

**CITY OF SILVERTON**  
**Public Works Design Standards**

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**Standard Construction Notes**

**Appendix B**

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Notes:

- 1) The developer's engineers can request the standard construction notes in digital format from the Public Works Director.
- 2) Per PWDS 1.10.d.1.f, all applicable City standard notes are to be included on construction drawings submitted for City review and approval. Supplemental notes may be added at the discretion of the design engineer.



## **GENERAL NOTES:**

1. Contractor shall procure and conform to all construction permits required by the City of Silverton and/or Marion County, and conform to all conditions and requirements of said permits. Issuance of a City Public Works street/site/utility construction permit does not relieve the contractor from obtaining any and all reviews and permits required under building, plumbing or electrical codes that any portions of the work may be subject to (including a site plumbing permit if required), or from any requirements under permits which may be required for the project by other agencies with jurisdiction.
2. Contractor shall procure a right-of-entry permit from ODOT State Highway Division for all work within the State right-of-way and conform to all conditions of the permit.
3. Contractor shall procure a right-of-entry permit from affected railroads for all work within the railroad right-of-way and conform to all conditions of the permit.
4. A copy of final approved construction drawings and any required permits shall be kept on-site at all times, for review by inspectors upon request.
5. Contractor shall provide all bonds and insurance required by public and/or private agencies having jurisdiction.
6. All materials and workmanship for facilities in street right-of-way or easements shall conform to approving agencies' construction specifications wherein each has jurisdiction, including but not limited to the City, County, Oregon Health Authority –Drinking Water Services (OHA-DWS) and the Oregon Department of Environmental Quality (DEQ).
7. Unless otherwise approved by the Public Works Director, construction of all public facilities shall be done between 7:00 a.m. and 6:00 p.m., Monday through Friday, and between 9:00 a.m. and 6:00 p.m. Saturday.
8. The Contractor shall perform all work necessary to complete the project in accordance with the approved construction drawings including such incidentals as may be necessary to meet applicable agency requirements and provide a completed project.
9. Contractor to notify City, County, ODOT and all utility companies a minimum of 48 business hours (2 business days) prior to start of construction, and comply with all other requirements of ORS 757.541 to 757.571.
10. Any inspection by the City, County or other agencies shall not, in any way, relieve the Contractor from any obligation to perform the work in strict compliance with the applicable codes and agency requirements.
11. All traffic control plans & measures shall be approved by the agency with jurisdiction and in place prior to any construction activity. Contractor shall erect and maintain barricades, warning signs, traffic cones (and all other traffic control devices required) per City, County and

ODOT requirements in accordance with the current MUTCD (including Oregon amendments). Access to driveways and buildings shall be maintained at all times for residential, fire and emergency vehicles.

12. **Record Drawings.** The Contractor shall maintain one complete set of approved drawings on the construction site at all times whereon he will record any approved deviations in construction from the approved drawings, as well as the station locations and depths of all existing utilities encountered (whether or not existing utilities are shown on the construction drawings). These field record drawings shall be kept up to date at all times and shall be available for inspection by the City upon request. Information on the field record drawings shall include reference measurements and materials type.
13. Upon completion of construction of public facilities, Contractor shall submit a clean set of field record drawings containing all as-built information to the Design Engineer for use in the preparation of As-Built drawings for submittal to the City.
14. The Contractor shall submit a suitable maintenance bond prior to final payment or final approval where required by public and/or private agencies having jurisdiction.
15. Contractor shall procure and conform to DEQ stormwater permit No. 1200C for construction activities where 1 acre or more are disturbed.
16. Elevations shown on the drawings are based from \_\_\_\_\_ (City; OSHD, etc) Bench Mark \_\_\_\_\_, Elevation \_\_\_\_\_ (adjusted 19\_\_), consisting of a \_\_\_\_\_ (brass cap; monument, etc.) Located at \_\_\_\_\_, *which is based on the NGVD 1929 datum corresponding to the FEMA flood map elevations.*
17. **Address Numbers.** Per OFC 505.1, all new and existing buildings shall have approved address numbers (4" minimum number height, color to contrast with background) placed in a position that is plainly legible and visible from the fronting street. For flaglots or other situations where the structure is not visible from the public street, an address sign shall be installed near the entrance to the driveway or private road. Temporary address signs shall be mounted in a visible location prior to and during any construction, and the permanent numbers mounted prior to occupancy, in a position that is plainly legible and visible from the street fronting the property.
18. Contractor is solely responsible for assuring that any site, street or utility work within the jurisdiction of the City, meets or exceeds any and all legal requirements and any and all industry best practices in the design, construction and/or performance of such site, street or utility work. Contractor is solely responsible for payment of any assessment, fine, penalty, claim, damages or costs that result from Contractor's (1) performing site, street or utility work or (2) failing to perform site, street or utility work that meets or exceeds any and all legal requirements and industry best practices. The City may require and Contractor shall provide the City with confined space entry plans conforming with the requirements of OR-OSHA, traffic control plans, or other plans or performance descriptions necessary or desirable for the Public Works Director to assure that these requirements can be met in performing the work.

The City's acceptance, review, or comments on or about the adequacy of any such plan shall not remove or reduce Contractor's sole responsibility to meet any and all legal requirements, administrative requirements, or industry best practices, and Contractor specially assumes, will defend, and will indemnify the City for any liability, damages, fines, fees or assessments related in any manner to Contractor's site, street or utility work.

19. All construction water must be obtained through an approved hydrant meter or bulk water meter, at a location approved by Public Works.
20. The Contractor shall provide the City and the project engineer with the names and 24 hour telephone numbers of at least two persons associated with the project who can be contacted outside of regular work hours in case of emergencies.

