information on Drawings

All drawings that include water and sewer mains submitted for review by the City Engineer shall have the street station and offset, size, number, and type of fittings specified at the location they occur. Specifying only the deflection angle of the line, e.g. 30°, is not acceptable.

c. Location

Water mains are normally located 12 feet from roadway centerline with a minimum 10 foot horizontal separation from parallel underground utilities unless written approval of the City Engineer is obtained. Separation from sewer lines shall be in accordance with OAR 333-61-0050 (see City Standard Drawing 1-2).

d. Service Lines

A separate water service, including meter, shall be required for each lot of record. Refer to the most current version of the City of Redmond's "Water Service and Meter Installation Manual" for approved fittings, boxes and meters as well as installation requirements.

Service lines are to terminate in an approved meter box. Service lines shall be constructed, complete and with all incidentals to the terminus of the meter box as shown in drawing 4-5, to be located directly behind the sidewalk or, if there is no sidewalk, directly behind the curb. An approved meter shall be installed in the meter box. Any services larger than 1" shall be provided with a saddle or tee at the main.

A back flow prevention device, as approved by the Oregon State Health Division and the City of Redmond, shall be installed on all new services larger than 1" diameter and all fire service lines. Backflow devices shall be installed at the property line unless otherwise approved by the City Engineer.

e. Valves

Valves in water mains shall be located in the street right-of-way, preferably in intersections unless otherwise approved. Maximum distance between valves is 1,000 feet on transmission mains and 500 feet on distribution mains. Valves will be provided so as to minimize the number needed to be closed to isolate sections of line and minimize the number of customers impacted by shutdowns. A cross will normally require 3 or 4 valves, and a tee 2 or 3 valves. Valves are required on the end of lines for future extension. Valves shall be installed on flanged tees or crosses, unless otherwise approved by City Engineer. No valve shall be located closer than 3 feet from existing or proposed gutter line. All valves shall conform to AWWA Standards. All intersections shall have approved valving. Butterfly valves shall be used on all waterlines 10" or larger; or where 18" of cover to the top of a gate valve body cannot be obtained. Where valves are located outside of paved areas they shall be provided with a concrete collar not less than 30" square. Valve clusters may be set in a single collar provided there is not less than 12" from the edge of the valve to the edge of the collar.

f. Detection Tape and Wire

Detection wire and tape shall be installed on all non-metallic main line, non-metallic service line, angled or meandering service lines. Note that ductile iron pipe is the only currently approved material for water mainlines. Detection tape shall be as manufactured by Allen Systems or an approved equal. One course of detection tape shall be installed 12" above the pipe. Detection wire shall be a Blue 18 gauge UF bury solid copper wire located within 6" of the top of the pipe. The wire shall have electrical continuity and a lead shall be brought to within of the surface in valve stacks. Wherever there is a splice, it shall be repaired according to manufacturer's recommendation.

g. All Weather Access

Where water facilities requiring maintenance access lie outside paved right of way, a paved access pad sufficient for service equipment to operate without blocking the traveled way shall be provided. Where water facilities (such as fire hydrants and valves) lie away from paved right of way, an all weather access road shall be constructed to provide all weather access to the facilities. This access road shall meet all weather service road standards (See Standard Drawing 2-5) or be paved. Support facilities such as, but not limited to, drainage structures, vehicular turnaround with a 38 foot radius, or a pad-lockable gate may be required on any water facility location.

h. Thrust Restraint

Thrust restraint shall be provided for water fittings. Internal pipe joint restraints, such as Field-Lok gaskets and external joint restrains, such as Mega-lugs, are generally preferred to concrete thrust blocks. Plans shall show the required restrained pipe length in accordance with the table below. When concrete thrust blocks are necessary, plans shall include Standard Drawings 4-3 and 4-4 for thrust blocks.

2. Meters

Approved water meters and meter boxes are described in the most current Water Service and Meter Installation Manual.

3. Fire Hydrants

a. General

Each hydrant shall be connected to the main with a 6-inch branch controlled by an independent 6-inch gate valve bolted to a flanged tee. On hydrant lines over one hundred (100) feet long, a second valve shall be required within 10 feet of the hydrant. No other lines are allowed to be connected to this 6 inch fire hydrant line unless the line is upsized to 8 inches and flow calculations have been provided that show the line can provide the required fire flow and peak domestic flow simultaneously.

b. Location

Hydrants shall be placed at maximum 400' intervals. Any other spacing requires approval of the Redmond Fire Marshall. Hydrants shall be located as shown on the plans or as directed by the City Engineer, in a manner to provide complete accessibility and to minimize the possibility of damage from vehicles or injury to pedestrians. The hydrant barrel shall be set as shown in the standard drawings.

On hydrant runs exceeding that shown on Standard Drawing 4-13, design and installation shall be such that the hydrant can be excavated and repaired without danger of the hydrant valve blowing off the line or causing the main line to be taken out of service. This requirement may result in the installation of a second hydrant valve at the mainline tee, or joint and fitting restraints. Hydrant valves shall be located reasonably close to the hydrant as indicated in the drawings so as to be obvious in the event of an emergency.

c. Staking

All hydrants shall have two reference points (swing ties) indicating the face of hydrant and tops of curb and face of curb. These reference points are the responsibility of the Design Engineer and he/she shall be responsible for position of such prior to construction.

d. Concrete Pad

A concrete pad shall be installed around the barrel as specified in Section 404.3.00 of the Standard Specifications of the City of Redmond.

e. Bollards

All hydrants located in areas vulnerable to traffic shall be protected by bollards as shown in Standard Drawing 4-14. The design and location shall be approved prior to installation.

E. UTILITIES

1. Prohibition on Cutting Recently Constructed Streets

No open cut for utilities will be allowed within 2 years of completion of a street construction project, unless approved by City Engineer. If permitted within two years of pavement installation, additional paving and/or improved backfill will be required. This may include, removal to centerline or full width of street, full street overlays, grinding and inlay or controlled density backfill.

2. Utility Conduit

Where any utility is not completely installed by the time of the sub-grade inspection, provisions such as utility conduit placed under all areas to be improved, shall be implemented to protect the improvement. This installation shall be acceptable to the affected utility and the City of Redmond. Conduit banks shall be spaced no greater than 300' apart and not less than one per block.

3. Shared Trenches

Underground utilities shall not be located closer than 10 feet horizontally from any water or sewer main. With special permission from the City Engineer this separation may be reduced, but should never be less than 5 feet. Utility crossings of water or sewer mains shall be as close to perpendicular as practicable.

4. Utilities in Public Rights of Way

a. General

Utility companies shall construct facilities in City of Redmond public rights of way in strict accordance with City of Redmond Standards and Specifications. Utility companies and their agents shall cooperate with the City of Redmond Engineering Division to provide for City inspection of their facilities during construction to insure that City of Redmond facilities are not damaged during construction. If a city facility is damaged during construction, it shall be repaired or reconstructed to current City standards. Public Utility easements shall be required adjacent to all city street rights of way for power, communication and gas lines.

b. Plan Submittal

Utility companies must submit plans and profiles of any proposed work in City of Redmond Public rights of way for review by the City of Redmond Engineering Division. These plans must be approved by the City of Redmond before start of construction. Emergency work requiring immediate action shall be exempted from this requirement. All existing underground utilities shall be shown on these plans and shall have been field located by the appropriate utility company through the "one call" network. Failure to field locate existing utilities on the plans will be cause for the City to deny permission to work in the public right of way.

5. Trench Patching in Paved Right of Way Areas

Trench backfill and patching in pavement areas shall conform to Section 212 of the Standards and Specifications.

6. Trench Backfill

Trench backfill shall conform to Section 101 of the Standards and Specifications.

F. IRRIGATION

1. General

Irrigation laterals shall be installed in culvert pipe to the outside limits of public and utilities improvements in right of ways. The construction shall conform to the requirements of the Irrigation Company and the City of Redmond. Where requirements may conflict or differ, the requirement providing the highest level of control, security, and/or integrity shall govern the construction.

2. Materials

Pipe used for irrigation in City right of way shall meet the requirements of AWWA C900 or C905.

III. DRAWINGS

A. SUBMITTAL

For information concerning the process of submitting plans, see Section 04 of the Development Provisions.

B. PLAN SCALE & SIZE

The drawing scale shall be such as to clearly show the proposed improvements and any conflicts with existing or proposed improvements. Where clarity is not compromised, it is preferred that street, sewer and water be combined on one drawing to better disclose the potential for utility conflicts. Plan views shall incorporate a grid to assist in the determination of distance and elevation of improvements. The preferred scale for combined drawings showing multiple facilities is 1" = 20'. Depending on the amount of information shown on the drawings, the scale may be increased to 1" = 40'. Smaller scales will not be accepted. All construction drawings submitted shall be 22" by 34" or 24" by 36" overall size.

C. INFORMATION REQUIRED ON PLANS

1. General

- a. Vicinity map
- b. North arrow, preferably to top or right of each sheet
- c. Project title or name
- d. Sheet Index
- e. Quantities for Engineering Fees
 - 1) Size and total lineal feet of sewer main
 - 2) Size and total lineal feet of water main
 - 3) Size and total lineal feet of fire service lines
 - 4) Size and total number of water services/sewer services
 - 5) Size and total number of water meters
 - 6) Size and total number of manholes
 - 7) Total number of fire hydrants
 - 8) Lineal feet of all streets and alleys
- f. Approval signature block including Public Works Director, City Engineer, Redmond Fire Department, Central Oregon Irrigation District and all Utility Providers impacted by project.
- g. Owner/Developer name, address, and phone number
- h. Consulting Engineer/Surveyor name, address, and phone number
- i. Any associated City or County Land Use application number
- j. Indicate City benchmark used to establish control
- k. Existing topography
- l. Location of all utilities and roads, existing and proposed
- m. Rights of way, property lines, and any easements
- n. Provide the following notes on all plan sets.
 1. Provide the following notes on all **public improvement plan** sets.
 - a. City Engineers signature does not grant approval for construction to begin.
 - b. Inspection of public and site grading/drainage improvements will be

performed by the City of Redmond Engineering Department with the exception of plumbing code/permit improvements.

- c. Excavation shall conform to the provisions of OAR 952-001-0090.
 - d. All materials and workmanship shall conform to the current City of Redmond Public Works Standards and Specifications requirements.
 - e. Contractor is required to notify the City of Redmond 24 hours in advance of commencing construction and to coordinate inspections until project is deemed complete by the Engineering Department.
 - f. Access to existing properties/residences affected by construction activities shall be maintained at all times by the contractor. Emergency access and coordination of Redmond Emergency Services shall be required.
 - g. Survey monuments, controls or property corners which are disturbed or destroyed by construction activities shall be re-established, restored and/or replaced at the contractor's expense.
 - h. Public street lights and utility layout shall be installed per approved construction plans. Public street lights shall be constructed, installed and completed prior to City acceptance of project.
 - i. Contractor shall coordinate installation of public street lights with the local power company. All costs related to street light installation including but not limited to base, pole, conduit and wiring shall be provided by the property owner/project developer.
 - j. Contractor is responsible for contacting the Oregon Utility Notification Center or LOCATE prior to excavation. Contractor shall verify location and elevation of existing utilities.
 - k. The location of proposed drywells/UICD's shall not conflict with existing domestic water wells or existing and planned City municipal water wells.
 - l. Topography survey is based on City Datum _____ located at _____
_____.
 - m. All necessary changes to design plans, revealed during construction, must be approved by the Design Engineer and City of Redmond.
 - n. Plan approval does not assume liability or responsibility for errors and omissions in the design and/or construction plans.
2. Provide the following on all **private improvement plan** sets.
- a. Inspection of public and site grading/drainage improvements will be performed by the City of Redmond Engineering Department with the exception of plumbing code/permit improvements.
 - b. Contractor is required to notify the City of Redmond 24 hours in advance of commencing construction and to coordinate inspections until project is deemed complete by the Engineering Department.
 - c. Where applicable, all materials and workmanship shall conform to the current City of Redmond Public Works Standards and Specifications requirements.

- d. Access to existing properties/residences affected by construction activities shall be maintained at all times by the contractor. Emergency access and coordination of Redmond Emergency Services shall be required.
- e. Survey monuments, controls or property corners which are disturbed or destroyed by construction activities shall be re-established, restored and/or replaced at the contractor's expense.
- f. Topography survey is based on City Datum _____ located at _____
_____.
- g. All necessary changes to design plans, revealed during construction, must be approved by the Design Engineer and City of Redmond.
- h. Plan approval does not assume liability or responsibility for errors and omissions in the design and/or construction plans.

2. Streets

- a. North arrow, preferably to top or right of page
- b. Vertical and horizontal curve data
- c. Indicate roadway centerline and stationing along centerline
- d. Indicate slopes of centerline, and gutter lines if necessary
- e. Indicate curb return radius
- f. Indicate grades at the ends and midpoint of the curb returns
- g. Detailed design of each curb ramp showing slopes of all ramps and landings with spot elevations as necessary and in conformance with Public Right of Way Accessibility Guidelines.
- h. Indicate drainage system and location and size, in square foot, of drainage area served by every dry well
- i. Indicate the location of utilities, existing and proposed
- j. All relevant street system details
- k. Demonstrate that streets may be extended thru adjacent properties if so desired
- l. Show location, direction, size, type and of MUTCD number of all permanent street signing
- m. Show location and size of any postal delivery boxes to be placed on public right of way
- n. Existing street lights within one block radius of project boundary
- o. Location of street lights to be installed by local power company

3. Stormwater – See Chapter 3 Central Oregon Stormwater Manual

- a. Location of manholes, inlets and storm line
- b. Stationing of structures relative to street stationing
- c. Invert and rim elevations at junction and sediment manholes and inlets
- d. Inlet type, size, rim elevation
- e. Swale and pond edge, slope, contours, inlets, outlets, surfacing, overflow, outlet protection
- f. All relevant storm system details.
- g. A profile demonstrating that sufficient cover will be maintained and showing finished street where applicable.
- h. Drainage report including narrative, basin map and other figures, calculations, downstream analysis and other required submittals as appropriate
- i. Wellhead protection areas within project.

4. Sanitary Sewer

- a. Location of manholes, sewer line
- b. Location of gravity grease interceptors and sampling manholes as required
- c. Stationing along sewer line
- d. Entering and exiting invert elevations at manholes
- e. Sewer is designed and extended to provide service to adjacent properties
- f. All relevant sewer system details
- g. Sewer cleanout locations
- h. A profile demonstrating that sufficient cover will be maintained and showing finished street where applicable

5. Water

- a. Location of valves, fittings and fire hydrants, and water lines
- b. Stationing along waterline
- c. Water system is designed to provide service to adjacent properties
- d. All relevant water system details.
- e. A profile demonstrating that sufficient cover will be maintained and showing finished street grade where applicable.

6. Construction Cost Estimate and Fees

An estimate of probable cost must be provided to determine plan review and inspection fees. Final plans will not be approved until fees have been paid.

CITY OF REDMOND, OREGON

GENERAL CONDITIONS FOR PUBLIC IMPROVEMENT CONTRACTS

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GENERAL CONDITIONS FOR PUBLIC IMPROVEMENT CONTRACTS

SECTION A GENERAL PROVISIONS

A.1 DEFINITION OF TERMS

Whenever the following terms are used in these Standard Specifications, the Agreement, the Supplemental Specifications, Special Provisions, on the Plans, and in any other Contract Documents or other instruments pertaining to construction where these specifications govern, the intent and meaning shall be interpreted as follows, applicable to both the singular and plural thereof.

Addendum A written or graphic modification to any of the Contract Documents issued before the opening of bids, which revises, adds to, or deletes information in the Solicitation Documents or previously issued Addenda.

Additional Work Increased quantities of any Pay Item, within the scope of the Contract, for which a unit price has been established.

Advertisement The public announcement inviting bids for work to be performed and materials to be furnished.

Agency The city, county, state, special district, or political subdivision, as applicable, which has entered into an Agreement with the Contractor.

Aggregate Rock product of a specified quality and gradation.

Agreement The written contract between Owner and Contractor, signed and executed by both parties, describing the work to be performed and compensation to be paid and other Contract Documents that are attached to the Agreement or incorporated by reference into the Agreement.

Architect/Engineer means the Person appointed by the Owner to make drawings and specifications and, to provide contract administration of the Work contemplated by the Contract to the extent provided herein or by supplemental instruction of Owner (under which Owner may delegate responsibilities of the Owner's Authorized Representative to the Architect/Engineer), in accordance with ORS Chapter 671 (Architects) or ORS Chapter 672 (Engineers) and administrative rules adopted thereunder. For contract agreements for and through the City of Redmond Public Works, the Architect/Engineer is the City Engineer unless specified in the Supplemental Specifications otherwise.

Attorney in Fact An Entity, or person, appointed by another to act in its place, either for some particular purpose, or for the transaction of business in general.

As Approved A phrase understood to mean reviewed and accepted by the City Engineer or his authorized representative.

Base A course or layer of specified aggregate material of specified thickness placed below the pavement course.

Bid A competitive offer submitted in response to an Invitation to Bid or solicitation of a price to supply materials or services.

Bid Bond The Surety bond for a Bid guarantee.

Bid Closing The date and time, specified in the advertisement or Addenda, after which Bids, Bid modifications, and Bid withdrawals will no longer be accepted.

Bidder An entity, person, firm, partnership, or corporation submitting a formal proposal on a project.

Bid Security A certified check, cashier's check, or surety bond, required to be submitted with the Proposal, to guarantee execution of the Agreement.

Bid Schedule The list of Pay Items, their units of measurement, and estimated quantities in the Proposal Documents.

Boulders Particles of rock too large to pass a 12-inch square opening.

Calendar Day Any day shown on the calendar, beginning and ending at midnight.

Change Order A written order issued by the Engineer or Owner to the Contractor, and signed by an authorized agent of the City of Redmond, modifying Work required by the Contract and, if applicable, establishing the basis of payment for the modified work, or an adjustment in the Contract Price or the Contract Time issued after execution of the Agreement.

City The City of Redmond, including its duly authorized representatives.

City Council The duly elected City Council of the City of Redmond.

City Engineer See Engineer.

Claim A demand by Contractor pursuant to the Claims Review Process for review of the denial of Contractor's initial request for an adjustment of Contract terms, payment of money, extension of Contract Time or other relief, submitted in accordance with the requirements and within the time limits established for review of Claims in these General Conditions.

Contract means the written agreement between the Owner and the Contractor comprised of the Contract Documents which describe the Work to be done and the obligations between the parties. See Agreement.

Contract Amount (Contract Price) Total sum of the Contract Pay Items calculated by multiplying the Pay Item quantities by the unit prices in the Schedule of Items, and including all Extra Work authorized by Change Orders.

Contract Documents Solicitation Documents, Addenda, Proposal, Agreement, General Conditions, Supplemental Conditions, Specifications, and Drawings, including all modifications thereof incorporated into the Documents before their execution, and including all Change Orders, written orders and authorizations issued by the Agency, Permits, orders, and authorizations obtained by the Contractor applicable to the Project, and all other documents and requirements incorporated by specific reference thereto.

Contract Item (Pay Item) A specific unit of work for which a price is provided in the proposal.

Contractor The entity, person or persons, partnership, corporation, or joint venture, who has entered into an agreement with the City as party or parties of the second part, or her/his or their

legal representatives. The word "Contractor" shall be taken to mean the Contractor, her/his agents, employees, officials, subcontractors, or anyone connected with the work herein set forth on behalf of the Contractor.

Contract Time/Period The amount of time Owner allows Contractor to complete the Work under the Contract, counted as the number of calendar or work days stated in the Contract Documents, and including authorized time extensions, starting from the date of the Notice to Proceed. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar days, the contract shall be completed by that date.

Developer A private entity, person, partnership or corporation, who has expressed the intention of providing, or who has undertaken to provide, a facility, structure, or like public improvement project to be accepted for maintenance and ownership by the City.

Design Engineer A private engineering firm retained by the City, Developer, or Owner to provide design, construction management, or some other service necessary for the construction of the proposed public facility.

Drawings See Plans.

Engineer The term "Engineer" shall mean the "City Engineer or his/her authorized representative".

Entity A natural person capable of being legally bound, sole proprietorship, limited liability company, corporation, partnership, limited liability partnership, limited partnership, profit or nonprofit unincorporated association, business trust, two or more persons having a joint or common economic interest, or any other person with legal capacity to contract, or a government or governmental subdivision.

Equipment All machinery, tools, manufactured products, and fabricated items, together with the necessary supplies for upkeep and maintenance, and all apparatus necessary for the proper construction and acceptable completion of the work, or specified for incorporation into the Work.

Establishment Period The time specified to assure satisfactory establishment and growth of planted materials.

Extra Work Work not included in the Contract, but deemed by the Engineer to be necessary to complete the Project.

Final Acceptance Written confirmation by the City that the Project has been completed in accordance with the Contract, with the exception of latent defects and Warranty obligations, if any, and has been accepted for maintenance by the City.

Final Completion means the final completion of all requirements under the Contract, including Contract Closeout as described in Section K but excluding Warranty Work as described in Section I.2, and the final payment and release of all retainage, if any, released.

Final Inspection The inspection conducted by the Engineer to determine that the Project has been completed in accordance with the Contract.

Force Majeure means an act, event or occurrence caused by fire, riot, war, acts of God, nature,

sovereign, or public enemy, strikes, freight embargoes or any other act, event or occurrence that is beyond the control of the party to this Contract who is asserting Force Majeure.

Incidental A term identifying those acts, services, transactions, property, or other items for which the City will make no separate or additional payment.

Inspector The representative of the City Engineer authorized to inspect and report on Contract performance, and assigned to witness and verify tests of the work and the materials furnished or being furnished by the City of Redmond.

Intention of Terms Whenever, in these specifications or on the plans, the words "require", "permitted", "ordered", "designated", "prescribed" or words of like import are used, it shall be understood that the requirements, permission, order, designation, or prescription of the City Engineer is intended; and similarly, the words "approved", "acceptable", "satisfactory", or words of like import shall mean approved by, or acceptable to, or satisfactory to the City Engineer, subject in each case to the final determination of the City.

Laboratory The official testing laboratories of the City or such other laboratories as may be designated by the City Engineer.

Legal Holiday The following are legal holidays for the City, subject to subsequent change by law: Sundays, New Year's Day, M.L. King's Birthday, President's day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving and the Friday after Thanksgiving, Christmas, and other days declared as holidays by public proclamation. When a legal holiday, other than Sunday falls on a Sunday, the Monday immediately following is a legal holiday.

Materials Any natural or manmade substance specified for use in the construction of the Project or for incorporation into the Work.

Modification

- (a) A written amendment of the Contract Documents signed by both parties.
- (b) A Contract Change Order issued by the City or Owner.
- (c) Written clarification or interpretation issued by the City Engineer.
- (d) A written order for a minor change or alteration in the work issued by the City Engineer.
- (e) A modification may only be issued after execution of the Agreement.

Notice of Award The written notice by City to the apparent successful Bidder stating that upon compliance with the conditions precedent to be fulfilled by him within the time specified, the City will execute and deliver the Agreement to him.

Notice to Proceed the official written notice from the Owner stating that the Contractor is to proceed with the Work defined in the Contract Documents. Notwithstanding the Notice to Proceed, Contractor shall not be authorized to proceed with the Work until all initial Contract requirements, including the Agreement, performance bond and payment bond, and certificates of insurance, have been fully executed and submitted to Owner in a suitable form.

Offer means a bid in connection with an invitation to bid and a proposal in connection with a request for proposals.

Offeror means a bidder in connection with an invitation to bid and a proposer in connection with a request for proposals.

Overhead means those items which may be included in the Contractor's markup (general and administrative expense and profit) and that shall not be charged as Direct Cost of the Work, including without limitation such Overhead expenses as wages or salary of personnel above the level of foreman (i.e., superintendents and project managers), expenses of Contractor's offices at the job site (e.g. job trailer) including expenses of personnel staffing the job site office, and Commercial General Liability Insurance and Automobile Liability Insurance.

Or Equal The term "or equal" shall be understood to mean that an "equal" product is the same or better than the product named in function, performance, reliability, quality, and general configuration. Determination of equality in reference to the project design requirements will be made by the City Engineer. Such "equal" products shall not be purchased or installed by the Contractor without the City Engineer's written approval.

Owner The legal entity or contracting agency (City) for which the work is being performed. Where applicable the Developer is the owner until such time as the improvements are accepted by the City for maintenance.

Pavement Asphalt Concrete or Portland cement concrete placed for the use of motor vehicles, bicycles, or pedestrians on streets, roadways, shoulders, Multi-use paths and parking areas.

Pay Item A specific unit of Work for which a price is provided in the Contract.

Payment Bond The approved form of security furnished by the Contractor and Contractor's surety as a guaranty of the Contractor's performance of its obligation to pay promptly in full all sums due for materials, equipment, and labor furnished to complete construction of the work.

Person includes an entity doing business as a sole proprietorship, a partnership, a joint venture, a corporation, a limited liability company or partnership, or any other entity possessing the legal capacity to contract

Performance Bond The approved form of security furnished by the Contractor and Contractor's surety as a guaranty that the Contractor will complete the work in accordance with the terms of the Agreement.

Plans Standard and Supplemental Drawings, profiles, cross sections, elevations, details and other working drawings and supplementary drawings, or reproductions thereof, signed by the City Engineer, which show the location, character, dimensions, and details of the Work to be performed. Plans may either be bound in the same book as the balance of the Contract Documents or bound in separate sets, and are a part of the Contract Documents regardless of the method of binding.

Project The sum of all Work to be performed under the Contract.

Proposal The written offer of a bidder submitted on the approved proposal form(s) agreeing to enter into a Contract with the City to perform the Work described in the Contract Documents and stating the unit prices or lump sum amounts for the items of Work.

Proposal Guaranty See Bid Security.

Punchlist means the list of Work yet to be completed or deficiencies which need to be corrected in order to achieve Final Completion of the Contract.

Reference Specifications Bulletins, standards, rules, methods of analysis or test, codes and specifications included by reference in the Contract Documents.

Record Document means the as-built Plans, Specifications, testing and inspection records, product data, samples, manufacturer and distributor/supplier warranties evidencing transfer to Owner, operational and maintenance manuals, shop drawings, Change Orders, correspondence, certificate(s) of occupancy, and other applicable documents recording all Services performed.

Solicitation Document means an invitation to bid or request for proposal or request for quotes.

Special Provisions See **Special Specifications**.

Special Specifications Requirements peculiar to the project; and modifications to the Standards and Specifications. Special Specifications are used interchangeably with Special Provisions.

Specifications any description of the physical or functional characteristics of the Work, or of the nature of a supply, service or construction item. Specifications may include a description of any requirement for inspecting, testing or preparing a supply, service or construction item for delivery and the quantities or qualities of materials to be furnished under the Contract. Specifications generally will state the results or products to be obtained and may, on occasion, describe the method and manner of doing the Work to be performed. Specifications may be incorporated by reference and/or may be attached to the Contract.

Standard Specifications Codes, rules and regulations referred to in these specifications by basic name or designation only, shall be considered to be of the latest issue with all amendments as of the date of these specifications. Applicable portions of such shall become a part of these Contract Documents.

Structures Facilities such as bridges, culverts, catch basins, inlets, retaining walls, cribbing, storm and sanitary sewer lines, water lines, utility cables and pipelines, underdrains, electrical ducts, manholes, handholes, lighting fixtures and bases, transformers, flexible and rigid pavements; buildings, vaults, and other man-made features that may be encountered in the work and not otherwise classified herein.

Subcontractor An individual, firm, or corporation having a direct contract with the Contractor or any other subcontractor for the performance of a portion of the Work on the project, or those who furnish material for the project.

Subbase A course of specified material of specified thickness between the Subgrade and a Base.

Subgrade The top surface of completed earthwork on which Subbase, Base, Surfacing, Pavement, or a course of other material is to be placed.

Substantial Completion means the date when the Owner accepts in writing the construction, alteration or repair of the improvement to real property or any designated portion thereof as having reached that state of completion when it may be used or occupied for its intended purpose. Substantial Completion of facilities with operating systems occurs only after thirty (30) continuous Days of successful, trouble-free operation of the operating systems

Substitutions means items that in function, performance, reliability, quality, and general configuration are the same or better than the product(s) specified. Approval of any substitute item shall be solely determined by the Owner's Authorized Representative. The decision of the Owner's Authorized Representative is final.

Superintendent The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the City Engineer, and who shall supervise and direct the construction.

Supplemental General Conditions means those conditions that remove from, add to, or modify these General Conditions. Supplemental General Conditions may be included in the Solicitation Document or may be a separate attachment to the Contract.

