Standard Construction Notes
Appendix B

Notes:

1) City Notes Required on Drawings. Per PWDS 1.11.d.1, 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.

2) The developer's engineers can request the standard construction notes in digital format from the City Engineer. The current version of the notes available from the City Engineer shall be utilized, whether or not the current version has been published in an updated PWDS manual.

3) The developer's engineer is responsible to fill in the blanks in the City standard notes as applicable *(ie. elevation datum reference, geotech report reference, etc.)*.

4) All provisions in the current City standard construction notes shall apply to any Public Works construction permit issued by the City, or to any infrastructure work performed within its jurisdiction, regardless of whether or not a particular note is included on the drawings prepared for such work,

GENERAL NOTES:

1. Contractor shall procure and conform to all construction permits required by the City of Jefferson and 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. Full-Size Approved Drawings & Permits Required at Site. A copy of final approved full-size construction drawings and any required permits/approval letters shall be kept on-site at all times, for reference and/or review by inspectors upon request.

5. Contractor shall provide all bonds and insurance required by public and/or private agencies having jurisdiction.

6. Any permit or authorization to proceed with construction issued by the City is considered to be a "written contract" for purposes of triggering "additional insured" coverage of the City and City Engineer under the Contractor's required insurance policy(s) *(including insurance certificates provided by subcontractors)*, and for bonding purposes.

7. All grading, rocking, paving, utility *(water, sewer, storm, etc.)* and related work shall conform to drawing requirements, Oregon Standard Specifications for Construction - OSSC (ODOT/APWA), 2024 edition and applicable ODOT/APWA details, or local jurisdiction specifications, standards & details, whichever is more stringent.

8. 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, ODOT, Oregon Health Authority – Drinking Water Services (OHA-DWS) and the Oregon Department of Environmental Quality (DEQ).

9. 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 Saturday.

10. 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.

11. Contractor to notify City, County, ODOT and all utility companies a minimum of 48 hours *(2*

business days) prior to start of construction, and comply with all other notice and marking requirements of agencies with jurisdiction over the work, including requirements of OAR 952 *(Oregon Utility Notification Center)* as applicable *(excavation work shall not commence until at least the third business day after providing such notice)*.

12. Weekly Construction Schedule. By close of business each week, the Contractor shall submit a weekly work schedule for the following week to the City, summarizing the class of work and areas where work will occur during the following week, and any anticipated inspection requirements.

13. 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.

14. 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, business, fire and emergency vehicles.

15. Unless specifically approved in writing by Public Works prior to start of construction, full street closures or detours are prohibited, and excavation work is to be staged to maintain one-way traffic during construction, and to restore two way traffic during non-construction hours. Any proposed detours must be approved in writing by the City, Fire Department, police, and transit authority if applicable prior to any full street closure or detour *(Contractor shall also obtain ODOT or County approval where applicable)*.

16. Unless authorized in writing by the City prior to the start of the work, no work within any existing public roadway shall disrupt traffic flow for more than 14 consecutive days *(timeframe applies independently and separately to each block or intersection where traffic control work is required)*.

17. **Record Drawings**. The Contractor shall maintain one complete set of approved drawings on the construction site at all times whereon will be recorded 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.

18. 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 which must be submitted to the City prior to the first final walkthrough inspection.

19. The Contractor shall submit a suitable warranty/maintenance bond prior to final payment where required by public and/or private agencies having jurisdiction.

20. 1200-C Permit. Contractor shall procure and conform to DEQ stormwater permit No. 1200C for construction activities where 1 acre or more are disturbed.

21. 1200-C Erosion Control Permit & Inspection Responsibilities: For City funded projects where a 1200-C permit is required, the Contractor shall (after contract award and prior to construction) formally transfer (into Contractor's name) the 1200-C permit and the responsibility for erosion control inspection under the permit. The Contractor shall notify the Public Works Director & City Engineer in writing when the transfer is complete. No ground disturbing work shall be performed on the project until the 1200-C permit has been transferred and DEQ has been notified of the change in inspector responsibility.