**EXISTING UTILITIES & FACILITIES:**

21. The location and descriptions of existing utilities shown on the drawings are compiled from available records and/or field surveys. The engineer or utility companies do not guarantee the accuracy or the completeness of such records. Contractor shall field verify sizes and locations of all existing utilities prior to construction.
22. 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. (Note: the telephone number for the Oregon Utility Notification Center is (503) 232-1987).
23. The Contractor shall locate and mark all existing property and street monuments prior to construction. Any survey monuments disturbed during construction of the project shall be replaced by a Registered Land Surveyor at the Contractor's expense. The monuments shall be replaced within a maximum of 90 days, and the County Surveyor shall be notified in writing as required by ORS 209.150.
24. Contractor shall field verify location and depth of all existing utilities where new facilities cross or are closely parallel to the existing facilities. All utility crossings marked or shown on the drawings shall be potholed using hand tools or other non-invasive methods prior to excavating or boring. Contractor shall be responsible for exposing potential utility conflicts far enough ahead of construction to make necessary grade modifications without delaying the work. If grade modification is necessary, Contractor shall notify the Design Engineer, and the Design Engineer shall obtain approval from the Public Works Director prior to construction. All utility crossings shall be potholed as necessary prior to excavating or boring to allow the Contractor to prevent grade or alignment conflicts.
25. All existing facilities shall be maintained in-place by the Contractor unless otherwise shown or directed. Contractor shall take all precautions necessary to support, maintain, or otherwise protect existing utilities and other facilities at all times during construction. Contractor to leave existing facilities in an equal or better-than-original condition and to the satisfaction of the Public Works Director.

26. Except where otherwise shown on the drawings and explicitly approved in writing by the City, existing City utilities crossed, intercepted by or in the vicinity of new utility lines or facilities (of the same system) shall be connected to the new City utility system at locations as required by the Public Works Director. Existing City utility lines which are parallel with, or which are replaced or superseded by the new utility lines (as determined by the City), shall be abandoned or removed as part of the project (and existing facilities or structures served by the abandoned lines shall be connected to the new system as applicable), as required by the Public Works Director.
27. Utilities that are abandoned in place, or interfering portions of utilities, shall be removed by the Contractor to the extent necessary to accomplish the work. The Contractor shall plug the remaining exposed ends of abandoned utilities (grout or concrete plugs, if used, shall be installed to fill the full pipe diameter for a distance of two times the pipe diameter back from the pipe end).
28. Contractor shall remove all existing signs, mailboxes, fences, landscaping, etc., as required to avoid damage during construction and replace them to existing or better condition.
29. Unless otherwise approved by the City, all springs, field tiles or drain lines intercepted or exposed during construction shall be connected to catch basins or new storm lines, except for field tiles or drain lines which are removed completely during construction, or are located and plugged at 50 foot maximum intervals uphill of the location intercepted (grout plugs, if used, shall have a length of two times the pipe diameter). Any abandoned drain tiles downstream of the intercepting trenches shall be plugged with grout for a distance of two times the pipe diameter back from the pipe end.
30. Any septic tanks encountered during construction shall be pumped out. Contractor shall break bottom of tank out and backfill with pea gravel unless otherwise required by public agencies having jurisdiction. Septic tank removal to be in accordance with County Sanitarian requirements.
31. Any wells encountered shall be abandoned per state of Oregon water resources department requirements.
32. Any fuel tanks encountered shall be removed and disposed of per State of Oregon DEQ requirements. Backfill with compacted granular material.

**GRADING, PAVING & DRAINAGE:**

33. Contractor to review soils report prepared by \_\_\_\_\_, and conform to all recommendations listed in the report.
34. The Contractor shall be responsible for managing construction activities to insure that public streets and right-of-ways are kept clean of mud, dust or debris. Dust abatement shall be maintained by adequate watering of the site by the Contractor.

35. Unless otherwise noted, all grading, rocking and paving to conform to OSSC (ODOT/APWA) Specifications, 2015 edition.
36. Clear and grub within work limits all surface vegetation, trees, stumps, brush, roots, etc. Do not damage or remove trees except as approved by the engineer or as shown on the drawings. Protect all roots two inches in diameter or larger on trees which are not scheduled for removal.
37. Strip work limits, removing all organic matter which cannot be compacted into a stable mass. All trees, brush and debris associated with clearing, stripping or grading shall be removed and disposed of off-site. Fills are not to be placed prior to approval of striping limits and depths and concurrence of such approval by the City.
38. Immediately following fine grading operations, compact subgrade to 95% of the maximum dry density per AASHTO T-180 test method (Modified Proctor). Subgrade must be inspected and approved by the City prior to placing embankments or base rock.
39. Engineered fills shall be constructed and compacted in 6" lifts over approved subgrade. All fills within public right-of-ways and easements shall be engineered, with each lift compacted to 95% of the maximum dry density per AASHTO T-180 test method (Modified Proctor).
40. All fills outside of public right-of-ways which are within potential building envelopes shall be engineered and comply with the Oregon Structural Specialty Code, with each lift compacted to 90% of the maximum dry density per AASHTO T-180 test method (Modified Proctor). Fills outside of building envelopes which are over 12-inches in depth shall also be engineered and compacted.
41. Unless otherwise shown on the drawings, straight grades shall be run between all finish grade elevations and/or finish contour lines shown. Finish pavement grades at transition to existing pavement shall match existing pavement grades or be feathered past joints with existing pavement as required to provide a smooth, free draining surface.
42. Contractor is responsible for coordinating with the City for the following proof-rolls (witnessed by the City, with a fully loaded rock truck). Performance of proof-rolls summarized below are required for all public street, fire lane or common use driveway improvements. Performance of a proof-roll does not replace the requirement for density testing where specified or where required by City standards.
  - Subgrade proof-roll – prior to fabric or baserock placement
  - Curblin proof-roll – prior to placement of curb & gutter
  - Finished rock proof-roll – prior to pavingIf the subgrade is disturbed after the subgrade proofroll, or if inclement weather (ie. significant rain) occurs between the time any proof roll is performed and baserock placement, curb placement or paving, another proof roll may be required by the City.
43. Crushed granular baserock shall conform to the requirements of OSSC (ODOT/APWA) 02630.10 (Dense Graded Base Aggregate), with no more than 10% passing the #40 sieve

and no more than 5% passing the #200 sieve, and shall be approved by the City prior to placement.