Surety A corporation, licensed to conduct the business of surety in the State of Oregon, and named in the current list of approved sureties published by the U. S. Treasury Circular 570. All bonds signed on behalf of the Surety must be accompanied by a certified copy of the authority to act.

If the Surety on any bond furnished by the Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in the State of Oregon, or it ceases to meet the requirements outlined above, Contractor shall within five (5) days thereafter, substitute another Bond and Surety, both of which shall be acceptable to City of Redmond.

Topsoil Soil ready for use in a planting bed.

Traveled Way That part of a street or highway for moving vehicles, exclusive of auxiliary lanes, berms, curbs, and shoulders.

Typical Section the Cross Section established by the Plans which represents in general the lines to which the Contractor shall work in the performance of the Contract.

Unsuitable Material Frozen material, or material that contains organic matter, muck, humus, peat, sticks, wood chips, debris, chemicals, toxic matter, or other deleterious materials not normally suitable for use in earthwork.

Utility A line, facility, or system for producing, transmitting, or distributing communications, power, electricity, heat, gas, oil, water, steam, waste, storm water not connected with highway drainage, or any other similar commodity which directly or indirectly serves the public.

Work the term shall signify all materials, labor, tools and all appliances, machinery and appurtenances necessary to perform and complete the construction of all facilities specified in the Contract Documents or shown on the Plans, and such additional items of labor, material, and equipment not specifically indicated or described which can be reasonably inferred as belonging to the item described or indicated and as required by good practice to provide a complete and satisfactory system or structure. As used herein, "provide" shall be understood to mean "furnish and install".

Working Day Any and every calendar day excluding Saturdays, Sundays, and legal holidays. Unless otherwise permitted a working day occurs between the hours of 7:00 am and 5:00 pm.

Written Notice A written communication delivered to the individual, or to a member of the firm,

or to an officer of the corporation for whom it is intended, or, if delivered or sent by registered mail, to the last business address known to him who gives the notice.

A.2 SCOPE OF WORK

The Work contemplated under this Contract includes all labor, materials, transportation, equipment and services for, and incidental to, the completion of all construction work in connection with the project described in the Contract Documents. The Contractor shall perform all Work necessary so that the project can be legally occupied and fully used for the intended use as set forth in the Contract Documents.

A.3 INTERPRETATION OF CONTRACT DOCUMENTS

A.3.1 Unless otherwise specifically defined in the Contract Documents, words which have well-known technical meanings or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Contract Documents are intended to be complementary. Whatever is called for in one is interpreted to be called for in all. However, in the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following descending order of precedence:

1. Contract amendments and Change Orders, with those of later date having precedence over those of an earlier date;
2. The Supplemental General Conditions;
3. The Agreement; The General Conditions
4. The Plans and Specifications
5. The Solicitation Document and any addenda thereto;
6. The accepted Offer.

A.3.2 In the case of an inconsistency between Plans and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Owner or Owner's Authorized Representative's interpretation in writing.

A.3.3 If the Contractor finds discrepancies in, or omissions from the Contract Documents, or if the Contractor is in doubt as to their meaning, the Contractor shall at once notify the Owner or Owner's Authorized Representative. Matters concerning performance under, and interpretation of requirements of, the Contract Documents will be decided by the Owner's Authorized Representative, who may delegate that duty in some instances to the Architect/Engineer. Responses to Contractor's requests for interpretation of Contract Documents will be made in writing by Owner's Authorized Representative (or the Architect/Engineer) within any time limits agreed upon or otherwise with reasonable promptness. Interpretations and decisions of the Owner's Authorized Representative (or Architect/Engineer) will be consistent with the intent of and reasonably inferable from the Contract Documents. Contractor shall not proceed without direction in writing from the Owner's Authorized Representative (or Architect/Engineer).

A.3.4 References to standard specifications, manuals, codes of any technical society, organization or association, to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, laws or regulations in effect in the jurisdiction where the project is occurring on the first published date of the Solicitation Document, except as may be otherwise specifically stated.

A.4 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE

A.4.1 It is understood that the Contractor, before submitting an Offer, has made a careful examination of the Contract Documents; has become fully informed as to the quality and quantity

of materials and the character of the Work required; and has made a careful examination of the location and conditions of the Work and the sources of supply for materials. The Owner will in no case be responsible for any loss or for any unanticipated costs that may be suffered by the Contractor as a result of the Contractor's failure to acquire full information in advance in regard to all conditions pertaining to the Work. No oral agreement or conversation with any officer, agent, or personnel of the Owner, or with the Architect/Engineer either before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.

A.4.2 Should the Plans or Specifications fail to particularly describe the materials, kind of goods, or details of construction of any aspect of the Work, Contractor shall have the duty to make inquiry of the Owner and Architect/Engineer as to what is required prior to performance of the Work. Absent Specifications to the contrary, the materials or processes that would normally be used to produce first quality finished Work shall be considered a part of the Contract requirements.

A.4.3 Any design errors or omissions noted by the Contractor shall be reported promptly to the Owner's Authorized Representative, including without limitation, any nonconformity with applicable laws, statutes, ordinances, building codes, rules and regulations.

A.4.4 If the Contractor believes that additional cost or Contract Time is involved because of clarifications or instructions issued by the Owner's Authorized Representative (or Architect/Engineer) in response to the Contractor's notices or requests for information, the Contractor must submit a written request to the Owner's Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt by Contractor of the clarifications or instructions issued. If the Owner's Authorized Representative denies Contractor's request for additional compensation, additional Contract Time, or other relief that Contractor believes results from the clarifications or instructions, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process. If the Contractor fails to perform the obligations of Sections A.4.1 to A.4.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations.

A.5 INDEPENDENT CONTRACTOR STATUS

The service or services to be performed under this Contract are those of an independent contractor as defined in ORS 670.600. Contractor represents and warrants that it is not an officer, employee or agent of the Owner.

A.6 RETIREMENT SYSTEM STATUS AND TAXES

Contractor represents and warrants that it is not a contributing member of the Public Employees' Retirement System and will be responsible for any federal or state taxes applicable to payment received under this Contract. Contractor will not be eligible for any benefits from these Contract payments of federal Social Security, employment insurance, workers' compensation or the Public Employees' Retirement System, except as a self-employed individual. Unless the Contractor is subject to backup withholding, Owner will not withhold from such payments any amount(s) to cover Contractor's federal or state tax obligations.

A.7 GOVERNMENT EMPLOYMENT STATUS

A.7.1 If this payment is to be charged against federal funds, Contractor represents and warrants that it is not currently employed by the Federal Government. This does not preclude the Contractor from holding another contract with the Federal Government.

A.7.2 Contractor represents and warrants that Contractor is not an employee of the City.

SECTION B ADMINISTRATION OF THE CONTRACT

B.1 OWNER'S ADMINISTRATION OF THE CONTRACT

B.1.1 The Owner's Authorized Representative will provide administration of the Contract as described in the Contract Documents (1) during construction (2) until final payment is due and (3) during the one-year period for correction of Work. The Owner's Authorized Representative will act on behalf of the Owner to the extent provided in the Contract Documents, unless modified in writing in accordance with other provisions of the Contract. In performing these tasks, the Owner's Authorized Representative may rely on the Architect/Engineer or other consultants to perform some or all of these tasks.

B.1.2 The Owner's Authorized Representative will visit the site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, and (3) to determine in general if Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. The Owner's Authorized Representative will not make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Owner's Authorized Representative will neither have control over or charge of, nor be responsible for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work.

B.1.3 Except as otherwise provided in the Contract Documents or when direct communications have been specifically authorized, the Owner and Contractor shall endeavor to communicate with each other through the Owner's Authorized Representative or designee about matters arising out of or relating to the Contract. Communications by and with the Architect/Engineer's consultants shall be through the Architect/Engineer. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner's Authorized Representative.

B.1.4 Based upon the Architect/Engineer's evaluations of the Contractor's Application for Payment, or unless otherwise stipulated by the Owner's Authorized Representative, the Architect/Engineer will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

B.2 CONTRACTOR'S MEANS AND METHODS; MITIGATION OF IMPACTS

B.2.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures.

B.2.2 The Contractor is responsible to protect and maintain the Work during the course of construction and to mitigate any adverse impacts to the project, including those caused by authorized changes, which may affect cost, schedule, or quality.

B.2.3 The Contractor is responsible for the actions of all its personnel, laborers, suppliers, and Subcontractors on the project. The Contractor shall enforce strict discipline and good order among

Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of persons who are unfit or unskilled for the tasks assigned to them.

B.3 MATERIALS AND WORKMANSHIP

B.3.1 The intent of the Contract Documents is to provide for the construction and completion in every detail of the Work described. All Work shall be performed in a professional manner and unless the means or methods of performing a task are specified elsewhere in the Contract Documents, Contractor shall employ methods that are generally accepted and used by the industry, in accordance with industry standards.

B.3.2 The Contractor is responsible to perform the Work as required by the Contract Documents. Defective Work shall be corrected at the Contractor's expense.

B.3.3 Work done and materials furnished shall be subject to inspection and/or observation and testing by the Owner's Authorized Representative to determine if they conform to the Contract Documents. Inspection of the Work by the Owner's Authorized Representative does not relieve the Contractor of responsibility for the Work in accordance with the Contract Documents.

B.3.4 Contractor shall furnish adequate facilities, as required, for the Owner's Authorized Representative to have safe access to the Work including without limitation walkways, railings, ladders, tunnels, and platforms. Producers, suppliers, and fabricators shall also provide proper facilities and access to their facilities.

B.3.5 The Contractor shall furnish Samples of materials for testing by the Owner's Authorized Representative and include the cost of the Samples in the Contract Price.

B.4 PERMITS

Contractor shall obtain and pay for all necessary permits and licenses, except for any specifically excluded in the Supplemental General Conditions, for the construction of the Work, for temporary obstructions, enclosures, opening of streets for pipes, walls, utilities, environmental Work, etc., as required for the project. Contractor shall be responsible for all violations of the law, in connection with the construction or caused by obstructing streets, sidewalks or otherwise. Contractor shall give all requisite notices to public authorities. The Contractor shall pay all royalties and license fees. The Contractor shall defend all suits or claims for infringement of any patent or other proprietary rights and save harmless and blameless from loss, on account thereof, the City, and its officers, employees, agents and assigns.

B.5 COMPLIANCE WITH GOVERNMENT LAWS AND REGULATIONS

B.5.1 Contractor shall comply with all federal, state and local laws, codes, regulations and ordinances applicable to the Work and the Contract. Failure to comply with such requirements shall constitute a breach of Contract and shall be grounds for Contract termination. Without limiting the generality of the foregoing, Contractor expressly agrees to comply with the following as applicable: i) Title VI and VII of Civil Rights Act of 1964, as amended; (ii) Section 503 and 504 of the Rehabilitation Act of 1973, as amended; (iii) the Health Insurance Portability and Accountability Act of 1996; (iv) the Americans with Disabilities Act of 1990, as amended; (v) ORS Chapter 659A; as amended (vi) all regulations and administrative rules established pursuant to the foregoing laws; and (vii) all other applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations. Owner's performance under the Contract is conditioned upon Contractor's compliance with the provisions of ORS 279C.505, 279C.510, 279C.515, 279C.520, and 279C.530, which are incorporated by reference herein.

B.5.2 Contractor shall comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations; and

- a. Contractor shall not discriminate against Disadvantaged, Minority, Women or Emerging Small Business enterprises, as those terms are defined in ORS 200.005, or a business enterprise that is owned or controlled by or that employs a disabled veteran, as that term is defined in ORS 408.225, in the awarding of subcontracts.
- b. Contractor shall maintain, in current and valid form, all licenses and certificates required by law, regulation, or this Contract when performing the Work.

B.5.3 Unless contrary to federal law, Contractor shall certify that it shall not accept a bid from Subcontractors to perform Work as described in ORS 701.005 under this Contract unless such Subcontractors are registered with the Construction Contractors Board in accordance with ORS 701.035 to 701.055 at the time they submit their bids to the Contractor.

B.5.4 Unless contrary to federal law, Contractor shall certify that each landscape contractor, as defined in ORS 671.520(2), performing Work under this Contract holds a valid landscape contractor's license issued pursuant to ORS 671.560.

B.5.5 The following notice is applicable to Contractors who perform excavation Work. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center at (503)232-1987.

B.5.6 Failure to comply with any or all of the requirements of B.5.1 through B.5.5 shall be a breach of Contract and constitute grounds for Contract termination. Damages or costs resulting from such noncompliance shall be the responsibility of Contractor.

B.6 SUPERINTENDENCE

Contractor shall keep on the site, during the progress of the Work, a competent superintendent and any necessary assistants who shall be satisfactory to the Owner and who shall represent the Contractor on the site. Directions given to the superintendent by the Owner's Authorized Representative shall be confirmed in writing to the Contractor.

B.7 INSPECTION

B.7.1 Owner's Authorized Representative shall have access to the Work at all times.

B.7.2 Inspection of the Work will be made by the Owner's Authorized Representative at its discretion. The Owner's Authorized Representative will have authority to reject Work that does not conform to the Contract Documents. Any Work found to be not in conformance with the Contract Documents, in the discretion of the Owner's Authorized Representative, shall be removed and replaced at the Contractor's expense.

B.7.3 Contractor shall make or obtain at the appropriate time all tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable

delay in the Work. The Contractor shall give the Owner's Authorized Representative timely notice of when and where tests and inspections are to be made so that the Owner's Authorized Representative may be present for such procedures. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Owner's Authorized Representative.

B.7.4 As required by the Contract Documents, Work done or material used without inspection or testing by the Owner's Authorized Representative may be ordered removed at the Contractor's expense.

B.7.5 If directed to do so any time before the Work is accepted, the Contractor shall uncover portions of the completed Work for inspection. After inspection, the Contractor shall restore such portions of Work to the standard required by the Contract. If the Work uncovered is unacceptable or was done without sufficient notice to the Owner's Authorized Representative, the uncovering and restoration shall be done at the Contractor's expense. If the Work uncovered is acceptable and was done with sufficient notice to the Owner's Authorized Representative, the uncovering and restoration will be paid for as a Change Order.

B.7.6 If any testing or inspection reveals failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Owner's Authorized Representative's and Architect/Engineer's services and expenses, shall be at the Contractor's expense.

B.7.7 When the United States government participates in the cost of the Work, or the Owner has an agreement with other public or private organizations, or if any portion of the Work is being performed for a third party or in close proximity to third party facilities, representatives of these organizations have the right to inspect the Work affecting their interests or property. Their right to inspect shall not make them a party to the Contract and shall not interfere with the rights of the parties of the Contract. Instructions or orders of such parties shall be transmitted to the Contractor, through the Owner's Authorized Representative.

B.8 SEVERABILITY

If any provision of this Contract is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected and the rights and obligations of the parties shall be construed and enforced as if the Contract did not contain the particular provision held to be invalid.

B.9 ACCESS TO RECORDS

B.9.1 Contractor shall keep, at all times on the Work site, one record copy of the complete Contract Documents, including the Plans, Specifications, Change Orders and addenda, in good order and marked currently to record field changes and selections made during construction, and one record copy of Shop Drawings, Product Data, Samples and similar submittals, and shall at all times give the Owner's Authorized Representative access thereto.

B.9.2 Contractor shall retain and the Owner and its duly authorized representatives shall have access to, for a period not less than ten (10) years, all Record Documents, financial and accounting records, and other books, documents, papers and records of Contractor which are pertinent to the Contract including records pertaining to Overhead and indirect

costs, for the purpose of making audit, examination, excerpts and transcripts. If for any reason, any part of the Contract is involved in litigation, Contractor shall retain all such records until all litigation is resolved. The Owner and/or its agents shall continue to be provided full access to the records during litigation.

B.10 WAIVER

Failure of the Owner to enforce any provision of this Contract shall not constitute a waiver or relinquishment by the Owner of the right to such performance in the future nor of the right to enforce any other provision of this Contract. Owner may only waive a right it has under the Contract in writing and bearing an authorized signature.

B.11 SUBCONTRACTS AND ASSIGNMENT

B.11.1 Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound by the terms and conditions of these General Conditions, and to assume toward the Contractor all of the obligations and responsibilities which the Contractor assumes toward the Owner thereunder, unless (1) the same are clearly inapplicable to the subcontract at issue because of legal requirements or industry practices, or (2) specific exceptions are requested by Contractor and approved in writing by Owner. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with sub-subcontractors at any level.

B.11.2 At Owner's request, Contractor shall submit to Owner prior to their execution either Contractor's form of subcontract, or the subcontract to be executed with any particular Subcontractor. If Owner disapproves such form, Contractor shall not execute the form until the matters disapproved are resolved to Owner's satisfaction. Owner's review, comment upon or approval of any such form shall not relieve Contractor of its obligations under this Agreement or be deemed a waiver of such obligations of Contractor.

B.11.3 Contractor shall not assign, sell, or transfer its rights, or delegate its responsibilities under this Contract, in whole or in part, without the prior written approval of the Owner. No such written approval shall relieve Contractor of any obligations of this Contract, and any transferee shall be considered the agent of the Contractor and bound to perform in accordance with the Contract Documents. Contractor shall remain liable as between the original parties to the Contract as if no assignment had occurred.

B.12 SUCCESSORS IN INTEREST

The provisions of this Contract shall be binding upon and shall accrue to the benefit of the parties to the Contract and their respective permitted successors and assigns.

B.13 OWNER'S RIGHT TO DO WORK

Owner reserves the right to perform other or additional work at or near the project site with other forces than those of the Contractor. If such work takes place within or next to the project site, Contractor will coordinate work with the other contractors or forces, cooperate with all other contractors or forces, carry out the Work in a way that will minimize interference and delay for all forces involved, place and dispose of materials being used so as not to interfere with the operations of another, and join the Work with the work of the others in an acceptable manner and perform it in proper sequence to that of the others. The Owner's Authorized Representative will resolve any disagreements that may arise between or among Contractor and the other contractors

over the method or order of doing all work (including the Work). In case of unavoidable interference, the Owner's Authorized Representative will establish work priority (including the Work) which generally will be in the sequence that the contracts were awarded.

B.14 OTHER CONTRACTS

In all cases and at any time, the Owner has the right to execute other contracts related to or unrelated to the Work of this Contract. The Contractor of this Contract will fully cooperate with any and all other contractors without additional cost to the Owner in the manner described in section B.13.

B.15 GOVERNING LAW

This Contract shall be governed by and construed in accordance with the laws of the State of Oregon without regard to principles of conflict of laws.

B.16 LITIGATION

Any Claim between Owner and Contractor that arises from or relates to this Contract and that is not resolved through the Claims Review Process in Section D.3 shall be brought and conducted solely and exclusively within the Circuit Court of Deschutes County for the State of Oregon; provided, however, if a Claim must be brought in a federal forum, then it shall be brought and conducted solely and exclusively within the United States District Court for the District of Oregon. Any trial will be to the court without a jury. In no event shall this section be construed as a waiver by Owner of any form of defense or immunity, whether sovereign immunity, governmental immunity, immunity based on the Eleventh Amendment to the Constitution of the United States or otherwise, from any claim or from the jurisdiction of any court. Contractor by execution of this contract hereby consents to the in personam jurisdiction of the courts referenced in this section B.16.

B.17 ALLOWANCES

B.17.1 The Contractor shall include in the Contract Price all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

B.17.2 Unless otherwise provided in the Contract Documents:

- a. when finally reconciled, allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- b. Contractor's costs for unloading and handling at the site, labor, installation costs, Overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Price but not in the allowances;
- c. Whenever costs are more than or less than allowances, the Contract Price shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (i) the difference between actual costs and the allowances under Section B.17.2(a) and (2) changes in Contractor's costs under Section B.17.2(b).
- d. Unless Owner requests otherwise, Contractor shall provide to Owner a proposed fixed price for any allowance work prior to its performance.

B.18 SUBMITTALS, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

B.18.1 The Contractor shall prepare and keep current, for the Architect's/Engineer's approval (or for the approval of Owner's Authorized Representative if approval authority has not been delegated to the

Architect/Engineer), a schedule and list of submittals which is coordinated with the Contractor's construction schedule and allows the Architect/Engineer reasonable time to review submittals. Owner reserves the right to finally approve the schedule and list of submittals. Submittals include, without limitation, Shop Drawings, Product Data, and Samples which are described below:

- a. Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor (including any sub-subcontractor), manufacturer, supplier or distributor to illustrate some portion of the Work.
- b. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
- c. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

B.18.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review of submittals by the Architect/Engineer is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, or for approval of safety precautions or, unless otherwise specifically stated by the Architect/Engineer, of any construction means, methods, techniques, sequences or procedures, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect/Engineer's review of the Contractor's submittals shall not relieve the Contractor of its obligations under the Contract Documents. The Architect/Engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component. Informational submittals upon which the Architect/Engineer is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect/Engineer without action.

B.18.3 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect/Engineer Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect/Engineer without action.

B.18.4 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

B.18.5 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect/Engineer.

B.18.6 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect/Engineer's review or approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect/Engineer in writing of such

deviation at the time of submittal and (i) the Architect/Engineer has given written approval to the specific deviation as a minor change in the Work, or (ii) a Change Order has been executed by Owner authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect/Engineer's review or approval thereof.

B.18.7 In the event that Owner elects not to have the obligations and duties described under this Section B.18 performed by the Architect/Engineer, or in the event no Architect/Engineer is employed by Owner on the project, all obligations and duties assigned to the Architect/Engineer hereunder shall be performed by the Owner's Authorized Representative

B.19 SUBSTITUTIONS

The Contractor may make Substitutions only with the consent of the Owner, after evaluation by the Owner's Authorized Representative and only in accordance with a Change Order. Substitutions shall be subject to the requirements of the bid documents. By making requests for Substitutions, the Contractor represents that the Contractor has personally investigated the proposed substitute product; represents that the Contractor will provide the same warranty for the Substitution that the Contractor would for the product originally specified unless approved otherwise; certifies that the cost data presented is complete and includes all related costs under this Contract including redesign costs, and waives all claims for additional costs related to the Substitution which subsequently become apparent; and will coordinate the installation of the accepted Substitution, making such changes as may be required for the Work to be completed in all respects.

B.20 USE OF PLANS AND SPECIFICATIONS

Plans, Specifications and related Contract Documents furnished to Contractor by Owner or Owner's Architect/Engineer shall be used solely for the performance of the Work under this Contract. Contractor and its Subcontractors and suppliers are authorized to use and reproduce applicable portions of such documents appropriate to the execution of the Work, but shall not claim any ownership or other interest in them beyond the scope of this Contract, and no such interest shall attach. Unless otherwise indicated, all common law, statutory and other reserved rights, in addition to copyrights, are retained by Owner.

B.21 FUNDS AVAILABLE AND AUTHORIZED

Owner reasonably believes at the time of entering into this Contract that sufficient funds are available and authorized for expenditure to finance the cost of this Contract within the Owner's appropriation or limitation. Contractor understands and agrees that, to the extent that sufficient funds are not available and authorized for expenditure to finance the cost of this Contract, Owner's payment of amounts under this Contract attributable to Services performed after the last day of the current budget year is contingent on Owner receiving from the Redmond City Council appropriations, limitations or other expenditure authority sufficient to allow Owner, in the exercise of its reasonable administrative discretion, to continue to make payments under this Contract.

B.22 NO THIRD PARTY BENEFICIARIES

Owner and Contractor are the only parties to this Contract and are the only parties entitled to enforce its terms. Nothing in this Contract gives, is intended to give, or shall be construed to give or provide any benefit or right, whether directly, indirectly, or otherwise, to third persons unless such third persons are individually identified by name herein and expressly described as intended beneficiaries of the terms of this Contract.

B.23 LIQUIDATED DAMAGES

Should the Contractor fail to complete the work, or any part thereof, in the time agreed upon in these Contract Documents or within such extra time as may have been allowed for delays by extensions granted as provided in these Contract Documents, the Contractor shall reimburse the City for the additional expense and damage for every day specified that the Agreement remains uncompleted after the date of specified completion. It is agreed that the amount of such additional expense and damage incurred by reason of failure to complete the work shall be as given in the following schedule for each workday the work exceeds the number of workdays specified.

<u>Original Contract Amount</u>	<u>Liquidated Damages</u>
Up to \$100,000	\$200
\$100,000 to \$500,000	\$500
Greater than \$500,000	\$800

The said amounts are hereby agreed upon as liquidated damages for the loss to the City on account of expenses for the employment of engineers, inspectors, and other employees after the expiration of the time of completion, and on account of the value of the operation of the work dependent thereon. Contractor acknowledges the above amount as a fair and reasonable estimate of the Owner's damages in the event it fails to perform the Work within the Contract Time. It is expressly understood and agreed that this amount is not to be considered in the nature of a penalty, but as liquidated damages which have accrued against the Contractor; and the City is authorized to deduct the amount of such damages from any monies due the Contractor for work performed or material furnished under this Agreement; and the Contractor and Contractors' Sureties shall be liable for any excess.

SECTION C WAGES AND LABOR

C.1 MINIMUM WAGE RATES ON PUBLIC WORKS

Contractor shall comply fully with the provisions of ORS 279C.800 through 279C.870. Documents establishing those conditions, as determined by the Commissioner of the Bureau of Labor and Industries (BOLI), are included as attachments to or are incorporated by reference in the Contract Documents. Contractor shall pay workers at not less than the specified minimum statements to the Owner's Authorized Representative, on the form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying the hourly rate of wage paid each worker which the Contractor or the Subcontractor has employed on the project and further certifying that no worker employed on the project has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract, which certificate and statement shall be verified by the oath of the Contractor or the Subcontractor that the Contractor or Subcontractor has read the certified statement, that the Contractor or Subcontractor knows the contents of the certified statement and that to the Contractor's or Subcontractor's best knowledge and belief the certified statement is true. The certified statements shall set out accurately and completely the payroll records for the prior week including the name and address of each worker, the worker's correct classification, rate of pay, daily and weekly number of hours worked, deductions made and actual wages paid. Certified statements for each week during which the Contractor or Subcontractor has employed a worker on the project shall be submitted once a month, by the fifth business day of the following month. The Contractor and Subcontractors shall preserve the certified statements for a period of ten (10) years from the date of completion of the Contract.

C.2.2 Pursuant to ORS 279C.845(7), the Owner shall retain 25 percent of any amount earned by the Contractor on this public works project until the Contractor has filed the certified statements required by section C.2.1. The Owner shall pay to the Contractor the amount retained under this subsection within 14 days after the Contractor files the required certified statements, regardless of whether a Subcontractor has failed to file certified statements.

C.2.3 Pursuant to ORS 279C.845(8), the Contractor shall retain 25 percent of any amount earned by a first-tier Subcontractor on this public works project until the first-tier Subcontractor has filed with the Owner the certified statements required by C.2.1. Before paying any amount retained under this subsection, the Contractor shall verify that the first-tier Subcontractor has filed the certified statement, Within 14 days after the first-tier Subcontractor files the required certified statement the Contractor shall pay the first-tier Subcontractor any amount retained under this subsection.

C.2.4 In accordance with statutory requirements, and administrative rules promulgated by the Commissioner of the Bureau of Labor and Industries, the fee required by ORS 279C.825(1) will be paid by Owner to the Commissioner.

C.3 PROMPT PAYMENT AND CONTRACT CONDITIONS

C.3.1 Pursuant to ORS 279C.505 and as a condition to Owner's performance hereunder, the Contractor shall:

C.3.1.1 Make payment promptly, as due, to all persons supplying to Contractor labor or materials for the prosecution of the Work provided for in this Contract.

C.3.1.2 Pay all contributions or amounts due the State Industrial Accident Fund from such Contractor or Subcontractor incurred in the performance of the Contract.

C.3.1.3 Not permit any lien or claim to be filed or prosecuted against the Owner on account of any labor or material furnished. Contractor will not assign any claims that Contractor has against Owner, or assign any sums due by Owner, to Subcontractors, suppliers, or manufacturers, and will not make any agreement or act in any way to give Subcontractors a claim or standing to make a claim against the Owner.