22. 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 NVGD 1929 datum corresponding to the FEMA flood map elevations.*

23. 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.

24. 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 *(including compliance with all federal, state and local safety requirements, which remains the sole responsibility of the Contractor without reservation)*. Contractor is solely responsible for payment of any assessment, fine, penalty, claim, damages or costs that result from Contractor's (a) performing site, street or utility work or (b) 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 against any liability, damages, fines, fees or assessments related in any manner to Contractor's site, street or utility work.

25. All construction water must be obtained through an approved hydrant meter or bulk water meter, at a location approved by Public Works.

26. 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.

27. Notice to Property Owners, Contractor Responsibility. When work performed by Contractor will impact or interrupt water/sewer/storm drainage utility service or interrupt vehicular or pedestrian access to any public or private property, Contractor shall notify all the affected parties prior to the anticipated impact a minimum of 48 hours in advance. In addition, Contractor shall provide door hangers or equivalent a minimum of 24 hours *(and a maximum of 48 hours)* before such interruption of utility service *(or vehicular/pedestrian access)* to all residences, structures or businesses impacted by the work *(Contractor is responsible to coordinate with the City staff a minimum of 1 week prior in order to verify area of impact or interruption)*. In addition to the written notice, a representative of the Contractor shall knock on the front door of all affected residences or businesses on the morning that the work will commence, and attempt to notify the residents or businesses regarding the start of the work.

28. Fire, Police, Transit, School Bus Notification. Contractor shall provide a minimum of 48 hours *(2 work days)* notice to police, fire department and Post Office prior to any work that will impact vehicular traffic, and ensure that alternate emergency access is available. Provide a minimum 1 week *(5 work days)* notice to any transit district or school district of any traffic impacts on streets which are on bus routes *(Contractor to verify routes)*, and verify that arrangements are made for alternate routes.

29. Garbage/Recycle Notification. Contractor shall provide a minimum 1 week advance notice for the garbage/recycle collector, and make arrangements for the garbage and/or recycle receptacles at all properties to be placed at a location where they can be collected on the appropriate day(s).

30. Construction Staking. Contractor shall ensure that surveying services are provided necessary to stake the project prior to and during construction, in conformance with City Standards. Construction staking shall be adequate to ensure that all streets, sidewalks, water, sewer, storm drainage and other improvements & utilities are properly installed to design alignments & grades, as well as with respect to easements, right-of-ways and property lines. All construction staking shall be clearly marked *(with elevations, offsets, etc.)* on lathe in the field *(or painted on the surface in the case of PK nails in asphalt)* for reference by the Contractor, inspectors, etc. during construction. Even when GPS is used during construction, adequate field staking shall be provided to allow verification of locations, alignments, depths, etc. during construction and inspection.

31. Material/Equipment Submittals from Contractor Required. Per PWDS G-1300, construction submittals shall be provided by the Contractor for review by the City, for all material & equipment which will incorporated into work covered under the PWDS.

CONNECTIONS, TIMING & COORDINATION:

32. Timing of Connections to City Utilities. Unless otherwise approved in writing by Public Works, connections to existing in-service water, sewer or storm drain mainlines *(or installation of fittings on or in such pipelines)* shall not occur on a weekend, on a Friday or on any day that precedes a holiday.

33. Coordination of Connections, Contractor Availability. The Contractor shall coordinate to ensure that the Public Works staff are notified and have the opportunity to be present during connection operations. After completing the connection work to existing in-service water, sewer or storm drain mainlines, the Contractor shall ensure that a work crew remains at the site and is immediately available to Public Works staff until after all in-service mainlines have been returned to service **AND** have been verified to be fully operational by Public Works.