44. Compact granular baserock to 95% of the maximum dry density per AASHTO T-180 test method (Modified Proctor). Prior to placing AC pavement, written compaction test results for baserock and trench backfill must be received by the City, and a finished rock grade proof-roll (witnessed by the City) must be performed.
45. Paving of streets shall not be allowed until after completion of all of the following as a minimum, including submittal of acceptable written test results to the City where applicable:
  - all required testing, inspection and proofroll of baserock;
  - installation and testing of all new water, sewer and storm drain lines under paved areas (including trench compaction testing and submittal of test results to the City, and testing of toning wire by the City);
  - review and approval of the franchise and/or private utility plans by the Public Works Director; and
  - installation of all franchise utilities or sleeves located under or crossing paved areas, curbs or sidewalks.
46. AC Pavement shall conform to OSSC (ODOT/APWA) 00744 (hot mixed Asphalt Concrete (HMAC) Pavements) for standard duty mix, and shall be approved by the City prior to placement. Unless otherwise approved in writing by the City (prior to paving), base course paving shall be 3/4 inch dense graded mix and wearing/leveling course paving shall be 1/2 inch dense graded mix (Level 2 JMF for local streets/parking lots/fires lanes, and Level 3 JMF for collector/arterial streets).
47. AC Pavement shall be compacted to a minimum of 91% of maximum density (at all locations) as determined by the Rice standard method, based on nuclear density testing.
48. Pavement surface shall be a smooth, well-sealed, tight mat without depressions or bird baths. Bony or open graded pavement surfaces shall be repaired to the satisfaction of the City, prior to final acceptance of the work.
49. HMAC mixtures shall be placed only when the surface is dry and weather conditions are such that proper handling, finishing and compaction can be accomplished. In no case shall HMAC mixtures be placed when the surface temperature is below the minimum established under 2015 OSSC (ODOT/APWA) 00744.40 (Season and Temperature Limitations) or the project specifications, whichever is more stringent.
50. Contractor shall protect new pavement against traffic as required, until it has cooled sufficiently to avoid tracking.
51. All existing or constructed manholes, cleanouts, monuments, gas valves, water valves and similar structures shall be adjusted to match finish grade of the pavement, sidewalk, landscaped area or median strip wherein they lie.

52. Street pavement widening cross slope shall be a minimum of 2% and a maximum of 5% except at intersections, where the street cross slopes shall not exceed 2% maximum (intersection defined from end of curb radius both directions) to comply with ADA and PROWAG standards. Prior to placing curbs, Contractor shall field verify pavement widening cross slope and contact City if the design pavement widening cross slope is not within the limits stated above.
53. All street signs, traffic control signs, curb & pavement painting or striping, and/or reflectors shall be installed (in conformance with City and MUTCD standards) prior to requesting final inspection by the City. All crosswalk striping and roadway emblems shall be thermoplastic.
54. Unless otherwise shown on the drawings, no cut or fill slopes shall be constructed steeper than 2H:1V maximum.
55. All planter areas shall be backfilled with approved top soil minimum 8" thick. Stripping materials shall **not** be used for planter backfill.
56. Contractor shall hydroseed all exposed slopes and disturbed areas which are not scheduled to be landscaped.
57. Grading shown on the drawings is critical to functioning of detention system and shall be strictly followed.
58. Contractor shall coordinate and ensure that detention volumes are inspected and approved by public agencies having jurisdiction prior to paving and landscaping.

• **Curbs & Sidewalks**

59. Unless otherwise shown or indicated on the drawings, 6-inches nominal curb exposure used for design of all parking lot and street grades.
60. Each lot shall be provided with a minimum two 3-inch diameter weep holes per lot in curbs on each frontage to provide for lot drainage. As a minimum, one weep hole shall be located 5 feet from the property line on the low point in the lot frontage at the time of curb construction. Weep holes shall also be provided as required for existing drainpipes whether or not shown on the drawings, additional drainpipes shown on the drawings, as well as on both sides of driveway aprons. Contractor shall install drainpipe (smooth wall PVC or ABS) from each weep hole to the back of sidewalk location prior to acceptance of the curbing by the City, and shall connect to existing drain piping where such piping exists within or adjacent to the right-of-way or easement. Where storm drain laterals for lots are constructed to weepholes in conjunction with subdivision or development improvements, the Contractor shall install 3" x 4" eccentric reducers just past the back of sidewalk to transition to 4-inch PVC rain drain lines as applicable.
61. Curbs shall be stamped with an 'S', 'D' or a 'W' at the point where each sanitary sewer, storm drain or water service lateral crosses the curb, respectively. Letters shall be a minimum of 3-

inches high and ¼-inch deep.

62. Contractor shall construct handicap access ramps at all intersections in accordance with current ADA and PROWAG requirements.
63. All curbs, sidewalks and driveways shall be constructed using 3300-psi concrete, and shall be cured with Type 1 or Type 1D clear curing compound. All sidewalks shall fully comply with all ADA and PROWAG standards.
  - Standard sidewalks shall be a minimum of 4-inches thick.
  - All pedestrian ramps and standard residential driveways shall be a minimum of 6-inches thick.
  - Commercial or industrial use driveways and alley approaches shall be minimum 8-inches thick.
64. Curb & sidewalk concrete shall be placed only during periods when it will not be damaged by rain (protect unhardened concrete from precipitation). Concrete shall not be placed on frozen baserock. Do not begin concrete placement until temperature in the shade is a minimum of 35°F and rising, and stop placement if air temperature falls below 35°F. Protect concrete from freezing for a minimum of 5 days after placement per OSSC (ODOT/APWA) 0000440.40.d & 00756.40 or the project specifications, whichever is more stringent.
65. Contraction joints shall be installed directly over any pipes that cross under the sidewalk, to control cracking. In general, cracks in new curbs or sidewalks (at locations other than contraction joints) are not acceptable, and cracked panels shall be removed & replaced unless otherwise approved by Public Works.
66. Contractor shall conduct a flood test of all pedestrian ramps after concrete is cured to demonstrate that the ramp does not hold water. After water is poured into the ramp area, the inspector shall check the ramp 15 minutes later to determine if water is ponding in the ramp or gutter area. If water is ponding in the ramp or gutter area and the pond is more than 1-foot in length or ¼-inch in depth, the Contractor shall be required to make repairs in an approved manner at his sole expense.
67. Where trench excavation requires removal of PCC curbs and/or sidewalks, the curbs and/or sidewalks shall be sawcut and removed at a tooled joint unless otherwise authorized in writing by the City. The sawcut lines shown on the drawings are schematic and not intended to show the exact alignment of such cuts.
68. Unless otherwise approved in writing by Public Works, areas along curbs and public sidewalks shall be backfilled with approved topsoil, as well as being seeded and mulched (or hydroseeded).