C.3.1.4 Pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

C.3.1.5 Demonstrate that an employee drug testing program is in place as follows:

- a. Contractor represents and warrants that Contractor has in place at the time of the execution of this Contract, and shall maintain during the term of this Contract, a Qualifying Employee Drug Testing Program for its employees that includes, at a minimum, the following:
 - 1) A written employee drug testing policy,
 - 2) Required drug testing for all new Subject Employees or, alternatively, required testing of all Subject Employees every 12 months on a random selection basis, and
 - 3) Required testing of a Subject Employee when the Contractor has reasonable cause to believe the Subject Employee is under the influence of drugs.
- b. A drug testing program that meets the above requirements will be deemed a "Qualifying Employee Drug Testing Program." For the purposes of this section, an employee is a "Subject Employee" only if that employee will be working on the project job site.
- c. Contractor shall require each Subcontractor providing labor for the project to:
 - 1) Demonstrate to the Contractor that it has a Qualifying Employee Drug Testing Program for the Subcontractor's Subject Employees, and represent and warrant to the Contractor that the Qualifying Employee Drug Testing Program is in place at the time of subcontract execution and will continue in full force and effect for the duration of the subcontract, or
 - 2) Require that the Subcontractor's Subject Employees participate in the Contractor's Qualifying Employee Drug Testing Program for the duration of the subcontract.

C.3.2 Pursuant to ORS 279C.515, and as a condition to Owner's performance hereunder, Contractor agrees:

C.3.2.1 If Contractor fails, neglects or refuses to pay promptly a person's claim for labor or services that the person provides to the Contractor or a Subcontractor in connection with the project as such claim becomes due, the proper officer that represents the Owner may pay the amount of the claim and charge the amount of the payment against funds due or to become due Contractor under this Contract. Paying a claim in this manner shall not relieve the Contractor or the Contractor's surety from obligation with respect to an unpaid claim.

C.3.2.2 If the Contractor or a first-tier Subcontractor fails, neglects or refuses to pay a person that provides labor or materials in connection with the public contract for a public improvement within thirty (30) Days after receiving payment from Owner or a contractor, the contractor or first-tier Subcontractor owes the person the amount due plus interest charges that begin at the end of the 10-Day period within which payment is due under ORS 279C.580(3) and that end upon final payment, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest on the amount due is nine percent per annum. The amount of interest may not be waived.

C.3.2.3 If the Contractor or a Subcontractor fails, neglects or refuses to pay a person that provides labor or materials in connection with the Contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580. Every contract related to this Contract must contain a similar clause.

C.3.3 Pursuant to ORS 279C.580, Contractor shall include in each subcontract for property or services the Contractor enters into with a first-tier Subcontractor, including a material supplier, for the purpose of performing a construction contract:

- a. A payment clause that obligates the Contractor to pay the first-tier Subcontractor for satisfactory performance under the subcontract within ten (10) Days out of amounts the Owner pays to the Contractor under the Contract;
- b. A clause that requires the Contractor to provide the first-tier Subcontractor with a standard form that the first-tier Subcontractor may use as an application for payment or as another method by which the Subcontractor may claim a payment due from the Contractor;
- c. A clause that requires the Contractor, except as otherwise provided in this paragraph, to use the same form and regular administrative procedures for processing payments during the entire term of the subcontract. The Contractor may change the form or the regular administrative procedures the Contractor uses for processing payments if the Contractor:
 - 1) Notifies the Subcontractor in writing at least 45 days before the date on which the Contractor makes the change; and
 - 2) Includes with the written notice a copy of the new or changed form or a description of the new or changed procedure.
- d. An interest penalty clause that obligates the Contractor, if the Contractor does not pay the first-tier Subcontractor within thirty (30) Days after receiving payment from Owner, to pay the first-tier Subcontractor an interest penalty on amounts due in each payment the Contractor does not make in accordance with the payment clause included in the subcontract under paragraph (a) of this subsection. Contractor or first-tier Subcontractor is not obligated to pay an interest penalty if the only reason that the Contractor or first-tier Subcontractor did not make payment when payment was due is that the Contractor or first-tier Subcontractor did not receive payment from Owner or Contractor when payment was due. The interest penalty applies to the period that begins on the day after the required payment date and that ends on the date on which the amount due is paid; and is computed at the rate specified in ORS 279C.515(2).
- e. A clause which requires each of Contractor's Subcontractors to include, in each of their contracts with lower-tier Subcontractors or suppliers, provisions to the effect that the first-tier Subcontractor shall pay its lower-tier Subcontractors and suppliers in accordance with the provisions of paragraphs (a) through (d) above and requiring each of their Subcontractors and suppliers to include such clauses in their subcontracts and supply contracts.

C.3.4 All employers, including Contractor, that employ subject workers who work under this contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. Contractor shall ensure that each of its Subcontractors complies with these requirements.

C.4 PAYMENT FOR MEDICAL CARE

Pursuant to ORS 279C.530, and as a condition to Owner's performance hereunder, Contractor shall promptly, as due, make payment to any person, partnership, association or corporation furnishing medical, surgical, and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such Contractor, all sums of which the Contractor agrees

to pay for such services and all moneys and sums which the Contractor has collected or deducted from the wages of personnel pursuant to any law, contract or agreement for the purpose of providing or paying for such services.

C.5 HOURS OF LABOR

As a condition to Owner's performance hereunder, Contractor shall comply with ORS 279C.520, as amended from time to time and incorporated herein by this reference:

Pursuant to ORS 279C.520 and as a condition to Owner's performance hereunder, no person shall be employed to perform Work under this Contract for more than ten (10) hours in any one day or forty (40) hours in any one week, except in cases of necessity, emergency or where public policy absolutely requires it. In such instances, Contractor shall pay the employee at least time and a half pay:

- a. For all overtime in excess of eight (8) hours a day or forty (40) hours in any one week when the work week is five consecutive Days, Monday through Friday; or
- b. For all overtime in excess of ten (10) hours a day or forty (40) hours in any one week when the work week is four consecutive Days, Monday through Friday; and
- c. For all Work performed on Saturday and on any legal holiday specified in ORS 279C.540.

This section C.5 will not apply to Contractor's Work under this Contract if Contractor is currently a party to a collective bargaining agreement with any labor organization.

This Section C.5 shall not excuse Contractor from completion of the Work within the time required under this Contract.

SECTION D CHANGES IN THE WORK

D.1 CHANGES IN WORK

D.1.1 The terms of this Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever without prior written approval of the Owner's Authorized Representative, and then only in a manner consistent with the Change Order provisions of this Section D.1 and after any necessary approvals required by public contracting laws have been obtained. Otherwise, a formal contract amendment is required, which shall not be effective until its execution by the parties to this Contract and all approvals required by public contracting laws have been obtained.

D.1.2 It is mutually agreed that changes in Plans, quantities, or details of construction are inherent in the nature of construction and may be necessary or desirable during the course of construction. Within the general scope of this Contract, the Owner's Authorized Representative may at any time, without notice to the sureties and without impairing the Contract, require changes consistent with this Section D.1. All Change Order Work shall be executed under the conditions of the Contract Documents. Such changes may include, but are not limited to:

- a. Modification of specifications and design.
- b. Increases or decreases in quantities.
- c. Increases or decreases to the amount of Work.
- d. Addition or elimination of any Work item.
- e. Change in the duration of the project.
- f. Acceleration or delay in performance of Work.
- g. Deductive changes.

Deductive changes are those that reduce the scope of the Work, and shall be made by mutual agreement whenever feasible, as determined by Owner. In cases of suspension or partial termination under Section J, Owner reserves the right to unilaterally impose a deductive change and to self perform such Work, for which the provisions of B.13 (Owner's Right to Do Work) shall then apply.

Adjustments in compensation shall be made under the provisions of D.1.3, in which costs for deductive changes shall be based upon a Direct Costs adjustment together with the related percentage markup specified for profit, Overhead and other indirect costs, unless otherwise agreed to by Owner.

D.1.3 The Owner and Contractor agree that Change Order Work shall be administered and compensated according to the following:

- a. *Unit pricing* may be utilized at the Owner's option when unit prices or solicitation alternates were provided that established the cost for additional Work, and a binding obligation exists under the Contract on the parties covering the terms and conditions of the additional Work.
- b. If the Owner elects not to utilize unit pricing, or in the event that unit pricing is not available or appropriate, *fixed pricing* may be used for Change Order Work. In fixed pricing the basis of payments or total price shall be agreed upon in writing between the parties to the Contract, and shall be established before the Work is done whenever feasible. The mark-ups set forth in D.1.3(c) shall be utilized by the parties as a guide in establishing fixed pricing, and will not be exceeded by Owner without adequate justification. Cost and price data relating to Change Orders shall be supplied by Contractor to Owner upon request, but Owner shall be under no obligation to make such requests.
- c. In the event that unit pricing and fixed pricing are not utilized, then Change Order Work shall be performed on a *cost reimbursement* basis for Direct Costs. Such Work shall be

compensated on the basis of the actual, reasonable and allowable cost of labor, equipment, and material furnished on the Work performed. In addition, the following markups shall be added to the Contractor's or Subcontractor's Direct Costs as full compensation for profit, Overhead and other indirect costs for Work directly performed with the Contractor's or Subcontractor's own forces:

- On Labor..... 15%
- On Equipment..... 10%
- On Materials..... 10%

- d. When Change Order Work under D.1.3(c) is invoiced by an authorized Subcontractor at any level, each ascending tier Subcontractor or Contractor will be allowed a 5% supplemental mark-up on each piece of subcontract Work covered by such Change Order.
- e. Payments made to the Contractor shall be complete compensation for Overhead, profit, and all costs that were incurred by the Contractor or by other forces furnished by the Contractor, including Subcontractors, for Change Order Work. Owner may establish a maximum cost for Change Order Work under this Section D.1.3(c), which shall not be exceeded for reimbursement without additional written authorization from Owner. Contractor shall not be required to complete such Change Order Work without additional authorization.

D.1.4 Any necessary adjustment of Contract Time that may be required as a result of a Change Order must be agreed upon by the parties before the start of the Change Order Work unless Owner's Authorized Representative authorizes Contractor to start the Work before agreement on Contract Time adjustment. Contractor shall submit any request for additional compensation (and additional Contract Time if Contractor was authorized to start Work before an adjustment of Contract Time was approved) as soon as possible but no later than thirty (30) Days after receipt of the Change Order. If Contractor's request for additional compensation or adjustment of Contract Time is not made within the thirty (30) day time limit, Contractor's requests pertaining to that Change Order are barred. The thirty (30) day time limit for making requests shall not be extended for any reason, including without limitation Contractor's claimed inability to determine the amount of additional compensation or adjustment of Contract Time, unless an extension is granted in writing by Owner. If the Owner's Authorized Representative denies Contractor's request for additional compensation or adjustment of Contract Time, Contractor may proceed to file a Claim under Section D.3, Claims Review Process. No other reimbursement, compensation, or payment will be made, except as provided in Section D.1.5 for impact claims.

D.1.5 If any Change Order Work under Section D.1.3 causes an increase or decrease in the Contractor's cost of, or the Contract Time required for the performance of, any other part of the Work under this Contract, the Contractor must submit a written request to the Owner's Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt of the Change Order by Contractor. The thirty (30) day time limit applies to claims of Subcontractors, suppliers, or manufacturers that may be affected by the Change Order and that request additional compensation or an extension of Contract Time to perform; Contractor has responsibility for contacting its Subcontractors, suppliers, or manufacturers within the thirty (30) day time limit, and including their requests with Contractor's requests. If the request involves Work to be completed by Subcontractors, or materials to be furnished by suppliers or manufacturers, such requests shall be submitted to the Contractor in writing with full analysis and justification for the compensation and additional Contract Time requested. The Contractor will analyze and evaluate the merits of the requests submitted by Subcontractors, suppliers, and manufacturers to Contractor prior to including those requests and Contractor's analysis and evaluation of those requests with Contractor's requests for additional compensation or Contract Time that Contractor

submits to the Owner's Authorized Representative. Failure of Subcontractors, suppliers, manufacturers or others to submit their requests to Contractor for inclusion with Contractor's requests submitted to Owner's Authorized Representative within the time period and by the means described in this section shall constitute a waiver of these Subcontractor claims. The Owner's Authorized Representative and the Owner will not consider direct requests or claims from Subcontractors, suppliers, manufacturers or others not a party to this Contract. The consideration of such requests and claims under this section does not give any person, not a party to the Contract the right to bring a claim against the Owner, whether in this claims process, in litigation, or in any dispute resolution process. If the Owner's Authorized Representative denies the Contractor's request for additional compensation or an extension of Contract Time, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

D.1.6 No request or Claim by the Contractor for additional costs or an extension of Contract Time shall be allowed if made after receipt of final payment application under this Contract. Contractor agrees to submit its final payment application within ninety (90) days after Substantial Completion, unless written extension is granted by Owner. Contractor shall not delay final payment application for any reason, including without limitation nonpayment of Subcontractors, suppliers, manufacturers or others not a party to this Contract, or lack of resolution of a dispute with Owner or any other person of matters arising out of or relating to the Contract. If Contractor fails to submit its final payment application within ninety (90) days after Substantial Completion, and Contractor has not obtained written extension by Owner, all requests or Claims for additional costs or an extension of Contract Time shall be waived.

D.1.7 It is understood that changes in the Work are inherent in construction of this type. The number of changes, the scope of those changes, and the effect they have on the progress of the original Work cannot be defined at this time. The Contractor is notified that numerous changes may be required and that there will be no compensation made to the Contractor directly related to the number of changes. Each change will be evaluated for extension of Contract Time and increase or decrease in compensation based on its own merit.

D.2 DELAYS

D.2.1 Delays in construction include "Avoidable Delays", which are defined in Section D.2.1.1, and "Unavoidable Delays", which are defined in Section D.2.1.2. The effect of Avoidable Delays is described in Section D.2.2 and the effect of Unavoidable Delays is described in Section D.2.3.

D.2.1.1 Avoidable Delays include any delays other than Unavoidable Delays, and include delays that otherwise would be considered Unavoidable Delays but that:

- a. Could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its Subcontractors.
- b. Affect only a portion of the Work and do not necessarily prevent or delay the prosecution of other parts of the Work nor the completion of the whole Work within the Contract Time.
- c. Do not impact activities on the accepted critical path schedule.
- d. Are associated with the reasonable interference of other contractors employed by the Owner that do not necessarily prevent the completion of the whole Work within the Contract Time.

D.2.1.2 Unavoidable Delays include delays other than Avoidable Delays that are:

- a. Caused by any actions of the Owner, Owner's Authorized Representative, or any other employee or agent of the Owner, or by separate contractor employed by the Owner.

Contractor acknowledges that third-party utility companies operating in the public right-of-way are not agents of Owner or otherwise able to act on Owner's behalf.

- b. Caused by any site conditions which differ materially from what was represented in the Contract Documents or from conditions that would normally be expected to exist and be inherent to the construction activities defined in the Contract Documents. The Contractor shall notify the Owner's Authorized Representative immediately of differing site conditions before the area has been disturbed. The Owner's Authorized Representative will investigate the area and make a determination as to whether or not the conditions differ materially from either the conditions stated in the Contract Documents or those which could reasonably be expected in execution of this particular Contract. If Contractor and the Owner's Authorized Representative agree that a differing site condition exists, any additional compensation or additional Contract Time will be determined based on the process set forth in Section D.1.5 for Change Order Work. If the Owner's Authorized Representative disagrees that a differing site condition exists and denies Contractor's request for additional compensation or Contract Time, Contractor may proceed to file a Claim under Section D.3, Claims Review Process.
- c. Caused by Force Majeure acts, events or occurrences that could not have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its Subcontractors.
- d. Caused by adverse weather conditions. Any adverse weather conditions must be substantiated by documentary evidence that weather conditions were abnormal for the specific time period claimed, could not have been anticipated by the Contractor, and adversely impacted the project in a manner that could not be avoided by rescheduling the Work or by implementing measures to protect against the weather so that the Work could proceed. A rain, windstorm, high water, or other natural phenomenon for the specific locality of the Work, which might reasonably have been anticipated from the previous 10-year historical records of the general locality of the Work, shall not be construed as abnormal. The parties agree that rainfall greater than the following levels cannot be reasonably anticipated:
 - 1) Daily rainfall equal to, or greater than, 0.50 inch during a month when the monthly rainfall exceeds the normal monthly average by twenty-five percent (25 %) or more.
 - 2) daily rainfall equal to, or greater than, 0.75 inch at any time.
 - 3) The Office of the Environmental Data Service of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce nearest the project site shall be considered the official agency of record for weather information.

D.2.2 Except as otherwise provided in ORS 279C.315, Contractor shall not be entitled to additional compensation or additional Contract Time for Avoidable Delays.

D.2.3 In the event of Unavoidable Delays, based on principles of equitable adjustment, Contractor may be entitled to the following:

- a. Contractor may be entitled to additional compensation or additional Contract Time, or both, for Unavoidable Delays described in Section D.2.1.2 (a) and (b).
- b. Contractor may be entitled to additional Contract Time for Unavoidable Delays described in Section D.2.1.2(c) and (d).

In the event of any requests for additional compensation or additional Contract Time, or both, as applicable, arising under this Section D.2.3 for Unavoidable Delays, other than requests for additional compensation or additional Contract Time for differing site conditions for which a review process is established under Section D.2.1.2 (b), Contractor shall submit a written notification of the delay to the Owner's Authorized Representative within two (2) Days of the occurrence of the cause of the delay. This written notification shall state the cause of the potential delay, the project

components impacted by the delay, and the anticipated additional Contract Time or the additional compensation, or both, as applicable, resulting from the delay. Within seven (7) Days after the cause of the delay has been mitigated, or in no case more than thirty (30) Days after the initial written notification, the Contractor shall submit to the Owner's Authorized Representative, a complete and detailed request for additional compensation or additional Contract Time, or both, as applicable, resulting from the delay. If the Owner's Authorized Representative denies Contractor's request for additional compensation or adjustment of Contract Time, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process. If Contractor does not timely submit the notices required under this Section D.2., then unless otherwise prohibited by law, Contractor's Claim shall be barred.

D.3 CLAIMS REVIEW PROCESS

D.3.1 All Contractor Claims shall be referred to the Owner's Authorized Representative for review. Contractor's Claims, including Claims for additional compensation or additional Contract Time, shall be submitted in writing by Contractor to the Owner's Authorized Representative within five (5) Days after a denial of Contractor's initial request for an adjustment of Contract terms, payment of money, extension of Contract Time or other relief, provided that such initial request has been submitted in accordance with the requirements and within the time limits established in these General Conditions. Within thirty (30) Days after the initial Claim, Contractor shall submit to the Owner's Authorized Representative, a complete and detailed description of the Claim (the "Detailed Notice") that includes all information required by Section D.3.2. Unless the Claim is made in accordance with these time requirements, it shall be waived.

D.3.2 The Detailed Notice of the Claim shall be submitted in writing by Contractor and shall include a detailed, factual statement of the basis of the Claim, pertinent dates, Contract provisions which support or allow the Claim, reference to or copies of any documents which support the Claim, the dollar value of the Claim, and the Contract Time extension requested for the Claim. If the Claim involves Work to be completed by Subcontractors, the Contractor will analyze and evaluate the merits of the Subcontractor claim prior to forwarding it and that analysis and evaluation to the Owner's Authorized Representative. The Owner's Authorized Representative and the Owner will not consider direct claims from Subcontractors, suppliers, manufacturers, or others not a party to this Contract. Contractor agrees that it will make no agreement, covenant, or assignment, nor will it commit any other act that will permit or assist any Subcontractor, supplier, manufacturer, or other to directly or indirectly make a claim against Owner.

D.3.3 The Owner's Authorized Representative will review all Claims and take one or more of the following preliminary actions within ten (10) Days of receipt of the Detailed Notice of a Claim: (1) request additional supporting information from the Contractor; (2) inform the Contractor and Owner in writing of the time required for adequate review and response; (3) reject the Claim in whole or in part and identify the reasons for rejection; (4) based on principles of equitable adjustment, recommend approval of all or part of the Claim; or (5) propose an alternate resolution.

D.3.4 The Owner's Authorized Representative's decision shall be final and binding on the Contractor unless appealed by written notice to the Owner within fifteen (15) Days of receipt of the decision. The Contractor must present written documentation supporting the Claim within fifteen (15) Days of the notice of appeal. After receiving the appeal documentation, the Owner shall review the materials and render a decision within thirty (30) Days after receiving the appeal documents.

D.3.5 The decision of the Owner shall be final and binding unless the Contractor delivers to the Owner its requests for mediation, which shall be a non-binding process, within fifteen (15) Days of the date of the Owner's decision. The mediation process will be considered to have commenced as of the date the Contractor delivers the request. Both parties acknowledge and agree that participation in mediation is a prerequisite to commencement of litigation of any disputes relating to the Contract. Both parties further agree to exercise their best efforts in good faith to resolve all disputes within sixty (60) Days of the commencement of the mediation through the mediation process set forth herein. In the event that a lawsuit must be filed within this sixty (60) day period in order to preserve a cause of action, the parties agree that notwithstanding the filing, they shall proceed diligently with the mediation to its conclusion prior to actively prosecuting the lawsuit, and shall seek from the Court in which the lawsuit is pending such stays or extensions, including the filing of an answer, as may be necessary to facilitate the mediation process. Further, in the event settlements are reached on any issues through mediation, the parties agree to promptly submit the appropriate motions and orders documenting the settlement to the Court for its signature and filing.

D.3.6 The mediator shall be an individual mutually acceptable to both parties, but in the absence of agreement each party shall select a temporary mediator and the temporary mediators shall jointly select the permanent mediator. Each party shall pay its own costs for the time and effort involved in mediation. The cost of the mediator shall be split equally between the two parties. Both parties agree to exercise their best effort in good faith to resolve all disputes in mediation. Participation in mediation is a mandatory requirement of both the Owner and the Contractor. The schedule, time and place for mediation will be mutually acceptable, or, failing mutual agreement, shall be as established by the mediator. The parties agree to comply with Owner's administrative rules governing the confidentiality of mediation, if any, and shall execute all necessary documents to give effect to such confidentiality rules. In any event, the parties shall not subpoena the mediator or otherwise require the mediator to produce records, notes or work product, or to testify in any future proceedings as to information disclosed or representations made in the course of mediation, except to the extent disclosure is required by law.

D.3.7 Owner may at any time and at its discretion issue a construction change directive adding to, modifying or reducing the scope of Work. Contractor and Owner shall negotiate the need for any additional compensation or additional Contract Time related to the change, subject to the procedures for submitting requests or Claims for additional compensation or additional Contract Time established in this Section D. Unless otherwise directed by Owner's Authorized Representative, Contractor shall proceed with the Work while any request or Claim is pending, including but not limited to, a request or Claim for additional compensation or additional Contract Time resulting from Work under a Change Order or construction change directive. Regardless of the review period or the final decision of the Owner's Authorized Representative, the Contractor shall continue to diligently pursue the Work as identified in the Contract Documents. In no case is the Contractor justified or allowed to cease Work without a written stop work order from the Owner or Owner's Authorized Representative.

SECTION E PAYMENTS

E.1 SCHEDULE OF VALUES

The Contractor shall submit, at least ten (10) Days prior to submission of its first application for progress payment, a schedule of values ("Schedule of Values") for the contracted Work. This schedule will provide a breakdown of values for the contracted Work and will be the basis for progress payments. The breakdown will demonstrate reasonable, identifiable, and measurable components of the Work. Unless objected to by the Owner's Authorized Representative, this schedule shall be used as the basis for reviewing Contractor's applications for payment. If objected to by Owner's Authorized Representative, Contractor shall revise the schedule of values and resubmit the same for approval of Owner's Authorized Representative.

E.2 APPLICATIONS FOR PAYMENT

E.2.1 Owner shall make progress payments on the Contract monthly as Work progresses. Payments shall be based upon estimates of Work completed and the Schedule of Values. All payments shall be approved by the Owner's Authorized Representative. A progress payment shall not be considered acceptance or approval of any Work or waiver of any defects therein. Owner shall pay to Contractor interest on the progress payment, not including retainage, due the Contractor. The interest shall commence thirty (30) Days after the receipt of invoice ("application for payment") from the Contractor or fifteen (15) Days after the payment is approved by the Owner's Authorized Representative, whichever is the earlier date. The rate of interest shall equal three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is thirty (30) Days after receipt of the application for payment from the Contractor or fifteen (15) Days after the payment is approved by the Owner, whichever is the earlier date, but the rate of interest shall not exceed thirty (30) percent. Notwithstanding the foregoing, in instances when an application for payment is filled out incorrectly, or when there is any defect or impropriety in any submitted application or when there is a good faith dispute, Owner shall so notify the Contractor within fifteen (15) Days stating the reason or reasons the application for payment is defective or improper or the reasons for the dispute. A defective or improper application for payment, if corrected by the Contractor within seven (7) Days of being notified by the Owner, shall not cause a payment to be made later than specified in this section unless interest is also paid. Accrual of interest will be postponed when payment on the principal is delayed because of disagreement between the Owner and the Contractor. Owner reserves the right, instead of requiring the Contractor to correct or resubmit a defective or improper application for payment, to reject the defective or improper portion of the application for payment and pay the remainder of the application for payment that is correct and proper. Owner, upon written notice to the Contractor, may elect to make payments to the Contractor only by means of Electronic Funds Transfers (EFT) through Automated Clearing House (ACH) payments. If Owner makes this election, the Contractor will be required to arrange to receive EFT/ACH payments.

E.2.2 Contractor shall submit to the Owner's Authorized Representative, an application for each payment and, if required, receipts or other vouchers showing payments for materials and labor, including payments to Subcontractors. Contractor shall include, in its application for payment, a schedule of the percentages of the various parts of the Work completed, based on the Schedule of Values which shall aggregate to the payment application total, and shall include, on the face of each copy thereof, a certificate in substantially the following form:

"I, the undersigned, hereby certify that the above bill is true and correct, and the payment therefore, has not been received.

Signed: _____"

E.2.3 Generally, applications for payment will be accepted only for materials that have been installed. Under special conditions, applications for payment for stored materials will be accepted at Owner's sole discretion. Such a payment, if made, will be subject to the following conditions:

- a. The request for stored material shall be submitted at least thirty (30) Days in advance of the application for payment on which it appears. Applications for payment shall be entertained for major equipment, components or expenditures only.
- b. The Contractor shall submit applications for payment showing the quantity and cost of the material stored.
- c. The material shall be stored in a bonded warehouse and Owner's Authorized Representative shall be granted the right to access the material for the purpose of removal or inspection at any time during the Contract Period.
- d. The Contractor shall name the Owner as co-insured on the insurance policy covering the full value of the property while in the care and custody of the Contractor until it is installed. A certificate noting this coverage shall be issued to the Owner.
- e. Payments shall be made for materials only. The submitted amount of the application for payment shall be reduced by the cost of transportation and for the cost of an inspector to check the delivery at out of town storage sites. The cost of said inspection shall be borne solely by the Contractor.
- f. Within sixty (60) Days of the application for payment, the Contractor shall submit evidence of payment covering the material stored.
- g. Payment for stored materials shall in no way indicate acceptance of the materials or waive any rights under this Contract for the rejection of the Work or materials not in conformance with the Contract Documents.
- h. All required documentation must be submitted with the respective application for payment.

E.2.4 The Owner reserves the right to withhold all or part of a payment, or may nullify in whole or part any payment previously made, to such extent as may be necessary in the Owner's opinion to protect the Owner from loss because of:

- a. Work that is defective and not remedied, or that has been demonstrated or identified as failing to conform with the Contract Documents,
- b. Third party claims filed or evidence reasonably indicating that such claims will likely be filed unless security acceptable to the Owner is provided by the Contractor;
- c. Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment (in which case Owner may issue checks made payable jointly to Owner and such unpaid persons under this provision, or directly to Subcontractors and suppliers at any level under Section C.3.2.1);
- d. Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;
- e. Damage to the Owner or another contractor;
- f. Reasonable evidence that the Work will not be completed within the Contract Time required by the Contract, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- g. Failure to carry out the Work in accordance with the Contract Documents; or
- h. Assessment of liquidated damages, when withholding is made for offset purposes.

E.2.5 Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- a. Take that portion of the Contract Price properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Price allocated to that portion of the Work in the Schedule of Values, less retainage as provided in Section E.5. Pending final determination of cost to the Owner of changes in the Work, no amounts for changes in the Work can be included in application for payment until the Contract Price has been adjusted by Change Order;
- b. Add that portion of the Contract Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner pursuant to Section E.2.3, suitably stored off the site at a location agreed upon in writing), less retainage as provided in Section E.5;
- c. Subtract the aggregate of previous payments made by the Owner; and
- d. Subtract any amounts for which the Owner's Authorized Representative has withheld or nullified payment as provided in the Contract Documents.

E.2.6 Contractor's applications for payment may not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier.