## **PIPED UTILITIES:**

69. Contractor shall coordinate and pay all costs associated with connecting to existing water, sanitary sewer and storm sewer facilities.
70. Unless otherwise noted, materials and workmanship for water, sanitary sewer and storm sewer shall conform to OSSC (ODOT/APWA) Specifications, 2015 edition.
71. The Contractor shall have appropriate equipment on site to produce a firm, smooth, undisturbed subgrade at the trench bottom, true to grade. The bottom of the trench excavation shall be smooth, free of loose materials or tooth grooves for the entire width of the trench prior to placing the granular bedding material.
72. **Bedding and Backfill.** All pipes shall be bedded with minimum 6-inches of 3/4" minus crushed rock bedding and backfilled with compacted 3/4" minus crushed rock in the pipe zone (crushed rock shall extend a minimum of 12-inches over the top of the pipe in all cases). Crushed rock trench backfill shall be used under all improved areas, including sidewalks. Granular bedding & trench backfill shall be compacted to 92% of the maximum dry density per AASHTO T-180 test method (Modified Proctor).
73. Contractor shall arrange for and pay all costs to abandon existing sewer and water services not scheduled to remain in service.
74. All piped utilities abandoned in place shall have all openings closed with concrete plugs with a minimum length equal to 2 times the diameter of the abandoned pipe.
75. The end of all utility stubs shall be marked with a 2-x-4, extending 2 feet minimum above finish grade, painted white and wired to pipe stub (painted green for sanitary sewer, white for storm). Type of utility (ie. sewer, storm, etc.) and depth below grade to pipe invert shall be clearly & permanently labeled on the marker post.
76. Contractor shall provide all materials, equipment and facilities required for testing all utility piping in accordance with City construction specifications.
77. **Tracer (Toning) Wire.** All non-metallic water, sanitary and storm sewer piping shall have an electrically conductive insulated 12 gauge solid core copper tracer wire the full length of the installed pipe (blue wire for water, green for sanitary piping and white for storm piping).
  - Tracer wire shall be taped to the top of the pipe at 10 foot maximum intervals and shall be extended up into all valve boxes, and manholes and catch basins and accessible from the surface.
  - All tracer wire splices shall be made with corrosion resistant waterproof wire nuts (DBR direct bury splice kit by 3M Company, no equal).
  - Tracer wire on water services shall connect to mainline tracer wire and to the angle meter valve per details.
  - Tracer wire penetrations into manholes shall be within 18 inches of the rim elevation and adjacent to manhole steps. The tracer wire shall be tied to the top manhole step or

otherwise supported to allow retrieval from the outside of the manhole or catch basin.

78. **Warning Tape.** Detectable or non-detectable acid and alkali resistant safety warning tape shall be provided along the full length of all water, sanitary sewer and storm drain service laterals and along the full length of all water, sanitary sewer and storm drain mainlines. Underground warning tape shall be continuous the entire length of service laterals installed from the mainline to the back of the PUE.
79. No trenches in roads or driveways shall be left in an open condition overnight. All such trenches shall be closed before the end of each work day and normal traffic flows restored.
80. Before mandrel testing, TV inspection or final acceptance of gravity sewer or storm pipelines, all trench compaction shall be completed and all sewers and storm drains flushed & cleaned to remove all mud, debris & foreign material from the pipelines, manholes and/or catch basins.
81. Where future extensions are shown upstream of new manholes (sewer or storm), catch basins or junction boxes, pipe stubs (with gasketed caps) shall be installed at design grades to a point 2' minimum outside of the structure.

• **Water**

82. City forces to operate all valves, including fire hydrants, on existing public mains.
83. Unless otherwise shown on plans approved by the Public Works Director, all public water mains shall be Class 52 ductile iron or C-900 PVC (DR 18) as follows.
  - Within ODOT right-of-way – DI pipe
  - 10" & larger in all locations – DI pipe.
  - fire hydrant leads (from mainline to hydrant) - DI pipe.
  - portion of fire service lines within public right-of-way - DI pipe.
  - 8" & smaller in City right-of-way or City waterline easement not meeting DI criteria above – PVC pipe
84. All fittings 4-inches through 24-inches in diameter shall be ductile iron fittings in conformance with AWWA C-153 or AWWA C-110. The minimum working pressure for all MJ cast iron or ductile iron fittings 4-inches through 24-inch in diameter shall be 350 psi for MJ fittings and 250 psi for flanged fittings.
85. All water mains to be installed with a minimum 36 inch cover to finish grade unless otherwise noted or directed. Service lines to be installed with a minimum 30 inches cover within the right-of-way. Deeper depths may be required as shown on the drawings or to avoid obstructions.
86. Unless otherwise approved by the Public Works Director, all valves shall be flange connected to adjacent tees or crosses (where such fittings are installed adjacent to valves). In-line valves shall be MJ x MJ.

87. Thrust restraint (concrete thrust blocks) shall be provided on all bends, tees and other direction changes per local jurisdiction requirements and as specified or shown on the drawings. All concrete shall conform to the requirements of OSSC (ODOT/APWA) 00440, Commercial Grade Concrete, 3300 psi (5" slump or stiffer). Concrete mix design shall be submitted to the City for review and approval prior to use. If hand mixed sack-crete type concrete is proposed, it shall be a 4000 psi minimum mix (approved by the City prior to use), mixed with the minimum amount of water necessary for workability (5" slump or stiffer). In no case will dry sack-crete mix (either in bags or as loose mix) be considered as an acceptable substitute for an approved mixed concrete.
88. Where approved by the City prior to construction, temporary thrust restraint may be used at mainline connections where it is not possible (prior to pressurization of the connection and placing the waterline in service) to install permanent concrete thrust blocks, straddle blocks or other permanent thrust restraint as required or shown/noted on the drawings. Trenches at the temporary thrust restraint location shall be left open and not backfilled (but plated as necessary or required) until the permanent thrust restraint is installed and approved by the City. Unless otherwise approved in writing by the City, permanent thrust restraint shall be installed by the end of the next working day after installation of the temporary thrust restraint, but in no case later than the calendar third day following installation of the temporary thrust restraint.
89. Unless otherwise approved by the City, 1", 1½" and 2" water service pipe on the public side of the meter shall be CenCore blue HDPE tubing (CTS, SDR 9, 200 psi) conforming to AWWA C901 (ASTM D2239 & D2737) with 2½" long compression inserts and compression Q style compression fittings.
90. Unless otherwise noted, water service pipe on the private side of the meter shall be Schedule 40 PVC or as approved by the OPSC.
91. Domestic and fire backflow prevention devices and vaults shall conform to requirements of public and/or private agencies having jurisdiction.
92. Chains on all fire hydrant caps shall be cut and removed from all hydrants following installation.
93. Contractor shall install temporary plug and blowoff as required at the end of waterline for flushing, testing and chlorination.
94. The work shall be performed in a manner designated to maintain water service to buildings supplied from the existing waterlines. In no case shall service to any main line or building be interrupted for more than four (4) hours in any one day. Contractor shall notify the City and all affected residents and businesses a minimum of 24 business hours (1 business day) prior to any interruption of service.
95. **Sanitary Sewer & Waterline Crossings.** Where new waterlines cross below or within 18-inches vertical separation above a sewer main or sewer service lateral, center one full length of waterline pipe at point of crossing the sewer line or sewer lateral. Unless otherwise

approved in writing by the Public Works Director, existing sewer mains and/or service laterals within this zone shall be replaced with a full 12 foot length of new pipe CL 50 ductile iron), centered at the crossing in accordance with OAR 333-061 and local jurisdiction requirements. Connect to existing sewer lines with approved rubber couplings. Example: For an 8-inch waterline with 36-inches cover, 4-inch service lateral inverts within 5.67-feet (68-inches) of finish grade must have this pipe centered at the crossing.

96. Pressure Testing. All waterlines, services and appurtenances shall be pressure tested for leakage. All testing shall conform to requirements as outlined on City testing forms contained in the PWDS. The hydrostatic test shall be performed with all service line corporation stops open and meter stops closed, and with all hydrant line valves open. Prior to the start of each pressure test, the position of all mainline valves, hydrant line valves and service line corporation stops in the test segment shall be verified.
97. Cleaning & Flushing. After the pressure test and prior to disinfecting, the water lines shall be thoroughly flushed through hydrants, blow offs or by other approved means.
98. Disinfection & Bacteriological Testing. All water mains and service lines shall be chlorine disinfected per local jurisdiction requirements, AWWA C-651 or OAR 333-061 (25 mg/L minimum chlorine solution, 24 hours contact time), whichever is more stringent. Unless otherwise approved by the Public Works Director, a City representative shall witness the application of the chlorine solution and the chlorine testing at the end of the 24 hour contact period. After the 24 hour chlorine contact period, the free chlorine concentration shall be checked, and if it is found to be 10 mg/L or more, the chlorine solution shall be drained (otherwise the line shall be rechlorinated), the waterline flushed with potable water, and a minimum of two consecutive samples taken at least 24 hours apart shall be collected from the waterline for microbiological analysis (ie. one sample immediately after flushing, and another sample 24 hours later). Contractor to pay for laboratory analysis of water samples taken under the supervision of the City. If the results of both analyses indicate that the water is free of coliform organisms, the waterline may be placed in service. Should the initial treatment prove ineffective, the flushing & chlorination shall be repeated until confirmed tests show acceptable results.
99. Disinfection of Connections. For connections which cannot be disinfected with the waterline mainlines as noted above, all fittings, valves and appurtenances, including tool surfaces which will come in contact with potable water, shall be thoroughly cleaned by washing with potable water and then swabbed or sprayed with a one percent (1%) hypochlorite solution (10,000 mg/L) in accordance with the requirements of AWWA C-651 and OAR 333-061.
100. All meters 3-inch and larger shall be calibration tested after installation and prior to being placed in service. Testing shall be done by a qualified and trained water meter tester at the developer's expense. All test results shall be submitted to Public Works for review and approval.
101. Unless otherwise shown on the drawings AND explicitly approved in writing by the City, any existing waterlines abandoned in place shall be physically disconnected from valves and other

connection points to the existing water system. A blind flange or restrained MJ plug (as applicable) shall be installed on the back side of all valves from which abandoned waterlines are disconnected. Remove valve boxes from abandoned valves.

- **Sewer & Storm Manholes**

102. All precast sanitary sewer manholes shall be provide with integral rubber boots. Lockdown lids shall be used on manholes outside of public right-of-way only where specifically required by the Public Works Director.
103. All connections to existing manholes shall be made by core-drilling the existing manhole structure and installing a rubber boot. Revisions to the design approved by the City will not constitute approval of a variance to this core drill requirement, and may (at the City's discretion) require installation of a new manhole structure to accommodate the design revisions. Connections to manholes shall be watertight and shall provide a smooth flow into and through the manhole. Small chipping hammers or similar light tools which will not damage or crack the manhole base may be used to shape channels. Use of large pneumatic jackhammers shall be prohibited. Unless otherwise approved in writing by the Public Works Director, manhole steps shall be installed in any manhole tapped which does not have existing steps.
104. Manhole channels depths (sewer & storm) shall be to the heights shown on the drawings, but in no case shall be the channel depth be less than 2/3 of the pipe diameter. Channels, as well as shelves between the channels and the manhole walls, shall be sloped to drain per plan details.
105. All new sanitary sewer manholes (or existing sewer manholes connected to) shall be provided with inflow protector lid inserts. Manhole inflow inserts shall be of ABS or HDPE plastic, and shall include integral lifting lugs on each side of the insert allowing removal with a manhole hook (*lift straps are not an acceptable alternate*), a factory installed closed cell neoprene rubber gasket bonded to the underside of the insert rim. Inserts shall be ManPan manhole inserts or approved equal. Where required by the Public Works Director for specific manholes, manhole inserts shall be provided with an integral clog free vent rubber check valve by Tideflex.