E.2.7 The Contractor warrants to Owner that title to all Work covered by an application for payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an application for payment all Work for which payments are received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

E.2.8 If Contractor disputes any determination by Owner's Authorized Representative with regard to any application for payment, Contractor nevertheless shall continue to prosecute expeditiously the Work. No payment made hereunder shall be or be construed to be final acceptance or approval of that portion of the Work to which such partial payment relates or shall relieve Contractor of any of its obligations hereunder.

E.3 PAYROLL CERTIFICATION REQUIREMENT

Payroll certification is required before payments are made on the Contract. Refer to Section C.2 for this information.

E.4 DUAL PAYMENT SOURCES

[SECTION INTENTIONALLY OMITTED]

E.5 RETAINAGE

E.5.1 Retainage shall be withheld and released in accordance with ORS 279C.550 to 279C.580:

E.5.1.1 Owner may reserve as retainage from any progress payment an amount not to exceed five percent of the payment. As Work progresses, Owner may reduce the amount of the retainage and may eliminate retainage on any remaining monthly Contract payments after 50 percent of the Work under the Contract is completed if, in the Owner's opinion, such Work is progressing satisfactorily. Elimination or reduction of retainage shall be allowed only upon written application by the Contractor, which application shall include written approval of Contractor's surety; except that when the Work is 97-1/2 percent completed the Owner may, at its discretion and without

application by the Contractor, reduce the retained amount to 100 percent of the value of the Work remaining to be done. Upon receipt of written application by the Contractor, Owner shall respond in writing within a reasonable time.

E.5.1.2 In accordance with the provisions of ORS 279C.560 and any applicable administrative rules, unless the Owner finds in writing that accepting a bond, security or other instrument described in options (a) or (c) below poses an extraordinary risk that is not typically associated with the bond, security or instrument, the Owner will approve the Contractor's written request:

- a. to be paid amounts which would otherwise have been retained from progress payments where Contractor has deposited acceptable bonds, securities or other instruments of equal value with Owner or in a custodial account or other mutually-agreed account satisfactory to Owner, with an approved bank or trust company to be held in lieu of the cash retainage for the benefit of Owner. Interest or earnings on the bonds, securities or other instruments shall accrue to the Contractor. The Contractor shall execute and provide such documentation and instructions respecting the bonds, securities and other instruments as the Owner may require to protect its interests. To be permissible the bonds, securities and other instruments must be of a character approved by the Owner, including but not limited to:
 - 1) Bills, certificates, notes or bonds of the United States.
 - 2) Irrevocable letters of credit issued by an insured institution, as defined in ORS 706.008.
- b. that retainage be deposited in an interest bearing account, established through the State Treasurer for state agencies, in a bank, savings bank, trust company or savings association for the benefit of Owner, with interest from such account accruing to the Contractor; or
- c. that the Contractor be allowed, with the approval of the Owner, to deposit a surety bond for the benefit of Owner, in a form acceptable to Owner, in lieu of all or a portion of funds retained, or to be retained. Such bond and any proceeds therefrom shall be made subject to all claims and liens in the manner and priority as set forth for retainage under ORS 279C.550 to ORS 279C.625.
- d. Where the Owner has accepted the Contractor's election of any of the options above, Owner may recover from Contractor any additional costs incurred through such election by reducing Contractor's final payment. Where the Owner has agreed to Contractor's request to deposit a surety bond under option (c), Contractor shall accept like bonds from Subcontractors and suppliers on the project from which Contractor has required retainage.

E.5.1.3 The retainage held by Owner shall be included in and paid to the Contractor as part of the final payment of the Contract Price. The Owner shall pay to Contractor interest at the rate of one and one-half percent per month on the final payment due Contractor, interest to commence thirty (30) Days after the Work under the Contract has been completed and accepted and to run until the date Contractor shall notify Owner in writing when the Contractor considers the Work complete and Owner shall, within fifteen (15) Days after receiving the written notice, either accept the Work or notify the Contractor of Work yet to be performed on the Contract. If Owner does not within the time allowed notify the Contractor of Work yet to be performed to fulfill contractual obligations, the interest provided by this subsection shall commence to run thirty (30) Days after the end of the 15-Day period.

E.5.1.4 In accordance with the provisions of ORS 279C.560, if the Owner accepts bonds, securities or other instruments deposited as provided in paragraphs (a) and (c) of subsection

E.5.1.2. The Owner shall reduce the moneys held as retainage in an amount equal to the value of the bonds, securities and other instruments and pay the amount of the reduction to the Contractor in accordance with ORS 279C.570.

E.5.1.5 Contractor agrees that if Contractor elects to reserve a retainage from any progress payment due to any Subcontractor or supplier, such retainage shall not exceed five percent of the payment, and such retainage withheld from Subcontractors and suppliers shall be subject to the same terms and conditions stated in Subsection E.5 as apply to Owner's retainage from any progress payment due to Contractor. Provided, however, if in accordance with the provisions of ORS 279C.560 the Contractor has deposited bonds, securities or other instruments or has elected to have the Owner deposit accumulated retainage in an interest-bearing account, the Contractor shall comply with the provisions of ORS 701.435 respecting the deposit of bonds, securities or other instruments by Subcontractors and suppliers and the sharing of interest earnings with Subcontractors and suppliers.

E.5.2 As provided in subsections C.2.2 and C.2.3, additional retainage in the amount of 25% of amounts earned shall be withheld and released in accordance with ORS 279C.845(7) when the Contractor fails to file certified statements as required by section C.2.1.

E.5.3 The Owner may, at its sole discretion, issue a written notice of Substantial Completion for the purpose of establishing the starting date for specific guarantees, and to establish the date that the Owner will assume the responsibility for the cost of operating such portions of the Project. Said notice shall not be considered as final acceptance of any portion of the Work or relieve the Contractor from completing the remaining Work within the specified time and in full compliance with the Contract Documents. All equipment contained in the Work, plus all other components necessary to enable the Owner to operate the facility in the manner that was intended, shall be complete including acceptable testing as specified in these Contract Documents on the Substantial Completion date. The Owner shall have the right to exclude Contractor from the project after the date of Substantial Completion, but the Owner shall allow Contractor reasonable access to complete or correct remaining items of Work.

E.6 FINAL PAYMENT

E.6.1 Upon completion of all the Work under this Contract, the Contractor shall notify the Owner's Authorized Representative, in writing, that Contractor has completed Contractor's part of the Contract and shall request final payment. Upon receipt of such notice the Owner's Authorized Representative will inspect the Work, and if acceptable, submit to the Owner a recommendation as to acceptance of the completed Work and the final estimate of the amount due the Contractor. If the Work is not acceptable, Owner will notify Contractor within fifteen (15) Days of Contractor's request for final payment. Upon approval of this final estimate by the Owner and compliance by the Contractor with provisions in Section K. 3 AFFIDAVIT/RELEASE OF LIENS AND CLAIMS, and other provisions as may be applicable, the Owner shall pay to the Contractor all monies due under the provisions of these Contract Documents.

E.6.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Owner's Authorized Representative (1) a notarized affidavit/release of liens and claims in a form satisfactory to Owner that states that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) Days' prior written notice has been given to the Owner,

(3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

E.6.3 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final application for payment.

SECTION F JOB SITE CONDITIONS

F.1 USE OF PREMISES

Contractor shall confine equipment, storage of materials and operation of Work to the limits indicated by Contract Documents, law, ordinances, permits or directions of the Owner's Authorized Representative. Contractor shall follow the Owner's Authorized Representative's instructions regarding use of premises, if any.

F.2 PROTECTION OF WORKERS, PROPERTY, AND THE PUBLIC

F.2.1 Contractor shall maintain continuous and adequate protection of all of the Work from damage, and shall protect the Owner's Authorized Representative, workers and property from injury or loss arising in connection with this Contract. Contractor shall remedy acceptably to the Owner, any damage, injury, or loss, except such as may be directly due to errors in the Contract Documents or caused by authorized representatives or personnel of the Owner. Contractor shall adequately protect adjacent property as provided by law and the Contract Documents.

F.2.2 Contractor shall take all necessary precautions for the safety of all personnel on the job site, and shall comply with the Contract Documents and all applicable provisions of federal, state and municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for protection of workers and the public against any hazards created by construction. Contractor shall designate a responsible employee or associate on the Work site, whose duty shall be the prevention of accidents. The name and position of the person designated shall be reported to the Owner's Authorized Representative. The Owner's Authorized Representative has no responsibility for Work site safety. Work site safety is the responsibility of the Contractor.

F.2.3 Contractor shall not enter upon private property without first obtaining permission from the property owner or its duly authorized representative. Contractor shall be responsible for the preservation of all public and private property along and adjacent to the Work contemplated under the Contract and shall use every precaution necessary to prevent damage thereto. In the event the Contractor damages any property, the Contractor shall at once notify the property owner and make, or arrange to make, full restitution. Contractor shall immediately and in writing, report to the Owner's Authorized Representative, all pertinent facts relating to such property damage and the ultimate disposition of the claim for damage.

F.2.4 Contractor is responsible for protection of adjacent work areas including impacts brought about by activities, equipment, labor, utilities, and materials on the site.

F.2.5 Contractor shall at all times direct its activities in such a manner as to minimize adverse effects on the environment. Handling of all materials will be conducted so no release will occur that may pollute or become hazardous.

F.2.6 In an emergency affecting the safety of life or of the Work or of adjoining property, the Contractor, without special instruction or authorization from the Owner's Authorized Representative, shall act reasonably to prevent threatened loss or injury, and shall so act, without appeal, if instructed by the Owner's Authorized Representative. Any compensation claimed by the Contractor on account of emergency work shall be determined in accordance with Section D.

F.2.7 The Contractor is responsible for coordinating with utility owners. Before the Contractor performs any excavation she/he is to contact the Utilities Notification Center at 1-800-332-2344

at least forty-eight (48) hours prior to excavation. The Contractor shall conform to the requirements of ORS 757.541 to 757.571.

F.2.8 The Contractor will be responsible to maintain two-way traffic at all times unless otherwise specified. The public streets shall be open for two-way traffic at all times when the Contractor is not performing work unless otherwise specified. Approaches to all properties accessing to the project shall be maintained by the Contractor at all times except for short periods necessary to the progress of the construction.

F.2.9 The Contractor shall conduct the project with proper regard for the safety and convenience of the public. When the project involves use of public ways, Contractor shall provide flagmen when directed and install and maintain means of free access to all fire hydrants, service stations, warehouses, stores, houses, garages and other property. Private residential driveways shall be closed only with approval of the Architect/Engineer or specific permission of the property owner. The Contractor shall not interfere with normal operation of public transit vehicles unless otherwise authorized. The Contractor shall not obstruct or interfere with travel over any public street or sidewalk without approval. Where detours are necessary, they shall be maintained with good surface and shall be clearly marked. The Contractor shall provide open trenches and excavations with adequate barricades of an approved type which can be seen from a reasonable distance. At night, the Contractor shall mark all open work and obstructions by lights. The Contractor shall install and maintain all necessary signs, lights, flares, barricades, railings, runways, stairs, bridges and facilities. The Contractor shall observe all safety instructions received from the Architect/Engineer or governmental authorities, but following of such instructions shall not relieve the Contractor from the responsibility or liability for accidents to workers or damage or injury to person or property.

F.2.10 Emergency traffic such as police, fire and disaster units shall be provided reasonable access to the work area at all times. The Contractor shall be liable for any damages which may result from failure to provide such reasonable access or failure to notify the appropriate authority.

F.3 CUTTING AND PATCHING

F.3.1 Contractor shall be responsible for coordinating all cutting, fitting, or patching of the Work to make its several parts come together properly and fit to receive or be received by work of other contractors or Subcontractors shown upon, or reasonably implied by, the Contract Documents.

F.3.2 Contractor shall be responsible for restoring all cut, fitted, or patched surfaces to an original condition; provided, however, that if a different condition is specified in the Contract Documents, then Contractor shall be responsible for restoring such surfaces to the condition specified in the Contract Documents.

F.4 CLEANING UP

From time to time as may be ordered by the Owner the Contractor shall, at its own expense, clean up and remove all refuse and unused materials of any kind resulting from the Work. If Contractor fails to do so within twenty-four hours after notification by the Owner the work may be done by others and the cost charged to the Contractor and deducted from payment due the Contractor.

F.5 ENVIRONMENTAL CONTAMINATION

F.5.1 Contractor will be held responsible for and shall indemnify, defend (with counsel of Owner's choice) and hold harmless Owner from and against any costs, expenses, damages, claims, and causes of action, (including attorney fees), or any of them, resulting from all spills, releases, discharges, leaks and disposal of environmental pollution, including storage, transportation, and

handling during the performance of the Contract which occur as a result of, or are contributed by, the negligence or actions of the Contractor or its personnel, agents, or Subcontractors or any failure to perform in accordance with the Contract Documents (except to the extent otherwise void under ORS 30.140). Nothing in this section F.5.1 shall limit Contractor's responsibility for obtaining insurance coverages required under Section G.3 of these General Conditions, and Contractor shall take no action that would void or impair such coverages

F.5.1.1 Contractor agrees to promptly dispose of such spills, releases, discharge or leaks to the satisfaction of Owner and proper regulatory agencies in a manner that complies with applicable federal, state, and local laws and regulations. Cleanup shall be at no cost to the Owner and be performed by properly qualified personnel.

F.5.1.2 Contractor shall obtain the Owner's written consent prior to bringing onto the Work site any (i) environmental pollutants or (ii) hazardous substances or materials, as the same or reasonably similar terms are used in any applicable federal, state, or local statutes, rules or ordinances. Notwithstanding such written consent from the Owner, the Contractor, at all times, shall:

- a. properly handle, use and dispose of all environmental pollutants and hazardous substances or materials brought onto the Work site, in accordance with all applicable federal, state, or local statutes, rules, or ordinances;
- b. be responsible for any and all spills, releases, discharges, or leaks of (or from) environmental pollutants or hazardous substances or materials which Contractor has brought onto the Work site; and
- c. promptly clean up, without cost to the Owner, such spills, releases, discharges, or leaks to the Owner's satisfaction and in compliance with all applicable federal, state, or local statutes, rules or ordinances.

F.5.2 Contractor shall report all reportable quantity releases to applicable federal, state, and local regulatory and emergency response agencies. Reportable quantities are found in 40 CFR Part 302, Table 302.4 for hazardous substances and in OAR 340-142-0050 for all products addressed therein. Upon discovery, regardless of quantity, Contractor must telephonically report all releases to the Owner. A written follow-up report shall be submitted to Owner within 48 hours of the telephonic report. Such written report shall contain, as a minimum:

- a. Description of items released (identity, quantity, manifest no., and all other documentation required by law.)
- b. Whether amount of items released is EPA/DEQ reportable, and, if so, when it was reported.
- c. Exact time and location of release, including a description of the area involved.
- d. Containment procedures initiated.
- e. Summary of communications about the release Contractor has had with members of the press or State officials other than Owner.
- f. Description of cleanup procedures employed or to be employed at the site, including disposal location of spill residue.
- g. Personnel injuries, if any, resulting from, or aggravated by, the release.

F.6 ENVIRONMENTAL CLEAN-UP

F.6.1 Unless disposition of environmental pollution is specifically a part of this Contract, or was caused by the Contractor (reference F.5 Environmental Contamination), Contractor shall immediately notify Owner of any hazardous substance(s) which Contractor discovers or encounters during performance of the Work required by this Contract. "Hazardous substance(s)"

means any hazardous, toxic and radioactive materials and those substances defined as "hazardous substances," "hazardous materials," "hazardous wastes," "toxic substances," or other similar designations in any federal, state, or local law, regulation, or ordinance, including without limitation asbestos, polychlorinated biphenyl (PCB), or petroleum, and any substances, materials or wastes regulated in 40 CFR, Part 261 and defined as hazardous in 40 CFR S 261.3. In addition to notifying Owner of any hazardous substance(s) discovered or encountered, Contractor shall immediately cease working in any particular area of the project where a hazardous substance(s) has been discovered or encountered if continued work in such area would present a risk or danger to the health or well being of Contractor's or any Subcontractor's work force.

F.6.2 Upon being notified by Contractor of the presence of hazardous substance(s) on the project site, Owner shall arrange for the proper disposition of such hazardous substance(s).

F.7 FORCE MAJEURE

A party to this Contract shall not be held responsible for delay or default due to Force Majeure acts, events or occurrences unless they could have been avoided by the exercise of reasonable care, prudence, foresight, and diligence by that party. The Owner may terminate this Contract upon written notice after determining that delay or default caused by Force Majeure acts, events or occurrences will reasonably prevent successful performance of the Contract.

SECTION G INDEMNITY, BONDING, AND INSURANCE

G.1 RESPONSIBILITY FOR DAMAGES / INDEMNITY

G.1.1 Contractor shall be responsible for all damage to property, injury to persons, and loss, expense, inconvenience, and delay that may be caused by, or result from, the carrying out of the Work to be done under this Contract, or from any act, omission or neglect of the Contractor, its Subcontractors, personnel, or agents.

G.1.2 To the fullest extent permitted by law, Contractor shall indemnify, defend (with counsel approved by Owner) and hold harmless the Owner, Owner's Authorized Representative, Architect/Engineer, Architect/Engineer's consultants, and their respective officers, directors, agents, employees, partners, members, stockholders and affiliated companies (collectively "Indemnitees") from and against all liabilities, damages, losses, claims, expenses (including reasonable attorney fees), demands and actions of any nature whatsoever which arise out of, result from or are related to, (a) any damage, injury, loss, expense, inconvenience or delay described in this Section G.1.2, (b) any accident or occurrence which happens or is alleged to have happened in or about the project site or any place where the Work is being performed, or in the vicinity of either, at any time prior to the time the Work is fully completed in all respects, (c) any failure of the Contractor to observe or perform any duty or obligation under the Contract Documents which is to be observed or performed by the Contractor, or any breach of any agreement, representation or warranty of the Contractor contained in the Contract Documents or in any subcontract, (d) the negligent acts or omissions of the Contractor, a Subcontractor or anyone directly or indirectly employed by them or any one of them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder (except to the extent otherwise void under ORS 30.140), and (e) any lien filed upon the project or bond claim in connection with the Work. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section G.1.2.

G.1.3 In claims against any person or entity indemnified under this Section G.1.2 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section G.1.2 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

G.2 PERFORMANCE AND PAYMENT SECURITY; PUBLIC WORKS BOND

G.2.1 When the Contract Price is \$100,000 or more (or \$50,000 or more in the case of Contracts for highways, bridges and other transportation projects) the Contractor shall furnish and maintain in effect at all times during the Contract Period, a performance bond in a sum equal to the Contract Price, and a separate payment bond also in a sum equal to the Contract Price. The bonds may be required if the Contract Price is less than the above thresholds, if required by the Contract Documents.

G.2.2 Bond forms furnished by the Owner and notarized by awarded Contractor's surety company authorized to do business in Oregon are the only acceptable forms of performance and payment security, unless otherwise specified in the Contract Documents.

G.2.3 Before execution of the Contract Contractor shall file with the Construction Contractors Board, and maintain in full force and effect, the separate public works bond required by Oregon Laws 2005, Chapter 360, and OAR 839-025-0015, unless otherwise exempt under those

provisions. The Contractor shall also include in every subcontract a provision requiring the Subcontractor to have a public works bond filed with the Construction Contractors Board before starting Work, unless otherwise exempt, and shall verify that the Subcontractor has filed a public works bond before permitting the Subcontractor to start Work.

G.3 INSURANCE

G.3.1 Primary Coverage: Insurance carried by Contractor under this Contract shall be the primary coverage and non-contributory with any other insurance and self-insurance, and the Owner's insurance is excess and solely for damages or losses for which the Owner is responsible. The coverages indicated are minimums unless otherwise specified in the Contract Documents.

G.3.2 Workers' Compensation: All employers, including Contractor, that employ subject workers who work under this contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. This shall include Employer's Liability Insurance with coverage limits of not less than \$100,000 for each accident. Contractors who perform the Work without the assistance or labor of any employee need not obtain such coverage if the Contractor certifies so in writing. Contractor shall ensure that each of its Subcontractors complies with these requirements. The Contractor shall require proof of such Workers' Compensation by receiving and keeping on file a certificate of insurance from each Subcontractor or anyone else directly employed by either the Contractor or its Subcontractors.

G.3.3 Builder's Risk Insurance:

G.3.3.1 Builder's Risk: During the term of this Contract, for new construction the Contractor shall obtain and keep in effect Builder's Risk insurance on an all risk form, including earthquake and flood, for an amount equal to the full amount of the Contract. Any deductible shall not exceed \$50,000 for each loss, except the earthquake and flood deductible shall not exceed 2 percent of each loss or \$50,000, whichever is more. The policy will include as loss payees the Owner, the Contractor and its Subcontractors as their interests may appear.

G.3.3.2 Builder's Risk Installation Floater: For other than new construction the Contractor shall obtain and keep in effect during the term of this Contract, a Builder's Risk Installation Floater for coverage of the Contractor's labor, materials and equipment to be used for completion of the Work performed under this Contract. The minimum amount of coverage to be carried shall be equal to the full amount of the Contract. This insurance shall include as loss payees the Owner, the Contractor and its Subcontractors as their interests may appear.

G.3.3.3 Such insurance shall be maintained until Owner has occupied the facility.

G.3.3.4 A loss insured under the Builder's Risk insurance shall be adjusted by the Owner and made payable to the Owner for the insureds, as their interests may appear. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner. The Owner shall have power to adjust and settle a loss with insurers.

G.3.4 Liability Insurance:

G.3.4.1 Commercial General Liability: Contractor shall obtain, at Contractor's expense, and keep in effect during the term of this Contract, Commercial General Liability Insurance covering bodily injury and property damage in a form and with coverages that are satisfactory to the State. This

insurance shall include personal injury liability, products and completed operations, and contractual liability coverage for the indemnity provided under this Contract (to the extent contractual liability coverage for the indemnity is available in the marketplace), and shall be issued on an occurrence basis. Contractor shall provide proof of insurance of not less than the amounts listed in the following schedules:

- Per Occurrence Limit for any single claimant: \$2,000,000
- Per Occurrence Limit for multiple claimants: \$4,000,000
- Property Damage: Per Occurrence Limit for any single claimant: \$100,100
- Per Occurrence Limit for multiple claimants: \$500,600

G.3.4.2 Automobile Liability: Contractor shall obtain, at Contractor's expense, and keep in effect during the term of this Contract, Automobile Liability Insurance covering owned, non-owned and/or hired vehicles, as applicable. The coverage may be written in combination with the Commercial General Liability Insurance. Contractor shall provide proof of insurance of not less than the amounts listed in the following schedules:

- Bodily Injury/Death:
 - Per Occurrence Limit for any single claimant: \$2,000,000
 - Per Occurrence Limit for multiple claimants: \$4,000,000
- Property Damage:
 - Per Occurrence Limit for any single claimant: \$100,100
 - Per Occurrence Limit for multiple claimants: \$500,600

G.3.4.3 "Tail" Coverage: If any of the required liability insurance is arranged on a "claims made" basis, "tail" coverage will be required at the completion of this Contract for a duration of 24 months or the maximum time period available in the marketplace if less than 24 months. Contractor will be responsible for furnishing certification of "tail" coverage as described or continuous "claims made" liability coverage for 24 months following Final Completion. Continuous "claims made" coverage will be acceptable in lieu of "tail" coverage, provided its retroactive date is on or before the effective date of this Contract. This will be a condition of the final acceptance of Work or services and related warranty (if any).

G.3.5 Excess/Umbrella Insurance: A combination of primary and excess/umbrella insurance is acceptable to meet the minimum coverage requirements for Commercial General Liability and Automobile Liability Insurance. In such case, the insurance certificate must include a list of the policies that fall under the excess/umbrella insurance. Sample wording is "The Excess/Umbrella policy is excess over primary Commercial General Liability and primary Automobile Liability Insurance."

G.3.6 Additional Insured: The liability insurance coverage, except Professional Liability if included, required for performance of this Contract shall include the Owner as an Additional Insured, but only with respect to the Contractor's activities to be performed under this Contract. If Contractor cannot obtain an insurer to name the Owner as an Additional Insured, Contractor shall obtain at Contractor's expense, and keep in effect during the term of this Contract, Owners and Contractors Protective Liability Insurance, naming the Owner as a Named Insured with not less than a \$1,500,000.00 limit per occurrence. This policy must be kept in effect for 12 months following Final Completion. As evidence of coverage, Contractor shall furnish the actual policy to Owner prior to execution of the Contract.

G.3.7 Certificate(s) of Insurance: As evidence of the insurance coverage required by this Contract, the Contractor shall furnish certificate(s) of insurance to the Owner prior to execution of the Contract. The certificate(s) will specify all of the parties who are Additional Insureds or Loss

Payees. Insurance coverage required under this Contract shall be obtained from insurance companies or entities acceptable to the Owner that are allowed to provide such insurance under Oregon law. Eligible insurers include admitted insurers that have been issued a certificate of authority from the Oregon Department of Consumer and Business Services authorizing them to do an insurance business in the state of Oregon, and certain non-admitted surplus lines insurers that satisfy the requirements of applicable Oregon law and are approved by the Owner. The Contractor shall be financially responsible for all deductibles, self-insured retentions and/or self-insurance included hereunder. Any deductible, self-insured retention and/or self-insurance in excess of \$50,000 shall be approved by the Owner in writing prior execution of the Contract and is subject to Owner's approval. The Contractor shall immediately notify the Owner's Authorized Representative in writing of any change in insurance coverage.

SECTION H SCHEDULE OF WORK

H.1 CONTRACT PERIOD

H.1.1 Time is of the essence on this Contract. The Contractor shall at all times carry on the Work diligently, without delay and punctually fulfill all requirements herein. Contractor shall commence Work on the site within fifteen (15) Days of Notice to Proceed, unless directed otherwise.

H.1.2 Unless specifically extended by Change Order, all Work shall be complete by the date contained in the Contract Documents. The Owner shall have the right to accelerate the completion date of the Work, which may require the use of overtime. Such accelerated Work schedule shall be an acceleration in performance of Work under Section D.1.2 (f) and shall be subject to the Change Order process of Section D.1.

H.1.3 The Owner shall not waive any rights under the Contract by permitting the Contractor to continue or complete in whole or in part the Work after the date described in Section H.1.2 above.

H.2 SCHEDULE

H.2.1 Contractor shall provide, by or before the pre-construction conference, a detailed schedule for review and acceptance by the Owner. The submitted schedule must illustrate Work by significant project components, significant labor trades, long lead items, broken down by building and/or floor where applicable. Each schedule item shall account for no greater than 5 % of the monetary value of the project or 5 % of the available Contract Time. Schedules with activities of less than one day or valued at less than 1% of the Contract will be considered too detailed and will not be accepted. Schedules lacking adequate detail, or unreasonably detailed, will be rejected. Included within the schedule are the following: Notice to Proceed, Substantial Completion, and Final Completion. Schedules will be updated monthly and submitted with the monthly payment application. Acceptance of the Schedule by the Owner does not constitute agreement by the Owner, as to the Contractor's sequencing, means, methods, or allocated Contract Time. Any positive difference between the Contractor's scheduled completion and the Contract completion date is float owned by the Owner. Owner reserves the right to negotiate the float if it is deemed to be in Owner's best interest to do so. In no case shall the Contractor make a request for additional compensation for delays if the Work is completed within the Contract Time but after Contractor's scheduled completion.

H.3 PARTIAL OCCUPANCY OR USE

H.3.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage, provided such occupancy or use is consented to by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have reasonably accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, insurance or self-insurance, maintenance, heat, utilities, and damage to the Work, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents with respect to such portion of the Work. Approval by the Contractor to partial occupancy or use shall not be unreasonably withheld. Immediately prior to such partial occupancy or use, the Owner and Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

SECTION I CORRECTION OF WORK

I.1 CORRECTION OF WORK BEFORE FINAL PAYMENT

The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects, and that the Work will conform to the requirements of the Contract Documents. Work failing to conform to these requirements shall be deemed defective. Contractor shall promptly remove from the premises and replace all defective materials and equipment as determined by the Owner's Authorized Representative, whether incorporated in the Work or not. Removal and replacement shall be without loss or expense to the Owner, and Contractor shall bear the cost of repairing all Work destroyed or damaged by such removal or replacement. Contractor shall be allowed a period of no longer than thirty (30) Days after Substantial Completion for completion of defective (punch list) work, unless otherwise agreed. At the end of that period, or earlier if requested by the Contractor, Owner shall arrange for inspection of the Work by the Architect/Engineer. Should the Work not be complete, and all corrections made, the costs for all subsequent re-inspections shall be borne by the Contractor. If Contractor fails to complete the punch list work within the above time period, Owner may perform such work and Contractor shall reimburse Owner all costs of the same within ten (10) days after demand without affecting Contractor's obligations.