- **Sewer & Storm Warranty Inspections**

106. Re-inspection of the sanitary sewer and storm drainage systems by cleaning & TV inspection shall be performed within the last month of the warranty period. Based on the results of the TV inspections and/or the City's warranty inspections, additional warranty tests may include mandrel testing or low pressure air testing. The results of these test(s) will be used by the Public Works Director to determine if final acceptance of the system is warranted and what corrective work is required prior to final acceptance. The cost of these re-inspections and any corrective work shall be the responsibility of the Developer. The warranty period will not be considered to be complete, and maintenance bonds will not be released until after all warranty inspections are finished and any resulting corrective work is completed.

- **Sanitary Sewer**

107. Unless otherwise shown, sanitary sewer pipe shall be PVC in conformance with ASTM D3034, SDR 35. All other appurtenances and installation to conform to the City specifications.
108. Sanitary sewer laterals for single family residential & each side of duplexes shall be a minimum of 4-inches in diameter (6-inch minimum for other laterals), and shall include toning wire and warning tape per standard details.
109. **Sewer Cleaning.** After manhole channeling and prior to leakage testing, mandrel testing and/or TV inspection, flush and clean all sewers, and remove all foreign material from mainlines and manholes. Failure to clean all dirt, rock and debris from pipelines prior to TV inspection will result in the need to re-clean and re-TV the sewer lines.
110. **Sewer Leakage Testing.** Sanitary sewer pipe and appurtenances shall be tested for leakage. Leakage tests shall include an air test of all sewer mains and laterals prior to paving, and a separate air test of all sewer mains and laterals following excavation and backfilling of any franchise utility trenches or other utility work that crosses sanitary sewer laterals. All sanitary sewer manholes shall be vacuum tested following completion of paving or final surface restoration. All testing shall conform to requirements as outlined on City testing forms contained in the PWDS.
111. **Sewer Mandrel Testing.** Contractor shall conduct deflection test of flexible sanitary sewer pipes by pulling an approved mandrel through the completed pipe line following trench compaction. The diameter of the mandrel shall be 95% of the initial pipe diameter. Test shall be conducted not more than 30 days after the trench backfilling and compaction has been completed.
112. **Sewer TV Inspection.** Upon completion of all sewer construction, testing and repair, the Contractor shall conduct a color TV acceptance inspection of all mainlines in accordance with OSSC (ODOT/APWA) 445.74 to determine compliance with grade requirements of OSSC (ODOT/APWA) 445.40.b. The TV inspection shall be conducted by an approved technical service which is equipped to make audio-visual recordings of the TV inspections on DVD. Unless otherwise required by the agency with jurisdiction, a standard 1-inch diameter ball shall

be suspended in front of the camera during the inspection to determine the depth of any standing water. Sufficient water to reveal low areas or reverse grades shall be discharged into the pipe immediately prior to initiation of the TV inspection. The DVD and written report shall be delivered to the Public Works Director.

113. Prior to or concurrent with connection to a sanitary sewer lateral, it shall be demonstrated to the City that the sewer lateral is not obstructed. This shall be accomplished by “snaking” the service lateral downstream of the connection point to the mainline, or similar method acceptable to the City. City personnel or authorized agent shall be present during the “snaking” or other demonstration method.

- **Storm Drain**

114. Storm drain pipe materials shall conform to the construction drawings and City requirements. Contractor shall use uniform pipe material on each pipe run between structures unless otherwise directed or approved. Jointed HDPE pipe shall not be used for slopes exceeding ten percent (10%).
115. Catch basins and junction boxes shall be set square with buildings or with the edge of the parking lot or street wherein they lie. Storm drain inlet structures and paving shall be adjusted so water flows into the structure without ponding water.
116. Unless otherwise approved by the Public Works Director, all storm drain connections shall be by manufactured tee or wye fittings.
117. Sweep (deflect) storm drain pipe into catch basins and manholes as required. Maximum joint deflection shall not exceed 5 degrees or manufacturers recommendations, whichever is less.
118. Storm laterals shall be a minimum of 4-inches in diameter (larger diameter where required by City or shown on drawings), and shall include toning wire and warning tape per standard details.
119. Unless otherwise specified or directed, install storm drain pipe in accordance with manufacturer's installation guidelines.
120. **Storm Cleaning.** After manhole channeling and prior to mandrel testing or final acceptance, flush and clean all sewers, and remove all foreign material from the mainlines, manholes and catch basins.
121. **Storm Mandrel Testing.** Contractor shall conduct deflection test of flexible storm sewer pipes by pulling an approved mandrel through the completed pipe line following trench compaction. The diameter of the mandrel shall be 95% of the initial pipe diameter. Test shall be conducted not more than 30 days after the trench backfilling and compaction has been completed.
122. **Storm TV Inspection.** Upon completion of all storm drain construction, testing and repair, the

Contractor shall conduct a color TV acceptance inspection of all mainlines in accordance with APWA 303.3.11. The TV inspection shall be conducted by an approved technical service which is equipped to make audio-visual recordings of the TV inspections on DVD. Unless otherwise required by agency with jurisdiction, a standard 1-inch diameter ball shall be suspended in front of the camera during the inspection. Sufficient water to reveal low areas or reverse grades shall be discharged into the pipe immediately prior to initiation of the TV inspection. The DVD and written report shall be delivered to the City.

123. **Tracer Wire (Storm).** Tracer wire shall be installed on mainline storm lines, and shall be stubbed into manholes, catch basins and cleanouts. All storm drain laterals shall have tracer wire installed from the mainline to the property line (insulated 12 gauge solid core copper, white for storm). Tracer wire shall be extended up into all storm lateral cleanout boxes, and shall be extended to the property line to allow the private storm service tracer wire to be connected.

### **STREET LIGHTS**

124. Street lights shall be installed after all other earthwork and public utility installations are completed and after rough grading of the property is accomplished to prevent damage to the poles.
125. Public street light poles, conduit and junction boxes shall conform with the requirements of the City and the power company providing service. Junction boxes shall be H-20 rated and set to finish grade. Direct bury street lights poles shall be set to a depth as specified by the manufacturer, but not less than 5 feet.
126. Street light poles shall be installed within one degree (1°) of plumb.
127. All public street lights shall be energized and fully operational prior to requesting final inspection by the City.

### **FRANCHISE UTILITIES**

128. Unless otherwise shown on the drawings and approved in writing by all jurisdictions having authority, new and relocated franchise utilities (power, cable TV, telephone & gas) shall be installed underground in conjunction with the development.
129. Franchise utility plans shall be submitted to Public Works for review prior to installation. All franchise utility street crossings shall be installed at right angles to the street centerline, and all crossings of water, sewer or storm mainlines or laterals shall be as close to perpendicular as feasible.
130. Where franchise utilities are installed along new streets, franchise utilities shall either be extended across the entire frontage of the property or to the end of the street improvements (whichever is further) or conduit shall be provided for extension of franchise utilities in the

future without additional excavation along the new street frontage.

131. Contractor shall coordinate with gas, power, telephone, and cable TV company for location of conduits in common trenches, as well as location of vaults, pedestals, etc. The Contractor shall be responsible for providing franchise utility companies adequate written notice of availability of the open trench (typically 10 days minimum), and reasonable access to the open trench.
132. Unless otherwise approved in writing by the City, all above-grade facilities shall be located in PUEs (where PUEs exist or will be granted by the development), and otherwise shall be placed in a location outside the proposed sidewalk location. Contractor shall grade street frontage PUEs so that all franchise utility pedestals and vaults can be set to finished grade as measured from the back of the public sidewalk (whether the sidewalk is installed with street construction or deferred to a later time).
133. Installation of private utilities (including either franchise utilities or private water, sewer or storm services) in a common trench with or within 3 feet horizontally of and paralleling public water, sanitary sewer or storm drains is prohibited.
134. Power, telephone and TV trenching and conduits shall be installed per utility company requirements with pull wire. Contractor shall verify with utility company for size, location and type of conduit prior to construction, and shall ensure that trenches are adequately prepared for installation per utility company requirements. All changes in direction of utility conduit runs shall have long radius steel bends.
135. Contractor shall notify and coordinate with franchise utilities for relocation of power poles, vaults, etc. to avoid conflict with City utility structures, fire hydrants, meters, sewer or storm laterals, etc.
136. All existing overhead utilities within the project boundaries shall be relocated underground at the applicant/contractor's expense unless otherwise approved in writing by the City.

#### **STREET TREES, LANDSCAPING & IRRIGATION:**

137. Street trees and landscaping shall not conflict with sight distance standards.
138. Street trees shall maintain the following minimum clearances from existing or new facilities:
  - five (5) feet minimum from any sanitary sewer, storm or water service pipe;
  - ten (10) feet minimum clear from fire hydrants;
  - twenty (20) feet minimum from catch basins/gutter inlets;
  - twenty (20) feet minimum from street lights;
  - forty (40) feet minimum from near curblines of intersecting streets.
139. Landscape plantings shall maintain a minimum of three (3) feet clear from all fire hydrants. Maintenance of this clearance is an ongoing obligation of the property owner.
140. All irrigation systems shall be provided with backflow protection conforming to state and City

standards. Backflow testing results shall be submitted to Public Works prior to requesting final inspection by the City.

**TESTING AND INSPECTION:**

141. The Contractor shall be responsible to ensure that all required or necessary inspections are completed by authorized inspectors prior to proceeding with subsequent work which covers or that is dependent on the work to be inspected. Failure to obtain necessary inspection(s) and approval(s) shall result in the Contractor being fully responsible for all problems and/or corrective measures arising from uninspected work.
142. Unless otherwise specified, the attached “Minimum Required Testing and Frequency” table outlines the minimum testing schedule for the project. This testing schedule is not complete, and does not relieve the Contractor of the responsibility of obtaining all necessary inspections or observations for all work performed, regardless of who is responsible for payment. Cost for retesting shall be borne by the Contractor. Copies of all test reports shall be submitted to the designated City representative.

MINIMUM REQUIRED TESTING AND FREQUENCY TABLE (see note 1)

Notes

Streets, Fire Lanes, Common Driveways, Parking Lots, etc.

Subgrade 1 Test/4000 S.F. (4 min\*\*)

See note 2  
& note 3

Engineered Fills 1 Test/4000 S.F./Lift (4 min\*\*)

See note 2  
& note 5

Baserock 1 Test/4000 S.F./Lift (4 min\*\*)

See note 2  
& note 3

Asphalt 1 Test/6000 S.F./Lift (4 min\*\*)

See note 2

Piped Utilities, All

Trench Backfill 1 Test/200 Foot Trench/Lift (4 min)

See note 2

Trench AC Restoration 1 Test/300 Foot Trench/Lift (4 min\*\*)

See note 2

Water

Pressure Test (to be witnessed by City representative)

See note 4

Bacterial Water Test Per Oregon Health Division

See note 2

Chlorine Residual Test Per City Requirements

Sanitary Sewer

Air Test Per City Requirements (see PWDS form)

See note 4

Mandrel 95% of actual inside diameter

See note 4

TV Inspection All. Lines must be cleaned prior to TV work

Manhole (1) Vacuum test per manhole, witnessed by City representative.

See note 4

Pressure Test (force main) Hydrostatic pressure test, witnessed by City representative.