I.2 WARRANTY WORK

I.2.1 Neither the final certificate of payment nor any provision of the Contract Documents shall relieve the Contractor from responsibility for defective Work and, unless a longer period is specified, Contractor shall correct all defects that appear in the Work within a period of one year from the date of issuance of the written notice of Substantial Completion by the Owner except for latent defects which will be remedied by the Contractor at any time they become apparent.

The Owner shall give Contractor notice of defects with reasonable promptness. Contractor shall perform such warranty work within a reasonable time after Owner's demand. If Contractor fails to complete the warranty work within such period as Owner determines reasonable, or at any time in the event of warranty work consisting of emergency repairs, Owner may perform such work and Contractor shall reimburse Owner all costs of the same within ten (10) Days after demand without affecting Contractors obligations.

I.2.2 This provision does not negate guarantees or warranties for periods longer than one year including without limitation such guarantees or warranties required by other sections of the Contract Documents for specific installations, materials, processes, equipment or fixtures.

I.2.3 In addition to Contractor's warranty, manufacturer's warranties shall pass to the Owner and shall not take effect until affected Work has been accepted in writing by the Owner's Authorized Representative.

I.2.4 The one-year period for correction of Work shall be extended with respect to portions of Work performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work, and shall be extended by corrective Work performed by the Contractor pursuant to this Section, as to the Work corrected. The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

I.2.5 Nothing contained in this Section I.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents.

Establishment of the period for correction of Work as described in this Section I.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

I.2.6 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Price will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

SECTION J SUSPENSION AND/OR TERMINATION OF THE WORK

J.1 OWNER'S RIGHT TO SUSPEND THE WORK

J.1.1 The Owner and/or the Owner's Authorized Representative has the authority to suspend portions or all of the Work due to the following causes:

- a. Failure of the Contractor to correct unsafe conditions;
- b. Failure of the Contractor to carry out any provision of the Contract;
- c. Failure of the Contractor to carry out orders;
- d. Conditions, in the opinion of the Owner's Authorized Representative, which are unsuitable for performing the Work;
- e. Time required to investigate differing site conditions;
- f. Any reason considered to be in the public interest.

J.1.2 The Owner shall notify Contractor and the Contractor's Surety in writing of the effective date and time of the suspension and Owner shall notify Contractor and Contractor's surety in writing to resume Work.

J.2 CONTRACTOR'S RESPONSIBILITIES

J.2.1 During the period of the suspension, Contractor is responsible to continue maintenance at the project just as if the Work were in progress. This includes, but is not limited to, protection of completed Work, maintenance of access, protection of stored materials, temporary facilities, and clean-up.

J.2.2 When the Work is recommenced after the suspension, the Contractor shall replace or renew any Work damaged during the suspension, remove any materials or facilities used as part of temporary maintenance, and complete the project in every respect as though its prosecution had been continuous and without suspension.

J.3 COMPENSATION FOR SUSPENSION

J.3.1 Depending on the reason for suspension of the Work, the Contractor or the Owner may be due compensation by the other party. If the suspension was required due to acts or omissions of Contractor, the Owner may assess the Contractor actual costs of the suspension in terms of administration, remedial work by the Owner's forces or another contractor to correct the problem associated with the suspension, rent of temporary facilities, and other actual costs related to the suspension. If the suspension was caused by acts or omissions of the Owner, the Contractor shall be due compensation which shall be defined using Section D, Changes in Work. If the suspension was required through no fault of the Contractor or the Owner, neither party owes the other for the impact.

J.4 OWNER'S RIGHT TO TERMINATE CONTRACT

J.4.1 The Owner may, without prejudice to any other right or remedy, and after giving Contractor seven (7) Days' written notice and an opportunity to cure, terminate the Contract in whole or in part under the following conditions:

- a. If Contractor should voluntarily or involuntarily, seek protection under the United States Bankruptcy Code and Contractor as debtor-in-possession or the Trustee for the estate fails to assume the Contract within a reasonable time;
- b. If Contractor should make a general assignment for the benefit of Contractor's creditors;
- c. If a receiver should be appointed on account of Contractor's insolvency;

- d. If Contractor should repeatedly refuse or fail to supply an adequate number of skilled workers or proper materials to carry on the Work as required by the Contract Documents, or otherwise fail to perform the Work in a timely manner;
- e. If Contractor should repeatedly fail to make prompt payment to Subcontractors or for material or labor, or should disregard laws, ordinances or the instructions of the Owner or its Authorized Representative; or
- f. If Contractor is otherwise in material breach of any part of the Contract.

J.4.2 At any time that any of the above occurs, Owner may exercise all rights and remedies available to Owner at law or in equity, and in addition, Owner may take possession of the premises and of all materials and appliances and finish the Work by whatever method it may deem expedient. In such case, the Contractor shall not be entitled to receive further payment until the Work is completed. If the Owner's cost of finishing the Work exceeds the unpaid balance of the Contract Price, Contractor shall pay the difference to the Owner. If a court or another trier of fact determines the Owner improperly terminated Contractor for cause, the termination will be deemed a termination for convenience pursuant to this Contract.

J.5 TERMINATION FOR CONVENIENCE

J.5.1 Owner may terminate the Contract in whole or in part whenever Owner determines that termination of the Contract is in the best interest of the public.

J.5.2 The Owner will provide the Contractor with seven (7) Days' prior written notice of a termination for public convenience. After such notice, the Contractor shall provide the Owner with immediate and peaceful possession of the premises and materials located on and off the premises for which the Contractor received progress payment under Section E. Compensation for Work terminated by the Owner under this provision will be according to Section E. In no circumstance shall Contractor be entitled to lost profits for Work not performed due to termination.

J.6 ACTION UPON TERMINATION

J.6.1 Upon receiving a notice of termination, and except as directed otherwise by the Owner, Contractor shall immediately cease placing further subcontracts or orders for materials, services, or facilities. In addition, Contractor shall terminate all subcontracts or orders to the extent they relate to the Work terminated and, with the prior written approval of the Owner, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts and orders.

J.6.2 As directed by the Owner, Contractor shall upon termination transfer title and deliver to the Owner all Record Documents, information, and other property that, if the Contract had been completed, would have been required to be furnished to the Owner.

SECTION K CONTRACT CLOSE OUT

K.1 RECORD DOCUMENTS

As a condition of final payment (refer also to section E.6), Contractor shall comply with the following: Contractor shall provide to Owner's Authorized Representative, Record Documents of the entire project. Record Documents shall depict the project as constructed and shall reflect each and every change, modification, and deletion made during the construction. Record Documents are part of the Work and shall be provided prior to the Owner's issuance of final payment. Record Documents include all modifications to the Contract Documents unless otherwise directed.

K.2 OPERATION AND MAINTENANCE MANUALS

As part of the Work, Contractor shall submit two completed operation and maintenance manuals ("O & M Manuals") for review by the Owner's Authorized Representative prior to submission of any pay request for more than 75% of the Work. No payments beyond 75% will be made by the Owner until the O & M Manuals have been received. The O & M Manuals shall contain a complete set of all submittals, all product data as required by the specifications, training information, phone list of consultants, manufacturers, installer and suppliers, manufacturer's printed data, record and shop drawings, schematic diagrams of systems, appropriate equipment indices, warranties and bonds. The Owner's Authorized Representative shall review and return one O & M Manual for any modifications or additions required. Prior to submission of its final pay request, Contractor shall deliver three (3) complete and approved sets of O & M Manuals to the Owner's Authorized Representative.

K.3 AFFIDAVIT/RELEASE OF LIENS AND CLAIMS

As a condition of final payment, the Contractor shall submit to the Owner's Authorized Representative a notarized affidavit/release of liens and claims form, in a form satisfactory to Owner, which states that all Subcontractors and suppliers have been paid in full, all disputes with property owners have been resolved, all obligations on the project have been satisfied, all monetary claims and indebtedness have been paid, and that, to the best of the Contractor's knowledge, there are no claims of any kind outstanding against the project. The Contractor shall indemnify, defend (with counsel of Owner's choice) and hold harmless the Owner from all claims for labor and materials finished under this Contract. The Contractor shall furnish complete and valid releases or waivers, satisfactory to the Owner, of all liens arising out of or filed in connection with the Work.

K.4 COMPLETION NOTICES

K.4.1 Contractor shall provide Owner notice of both Substantial and Final Completion. The certificate of Substantial Completion shall state the date of Substantial Completion, the responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and the time within which the Contractor shall finish all items on the punchlist accompanying the Certificate. Both completion notices must be signed by the Contractor and the Owner to be valid. The Owner shall provide the final signature on the notices. The notices shall take effect on the date they are signed by the Owner.

K.4.2 Substantial Completion of a facility with operating systems (e.g., mechanical, electrical, HVAC) shall be that degree of completion that has provided a minimum of thirty (30) continuous Days of successful, trouble-free operation, which period shall begin after all performance and acceptance testing has been successfully demonstrated to the Owner's Authorized Representative. All equipment contained in the Work, plus all other components necessary to enable the Owner to operate the facility in the manner that was intended, shall be complete on

the Substantial Completion date. The Contractor may request that a punch list be prepared by the Owner's Authorized Representative with submission of the request for the Substantial Completion notice.

K.5 TRAINING

As part of the Work, and prior to submission of the request for final payment, the Contractor shall schedule with the Owner's Authorized Representative, training sessions for all equipment and systems, as required in the individual specifications sections. Contractor shall schedule training sessions at least two weeks in advance of the date of training to allow Owner personnel adequate notice. The O & M Manual shall be used as a basis for training. Training shall be a formal session, held after the equipment and/or system is completely installed and operational in its normal operating environment.

K.6 EXTRA MATERIALS

As part of the Work, Contractor shall provide spare parts, extra maintenance materials, and other materials or products in the quantities specified in the specifications, prior to final payment. Delivery point for extra materials shall be designated by the Owner's Authorized Representative.

K.7 ENVIRONMENTAL CLEAN-UP

As part of the Final Completion notice, or as a separate written notice submitted with or before the notice of Final Completion, the Contractor shall notify the Owner that all environmental pollution clean-up performed as a part of this Contract has been disposed of in accordance with all applicable rules, regulations, laws, and statutes of all agencies having jurisdiction over such environmental pollution. The notice shall reaffirm the indemnification given under Section F.5.1 above.

K.8 CERTIFICATE OF OCCUPANCY

The Contractor shall not be granted Final Completion or receive final payment if the Owner has not received an unconditioned certificate of occupancy from the appropriate state and/or local building officials, unless failure to obtain an unconditional certificate of occupancy is due to the fault or neglect of Owner.

K.9 OTHER CONTRACTOR RESPONSIBILITIES

The Contractor shall be responsible for returning to the Owner all items issued during construction such as keys, security passes, site admittance badges, and all other pertinent items. The Contractor shall be responsible for notifying the appropriate utility companies to transfer utility charges from the Contractor to the Owner. The utility transfer date shall not be before Substantial Completion and may not be until Final Completion, if the Owner does not take beneficial use of the facility and the Contractor's forces continue with the Work.

K.10 SURVIVAL

All warranty and indemnification provisions of this Contract, and all of Contractor's other obligations under this Contract that are not fully performed by the time of Final Completion or termination, shall survive Final Completion or any termination of the Contract.

SECTION L LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC
[SECTION INTENTIONALLY OMITTED]

SECTION M PUBLIC WORKS IMPROVEMENTS

M.1 CITY ENGINEER'S AUTHORITY

The City Engineer shall be the City of Redmond's representative during the construction and shall observe the work in progress on behalf of the City. The general inspection of the construction will not, however, relieve the Contractor(s) from their obligation to conduct comprehensive inspections and to maintain full responsibility for the methods and sequence of construction, the safety precautions incidental thereto, and for performing the construction work in accordance with the Contract Documents. The City Engineer shall also have the authority to reject all work and materials which do not conform to the Plans or Specifications, or other Contract Documents. The City Engineer will render decisions, in writing, on all claims of the City or the Contractor, and on all other matters relating to the execution and progress of the work or the interpretation of the Contract Documents. The City Engineer's estimates and decisions shall be the condition precedent to the right of the Contractor to any action on the Agreement and to any right to receive additional money under the Agreement. The City Engineer shall have the authority to order changes in the work or extra work, as provided in the paragraph "Alterations and Change Orders" of the Section CONTRACT DOCUMENTS.

M.1.1 The City Engineer will not be responsible and has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences, or procedures required for the Contractor to perform work.

M.1.2 Reception of the City Engineer's Direction - The superintendent, or other duly authorized representative of the Contractor, shall represent the Contractor in his/her absence; and all directions given to him/her shall be as binding as if given to the Contractor.

M.1.3 CITY ENGINEER'S REPRESENTATIVES (INSPECTORS) Assistants may be assigned to various portions of the work by the City Engineer. It is understood that such assistants shall have the power, in the absence of the City Engineer, to issue clarifications and make decisions within the limitations of the authority of the City Engineer.

M.1.3.1 AUTHORITY AND DUTIES OF THE ENGINEER'S REPRESENTATIVE - The City Engineer may appoint assistants to inspect all materials used and all work done. Such inspection may extend to any or all parts of the work and to the preparation or manufacture of the materials to be used. The Inspectors will be authorized to revoke, alter, enlarge, or relax the provision on the work, to check the necessary lines and grades, and to keep the Engineer informed as to the progress of the work and the manner in which it is being done; also to call the attention of the Contractor to any discrepancies from approved plans and specifications. Failure of the Inspector or the Engineer to call the attention of the Contractor to faulty work or discrepancies from the plans or specifications shall not constitute acceptance of said work.

The Inspector will not be authorized to approve or accept any portion of the work, nor to issue instructions contrary to the approved plans and specifications. The Inspector will have authority to reject defective material and to suspend any work that is being improperly done, subject to the final decision of the Engineer. The Inspector will exercise such additional authority as may, from time to time, be delegated to the Inspector by the Engineer. The authority of such Engineer's, representatives, assistants, and inspectors shall, however, be limited to the particular portion or phase of the work to which they are assigned, and by the particular duties assigned to them. Upon request, the assignment and duties of the Inspector(s) will be provided in writing.

The City Engineer and/or Inspector will make periodic visits to the site to observe the progress and quality of the executed work and to determine, in general, if the work is proceeding in

accordance with the Contract Documents. The City Engineer and/or Inspector will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the work. His/her efforts will be directed toward providing assurance for the City of Redmond that the completed project will conform to the requirements of the Contract Documents. On the basis of his/her on-site observations as an experienced and qualified professional, the Inspector will keep City of Redmond staff informed in the progress of the work and will endeavor to guard City of Redmond against defects and deficiencies in the work of Contractors.

M.1.4 Any material condemned or rejected by the City Engineer, or authorized Inspector, because of non-conformity with the Contract Documents shall be removed at once from the vicinity of the work by the Contractor, at Contractors' own expense, and shall not be used on the work.

M.1.5 The City Engineer will not be responsible for the acts or omissions of Contractor, or any subcontractor, or other persons at the site performing any of the Work. Any defective work or material that may be discovered by the City Engineer before the final acceptance of work, or before final payment has been made, or during the guarantee period, shall be removed and replaced by work and materials which shall conform to the provisions of the Contract Documents. Failure on the part of the Engineer to condemn or reject bad or inferior work or materials shall not be construed to imply acceptance of such work or materials.

M.1.6 If any part or portion of the work done or material furnished under this Agreement shall prove defective and not in accordance with the Plans and Specifications, and if the imperfection in the work shall not be of sufficient magnitude or importance as to make the work dangerous or undesirable, or if the removal of such work will create conditions which are dangerous or undesirable, the City shall have the right and authority to retain such work. In such case, an appropriate amount shall be deducted from amounts due the Contractor for that portion of the Work, or if acceptance occurs after approval of final payment, an appropriate amount shall be paid by Contractor to City of Redmond.

M.4 DETAIL DRAWINGS AND INSTRUCTIONS

The City Engineer will furnish, with reasonable promptness, additional instructions by means of drawings or otherwise, as are necessary for the proper execution of the work. All such drawings and instructions will be consistent with the Contract Documents.

M.5 SHOP DRAWINGS AND SAMPLE SUBMITTAL

The Contractor shall submit in quadruplicate to the Engineer for this review such shop drawings, electrical diagrams, and catalog cuts for fabricated and manufactured items (including mechanical and electrical equipment) as required by the Contract Documents. Drawings shall be submitted in sufficient time to allow the City Engineer not less than ten (10) regular working days for examining the drawings.

The drawings shall be accurate, distinct, and complete, and shall contain all required information, including satisfactory identification of items, units, and assemblies in relation to the contract drawings and specifications.

Unless otherwise approved by the City Engineer, shop drawings shall be submitted only by the General Contractor, who shall indicate by a signed stamp on the drawings, or other approved means, that the Contractor has checked the shop drawings for dimensions and relationship with work of all other trades involved, and that the work shown is in accordance with contract requirements. The practice of submitting incomplete or unchecked shop drawings for the City Engineer to correct or finish will not be acceptable. Shop drawings which in the opinion of the City Engineer clearly indicate that they have not been checked by the General Contractor will be

considered not complying with the intent of the Contract Documents, and will be returned without review to the Contractor for resubmission in the proper form.

When the shop drawings have been reviewed by the City Engineer, two sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the drawing may be rejected and one set will be returned to the Contractor with such changes or corrections indicated. The Contractor shall have the drawings corrected, and resubmit the corrected drawings in quadruplicate, unless otherwise directed by the City Engineer. No changes shall be made by the Contractor to resubmitted shop drawings other than those changes indicated by the City Engineer.

The review of such drawings and catalog cuts by the City Engineer shall not relieve the Contractor from the responsibility for correctness of dimensions, fabrication details, and space requirements, or for deviations from the contract drawings or specifications, unless the Contractor has called attention to such deviations in writing by a letter accompanying the drawings, and the City Engineer approves the change or deviations in writing at the time of submission. Nor shall review by the City Engineer relieve the Contractor from the responsibility for errors in the shop drawings. When the Contractor does call such deviations to the attention of the City Engineer, the Contractor shall state in the letter whether or not such deviations involve any deduction in the Contract Price or extra cost adjustments. The approval of a separate item as such will not indicate approval of the assembly in which the item functions.

The Contractor shall also submit to the City Engineer for approval with such promptness as to cause no delay in the Work all samples required by the Contract Documents. All samples shall be clearly identified as to material, manufacturer, and any pertinent catalog number if applicable, and the use in the Work for which it is intended.

Where a shop drawing or sample submittal is required by the Contract Documents, no related work shall be commenced until the submittal has been approved by the City Engineer.

M.6 PROGRESS OF WORK

M.6.1 BEGINNING OF THE WORK Before work shall be started and materials ordered, the Contractor shall meet and consult with the City Engineer relative to materials, equipment, and all arrangements for prosecuting the work. The Contractor shall provide and comply with work schedule, as agreed upon in the preconstruction conference. The Contractor shall commence the Work contemplated under these Contract Documents within three (3) days after the City of Redmond's written notice to proceed unless otherwise notified by the City Engineer, and shall complete the Work within the time specified in the Agreement, it being expressly understood and agreed that the time of beginning, rate of progress, and time of completion of the Work are of the essence of this Agreement.

M.6.2 PROSECUTION OF THE WORK The Work shall be prosecuted at such time, and in or on such part or parts of the Project as may be required, to complete the project as contemplated in the Contract Documents. Time is essence of this contract. Upon starting construction, the Contractor shall diligently and continuously pursue completion of the work with adequate crew and equipment. Should the Contractor, without the express approval of the City Engineer, reduce this effort, it shall be considered a failure of the Contractor to complete the work in the time agreed upon. As such it shall fall under the provisions of B.23 LIQUIDATED DAMAGES and liquidated damages may be assessed for each day of reduced operations. It is expressly understood and mutually agreed between all parties to the Agreement that the City Engineer shall not determine

or be responsible for construction methods.

The Contractor shall perform the work and take such precautions as contractor may deem necessary to complete the project so all work will be in conformance with the Contract Documents within the Contract time.

If the Contractor desires to carry on work at night or outside the regular hours, contractor may submit application to the City Engineer; but Contractor shall allow ample time to enable satisfactory arrangements to be made for inspecting the work in progress. If granted permission, Contractor shall light the different parts of the work in a manner satisfactory to the City Engineer and shall comply with all regulations of the City or State or other public body having jurisdiction.

The Contractor shall complete the work called for under the contract in all parts and requirements within the number of workdays, or before the completion date, as set forth in the contract

Where such case applies, a notice to proceed may be issued to the Paving Contractor when individual streets have been constructed and approved for base rock by the Engineer. Once the base rock has been delivered and spread, it shall be the Paving Contractor's responsibility to maintain the surface, including blading and watering as may be required. It is the intent of these specifications that paving commence immediately following the placement of base rock.

M.7 SAMPLES, TESTING AND INSPECTION

All materials to be incorporated in the work shall be subject to sampling, testing, and approval. The City Engineer may select samples in the presence of the Contractor to be delivered and tested as required by the Specifications at a laboratory approved by the City, at no additional cost to the City of Redmond. Testing shall conform to City of Redmond Standards and Specifications and be performed by a certified/independent testing laboratory as approved by City Engineer.

All sampling and testing of materials shall be done in accordance with the latest designated standard methods of AASHTO, ASTM, etc., or in accordance with special methods designated.

The Contractor shall furnish, without extra charge, the necessary test pieces and samples, including facilities and labor for obtaining the same, as requested by the City Engineer. When required, the Contractor shall furnish certificates of tests of materials and equipment made at the point of manufacture by a independent, certified testing laboratory.

The City Engineer may require additional testing of any portion of the work. When additional testing is required by City Engineer, the City shall pay cost of any passing test. The Contractor shall pay the cost of any non-passing test.

The City Engineer and representatives, and authorized representatives of public agencies shall at all times have access to the work wherever it is in preparation or progress, and the Contractor shall provide facilities for such access and for inspection, including maintenance of temporary and permanent access routes.

If the Specifications, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the City Engineer timely notice of its readiness for inspection. If the inspection is by authority other than the City Engineer's, the City Engineer shall be given timely notice of the date fixed for such inspection. Inspections by the City Engineer will be promptly made, and where practicable, at the source of supply. If any work should be covered without approval or consent of the City Engineer, it shall, if required by the City Engineer, be uncovered for examination at the Contractor's expense.

Re-examination of questioned work may be ordered by the Engineer; and, if so ordered, the work shall be uncovered by the Contractor. If such work be found not in accordance with the Contract Documents, the Contractor shall correct the defective work at no additional cost to the City of Redmond.

Neither observations by City Engineer nor inspections, tests, or approvals by persons other than Contractor shall relieve Contractor from obligations to perform work in accordance with requirements of the Contract Documents.

M.7.1 Performance Testing - Operating equipment and systems shall be performance tested in the presence of the City Engineer to demonstrate compliance with the specified requirements. Performance testing shall be conducted under the specified design operating conditions or under such simulated operating conditions as recommended or approved by the City Engineer. Such testing shall be scheduled with the City Engineer at least one (1) week in advance of the planned date for testing and include a factory representative on site.

M.8 USE OF COMPLETED PORTIONS

The City shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding the time for completing the entire work or such portions which may not have expired. Such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of the work, or delays the completion of the work, the Contractor shall be entitled to extra compensation or an extension of time, or both. Should such condition or conditions prevail, the Contractor shall submit a claim for additional compensation or extension of time, in writing, to the City Engineer. The City Engineer will review the claim and determine its validity.

M.9 CONTRACT/SUBCONTRACT

All subcontractors shall be subject to the approval of the City Engineer. If requested, true copies of any and all subcontracts shall be furnished to the City Engineer; however, prices may be omitted. When the Contract Documents concern Public Works for the state or any county, municipality, or political subdivision created by its laws, the applicable statutes of the State of Oregon shall apply. For this reason, Sections 279C.800 through 279C.870 of the Oregon Revised Statutes, as amended or superseded, including the latest additions and revisions, are incorporated by reference as part of these Contract Documents.

M.10 MATERIALS AND APPLIANCES

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary for the execution and completion of the work.

Unless otherwise specified, all materials shall be new, of U.S. Domestic manufacture or as allowed by the North American Free Trade Agreement, and both workmanship and materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator or processors, except as otherwise provided in the Contract Documents.

If the specifications, law, ordinance or applicable rules or regulations permit Contractor to furnish or use a substitute that is equal to any material or equipment specified and if Contractor wishes

to furnish to use a proposed substitute, Contractor shall make written application to City Engineer for approval of such a substitute certifying in writing that the proposed substitute will perform adequately the functions called for by the general design, be similar and of equal substance to that specified and be suited to the same use and capable of performing the same function as that specified; stating whether or not its incorporation in or use in connection with the project is subject to the payment of any license fee or royalty; and identifying all variations of the proposed substitute from that specified and indicating available maintenance service. No substitute shall be ordered or installed without the written approval of City Engineer who will be the judge of equality and may require Contractor to furnish such other data about the proposed substitute as he/she considers pertinent. No substitute shall be ordered or installed without such performance guarantee and bonds as City of Redmond may require which shall be furnished at Contractor's expense.

In selecting and/or approving equipment for installation in the project, the City of Redmond and City Engineer assume no responsibility for injury or claims resulting from failure of the equipment to comply with applicable national, state, and local safety codes or requirements, or the safety requirements of a recognized agency, or failure due to faulty design concepts, or defective workmanship and materials.

M.10.1 Responsibility For Material Furnished By Contractor - In addition to language in Section B.3.3, the Contractor shall be responsible for all material furnished by Contractor. All such material shall be examined by a City Representative and any material not meeting specifications, or that is defective in manufacture, or that has been damaged after delivery, shall be replaced or corrected by the Contractor at Contractor's expense.

M.10.2 Responsibility For Material Furnished By City – In addition to language in Section B.3.3, the Contractor's responsibility for material furnished by the City shall begin upon Contractor's acceptance at the point of delivery to Contractor. All such material shall be immediately examined, and material defective in manufacture and/or otherwise damaged shall be rejected by the Contractor at the time and place of delivery to Contractor, to be replaced by the City. Once accepted by the Contractor, defective and/or damaged material discovered prior to final acceptance of the work shall be removed by the Contractor and shall be replaced, at Contractor's own expense, the defective material. In such case the Contractor shall furnish all labor, equipment and material incidental to replacement and necessary for the completion of the work to the satisfaction of the Engineer.

All materials and/or services furnished by the City shall be obtained by the Contractor as indicated in these Contract Documents. The cost of handling and placing City furnished materials shall be included in the price paid for the Agreement item involving such material.

M.11 LINES AND GRADES

The Engineer will provide survey monuments or reference points for use in determining lines and grades. The Contractor is responsible for determining the lines and grades to be used for the construction as shown on the plans and in these Contract Documents.

All monuments, stakes, marks, and other information shall be carefully preserved by the Contractor, and in case of their careless or unnecessary destruction or removal by the Contractor or Contractor's employees, such stakes, marks and other information will be replaced at the Contractor's expense.

M.11.1 RESPONSIBILITY FOR SURVEYING - The purpose of this section is to define the responsibilities for surveying. All survey work shall be conducted under the supervision of a

Registered Professional Land Surveyor, licensed in the State of Oregon. The Contractor will be responsible for providing all construction staking as required to complete the work. The City will provide bench marks, control points, and reference points as shown on the plans or as required by the Contractor to establish control for construction staking. The Contractor will be responsible for establishing centerline location and elevations.

M11.2 Stakes - Construction stakes and stakes which are reference points for construction work will be conspicuously marked. It shall be the responsibility of the Contractor to inform his/her employees and her/his subcontractors of their importance and the necessity for their preservation.

The Contractor will provide vertical and horizontal construction staking in the proximity of the work. Construction staking will be provided at 50' intervals on tangent and 25' intervals on curve. The grade stakes at a minimum should contain the following information: Engineer's station, Offset from line, and Cut or fill to grade.

M.11.3 Flagging Code - A color code may be established during the course of the project indicating specific colors for the various kinds of stakes to be set.

M.11.4 Sewer - Both gravity and pressure sewer lines will be construction staked by means of an offset line with pipe invert cut information provided. Grades for pressure sewer will be provided by the subgrade stakes for streets. Finish grades will be provided as required. Manholes will have two reference points (swing-ties) indicating the center of the manhole and, flow invert elevation. Ends of services will be staked.