See note 4

Storm

Mandrel 95% of actual inside diameter

See note 4

TV Inspection All. Lines must be cleaned prior to TV work

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Concrete, Block, etc.	
Slump, Air & Cylinders for all curbs, sidewalks, structures, reinforced concrete & PCC pavements. Unless otherwise specified, one set of cylinders per 100 cubic yards (or portion thereof) of concrete poured per day. Slump & air tests required on same load as cylinders.	See note 2
Building permit inspection & Special Inspection for structural concrete, reinforced masonry, epoxy anchors, etc. as required by current building codes.	See note 6
Retaining Walls	
Building permit inspection and Special Inspection, as well as compaction testing on backfill, all in conformance with all building code requirements	See note 5 & note 6
<p>Note 1: The City considers the Contractor as responsible for scheduling any and all required testing. All testing must be completed prior to performing subsequent work. Additional or more frequent tests may be required by Building Official.</p> <p>Note 2: Testing must be performed by an approved independent testing laboratory.</p> <p>Note 3: In addition to in-place density testing, the subgrade and base rock shall be proof-rolled with a loaded 10 yard dump truck provided by the Contractor. Baserock proofroll shall take place immediately prior to (within 24 hours of) paving, and shall be witnessed by the an authorized Representative of approving agency. Location and pattern of proofroll to be as directed by said authorized Representative of approving agency.</p> <p>Note 4: To be witnessed by City representative. The Contractor shall perform pretests prior to scheduling witnessed waterline or sanitary sewer pressure tests, or pipeline mandrel test.</p> <p>Note 5: The approved independent laboratory retained by the Contractor shall provide a certification (stamped by an engineer licensed in the State of Oregon) that the subgrade was prepared and all engineered fills were placed in accordance with the provisions of the construction drawings and the contract documents.</p> <p>Note 6: Regardless of who is responsible for payment, the Contractor is responsible for scheduling and coordinating any and all required inspections and Special Inspections as required by applicable building codes or jurisdictions having authority.</p> <p><b>**Unless otherwise approved in writing by the Public Works Director, the number of tests required shall be based on the area or length listed, or the minimum number of tests, whichever is greater.</b></p>	

## **EROSION CONTROL NOTES**

### **General**

1. Approval of an erosion/sedimentation control (ESC) plan does not constitute an approval of permanent road or drainage design (e.g. size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).
2. The implementation of ESC plans and the construction, maintenance, replacement and upgrading of ESC facilities is the responsibility of the applicant/contractor until all construction is completed and approved and vegetation/landscaping is established as provided for on the construction drawings, or until 75% coverage without bare spots (ie. vegetation well established and not just showing).
3. The erosion control measures shown on the ESC plan are considered the minimum required for anticipated site conditions, and shall be supplemented and/or upgraded by the applicant/contractor as required to control erosion or sediment within the project boundaries and avoid impacts to adjacent property. Additional measures shall be installed as required to ensure that all paved areas are kept clean for the duration of the project.
4. The boundaries of the clearing limits shown on the plans shall be clearly flagged in the field prior to construction. During the construction period, no disturbance beyond the flagged clearing limits shall be permitted. The flagging shall be maintained by the applicant/contractor for the duration of construction.
5. The ESC facilities must be installed and maintained in conjunction with all clearing, grading and construction activities, and in such a manner as to insure that sediment and sediment laden water do not enter the drainage system, roadways, or violate applicable water standards. The Contractor shall be financially responsible for all costs, violations, fines and/or penalties resulting from failure to adequately control erosion or sediment.
6. Erosion control facilities and sediment fences on active sites shall be inspected by the Contractor at least daily during any period with measurable precipitation. Any required repairs or maintenance shall be completed immediately. The erosion control facilities on inactive sites shall be inspected and maintained by the Contractor a minimum of once a month or within 24 hours following the start of a storm event.
7. Sediment protection (silt sack inserts with biobags) for storm drain inlets, catch basin and area drains shall be installed and maintained for the duration of the project, and until permanent vegetation/landscaping is established.
8. At no time shall sediment accumulation within a trapped catch basin exceed 50% of the sediment capacity. All catch basins and conveyance lines shall be cleaned prior to paving, by the Contractor at their cost. The cleaning operation shall not flush sediment laden water into the downstream system. Contractor shall also verify that all catch basins and conveyance lines are clean, and all trash or sediment deposits are removed, prior to requesting final inspection of

the project by the City.

9. In addition to hydroseeding, for slopes 2H:1V or steeper (or where slope protection matting is indicated on the drawings or required by the Public Works Director), the erosion matting shall be a type that has an extended term functional longevity (ie. minimum 24 months degradability) and specifically designed for use of 2:1 or steeper slopes to ensure that the steep slopes are protected until they have adequate vegetation cover established before the matting biodegrades away. Erosion control matting shall be SC150 matting by North American Green, or approved equal.
10. The Contractor shall provide (at Contractor's expense) site watering as necessary to prevent wind erosion of fine-grained soils, and to support vegetation until it is established as specified herein, or as required by an erosion control permit or to comply with City/state/federal erosion control standards.

### **Sediment Fences**

11. Sediment fences shall consist of standard strength filter fabric fastened securely to stitched post loops, and shall be installed on the upslope side of the posts, with 6 inches of the fabric extended into a trench along the sediment fence alignment. The fabric shall not extend more than 30 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
12. The sediment fence (filter fabric barrier) shall be purchased in a continuous roll cut to the length of the barrier to minimize joints. When joints are necessary, the sediment fence shall be spliced together only at a support post, with a minimum 6 inch overlap, and both ends securely fastened to a post.
13. The filter fabric fence shall be installed to follow the contours where feasible. The fence posts shall be spaced a maximum of 6 feet apart and driven securely into the ground, and shall be provided with additional support as required to contain all silt and sediment capture.
14. Sediment fences shall be inspected by applicant/contractor immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.
15. Sediment fences shall be removed by the Contractor when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

### **Gravel Construction Entrances**

16. Stabilized construction entrances shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures, such as wheel wash basins, may be required to insure that all paved areas are kept clean for the duration of the project. Where provided or required by the City, wheel wash basins shall be periodically (or as directed by City inspector) drained, cleaned of sediment and refilled with clean water.
17. The area of the entrance shall be cleared of all vegetation, roots, and other objectionable material. The gravel shall be placed to the specified dimensions.

18. The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public right-of-way.
19. The entrance may require periodic top dressing with additional stone as conditions demand, and repair and/or cleanout of any structures used to trap sediment.
20. The Contractor shall verify that all trucks are well sealed when transporting saturated soils from the site. Water drippage from trucks transporting saturated soils must be reduced to less than 1 gallon per hour prior to leaving the site.
21. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately by the Contractor at their expense and to the satisfaction of the Public Works Director or his designee.