M.11.5 Water - Water lines will be staked every 50ft. by means of an offset line after the street subgrade has been constructed. No cut stakes will be provided in existing streets where 30" of cover is all that is required. However, cut stakes will be required if deeper cuts are needed to go under or over utilities, etc. Appurtenances will be staked as required. Fire hydrants will have two reference points (swing ties) indicating the hydrant cap nut with elevations. Finish grades will be provided as required.

M.11.6 Street - Prior to commencing construction, clearing limits shall be established.

Where a significant (greater than 5') cut or fill is required for subgrade, slope stakes and construction staking for subgrade will be provided.

Curb line shall be staked by means of an offset line no more than 6' offset from the top face of curb, showing the cut or fill to the finish work. Said stakes shall be protected and saved for a period of five (5) working days after construction of curbs to enable the Inspector to approve the alignment and grade.

Base rock shall be staked by painting an appropriate target on the curb and providing construction stakes (blue tops) on centerline. Blue tops will also be provided at the gutter line for the centerline and gutter lines of any intersecting street.

M.11.7 Structures - All structures shall be staked to the line and grade as shown on the plans or as directed by the Engineer.

203 CLEARING AND GRUBBING

203.1.00 DESCRIPTION

CLEARING AND GRUBBING shall include, but not be limited to, the removal and disposal of all concrete including curbs, sidewalks and walls; all vegetative growth such as trees, snags, down timber, vines, shrubs, brush, stumps; fences, guard rails, irrigation pipe and street structures, pavement, debris and rubbish of any nature; and other similar items not specifically covered by unit price. All debris shall be broken up and removed from the site. The work also includes preserving vegetation and objects designated to remain in place and cleanup of the work area.

203.3.00 CONSTRUCTION

Trees, shrubbery and flowerbeds designated on the plans or directed by the Engineer to remain shall be left in place and care shall be taken by the Contractor not to damage or injure such trees, shrubbery or flowerbeds by any of Contractor's operations.

Where ornamental trees exist in parking areas and are not to be removed, it shall be the Contractor's responsibility to trim low limbs which will interfere with the normal operation of Contractor's equipment. The trimming shall be performed in a professional manner by competent personnel prior to Contractor's machine operations and in such a manner as the Engineer may direct.

The Contractor shall be responsible for all damages to existing improvements resulting from his construction operations or acts by his employees.

203.3.01 DISPOSAL

All matter and debris accumulated from clearing and grubbing operations become the Contractor's property. The Contractor shall make arrangements for disposal of this material in accordance with local laws and regulations. All expenses for disposal of waste materials shall be the responsibility of the Contractor.

203.3.02 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures shall be installed in accordance with Appendix 9B of the Central Oregon Stormwater Manual to insure that sediment laden runoff does not leave areas disturbed by construction.

203.4.00 MEASUREMENT AND PAYMENT

CLEARING AND GRUBBING will not be measured. Removal and disposal of all trees not specifically covered under TREE REMOVAL item shall be considered incidental to CLEARING AND GRUBBING. Payment will be at the contract lump sum amount bid for CLEARING AND GRUBBING. Payment shall include full compensation for all labor, equipment, tools, and incidentals necessary to complete the work and dispose of all waste materials.

204 EARTHWORK

204.1.00 DESCRIPTION

This work consists of excavation and grading the roadway, side streets, sidewalk and planting areas, alleys, cuts, embankments, slopes, roadway ditches, side streets, driveway and alley approaches and all other earth moving work required in the construction of the project including disposal of all surplus material. The term "earthwork" will be used as a general term to designate the work included within the scope of this section.

204.1.02 UNCLASSIFIED EXCAVATION

Unclassified excavation is defined as all excavation regardless of the type, nature, or condition of the materials encountered. The Contractor shall assume full responsibility to estimate the kind and extent of the various materials to be encountered in the work.

204.2.00 MATERIALS

Excavated materials may be used on the project unless declared unsuitable or surplus by the Engineer. It is the responsibility of the Contractor to separate unsuitable material from the excavated material, and to make arrangements for disposal of surplus material.

204.2.01 BORROW AND EMBANKMENT MATERIAL

Fills and embankments shall be constructed with material from the excavations or borrow material, subject to approval by the Engineer. Should additional fill material be needed, the Contractor shall supply borrow material in accordance with specifications acceptable to the Engineer.

204.3.00 CONSTRUCTION

204.3.01 PRESERVATION OF EXISTING IMPROVEMENTS

Asphalt pavement cuts shall be straight lines, having vertical faces and are required wherever existing pavement is to be matched or removed to a line designated on the plans and as directed by the Engineer. Where so specified, Asphalt pavement cuts shall be saw cut.

204.3.02 EXCAVATION OF EXISTING IMPROVEMENTS AND MISCELLANEOUS

Removal of existing roadbeds and driveways are included in the general excavation quantities. The Contractor will be responsible for the excavation of areas to be patched with asphalt concrete.

The Contractor shall place base material in all areas designated for asphalt patching as shown on the drawings. Base material shall be provided by the Contractor where a separate contract for paving work exists. No separate payment will be made for this work, but shall be considered incidental to General Excavation.

204.4.00 MEASUREMENT AND PAYMENT

204.4.01 UNCLASSIFIED AND CLASSIFIED EXCAVATION

Unless otherwise indicated in the Contract Documents, all excavation shall be considered unclassified. GENERAL EXCAVATION has been computed from cross sections and the excavation will not be re-measured unless there plan changes are directed or approved by the Engineer. The estimated quantity on the Schedule of Bid Items will be the measured quantity for payment. In the event of plan changes, the estimated quantity will be adjusted to reflect the change. Changes in general excavation will be measured by the cubic yard and payment will be made at the contract unit price bid for GENERAL EXCAVATION.

The unit price bid per cubic yard shall include full compensation for all labor, equipment and materials required to excavate the roadway to the lines and grades shown on the plans.

Asphalt pavement cuts will not be measured or paid for separately, unless specified on the plans and listed in the Schedule of Bid Items. If not listed separately, Asphalt pavement cuts will be considered incidental work to GENERAL EXCAVATION.

204.4.02 EMBANKMENT

The pay quantities of "Embankment in Place" will be limited to the neat lines of specified cross sections, lines, grades and slopes and above the ground or base elevations existing at the time embankment construction thereon begins. The pay quantities will not include additional quantities required caused by subsidence or settlement of the ground or foundations, to settlement of materials within the embankments, or to shrinkage, washout, slippage or loss of material regardless of cause. If at any time during construction the contractor feels that this is not an accurate representation of actual embankment constructed, he/she shall notify the City immediately of the possible discrepancy. The Contractor shall be responsible for collection of data necessary to determine the actual amount of construction embankment. The cost of data collection will be considered incidental to payment for unit prices, and no separate payment will be made. Cross-Sectional information used in the design of the project will be made available by the City.

205 WATERING

205.1.00 DESCRIPTION

This work consists of furnishing and applying water, or combinations of water and additives for compacting and preparing excavations, embankments, backfills, subgrades, subbases, surfacings or for dust control, clean-up, or other purposes as determined by the Engineer. Excluded from this section is water used in Portland cement concrete construction and water used for testing purposes.

205.2.00 MATERIAL

205.2.01 WATER

Water used in the work shall be free of silts and hazardous or deleterious substances. The Contractor shall maintain an adequate supply of water at the job to conduct operations in a timely manner.

The City may provide water for a fee to the Contractor from a fire hydrant or similar source. The Contractor must make application to the City Public Works Department, Water Division for such service. Only City furnished and approved metering and backflow prevention devices connected to designated fire hydrants may be used to obtain water from the City water distribution system.

205.3.00 CONSTRUCTION

The Contractor shall apply water by means which result in uniform and controlled application.

If the Contractor has not provided water as ordered by the Engineer, the Owner may provide water and charge any applicable costs to the Contractor.

205.4.00 MEASUREMENT AND PAYMENT

205.4.01 UNIT PRICE BASIS

When listed in the proposal as a separate pay item, measurement and payment for Watering will be made on a unit price basis. The Contractor shall be responsible for maintaining an accurate record of the amount of water approved or ordered by the Engineer and applied to the project; and for submitting these records with progress payment requests for payment on a monthly basis. Water will be measured by the number of thousands of gallons actually used according to the records maintained by the Contractor on City authorized forms and as verified by the Engineer.

Payment for water will be at the contract unit price bid for each 1,000 gallons (Mgal) of water, as measured to the nearest 1,000 gal increment.

205.4.02 INCIDENTAL BASIS

When neither specified nor listed in the Proposal as a separate pay item, watering will be considered incidental work for which no separate payment will be made.

206 SUBGRADE

206.1.00 DESCRIPTION

This work consists of excavating and disposing of unstable materials, and placing subgrade geotextiles, rock embankment and/or aggregate backfill necessary for the preparation of the subgrade. Subgrade is defined as the surface area upon which additional materials are to be placed as part of the work covered by this contract, or by future work.

206.3.00 CONSTRUCTION

206.3.01 PREPARATION

Prior to starting subgrade work, all underground work and installation of utilities in the area of the subgrade shall be completed.

The Contractor shall blade, shape, and compact the subgrade to lines and grades as shown or directed, removing all irregularities and securing a uniform surface. The Contractor shall remove all unsuitable material as directed and replace with suitable material at no extra cost to the owner.

After the placement of curbs and drainage structures, the Contractor shall fine blade the subgrade surface to the specified tolerances.

206.3.02 TOLERANCES

Subgrade shall not vary by more than 0.05 foot from the specified grades and cross section, except that, at the discretion of the Engineer, the specified grades and cross section at centerline may vary 0.1 foot, provided that the variance is at least 75 feet from a manhole or fixed feature, does not affect drainage, and a uniform and regular cross section is maintained. Variations within the above specified tolerances shall be compensating so that the average grade and cross section shall meet these specifications.

206.3.03 GEOTEXTILE STABILIZATION

Geotextile fabric installation for embankment reinforcement or subgrade/subbase stabilization will be as directed by the Engineer in locations where unsuitable materials are found below subgrade. Geotextile installation shall be in conformance with Section 00350 of the ***APWA Oregon Standard Specifications for Construction, latest edition.***

206.4.00 MEASUREMENT AND PAYMENT

No measurement or separate payments will be made for work required for the preparation of subgrade. This work is incidental to the price bid for EXCAVATION.

Furnishing and installation of Geotextile fabric, where directed by the Engineer, will be paid for on a square unit measurement basis. Payment will be full compensation for all equipment, labor, and incidentals necessary to complete the work. No separate payment will be made for constructing laps, seams, joints, and patches unless the Engineer orders additional amounts over the minimum.

207 AGGREGATE BASES

207.1.00 DESCRIPTION

This work consists of furnishing and placing, spreading, compacting, and fine grading aggregate base material for streets, driveways, sidewalks, pathways, and other structures.

207.2.00 MATERIALS

Base aggregates shall consist of crushed gravel or crushed rock, including sand, free of frozen material, with less than the percentage listed below by weight of deleterious material, to include humus, organic matter, vegetable matter, clods, sticks, and debris.

207.2.01 FRACTURE OF GRAVEL

Gravel shall have at least one fractured face on 50 percent of the material retained on each sieve size 1 1/2 inch and above and 70 percent for the material passing the 1 1/2-inch sieve and retained on each of the sieves down to 1/4 inch.

207.2.02 DURABILITY

The source material from which aggregate base materials are obtained, produced or manufactured, shall meet the following qualifying test requirements.

Test	Test Method	Requirements
Degradation (Coarse Aggregate):		
Passing No. 20 sieve	ODOT TM 208	30 percent maximum
Sediment Height	ODOT TM 208	3 inch maximum
Abrasion:	AASHTO T 96	35 percent maximum

207.2.03 SAND EQUIVALENT

Base aggregates to be incorporated in the work shall have a sand equivalent of not less than 30 when tested in conformance with AASHTO T 176.

207.2.04 DELETERIOUS MATERIALS

207.2.04A Wood Waste

Allowable limits of wood waste, as determined by weight by test method OSHD TM 225, follow:

- (1) Major Arterial - 0.1 percent
- (2) Minor Arterial – 0.1 percent
- (3) Industrial – 0.1 percent
- (4) Collector – 0.1 percent
- (5) Local Residential & Cul-de-sac - 0.35 percent
- (6) All Weather Surface Road - 0.35 percent
- (7) Alley - 0.35 percent

Oversize pieces, which are retained on the top sieve size, are limited to 25 percent of the total amount of wood waste allowed.

207.2.04B Metal Waste

Allowable limit of metal waste, as determined by weight, is 0.1 percent.

207.2.05 GRADING REQUIREMENTS

Base aggregates shall conform to the following grading requirements.

Separated Sizes:	2½"-0	2"-0	1½"-0	1"-0	¾"-0
<u>Sieve Size</u>	% Passing (by weight)				
3"	100				
2 1/2"	95-100	100			
2"		95 - 100	100		
1 1/2"			95 - 100	100	
1 1/4"	55 - 75				
1"		55 - 75		90 - 100	100
¾"			55-75		90 - 100
½"				55 - 75	
3/8"					55 - 75
¼"	30 - 45	30 - 45	35 - 50	40 - 55	40 - 60
No. 10	12 - 27	12 - 27	14 - 30	16 - 33	16 - 36
No. 40	0 - 16	0 - 16	3 - 18	8 - 24	8 - 24
No. 200	0 - 9	0 - 9	0 - 8	0 - 8	0 - 10

Sieve analysis will be determined according to AASTO T 27.

207.2.06 DRY UNIT WEIGHT

Base aggregates for use on arterials, collectors, and industrial streets shall have a dry unit weight of not less than 100 lbs./C.F. as determined per AASHTO T19.

207.2.07 ACCEPTANCE

Aggregate base will be sampled for acceptance in the following priority order:

- (a) Immediately after crushing as long as produced and placed within one year of placement.
- (b) In the stockpile after all shaping work has been completed; or, one test per project or 1 test every 5,000 cubic yards.
- (c) In its final state on the roadbed after all processing and prior to the placement of subsequent surfacing materials; See Section 108.2.00 General Conditions, for testing procedures. Frequency: One test per job or one test per 1,000 cubic yards.

*Jobs 500 Cu. Yd or less may use letter of certification or an approved testing lab as proof of acceptable aggregate base.

207.3.00 CONSTRUCTION

207.3.01 STOCKPILING

The materials to be furnished in stockpiles shall be of the kinds, sizes and quality specified. Each designated size of material shall be placed in a separate stockpile.

Stockpiles shall be at least 8 feet high with side slopes of 1 1/2 horizontal to 1 vertical. The method used in placing the material in the stockpile shall be such as to minimize segregation of the aggregate particles.

207.3.02 MIXING

The materials shall be mixed until well blended. The contractor shall add water during mixing in an amount sufficient to provide optimum moisture content plus or minus 2 percent.

The subbase or base course materials shall be mixed by one of the following methods:

- (a) Stationary Plant Method - Materials mixed by means of a pug mill or other type of mixer, transported to the project at proper moisture content and placed by an aggregate spreader;
- (b) Travel Plant Method - Materials mixed and placed on the project in a continuous operation; or,
- (c) Road Mix Method - Materials mixed on the project by motor graders or other approved equipment.

207.3.03 PLACING

207.3.03A Weather Limitations

When, in the judgment of the engineer, weather conditions will be detrimental to the work, the contractor shall suspend operations until the weather is favorable. No aggregate base materials shall be placed in the snow or on a soft, muddy or frozen subgrade.

207.3.03B Equipment

Equipment necessary for construction of aggregate base shall provide for efficient and continuous operation and shall conform to the following requirements.

(1) Hauling equipment - Vehicles for hauling aggregate or mixtures of aggregate and water shall be capable of depositing the material into or in front of spreading equipment with minimum of segregation.

(2) Spreading equipment - The equipment shall be capable of spreading and striking off material to the designated line, grade and transverse slope with a uniform surface texture free of excessive segregation or fracture of material.

207.3.03C Thickness of Lifts

If the required compacted depth of the subbase or base course exceeds 6 inches, it shall be constructed in two or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed 6 inches.

207.3.04 COMPACTION

207.3.04A Equipment

Equipment used to compact aggregate bases shall be self-propelled steel wheel or pneumatic tire rollers. Rollers shall be capable of compacting materials to a firm, even surface.

207.3.04B Density

During compaction, materials shall be maintained within 2 percent of the optimum moisture content. The Contractor shall begin compaction of each layer immediately after the material is spread and continue until a density of not less than 95 percent of the maximum density has been achieved. Maximum density will be determined by AASHTO T199 (100% Relative Maximum Density of Granular Base Materials).

If the specified compaction is not obtained, the contractor shall notify the engineer. The contractor may be required to use a modified compaction procedure or apply additional compaction effort. If approved materials meeting the specifications cannot be compacted to the required density regardless of compaction effort or method, the engineer may reduce the required density or direct that alternate materials be used. In no case shall aggregate placement proceed until the contractor is able to compact the material to the satisfaction of the engineer.

207.3.05 SURFACE TOLERANCE

The surface of the aggregate base shall be within -0.04 foot to +0.02 foot of plan elevation at any one point. The final surface shall not deviate at any point more than 0.04 foot from the bottom of a 12-foot straightedge laid in any direction on the surface on either side of the roadway crown.

When directed by the Engineer, the surface shall be tested with a 12-foot straightedge furnished and operated by the Contractor. The surface shall not vary from the testing edge by more than 0.04 foot at any point. The engineer will observe this testing and may require additional testing. The average of the variation from the design grade shall not be greater than 40 percent of the allowable maximum variation.

207.3.06 AGGREGATE BASE - CURB

The Contractor shall supply base rock to be placed under the curb with minimum depth of 2" under curb. Base rock under curbs is considered incidental to curb construction, and no separate payment will be made.

207.4.00 MEASUREMENT AND PAYMENT

207.4.01 SQUARE YARD BASIS

Aggregate base will be measured on the surface to the nearest 0.1 foot. Payment will be on a square yard basis, to the nearest 0.1 square yard between the hinge points or curb lines.

207.4.02 CUBIC YARD IN-PLACE BASIS

Aggregate base will be measured and paid for on a cubic yard basis, to the nearest 0.1 yard. The thickness will be measured by depth tests, cores, or elevations.

A minimum of one measurement shall be made for each 300 square yards of material placed. The measurements shall be made to the nearest 0.01 foot.

On individual depth measurements, thicknesses more than 0.04 foot in excess of the specified thickness shall be considered to be specified thickness plus 0.04 foot in computing the yardage for payment.

207.4.04 CUBIC YARD IN STOCKPILE

Aggregate base will be measured and paid for on a cubic yard basis, to the nearest 0.1 cubic yard, for the material in the stockpile.

207.4.05 TON BASIS

Aggregates will be measured and paid for on a ton basis, to the nearest 0.01 ton.

207.4.06 INCIDENTAL BASIS

When not specified nor listed in the bid schedule, base aggregates will be considered incidental work to HMAC Pavement or Asphalt Trench Patch, and no separate payment will be made.

211 ASPHALT CONCRETE PAVEMENT

211.1.00 DESCRIPTION

This work consists of furnishing and placing asphalt concrete pavement as designated on the plans. Where not specified herein, asphalt concrete paving materials and construction shall be in accordance with applicable sections of Part 00700 of the ***Oregon Standard Specifications for Construction***, current edition including all ODOT supplements.

Asphalt Patching consists of paving areas as designated on the plans as Asphalt Patching, or as directed by the Engineer. Asphalt Patching areas shall include driveways, cuts in existing pavement areas to be preserved, and other areas that are behind curb or involve a significant amount of hand labor to complete.

211.2.00 MATERIALS

211.2.01 GENERAL

Hot Mixed Asphalt Concrete (HMAC) shall be hot plant mixed, uniformly coated mixture of asphalt cement, graded aggregate and additives as required in accordance with the approved Job Mix Formula. HMAC shall be of the level specified for the class of street and anticipated traffic volume.

Level 1 HMAC - HMAC for use in applications with very low traffic and only limited exposure to trucks.

Level 2 HMAC - HMAC for use in applications with low traffic volumes and low volume truck traffic.

Level 3 HMAC - HMAC for use in applications exposed to moderate truck traffic.

211.2.02 AGGREGATE

Provide coarse and fine aggregates meeting the requirements of APWA Section 0074.10. Aggregates shall be hard, sound, durable, and free of deleterious substances.

(a) Soundness - Provide coarse and fine aggregate for soundness testing using sodium sulfate salt according to AASHTO T104. The weighted average percentage loss shall not exceed 12% by weight.

(b) Durability - Provide aggregate not exceeding the following maximum values:

Test	Test Method	Coarse Aggregates	Fine Aggregates
Abrasion	ASSHTO	30.0%	
Degradation			
Passing No. 20 sieve	ODOT TM208	30.0%	30.0%
Sediment Height	ODOT TM208	3"	4"

Deleterious Substances

The amount of deleterious substances in each test fraction of the crushed aggregate material shall not exceed the following values:

Test	Test Method	Course Aggregates	Fine Aggregates
Lightweight Pieces	AASHTO T113	1.0%	
Wood Particles	ODOT TM225	0.10%	
Friable Particles	ODOT TM221	1.0%	2.05%
Elongated Pieces(at a ratio of 5:1)	ODOT TM229	10.0%	
Plasticity Index	AASHTO T90		0 or NP
Sand Equivalent	AASHTO T176		45 min.

The aggregate shall be free of all other deleterious substances such as soft or disintegrating pieces, clay, loam, or vegetable matter, either in a free state or adherent to the aggregate.

211.2.03 RECLAIMED ASPHALT PAVEMENT (RAP) MATERIAL

Reclaimed HMAC Pavement material used in the production of new HMAC is optional. No more than 30% rap material will be allowed in the new HMAC pavement.

Recycled material used in HMAC pavement shall have a maximum size of 1 inch prior to entering the cold feed. Any recycled material larger than 1 inch shall be separated by screening or broken down by mechanical means to pass a 1-inch sieve, and reincorporated with the balance of the recycled material to form a mixture acceptable to the Engineer.

The recycled material shall be blended with new aggregate to provide a mix conforming to the job mix formula. If there is evidence that the recycled material is not breaking down during the heating and mixing of the asphalt concrete mixture, the Engineer may elect to modify the maximum size requirement.

211.2.04 ASPHALT CEMENT AND ADDITIVES

Provide asphalt cement conforming to the requirement of ODOT's current publication *Standard Specifications for Asphalt Materials*. The applicable specifications are those contained in the current publication on the date the Project is advertised. Use PG 64-28 or PG 70-28 asphalt unless otherwise specified in the Contract Documents. Refer to Design Standards Section 18 for asphalt binder use on various road classifications.

Asphalt in RAP material, when blended with new asphalt shall provide properties similar to the above specified asphalt. When RAP material is used at a rate of less than 15%, no adjustment to the new asphalt will be required. When utilizing RAP at a rate at or above 15%, the combined RAP and new asphalt shall provide blended properties equivalent to the specified grade. Determine the blended properties according to ASTM D 4887. Determine asphalt cement properties for the RAP material from asphalt cement recovered from the RAP according to AASHTO T 170.

Additives to prevent stripping or separation of asphalt coatings from aggregates, and admixtures used to aid in the mixing or use of asphalt mixes shall be standard recognized products of known value for the intended purpose and approved for use on the basis of laboratory tests. They shall have no deleterious effect of the asphalt material and be completely miscible. Do not use silicones as an additive.

at no cost to the owner or shall deduct from payments to the contractor an amount equal to the cumulative weighted percentage deviations from the job mix formula.

211.4.05B Compaction

Asphalt concrete pavement that does not comply with compaction requirements shall be removed and replaced or, at the discretion of the engineer, be subject to a price reduction determined from the following table:

PRICE REDUCTION SCHEDULE

% MAXIMUM DENSITY (Normal Method)	% Pay*	% TARGET DENSITY (Control Strip Method)
92.0 and above	100	98.0 and above
91.5 – 91.9	95	97.5 – 97.9
91.0 – 91.4	90	97.0 – 97.4
90.5 – 90.9	85	96.5 – 96.9
90.0 – 90.4	80	96.0 – 96.4
89.5 – 89.9	70	95.5 – 95.9
89.0 – 89.4	60	95.0 – 95.4
Below 89.0	0	Below 95.0

* Applies to price for in-place asphalt concrete, including asphalt cement where measured and paid for separately on City of Redmond Public Works contract.

211.4.05C Pavement Thickness

In determining payment reduction for deficient or excessive pavement thickness, a section of pavement will normally be on full roadway station (100 lineal feet). For non-roadway paving and in other situations where the engineer determines the above section is inappropriate, the engineer may establish a different unit of work on which to calculate average thicknesses and price reductions.

When pavement thickness, as determined by the engineer’s measurements or test cores, is found deficient by more than the thickness of the specified surface course of asphalt concrete, the engineer may allow the contractor to place an additional lift of asphalt concrete to bring the total thickness of the pavement into conformance with the specifications.

When the thickness in any section of pavement is found deficient by less than the specified thickness of the surface course, and the engineer allows the pavement to remain in place, payment for that pavement will be made at an adjusted price determined from the following table:

% REDUCTION IN PAY * (Payment on Weight Basis)	% DEFICIENCY IN THICKNESS	% REDUCTION IN PAY * (Payment on Area Basis)
No deduction	0.0 – 5.0	No Deduction
No deduction	5.1 – 10.0	1.0 x Deficiency
0.5 x Deficiency	10.1 – 20.0	1.5 x Deficiency
1.0 x Deficiency	20.1 – 30.0	2.0 x Deficiency

* Applies to price for in-place asphalt concrete, including asphalt cement where measured and paid for separately.

No payment will be made for any area of pavement found deficient in thickness by more than 30.0 percent even though the work is permitted by the engineer to remain in place.

212 ASPHALT CONCRETE PATCHING

212.1.00 DESCRIPTION

Where not specified herein, the provisions of Section 00495 of the *Oregon Standard Specifications for Construction*, current edition shall apply.

212.1.01 GENERAL

Asphalt patching will be required under two general situations:

- a. In new construction asphalt patching shall include driveways, trenching in existing pavement areas and other such areas that are behind the curb and/or involve a significant amount of hand labor to complete the work; and
- b. In existing pavements where the scope of the work is primarily paving underground utility trenches.

212.2.00 MATERIALS

212.2.01 Backfill

- a. Class A. Backfill
See Division 1 Trenches.
- b. Class B Backfill
See Division 1 Trenches.
- c. Cement Treated Base
See Division 1 Trenches.
- d. Pipe Bedding and Pipe Zone
See Division 1 Trenches.

212.2.02 Aggregate Base Shall conform to Section 207.

212.2.03 Asphalt Concrete Shall conform to Section 211.2.00.

212.2.04 Temporary Cold Mix AC Patches Patches constructed of cold mix AC will be acceptable during times when hot mix plants are not operating or to meet temporary trench surfacing requirements. Cold mix AC shall meet the requirements of Section 00735 of the Oregon Standard Specifications for Construction. All cold mix patches, shall be dug out and replaced with hot mix patches when hot mix AC becomes available.

212.3.00 CONSTRUCTION

212.3.01 PREPARATION

212.3.01a Sawcutting

The existing pavement shall be saw cut back to undisturbed areas and the edges shall be straight and vertical. Saw cuts are not permitted in the wheel line and must be located in the center or edge of the lane. Pavement previously sawcut for trenching and damaged during construction must be re-cut to a continuous straight line. A sawtooth pattern to the edge of the pavement patch is not allowed.

212.3.01b Tacking

All existing pavement or concrete surfaces shall be uniformly tacked with asphalt by brushing or spray equipment. A mist or fog application of tack is not sufficient and surfaces must be fully coated.

213 CURBS AND GUTTERS

213.1.00 DESCRIPTION

This work consists of furnishing, placing and finishing commercial grade concrete curbs, gutters, combination curb and gutter, combination curb, gutter and sidewalk, islands, and traffic separators, hereinafter collectively referred to as structures.

An incidental item included in this work shall be to stamp an "S" or "W" in the concrete curb at all locations where a sewer or water service line crosses under the curb.

The work included in CURB BACKFILL provides for the placing of clean backfill material behind the curbs, between the curb and sidewalk, behind sidewalks, and behind walls, at the grades and slopes shown on the plans.

213.2.00 MATERIALS

213.2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the applicable requirements of Section 00440 of the *Oregon Standard Specifications for Construction*, current edition.

Unless otherwise specified, commercial grade concrete shall conform to ODOT Class 3000. Portland Cement shall be Type I or type II. Air entrainment shall be between 4% and 7% as determined by AASHTO T 152 at the time of placing. The chloride content of any admixtures shall not exceed 0.5% by weight for applications with imbedded steel and shall not exceed 2% by weight for applications without imbedded steel. Set accelerating admixtures shall meet the requirements of AASHTO M 194 (ASTM C494, type C or E.)

The amount of deleterious substances shall not exceed the following limits:

Friable Particles	1% (by weight)
Lightweight Particles	1% (by weight)
Material Passing No.200 sieve	4% (by weight)

Concrete supplier shall provide batch tickets for each load to verify mix ingredients.

213.2.02 AGGREGATE BASE

Aggregate base shall conform to the requirements of Section 207.

213.2.03 CURB BACKFILL

Class A backfill material shall be placed behind the curbs, between the curb and sidewalk, behind sidewalks, and behind walls, sloping it as shown on the standard drawings. The top 8" of the backfill shall be good quality topsoil. Topsoil shall be a fertile, loamy, natural surface soil, well-graded and free from substances toxic to plant growth, noxious weeds, roots, refuse, sticks and lumps. Topsoil material shall be spread smoothly over the specified areas to the thickness, grades and slopes indicated on the plans or as otherwise ordered by the Engineer. Compaction shall be performed by a mechanical tamper or other method approved by the Engineer until the material is firm and unyielding. The finished surface shall be raked by hand.

213.3.00 CONSTRUCTION

213.3.01 PREPARATION OF SUBBASE AND BASE

Curb sub-base and base shall be constructed to the grades, and slopes indicated by the plans or as otherwise ordered by the Engineer. Sub-base shall be compacted to 95% of maximum density as determined by AASHTO T-99 prior to placing aggregate base material. Aggregate base shall be compacted to 95% of maximum density prior to placing curbs.

213.3.03 PLACING, FINISHING, AND CURING

213.3.03A Tolerances

The top and face of the finished curb shall be true and straight. The top surface or face shall not vary more than 1/4" from the edge of a 10 foot straightedge, except at changes in grade or in curves.

213.3.03B Finishing

Concrete shall be finished to a smooth and uniform texture by troweling and floating. The surface shall have a light broomed finish transverse to the direction of traffic, unless otherwise specified.

213.3.03C Curing

Concrete shall be cured by application of a liquid membrane forming compound applied uniformly to the damp concrete by pressure spray methods, or by keeping the concrete protected by covering and moist for a minimum of 72 hours. Curing compounds shall conform to the requirements of AASHTO M 148. All compounds shall be Class A. Solvent based compounds shall be Type 1-D.

Concrete curbs shall be allowed to cure for a minimum of 72 hours before starting spreading and compaction operations for aggregate base against or within 2 feet of new curbs. Curbs cracked, chipped or damaged by equipment operations shall be removed and replaced prior to paving. Curbs shall be replaced in sections by sawcutting at the nearest expansion joints.

213.3.03D Weather limitations

1. Concrete is to be placed when the air temperature is at least 25°F and rising.
2. Concrete shall not be placed on frozen ground. Frost and ice shall be removed from all forms, reinforcing steel, imbedded items, and subgrade.
3. Concrete from the chute shall have a temperature of not less than 55° F.
4. Concrete work shall be protected from freezing for at least seven days after placement. A curing sealant or impervious material shall be placed on the concrete.
5. The inspector can require the Contractor to provide a minimum recording thermometer, having not less than 2 degree divisions, to verify that the temperature at the surface of the work does not fall below 32° F. The reading shall be taken as close to the surface of the concrete as possible.
6. Any concrete indicated as being damaged from freezing shall be rejected and replaced by the contractor at no additional cost to the City.

213.3.04 EXPANSION JOINTS

Expansion joints in curbs shall be placed at no less than 100' spacing. Expansion joints are required on both sides of driveway approach where the top of the flare or wing meets the sidewalk, and at each point of tangency in the structure alignment.

213.3.05 CONTROL JOINTS

Concrete shall be scored with control joints at intervals not exceeding 15', or over contraction joints in concrete underlying the structure. Control joints shall be scored into the concrete a minimum of 1/3 the depth.

213.4.00 MEASUREMENT AND PAYMENT

213.4.01 INCIDENTAL BASIS

When neither specified nor listed in the proposal for separate payment, Curb and Curb Backfill shall be considered incidental work for which no separate payment will be made.

213.4.02 CURB

Concrete curb shall be measured to the nearest foot on a linear foot basis along the face of the curb for the actual length constructed. Payment for concrete curb will be at the price bid for concrete curb of the type and size specified and listed in the proposal.

213.4.03 CURB BACKFILL

When listed as an item in the Bid Schedule, Curb Backfill material will be measured by the linear foot of curb backfilled to the nearest foot. Payment for curb backfill will be at the contract bid unit price per linear foot of backfill, which price shall constitute full compensation for supplying and placing curb backfill.

214 DRIVEWAYS AND APPROACHES

214.1.00 DESCRIPTION

This work consists of forming, furnishing, placing and finishing Portland cement concrete driveways and approaches only. Asphalt concrete driveways shall be covered under Section 212 as ASPHALT PATCHING.

Driveways are considered to be that portion of paved vehicular access that lies behind the sidewalk or driveway entrance. Approaches shall also be referred to as aprons and are generally a transition section 5 feet in width between the grade of the gutter and the grade of the top of the curb.

214.1.01 GENERAL REQUIREMENTS

Driveways off all street classifications shall conform to the City of Redmond Access Management Standards, City Code Section 8.3035.9. Direct access to an arterial street should be avoided whenever practical, and is subject to approval by the City Engineer or Director of Public Works. Concrete Driveway Aprons are required on all new construction, except asphalt aprons approved by ODOT (Permit required). Driveways to multi-family residences (excluding duplexes) shall meet commercial standards.

Driveways on local streets should be spaced a minimum of 4' apart measured from the top of transition. The maximum practical spacing should be sought.

The distance between an intersection and the first driveway shall be in accordance with Development Code Section 8.3035(9). See Design Standards II.A.21 for additional information.

Residential driveway maximum width shall be 27'; commercial driveway maximum width shall be 35', unless an exception is granted.

214.2.00 MATERIAL

214.2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the requirements of Section 213.2.01.

214.2.02 INTERLOCKING PAVERS-DOWNTOWN AREA

Pavers shall be Uni-Decor design as manufactured by Concrete Paving Stone Company, Inc., 80 mm thick, cobble unit with edge units in the classic color. Herringbone pattern shall be used.

Cementitious materials shall conform to the following applicable ASTM specifications: Portland Cements-C150, blend cements-C595, Hydrated lime-Type S-C207, and Pozzolans-C618.

Physical Requirements: Air-entraining agents, coloring pigments, integral water repellants, finely ground silica, etc., shall be previously established as suitable for use in concrete and either will conform to ASTM standards where applicable or will be shown by test or experience not to be detrimental to the concrete.

At the time of delivery to the site, the average compressive strength shall not be less than 8000 psi.

The average absorption shall not be greater than 5% with no individual unit greater than 7%.

The Manufacturer shall verify durability by providing written documentation on the following:

Freeze-thaw testing: when tested in accordance with Section 8 of ASTM C 67-73, specimens shall have no breakage and not greater than 1.0% loss in dry weight of any individual unit when subjected to 50 cycles of freezing and thawing. This test shall be conducted not more than 12 months prior to delivery of units.

Abrasion resistance: when tested in accordance with ASTM C 418-76, "Abrasion Resistance of Concrete by Sandblasting", specimens will not have greater volume loss than 15 cubic centimeters per 50 square centimeters. The average thickness loss will not exceed 3 millimeters.

Permissible Variations in Dimensions: Length or width of units will not differ by more than 1.5 mm from approved samples. Heights of units will not differ by more than 3 mm from the specified standard dimension.

Visual Inspection: All units will be sound and free of defects that would interfere with the proper placing of unit or impair the strength or permanence of the construction. Minor cracks incidental to the usual methods of manufacture, or minor chipping resulting from the customary methods of handling in shipment and delivery, will not be deemed grounds for rejection.

Sampling And Testing:

1. The purchaser or authorized representative will be accorded proper facilities to inspect and sample the units at the place of manufacture from the lots ready for delivery.
2. Sample and test units in accordance with ASTM methods C140, Sampling and Testing Concrete Masonry Units, except as required in Section 3.3.

Rejection: In case the shipment fails to conform to the specified requirements, the manufacturer may sort it, and new specimens will be selected by the purchaser from the retained lot and tested at the expense of the manufacturer. In case the second set of specimens fails to conform to the test requirements, the entire lot will be rejected.

Expense of Test: Except as specified and unless otherwise agreed, the expense of inspection and testing will be borne by the purchaser.

Sand Laying Course: The sand laying course will consist of clean, sharp sand with the following gradation limits:

Sieve Size	% Passing
4	90 – 100
8	80 – 95
16	55 – 85
50	10 -- 35
200	0 – 5

Edge Restraint: All edges of the paving stone installation will be restrained. The type of edge restraint will be concrete curb or sidewalks.

214.2.03 AGGREGATE BASE

214.2.03A

Portland Cement Concrete Base aggregates for PCC driveways and approaches shall consist of Class B material meeting the requirements of Section 101.2.02B.

214.2.03B Interlocking Pavers

Base aggregates for interlocking pavers shall be 1"-0 in accordance with Section 207. A ½" leveling course of clean sand shall be placed between the pavers and aggregate base.

214.3.00 CONSTRUCTION

Driveway aprons shall be 6" thick, or as shown on the plans. Any transition from 6" to 4" thickness shall not occur in the apron.

214.3.01 PREPARATION OF SUBBASE AND BASE

Preparation of subbase shall conform to the requirements of section 213.3.01 and the following; If the in-situ material does not meet the material specification for base, then the base shall be excavated 8 inches from finish grade, raked smooth of large rocks and other organic material, and 4 inches of base placed and compacted per standard drawing. If the in-situ material meets the specification for base, as proven by the Contractor and verified by the City Engineer, then the base shall be excavated 4 inches from finish grade, raked smooth of large rocks and other organic material, and compacted.

A minimum of one test every 300 feet, or as directed by the City Engineer, is required. Costs of passing tests are the responsibility of the City. Costs of failing tests are the responsibility of the Contractor.

214.3.02 PLACING, FINISHING, AND CURING PORTLAND CEMENT CONCRETE

This work shall conform to the requirements of Subsection 213.3.03 and the following;

214.3.03 EXPANSION JOINTS

Expansion joints are required at ends of driveway in accordance with the standard drawings.

214.3.04 CONTRACTION JOINTS

Contraction joints are required at the center of the driveway in accordance with the standard drawings.

214.3.05 INTERLOCKING PAVERS - Downtown Area

Construction of the Base Course

1. The finished sub grade will be approved before placement of any base course.
2. The base course will be compacted with suitable compaction equipment that will ensure a minimum 90% of ASTM designation D1557.
3. The base course will be shaped to grade and cross section with an allowable local tolerance of 0.01 feet.
4. Construction of the base course will be the responsibility of the General Contractor.

Construction of the Sand Laying Course

1. The finished base course will be approved before the placement of the sand laying course.
2. The sand laying course will be spread evenly over the area to be paved and screeded to a level that will produce the ½ inch thickness when the paving stones have been placed and vibrated.
3. Apply granular pre-emergent herbicide over the prepared level bed according to the manufacturer's instructions.
4. Once screeded and leveled, this sand laying course will not be disturbed in any way.

Laying of Concrete Paving Stones

1. The paving stones will be laid in the approved pattern.
2. The paving stones will be laid in such a manner that the desired pattern is maintained and the joints between the stones do not exceed 1/8 inch.
3. The gaps at the edge of the paved surface will be filled with standard edge pieces or with stones cut to fit. The stones will be cut to a straight even surface without cracks or chips.
4. The paving stones will be vibrated to their final level by two or three passes of a vibrating plate compactor.
5. After vibration, white silica sand will be brushed over the surface and vibrated into the joints with additional passes of the plate vibrator so as to completely fill the joints.
6. Surplus material will be then swept from the surface and the entire site left clean.
7. After final vibration, the surface will be true to grade and will not vary by more than 1/2 inch when tested with a 3 foot straight edge at any location on the surface.

214.4.00 MEASUREMENT AND PAYMENT

214.4.01 INCIDENTAL BASIS

When neither specified nor listed in the proposal for separate payment, Driveways and Aprons shall be considered incidental work for which no separate payment will be made.

214.4.02 DRIVEWAYS

Driveways shall be measured on a square foot basis to the nearest whole square foot. Payment for driveways shall be at the unit price bid at the thickness and measurement unit specified.

214.4.03 DRIVEWAY APRONS

Aprons shall be measured on a square foot basis to the nearest whole square foot. Transition sections from apron to sidewalks shall not be measured. Payment for aprons shall be at the unit price bid at the thickness and measurement unit specified.

215 SIDEWALKS AND PATHWAYS

215.1.00 DESCRIPTION

The work covered in this section consists of forming, placing, and finishing standard Portland Cement Concrete sidewalks and pathways in accordance with standard drawings 2-12 to 2-18. This section also covers colored Portland Cement Concrete and interlocking paver downtown sidewalks in accordance with standard drawings 2-19 to 2-22. The construction of asphalt concrete pathways and sidewalks shall conform to specifications Section 211.

215.1.01 GENERAL REQUIREMENTS

Structures, such as fire hydrants and central delivery mailboxes, shall not be located in the sidewalk except as approved by the City Engineer. The back edge of the sidewalk shall smoothly meander back from the central delivery mailbox station to provide a 5' wide unobstructed pathway. No portion of the mailbox shall be within 6" of the curb.

Sidewalks constructed abutting the property line are the most desirable. When sidewalk is placed abutting curb, the sidewalk shall be poured separate from the curb. When a sidewalk meanders from the curb the alignment may require special approval; and the following conditions shall be met:

The sidewalk shall generally follow a smooth and gradual alignment free of sharp angles or bends. Horizontal curves shall not be less than 20 foot radius. The centerline of the side walk shall not meander more than 35 feet from the street curbline. All sidewalks shall be within the right-of-way or, in particular situations where topographical or vegetation limitations require sidewalks out of the right-of- way, 15 foot easements shall be provided. The location of meandering sidewalks shall be shown on the plans and profile as a condition for approval by the City Engineer.

Sidewalk grades shall not exceed 5% greater than the existing street grade and in no case greater than a 15% grade. The total vertical separation between the top of curb and the top of the sidewalk shall not be greater than 10 feet. In no case shall the cross slope of the parking strip between the curb and the sidewalk be steeper than 2:1. The grade of meandering sidewalks shall be shown on the profile as a condition for approval by the City of Redmond.

Safety is a primary design consideration. All portions of the sidewalk shall be visible from the street. Trees and brush shall be thinned or removed to provide the required visibility.

Meandering sidewalks shall cross intersections no further back than the center of the curb radius. Accessible ramps meeting the standards of ADA shall be provided.

The parking strip so created shall not be less than 36" wide, except where the sidewalk meander returns to be adjacent to the curb. To prevent sharp re-entrant angles in the parking strip, an edge not less than 8" long and squared to the curb shall be constructed at the juncture of the sidewalk to the curb. Provision shall be made for landscaping the parking strip. Provision shall be made and facilities installed for the irrigation of the parking strip.

215.2.00 MATERIALS

215.2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the requirements of Section 213.2.01.

215.2.02 COLORED PORTLAND CEMENT CONCRETE-DOWNTOWN SIDEWALKS

Portland cement concrete shall conform to the requirements of Section 213.2.01 and the following; color shall be Davis color #641 (Sequoia Sand, 1 lb. per sack of cement).

215.2.03 INTERLOCKING PAVERS-DOWNTOWN SIDEWALKS

Pavers shall conform to the requirements of section 214.2.02, 214.2.03B, and the standard drawings.

215.2.04 AGGREGATE BASE

215.2.04A Portland Cement Concrete

Portland Cement Concrete Base aggregates for PCC driveways and approaches shall consist of Class B material meeting the requirements of Section 101.2.02B.

215.2.04B Colored Portland Cement Concrete and Interlocking Pavers

Base aggregates for downtown sidewalks including colored Portland Cement Concrete and interlocking pavers shall be 1"-0 in accordance with Section 207. A ½" leveling course of clean sand shall be placed between pavers and aggregate base.

215.3.00 CONSTRUCTION

215.3.01 PREPARATION OF SUBBASE and BASE

Preparation of subbase and base shall conform to the requirements of Section 214.3.01.

215.3.02 PLACING, FINISHING, AND CURING PORTLAND CEMENT CONCRETE

This work shall conform to the requirements of Section 213.3.03.

215.3.03 CURB RAMPS

The Contractor shall construct accessible ramps at the locations shown on the plans and in accordance with the details shown on the plans and in conformance with all ADA requirements.

215.3.04 EXPANSION JOINTS

Expansion joints shall be constructed at each point of tangency, at connections to existing curbs, driveways, sidewalks, and pathways, around objects which protrude through, into, or about the sidewalk and at spacings not to exceed 25'.

215.3.05 CONTROL JOINTS

Control joints in sidewalks are required at 5' intervals. Control joints shall be scored in wet concrete a minimum of 1/3 the depth of the concrete section.

215.3.06 INTERLOCKING PAVERS - DOWNTOWN AREA

Pavers shall conform to requirements of 214.3.05

standard drawings.

217.4.00 MEASUREMENT AND PAYMENT

217.4.01 UNIT PRICE BASIS FOR SIGNS

Measurement for signs will be made on a per each basis for the signs specified in the Schedule of Bid Items. Payment will be for the actual number of signs installed as specified. No separate payment will be made for providing and installing posts.

217.4.02 LUMP SUM BASIS FOR STRIPING AND PAVEMENT MARKINGS

Unless otherwise noted on the plans, striping and pavement markings will be measured and paid for on a lump sum basis.

221 LANDSCAPING

221.1.00 DESCRIPTION

This work consists of furnishing and installing landscaping and irrigation facilities in public rights-of-way, including downtown sidewalks.

221.1.01 DOWNTOWN SIDEWALKS

Furnish labor, materials, equipment, and supervision necessary to complete all work shown on the Drawings and in the Specifications.

Protect active utilities encountered and notify persons or owner agencies. Landscape Contractor shall request utility markouts prior to excavating and verify with General Contractor the location of all underground site utilities.

221.1.02 IRRIGATION

Except as modified or supplemented herein, the provisions of Sections 01120 of the ***Oregon Standard Specifications for Construction***, current edition, and all supplements shall apply.

Furnish all labor, materials, equipment, and supervision necessary to complete all work shown on the Drawings and as described in the specifications. The Landscape Contractor shall employ and have on site at all times during installation of the system competent individuals knowledgeable about the irrigation products and equipment specified.

Before proceeding with the installation of any section of the irrigation system, Contractor will check and verify the correlation between ground measurements and the drawings. The layout of the irrigation system is schematic. Follow as closely as is practicable. Notify Engineer of changes that have taken place in the field.

Contractor shall have all utilities marked out prior to excavating for irrigation lines. Landscaper shall verify the location of all underground site utilities with General Contractor, and protect all active utilities encountered. Utility owners shall be notified if conflicts occur.

Provide and install sleeves, automatic irrigation system, and valve boxes. Remove existing soil from around existing trees to allow for irrigation heads and new tree grates as detailed. Coordinate installation of sleeves under all hard surfaces with General Contractor.

Points of Connections (P.O.C.) for the irrigation system and valve boxes shall be provided and installed by the Contractor in conformance with the Water Service and Meter Installation Manual. Meters will be provided and installed by the City of Redmond Public Works Department Water Division.

Protection Of Unfinished Work: Provide protection at all times to keep rock, dirt, gravel, debris and all other foreign materials from entering piping, valves, and other irrigation equipment.

Environmental Conditions: Solvent welding of PVC pipe shall be performed under cover during rainy weather, and is not allowed in freezing conditions.

Storage: PVC pipe and fittings shall not be stored or left out in direct sunlight.

Guarantee And Replacement: Contractor shall guaranty the irrigation system, or any part thereof, against defects in materials and workmanship for a period of one year from the date of acceptance by the City. Any defects appearing during the warranty period shall be repaired or replaced without additional expense to the City of Redmond. Any apparent settling of backfilled trenches occurring during the warranty period shall be properly filled and re-graded, including repair and complete restoration of all damaged planting, paving, or other improvements of any kind.

221.2.00 MATERIALS

221.2.01 DOWNTOWN SIDEWALKS

221.2.02A General - Materials shall be as shown on the Drawings and specified herein.

221.2.02B Topsoil - Clean, friable, natural sandy loam material, free of debris, roots, stones, weeds and grass.

221.2.02C Textural Soil Amendments - Garden Care Compost, as provided by North American Soils, Inc., Portland, Oregon 97203. Five (5) Cubic Yards required for each 9 trees to be planted.

221.2.02D Tree Grates - Tree grates will be provided by the City of Redmond. Contractor shall arrange to pick up grates at Public Works Department.

221.2.02E Trees - Trees will be minimum 2" caliber to be measured 6" from graft and an approved tree type. The City will approve tree type and location before ordering.

221.2.02 IRRIGATION

Furnish only commercial quality materials and equipment, new and of brands and types shown on Drawings and as specified herein. All items proposed for use will be subject to testing to assure compliance with the Specifications. Provide materials for the same or related function that are of the same type and manufacturer.

221.2.03A IRRIGATION EMITTERS

Cyclac construction except as otherwise specified by model number reference. Manufacturer's catalog numbers indicated on Drawings. RB-Rain Bug EM-M20 Emitter.

221.2.03B PIPE, FITTINGS and TUBING

(1) **PVC Pipe (Polyvinylchloride)** PVC 1120, Type 1, normal impact, I.P.S., NSF approved; plain and/or bell end; conforming to ASTM D1784-69 and D2241-73, color white. Sleeves under paved areas shall be Schedule 40 PVC with minimum 2-inch inside diameter.

(2) **PVC Pipe Fittings** PVC 1120, Schedule 40, Type 1, normal impact, I.P.S., NSF approved, meeting requirements of ASTM tentative specifications D-2466 and D-1784.

(3) **PVC Riser** PVC 1120, Type 1, normal impact, I.P.S., NSF approved schedule 80 PVC, conform to PS 21-70. Cut to required lengths threaded both ends, color: dark grey.

(4) **Irrigation Tubing** Rain Tube - low density polyethylene, manufactured under the strictest ASTM - RB - 1049.

(5) **Emitter distributing Tubing** RB-150 - Low density polyethylene.

221.2.03C PVC SOLVENTS:

(1) **PVC Solvent Cement** NSF approved solvent for PVC through 4", meeting requirements of ASTM D-2564, #705.

(2) **PVC Primer and Cleaner** Weld-On P-70

221.2.03D BACKFLOW DEVICES Refer to City of Redmond Water Service and Meter Installation Manual. C.O.R. Water Division will determine the final choice for backflow devices.

221.2.03E VALVES and VALVE BOXES:

- (1) **Automatic Control Valve** - 1" - 24 volt Irri: -Trol DC latching solenoid valves.
- (2) **Manual Drain Valve** - Rain Bird No. MVA - 3/4 or approved.
- (3) **Quick-Coupling Valve** - One piece, double slot 1" I.P.S. with vinyl cover and lock top. Rain Bird No. 5 LVC.
- (4) **Valve Box** - Jumbo concrete boxes.

221.2.03F CONTROLLERS and ELECTRICAL:

- (1) **Battery Operated Controller and Battery Box** - Two Station IBOC Irri-Tol Controller and BP-1 Battery Box.
- (2) **Control Wire** - Type UF bearing U/L approval for direct underground burial in National Electric Code Class II circuits. AWG sizes, minimum size #16.

221.2.03G GRAVEL 3/4" x 1/2" clean, washed, round gravel.

221.2.03H ACCESSORIES

- (1) **Quick-Coupling Valve Coupler** - Rain Bird No. 55 K-1.
- (2) **Hose Swivel** - Rain Bird No. SH-2.

221.3.00 CONSTRUCTION

221.3.01 DOWNTOWN SIDEWALKS

221.3.013A General - Remove from all planting openings, stones, mortar, concrete, asphalt, rubbish, debris, and any other materials considered harmful to plant life.

221.3.01B Soil Preparation - Thoroughly mix together 4.6 cubic yard topsoil and 6 inches textural soil amendment at each proposed tree location.

221.3.01C Tree Grates - Tree grates to be installed after the irrigation and topsoil placement has been completed. Verify tree grate installations with General Contractor.

221.3.02 IRRIGATION

221.3.02A GENERAL

Installation of all materials and equipment will be in accordance with the manufacturer's written instructions and recommendations, and all applicable local and State of Oregon requirements.

221.3.02B EXCAVATION AND BACKFILL

(1) **Trenches** Pipe trenches shall be straight or 'snaked' slightly allowing for expansion and contraction of PVC pipe.

(a) **Grades** - Bottoms of uniform slopes 1% minimum grade, except 1/2% minimum where greater slope is not practicable.

(b) **Trench Depth** - 12" minimum pipe cover where possible.

(c) **Trench Width** - Provide sufficient width at bottom of trench to allow for proper tamping around pipe.

304 SERVICE LINE SEWERS

304.1.00 DESCRIPTION

This section covers the work necessary for the installation of sewer service lines, service taps, and connections. In general, service lines will extend from the sewer main to the street or alley right of way line.

At the sole discretion of the City, the Contractor and/or material supplier shall provide certified manufacture date for any PVC pipe with visible cracking, discoloration and/or fading due to ultraviolet light exposure. Pipe which is one year or older may be rejected. The City also reserves the right to reject pipe material for cause regardless of age of pipe.

304.2.00 MATERIAL

304.2.03 PIPE AND FITTINGS FOR SERVICE LINES

Sewer service connection lines shall conform to the same specifications as sanitary sewer lines unless otherwise modified by these specifications.

304.2.04 SEWER SERVICE MARKERS

Service connection markers shall be new, one piece Douglas Fir or cedar, 2x4's, utility grade or better, or 2" PVC Schedule 40 pipe. All markers shall be painted green.

304.2.05 SERVICE SADDLES

Service saddles shall be Romac "CB" type saddles or equivalent. The type shall conform to style 101S with painted saddle and stainless steel strap. On sewer pipe with a diameter of 12" or larger, INSERTA TEE® service connections will be acceptable. No other type shall be permitted.

304.2.06 SWING CHECK VALVES

Swing valves shall be APCO series 100 or equivalent. The check valve shall be capable of passing a 3" diameter solid.

304.2.07 GATE VALVES

Iron body, resilient seated gate valves shall be "Kennedy Ken-Seal" type 1561x or equal. Gate valves will meet AWWA standards (C-500), have non-rising stems, be rated at 200 lbs. working pressure and 350 lbs. hydrostatic pressure, open left with 2" square operating nuts, with brass fittings, "O" ring stem pressure seals, non-directional, mechanical joints; as manufactured by Kennedy, Mueller, Waterous, or American Darling.

304.3.00 CONSTRUCTION

Sewer service lines shall not have less than 3.0 feet of cover under roadway area and shall not have less than 2.0 feet of cover to natural ground in the right-of-way. Services shall be extended at minimum grade or as required to provide gravity services to each property or building.

Each property shall be connected to the sewer main or lateral by an independent sewer service. Sewer services to adjacent properties may share the same trench.

Where a sewer service is to be connected to an existing sewer main and no connection fitting is available, the connection must be made by the City of Redmond Wastewater Department. Inspection by the City Engineering Division is required for work in the public right-of-way. Sewer services in new construction areas shall extend to the property line and be marked with material described in 304.2.04

extending a minimum of 6" above the natural ground surface. The distance from natural ground surface to the top of the service connection in feet and inches shall be neatly written in permanent ink on the sewer service marker.

304.3.01 SEWER TAPS

All taps on existing sewer mains shall be performed by City of Redmond Wastewater Division personnel. Contractor shall provide 72 hour advance notice to the City for all taps.

304.3.02 CITY SEWER TAP PREPARATION REQUIREMENTS

The Contractor shall provide a finished trench with appropriate safety shoring meeting OSHA requirements to allow City staff to tap active or existing main lines for service laterals. The full circumference of sewer main shall be exposed and accessible, and wiped free of dirt and foreign material prior to the scheduled arrival of the City tapping crew. When crossing streets, or when required by the City, traffic control shall be provided and maintained by the Contractor. Damage to existing pipe or other utilities in the ground is the responsibility of the excavator.

304.3.03 SEWER SERVICE ABANDONMENT

Sewer services are to be abandoned by cutting and capping service at edge of pavement or back of curb when possible. If sidewalk is curb-tight, cut and cap at back of sidewalk. Remove the cleanout and service line on property side. When converting split services to a single service, remove the 6x4 wye and replace/restore cleanout. Obtain plumbing permit for service abandonment on property.

304.4.00 MEASUREMENT AND PAYMENT

304.4.01 TRENCH EXCAVATION AND BACKFILL

Trench excavation and backfill shall be paid for under the provisions of Sec. 301.4.01.

Where no separate item exists in the Schedule of Bid Items, work for sewer service trench excavation and backfill shall be considered incidental to the work required to provide and install sewer services.

304.4.02 SEWER SERVICE LINE PIPE

Payment for sewer service line pipe will be made on a lineal foot basis for the size and type of pipe shown. Measurement will be made horizontally along the centerline of the service pipe from the main line fitting to the cap or termination of the service line.

No final payment for sewer service line pipe will be made until the section of sewer to which the services are connected has successfully passed the applicable internal pressure test as described in Section 303.

304.4.03 SEWER TAPS

Payment for sewer taps will be made on a per each basis for the type, kind, and size specified, and shall constitute full compensation for constructing the sewer tap complete and in place.

304.4.04 INCIDENTAL BASIS

When neither specified nor listed in the proposal for separate payment, sewer service lines shall be considered incidental work for which no separate payment will be made.

305 PIPE AND FITTINGS (STORM SEWERS)

305.1.00 DESCRIPTION

This section covers the work necessary for the construction of storm sewers. Except as amended or modified herein, the provisions of Section 303 shall apply.

At the sole discretion of the City, the Contractor and/or material supplier shall provide certified manufacture date of any PVC pipe with visible cracking, discoloration and/or fading due to ultraviolet light exposure. Pipe which is one year or older may be rejected. City also reserves the right to reject pipe material for cause regardless of age of pipe.

305.2.00 MATERIALS

305.2.01 GENERAL

Unless otherwise specified, all storm sewer pipe with less than 24 inches of cover to finish grade shall be AWWA C900, 8" thru 12", or AWWA C905, 14" through 24", DR 25 water pipe meeting the requirements of AWWA specifications for ***Poly Vinyl Chloride (PVC) Water Transmission and Distribution Pipe***. Pipes with more than 24 inches of cover to finish grade may be PVC meeting the requirements of ASTM D3034 SDR 35 for diameters up to and including 15 inch. Pipes larger than 15 inch with more than 24 inches of cover shall meet the requirements of ASTM F679 PS46.

305.3.00 CONSTRUCTION

305.3.01 TRENCH BACKFILL

Trench backfill shall be placed in accordance with the requirements of Division I – TRENCHES, except that the finished backfill shall be water jetted under the direction of the Engineer to demonstrate that all rock crevices that may have been opened up during excavation are sealed.

305.3.02 INSTALLATION

All storm sewer not located under paved roadway shall be provided with one layer of detection tape as required in Standard Drawing 3-1.

305.3.03 CLOSED CIRCUIT TELEVISION INSPECTION

All storm sewers shall be inspected in accordance with Section 303.3.11.

305.4.00 MEASUREMENT AND PAYMENT

305.4.01 TRENCH EXCAVATION AND BACKFILL

Trench excavation and backfill shall be paid for under the provisions of Sec. 301.4.01. Where no separate item exists in the Schedule of Bid Items, work for storm sewer trench excavation and backfill shall be considered incidental to the work required to construct storm sewers.

305.4.02 STORM SEWERS

Payment for storm sewers will be made on a lineal foot basis. Measurement will be made horizontally along the pipe centerline from the finished end to end of the pipe.

305.4.03 INCIDENTAL BASIS

When neither specified nor listed in the proposal for separate payment, storm drains shall be considered incidental work for which no separate payment will be made.

306 MANHOLES

306.1.00 DESCRIPTION

This section covers the work necessary for the construction of sanitary and stormwater sewer manholes. Except as modified or supplemented herein, the provisions of Section 00470 of the **APWA Oregon Standard Specifications for Construction**, current edition shall apply.

Manholes shall be located as shown on the Plans or as directed by the City Engineer, or City representative.

306.2.00 MATERIALS

306.2.01 CONCRETE

Concrete shall conform to the requirements of ASTM C94 Alternate 2. Compressive strength for manhole bases and miscellaneous concrete structures shall be not less than 3000 psi at 28 days. Maximum size of aggregate shall be 1 1/2 ". Slump shall be between 2" and 4".

306.2.02 METAL CASTINGS

Covers for sanitary sewer manholes shall comply with Standard Drawing 3-7. Storm sewer manhole covers shall comply with Standard Drawing 3-9. Locking and sealed manhole covers may be required in some locations.

306.2.03 RIM ADJUSTMENT

An adjustment system such as East Jordan Iron Works Infra-Riser or approved equal, shall be used to adjust manhole frame and cover to finish grade. Flexible sealant between manhole frame, Infra-Risers and grade rings suitable for metal concrete and rubber such as Hi-Tec Project 1 4000 Series Modified Poly Sealant or equal.

306.2.04 MANHOLES

306.2.04A Pre-cast Manhole Sections

Materials shall conform to the requirements of ASTM C478. Minimum wall thickness shall be 4 inches. Cones shall have the same wall thickness and reinforcement as riser sections. Joints shall be tongue-and-groove or keylock type. Cone shall be eccentric unless otherwise specified. Flat top manholes shall be used where depth is less than 6 feet.

Minimum manhole diameter shall be as 48" unless otherwise approved by the Engineer

306.2.04B Pre-cast Bases

At the option of the Contractor, pre-cast base sections or manhole bases maybe used provided all details of construction are approved by the City Engineer prior to construction.

306.2.04C Cast In Place Bases

Cast-in-place bases shall be formed prior to setting wall sections, i.e. blocking up walls and casting base beneath will not be acceptable. Options include using block outs in first wall section (over pipe) to use as form or casting base with form ring.

306.2.04D Mortar

Mortar shall conform to the requirements of ASTM C387, or be proportioned 1 part Portland cement to 2 parts clean, well graded sand passing a 1/8-inch screen. Admixtures may be used not exceeding the following percentages by weight of cement: hydrated lime, 10 percent; diatomaceous earth, or other inert materials, 5 percent. Consistency of the mortar shall be such that it will readily adhere to the pre-cast concrete.

306.2.04E Coatings

When required due to corrosion concerns, manholes shall be spray lined with Polysield HT Elastomeric Polyurea or approved equal.

306.2.05 PIPE FITTINGS

Pipe and fittings shall conform to the applicable portions of Section 303. Tees, ells, and other fittings for drop manholes shall be of the same material as the pipe in the adjacent mains unless specified otherwise.

306.2.06 PIPE STUB-OUTS FOR FUTURE SEWER CONNECTIONS

Pipe stub-outs shall be the same type as approved for use in the lateral, main, or trunk sewer construction. Strength classifications shall be the same class as specified for adjacent pipelines. Where there are two different classes of pipe at a manhole, the higher strength pipe shall govern strength classification. Rubber-gasketed water tight plugs shall be furnished with each stub-out and shall be adequately braced for hydrostatic or air test pressure.

306.3.00 CONSTRUCTION

306.3.01 GENERAL

306.1.01A Foundation Stabilization

If in the opinion of the Engineer, unstable material exists that will not support the manhole or other structure, the Contractor shall excavate to suitable supporting material and backfill with compacted foundation stabilization material to the design grade as directed by the Engineer.

306.3.01B Pipe Connections

All pipes entering or leaving the manhole or vault shall be provided with flexible joints within 18 inches of the manhole structure, and shall be placed on firmly compacted bedding. Special care shall be taken to see that the openings through which the pipes enter the structure are completely watertight. Flexible joints shall be constructed with rigid PVC repair couplings or the bell end of a PVC pipe section. Flexible rubber couplings are not an acceptable flexible joint.

306.3.02 PRECAST CONCRETE MANHOLES

306.3.02A Bases

If bases are cast-in-place, the concrete shall be consolidated by mechanical vibration. The concrete shall be screed off so that the first manhole section to be placed has a level uniform bearing for the full circumference.

Pre-cast base sections shall be carefully placed on the prepared bedding so as to be fully and uniformly supported in true alignment, and assuring that all entering pipes can be inserted on the proper grade.

The minimum open channel length thru the manhole shall not be less than the diameter of the manhole less 12", i.e., 48" manhole requires a 36" minimum channel length. All pipes entering or leaving shall be provided with flexible joints within 18" of the exterior wall of the manhole structure.

306.3.02B Frames and Covers

The final elevation for each manhole shall be within 1/4" of the finished street grade. It is permissible to adjust the manhole frame to final grade after street paving provided that the structure is low enough so as not to interfere with the street paving operation. Patching material shall be asphalt concrete or Portland Cement Concrete with a maximum patch diameter of 6 feet.

Manhole cover shall have two holes. A cut out at the rim should be provided for raising the lid.

Concrete grade rings may be used to bring the manhole frame and cover to grade, but the distance from the top of the flat top or cone section to the bottom of the manhole cover cannot exceed 18 inches. Grade rings shall be set in a bed of mortar that covers the full surface of the grade ring at a depth of 1/2 inch or less. Minimum grade ring thickness is 3 inches. Infra-risers or equal shall be used between the manhole frame and concrete with beveled risers used to adjust to the slope of the pavement. Apply a mastic between the grade ring, cone or flattop and the Infra-riser, between layers of Infra-risers and between the Infra-riser and manhole frame.

306.3.02C Cleanouts

Cleanouts are not acceptable on gravity sanitary or storm sewer lines in lieu of a manhole. Sanitary sewer cleanouts on pressure systems shall be located as shown on the plans.

306.3.03 MANHOLE TESTING

Manholes shall be tested using either hydrostatic or vacuum methods as specified by APWA Oregon Standard Specifications Section 00470.71.

306.4.00 MEASUREMENT AND PAYMENT

306.4.01 MANHOLES

Payment for manholes will be made on a per each basis as listed in the Bid Schedule for the type and size shown. Payment shall include all materials, labor, equipment, and incidentals necessary to construct and test manholes complete and in place as shown.

306.4.02 INCIDENTAL BASIS

When neither specified nor listed in the proposal for separate payment, Manholes shall be considered incidental work for which no separate payment will be made.

timely basis.

402.3.06B CERTIFICATION

The Contractor or Contractor's employee shall be not less than a State of Oregon Certified Water Distribution Systems Operator I. This person shall be present during and shall supervise all phases of these procedures.

The Contractor or Contractor's representative shall demonstrate knowledge of the steps required for chlorinating/flushing/testing; and conduct a field demonstration of technique.

402.3.06C MATERIALS

Equipment used for testing shall be kept clean and disinfected at all times. Tanks, hoses, pumps or any equipment directly in contact with any potable water piping or City of Redmond water facilities shall be dedicated for potable water use only. Equipment is subject to inspection and/or testing by the City at any time to prove compliance with these specifications.

The Contractor will supply all water and chemicals used for test procedures. The chlorine used will be approved by the City of Redmond prior to use. In some cases the City may be able to provide water. The method of chlorination will be by injection. Slug chlorination will not be allowed. The Contractor will also be responsible for the safe disposal of chlorinated water at the completion of the test.

402.3.06D PROCEDURES

Testing procedures shall be performed during normal City working hours, 7:00 AM to 4:00 PM, Monday through Friday. Pressure testing will be scheduled to allow completion of all tests within the normal working hours. Chlorination and pressure tests will not be performed when the temperature is expected to be less than 33° between the hours of 8 AM and 4 PM. Chlorine residual tests require a minimum of 24 hours.

The Contractor's personnel shall not operate any valve connected to the City water distribution system.

402.3.06E FLUSHING

The Contractor will be responsible for all flushing activity, including, but not limited to, flushing air from services and main lines at time of chlorination, flushing chlorinated water after all chlorination and re-chlorination, and as directed by the City's Representative prior to chlorination in case of dirty installation conditions.

The Contractor shall thoroughly flush all lines. Flushing velocity shall not be less than 3 fps. Flushing is considered completed when the system chlorine residual matches the background chlorine residual level of the City water distribution system at the source of water used for flushing.

402.3.06F CHLORINATION

The Contractor will be responsible for chlorine taps. Taps are required on all dead ends, and may be required on high points to vent trapped air. Taps will be coordinated and observed by the City of Redmond.

Before chlorination, the City Representative will witness all valves being opened in the system being chlorinated.

The City Representative will sample chlorine residuals as follows:

After chlorination (beginning of test initial value).

Prior to the chlorination solution being flushed at the end of the 24 hour test period (finish value).

The system water after the system has been thoroughly flushed.

A maximum of 60.00 PPM and a minimum of 25.00 PPM of free residual chlorine are the acceptable limits for the initial test. Optimum free chlorine residual for the initial test is 50.00 PPM. Any residual above or below the acceptable initial limits shall be grounds for restarting the chlorination test. If the finish residual value after 24 hours varies from the starting value by 60% or more, the test will be deemed to have failed, and the pipeline shall be thoroughly flushed and re-chlorinated in accordance with the specified procedures.

If a passing residual level is not obtained after three chlorinations of the system, the pipeline will be deemed to be contaminated and will not be accepted. The Contractor shall remove the contaminated pipeline and replace all pipe at his own expense.

402.3.06G BACTERIOLOGICAL

When the chlorination test has passed and been accepted, the system shall be thoroughly flushed until the chlorine residual is equal to the chlorine residual at the source of the water used for flushing. Twenty-four (24) hours after completion of flushing, a representative of the City of Redmond, or approved testing laboratory representative, shall draw bacteriological samples from the closed system.

There will be a minimum 48 hour period between collecting the chlorination sample and the scheduling of the beginning of the pressure testing to permit an acceptable bacteriological test to be conducted. If the bacteriological test result is negative, pressure testing of the main can proceed. However, if the bacteriological test result is positive, re-chlorination of the system is required. When re-chlorination is required because of a failed sample, a companion sample set will be taken with the second primary sample set.

402.3.06H PRESSURE TESTING

Prior to pressure testing, all air will be flushed and expelled from the system. The City Representative will witness all valves checked to be open, and all service stops and hydrants securely closed. All service lines shall be installed prior to testing and corp stop at main open during testing.

Pressure testing should be done from the high end of the main, unless otherwise directed by the City of Redmond. The test pressure shall be two times (2X) the system pressure, but not less than 150 psi, for a period of not less than two hours.

The Contractor's pressure testing equipment (hoses from pump to metering device and from metering device to main) will be made up to connect thru a 3/4" meter. The City will use their meter and gauge for pressure testing.

The length of the pressure test will be two hours. The allowable leakage shall be determined from the chart in the City of Redmond Water Specifications.

In-line valves in the test section shall be open during the 2-hour test. Once the line has passed, the in-line valve farthest from the pressure gauge shall be closed and the line pressure from that point on reduced to normal system operating pressure. Pressure shall be observed for 10 minutes. If there is no drop in pressure, close the next in-line valve towards the pressure gauge,

reduce pressure beyond that valve, observe for 10 minutes and repeat until all in-line valves have been tested. If the pressure drops during any of the in-line valve tests, repair as necessary and repeat the 2-hour test for the section of line with that valve at one end.

402.3.06I OTHER TESTS

The City Representative may require other tests, such as Volatile Organic Chemicals, Inorganic Chemicals, Synthetic Organic Chemicals, if he has reason to believe the line has been contaminated with such compounds. The costs for these tests may be substantial and shall be borne by the Contractor/Developer. Failure to pass such other tests will be grounds to reject the work, and may require that the pipe be replaced prior to further testing and acceptance.

402.3.06 J CLEANUP

Upon completion of the testing and acceptance of the tests by the City of Redmond, the Contractor shall clean the area and set valves to closed or open as directed by the City.

402.3.07 HOT TAPS

When shown on the plans, or as directed by the City Water Division, branches and large services may be connected to existing City of Redmond facilities by utilizing a tapping sleeve and tapping valve. The performance of this procedure shall be completed only by a City approved contractor. Approval shall be requested from the City Engineer, or City authorized representative, 48 hours in advance of performing the hot tap. No pipe shall be exposed without a City representative on-site.

Hot taps shall be scheduled only during the hours of 7:30AM to 3:30 PM, Monday through Friday. No hot taps shall be performed in cold weather until the air temperature is 35°F and rising, and no inclement weather is forecasted.

TAPPING SLEEVE REQUIREMENTS

Sleeve Types as Manufactured by JCM, Mueller, Romac, or Smith-Blair

1. Epoxy coated Fabricated Steel Sleeve; JCM 532 or equal.
2. Stainless Steel Sleeve: JCM 432; Romac SST III (with stainless steel flanges); Mueller H304; Smith-Blair 665, or equal.

Note: numbers in tables below correspond to accepted sleeve types.

FOR TAPS OTHER THAN SIZE- ON- SIZE

Type of Main being Tapped	Main 8" and under	Main 10" or 12" Tap 8" & under	12" Main 10" Tap	Main 14" & up Tap 8" & Under	Main 14" & up Tap 10" & 12"
C-900 Plastic	2	2	2	N/A	N/A
Steel Size Plastic	2	2	N/A	N/A	N/A
Ductile Iron	2	2	2	1	1
Cast Iron (spun)	2	2	2	1	1
Cast Iron (pit cast)	2	2	2	2	2
Steel	2	2	2	1	1

FOR TAPS OTHER THAN SIZE -ON-SIZE

Type of Main being Tapped	Main 8" & under	Main 10"	Main 12"	Main 14" & Over
C-900 Plastic	2	2	2	N/A
Ductile Iron	2	2	2	1
Cast Iron (spun)	2	2	2	1
Cast Iron (pit cast)	2	2	2	2
Steel	2	2	2	1

N/A = Not Applicable

N/R = Not Recommended

402.3.08 SERVICES

1. Fittings for copper tubing shall be pack joint.
2. All services will have minimum 30 inches of cover.
3. Approved bedding material shall be placed at least 4" below and at least 12" above all pipes. Material shall be hand tamped or water jetted to achieve 95% of maximum density.
4. Approved meter boxes with lids shall be installed at each meter location. The meter box shall be centered on the meter assembly and adjusted to existing ground level or proposed finished grade. All meter boxes shall be of the type approved by the Water Division as specified in the Water Service and Meter Installation Manual.
5. The main corporation stop shall be Copper Pack or approved equal.
6. Angled meter stops shall be Mueller or approved makes/models.
7. All services shall be blown free of all foreign objects before connecting double check valve.
8. All services to be flushed and checked for flow.
9. Meter boxes shall not be installed in driveways or closer than 5 feet from the edge of the driveway apron. In residential areas, meter boxes shall be set directly behind the sidewalk or directly behind the curb where there is no sidewalk. In commercial areas with sidewalks that occupy all of the space between the building and curb, meter boxes may be placed in the sidewalk unless there is a landscape or paver strip, in which case meter boxes shall be placed in these areas.
10. Where necessary, Meter boxes in traffic areas; e.g. streets, alleys, driveways, sidewalks, and parking lots shall be Armor, Armorcast, BES or Carson boxes fitted with concrete polymer lid rated to 10,000 lbs.
11. Commercial and industrial services, fire-lines, and all water services larger than 1" shall have an approved double check valve assembly installed on the service side of the meter.
12. Any service rising 30" or more above the top of the main shall have an approved double check valve assembly installed on the service side of the meter.
13. 3/4" Service runs shall not exceed 60 feet.
14. Service runs shall not contain fittings or unions unless approved by the City Engineer.
15. Service taps on C-900 shall be with a Ford S90 or Romac 901 series tapping saddle.
16. Electrical continuity shall be provided as shown in the standard drawings on all services.
17. All new duplexes shall have separate meters and shut off installed in individual conventional meter boxes. These shall be served by individual 1/2" or 1" copper service lines. Triplexes, four-plexes and other multi-family buildings will be master metered. Service size to be determined by Design Engineer and/or Building Official.
18. Pressure reducing valves may be required in areas of excess pressure, PRV's shall be placed on customer side of meter. PRV's will be maintained by property owner.
19. Water service meter boxes shall be set with a minimum separation of 18-inches between each water meter box to facilitate water meter maintenance. All water services shall have a minimum of 10 feet horizontal separation from power and other utilities in the public right-of-

- way.
20. All property that is the subject of a site plan, or any new construction that is being served by an inadequate water service, shall be required to upgrade the existing water service to current City Standards.
 21. All existing water services that are being abandoned must be cut and capped at the water main. All costs for abandonment shall be borne by the Developer/property owner. Whenever possible, the water service to be abandoned shall be physically removed. When a service is abandoned and left in place, its location (horizontal and vertical) shall be noted on the Record Drawings.

402.3.09 THRUST BLOCKING

402.3.09A MATERIALS

Concrete for thrust blocking and hydrant support shall conform to ASTM C 94, Alternate 2 and shall be proportioned to obtain a 28-day compressive strength of 2,500 pounds per square inch. Mix design with current material certifications and compressive strength test results shall be submitted prior to placement of Concrete. "Sacrete" type products are not allowed.

402.3.09B ANCHORAGE

- a) Limiting Pipe Diameter and Degree of Bend: On all pipe lines 6 inches in diameter or larger, all tees, plugs, caps, 11^o or greater bends, and other locations where unbalanced force exist, shall be securely anchored by suitable thrust blocking or other restraint as shown on the Plans or hereinafter specified.
- b) Thrust Blocking: Reaction or thrust blocking shall be placed as shown on the Plans and shall consist of concrete. Concrete blocking shall be placed between the undisturbed ground and the fitting to be anchored. The quantity of concrete and the area of bearing on the pipe shall be as shown on the Plans or as directed by the Inspector. The blocking shall be placed so it will not obstruct repairs to the joint, unless specifically shown otherwise on the Plans. The pipe and fitting joints shall be wrapped with plastic sheeting before placing concrete.

402.3.09C METAL HARNESS

Metal harness consisting of tie rods or clamps of adequate strength to prevent movement may be used instead of concrete blocking as an alternative means only with the Engineer's approval. Steel rods or clamps shall be stainless steel, galvanized, or otherwise rustproof treated as directed by the Inspector.

402.3.09D EXISTING THRUST BLOCKS

No existing thrust blocks shall be removed by the Contractor unless a City of Redmond representative is on-site for inspection and coordination.

402.3.09E JOINT RESTRAINT

On all pipelines 6 inches in diameter or larger, all tees, caps, plugs, and bends 11 ¼ degrees or greater, and other locations where unbalanced forces exist, shall be securely anchored by suitable mechanical restraints as specified on the plans or table below.

Joint restraint shall be installed on water pipelines and branches in accordance with the Joint Restraint Table below. Joint restraint shall be installed at all mechanical fittings and at pipe joints within the distance shown in the table.

JOINT RESTRAINT TABLE

FITTING	LENGTH -BRANCH	LENGTH -RUN
	(Feet)	(Feet)
6" x 6" TEE	15	0
6" 90° BEND		15
6" 45° BEND		6
6" 22 ½° BEND		3
6" 11 ¼° BEND		1
8" x 6" TEE	9	0
8" x 8" TEE	26	0
8" x 4" REDUCER		33
8" x 6" REDUCER		19
8" 90° BEND		20
8" 45° BEND		8
8" 22 ½° BEND		4
8" 11 ¼° BEND		2
8" CAP		46
12" x 6" TEE	1	
12" x 8" TEE	15	
12" x 12" TEE	45	
12" x 6" REDUCER		47
12" x 8" REDUCER		34
12" x 10" REDUCER		32
12" 90° BEND		28
12" 45° BEND		11
12" 22 ½° BEND		5
12" 11 ¼° BEND		3
12" 45° BEND	ROTATED DOWN	27
12" 22 ½° BEND	ROTATED DOWN	13

Pipe Zone bedding shall be compacted to 95% of AASHTO T-99-74 Method C. The restrained lengths are based on 150 PSI test pressure, and are the lengths required on each side of the bend or fitting.

402.3.10 DEADMAN TABLE

Deadman requirement: Able to withstand twice test pressure - 360 psi

THRUST (lbs)

Pipe (in.)	Plug	90°	45°	22-2°	11-3°
6	13,460	19,037	10,303	5,252	2,638
8	23,159	32,749	17,723	9,036	4,540
10	34,837	49,266	26,662	13,594	6,829
12	49,266	69,671	37,706	19,224	9,659
14	66,186	93,604	50,659	25,826	12,974
16	85,604	121,061	65,516	33,401	16,780

CONCRETE (cubic yards)

Pipe (in.)	Plug	90°	45°	22-2°	11-3°
6	3.3	4.7	2.5	1.3	0.7
8	5.7	8.1	4.4	2.2	1.1
10	8.6	12.2	6.6	3.4	1.7
12	12.2	17.2	9.3	4.7	2.4
14	16.3	23.1	12.5	6.4	3.2
16	21.1	29.9	16.2	8.2	4.1

402.4.00 MEASUREMENT AND PAYMENT

402.4.01 PIPE

Measurement and payment for water pipe will be made on a linear foot basis for the type and size of pipe installed. No reduction in length will be made for valves and fittings unless specified.

402.4.02 FITTINGS

Measurement and payment for fittings will be made on a per each basis for the type, kind, and size specified and installed. No separate or additional payment will be made for restrained couplings, joint lubricant, nuts and bolts, washers, and other fitting related hardware or supplies.

402.4.03 SERVICES

Measurement and payment for water services shall be on a per each basis for the type, kind and size specified. Measurement includes all valves, piping, fittings, jumpers, grounding strap, clamps, meter box, insulation, and backflow prevention devices required for a complete installation in accordance with the Water Service and Meter Installation Manual for the type and size indicated.

402.4.04 THRUST BLOCKS

Measurement and payment for thrust blocks will be made on a per each basis for each thrust block installed. No allowance will be made for additional concrete required for over-excavated areas.

402.4.05 INCIDENTAL BASIS

When neither specified nor listed in the proposal for separate payment, Pipe, Fittings, services, and Thrust Blocks shall be considered incidental work for which no separate payment will be made.

402.4.06 TESTING AND DISINFECTION

When neither specified nor listed in the proposal for separate payment, flushing, chlorination, and hydrostatic testing shall be considered incidental work for which no separate payment shall be made.

403 VALVES

403.1.00 DESCRIPTION

403.1.01 GENERAL

This section covers the work necessary for furnishing and installing valves and appurtenances.

403.2.00 MATERIALS

403.2.01 RESILIENT SEATED GATE VALVES

Buried epoxy coated, iron body gate valves shall meet AWWA standards (C-509 or C515), have non-rising stems, be rated at 200 lbs. working pressure and 350 lbs. hydrostatic pressure, open left with 2" square operating nuts, resilient seat, with brass fittings, "O" ring stem pressure seals, non-directional, mechanical joints with full body glands (AWWA C-110); as manufactured by Mueller, Kennedy, Waterous, CLOW, and American Flow Control, and approved by the City Engineer, or representative. Special attention should be made of AWWA specification, Section 10-4-3.

Above ground or in-vault gate valves shall be equipped with hand wheels.

403.2.02 BUTTERFLY VALVES

Butterfly valves shall meet the strength and performance characteristics of AWWA C 504, latest edition, Class 150-B, mechanical joint etc., except worm gear operators are not permitted. Manufacturer shall be Mueller, Pratt Groundhog, American Flow Control, CLOW or approved equal. Butterfly valves shall be required on all water lines of 10" size and larger, or where 24" of cover over the operating nut cannot be obtained on smaller mains. Variance may be obtained for special valve installation from the City Engineer, or his representative. Above ground or in-vault butterfly valves shall be equipped with hand wheels.

403.2.03 VALVE BOXES

All valve boxes shall be a two piece grade adjustable box. The valve box shall have 5-inch I.D. with a slip top section without a dirt flange on the bottom. Valve boxes shall be Tyler Model 6855 or equal as shown in the Standard Drawings. The extension piece shall be of the proper length for depth of cover. The word "WATER" shall be cast into the top of the lid. Where valve boxes are located outside of pavement they shall be provided with a 6" thick concrete collar not less than 30" square. Valve clusters may be set in a single collar provided there is not less than 12" from the edge of the valve box to the edge of concrete.

403.2.04 CHECK VALVES

403.2.04A SWING CHECK TYPE

Swing check valves shall be bronze mounted with cast or ductile iron body with outside lever and spring unless otherwise specified.

403.2.04B SPRING LOADED PLUG or DISC TYPE

Spring loaded plug or disc type check valves shall be bronze mounted with bronze, cast, or ductile iron body, bronze plug or disc, stainless steel spring and resilient seal suitable for clear cold water service. The plug or disc of the check valve shall be easily removable and replaceable.

403.2.04C HYDRAULIC CUSHION TYPE

Hydraulic cushion type check valves shall be of bronze, cast or ductile iron with bronze disc and