EXISTING UTILITIES & FACILITIES:

34. Utility Locate Requirements. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0001 through OAR 952-001-0100. 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 or 811)*. These requirements include, but are not limited to, responsibility for pre-marking by excavator, responsibility for notice to Oregon Utility Notification Center by excavator, responsibility of contractor to wait the specified time before starting excavation, responsibility of excavator to maintain marks during the excavation period to ensure that the original marks remain effective for the life of the project or the locate ticket life *(ticket life as defined under OAR 952-001-0010)*, whichever is the shorter period.

35. Potholing Requirements. Contractor shall field verify location and depth of all existing utilities where new utilities or facilities cross or are closely parallel to the existing utilities *(or which are otherwise in close proximity to new utilities)*. All existing utilities which are either (A) marked in the field or (B) which are shown on the drawings, shall be potholed using hand tools or other non-invasive methods prior to excavating or boring to determine the exact location and depth of the existing utility *(see OAR 952-001-0090 for State required potholing limits & depths)*. Persistent failure *(as determined by the City)* to follow these City & State rules regarding exposing & determining the exact location and depth of existing utilities shall be grounds for suspension or cancellation of the permit, or termination of the contract *(at the sole discretion of the City)*.

36. 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.

37. Existing Survey Monument Location & Marking. The Contractor or developer shall retain a surveyor to research, locate and mark all existing property and street monuments within or adjacent to the work areas prior to construction. Any survey monuments that will be disturbed

during construction of the project shall be referenced *(prior to construction)* and replaced *(following construction)* 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 and/or a survey document recorded as required by ORS 209 140, ORS 209.150 and/or ORS 209.155 as applicable.

38. Contractor shall be responsible for exposing potential utility conflicts far enough ahead of construction to determine necessary grade, alignment or depth modifications without delaying the work or requiring otherwise unnecessary materials, fittings or structures. If grade, alignment or depth modification is necessary, Contractor shall notify the Design Engineer, and the Design Engineer shall obtain approval from the City Engineer prior to construction.

39. 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 City Engineer.

40. Temporary Fencing. If existing fencing or other barriers are temporarily removed during construction for any reason, the Contractor shall coordinate in advance with the affected property owner or agency, and shall provide temporary fencing adequate to provide equivalent security as provided by the existing fencing or barriers which are removed *(including but not limited to containing or enclosing pets, livestock, children, etc.)*.

41. 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 City Engineer and 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 City Engineer and Public Works Director.

42. 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)*.

43. 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.

44. 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.

45. 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.

46. Any wells encountered *(which are not specifically designated as being for continued use as approved by the City)* shall be abandoned per the Oregon Water Resources Department (WRD) requirements, and a copy of the notice submitted to WRD shall be provided to the Public Works Director and the City Engineer. Locations and designation of all wells *(abandoned or designed for continued use)* shall be noted and clearly shown on the as-built drawings.

47. Any fuel tanks encountered shall be removed and disposed of per State of Oregon DEQ requirements, and notice provided to the Public Works Director and the City Engineer. Locations of abandoned fuel tanks shall be noted and clearly shown on the as-built drawings. Backfill with compacted granular material.

GRADING, PAVING & DRAINAGE:

48. Contractor to review soils/geotechnical report prepared by _____ (dated __/20__), and conform to all recommendations listed in the report or requirements shown on these plans, whichever is more stringent.

49. The Contractor shall be responsible for managing construction activities to ensure 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.

50. Unless otherwise noted, all grading, rocking and paving to conform to OSSC (ODOT/APWA) Specifications, most recent edition.

51. 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.

52. 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 stripping limits and depths and concurrence of such approval by the City.

53. Clearing & stripping areas near water bodies or on sloped terrain shall follow best management practices to prevent erosion or runoff at any time.

54. Subgrade Compaction Standard. Immediately following fine grading operations, compact

subgrade to 95% of the maximum dry density per AASHTO T-180 test method *(Modified Proctor, ASTM D1557)*, based on nuclear density testing, and perform a proof-roll as noted below. Subgrade must be inspected and approved by the City prior to placing embankments or base rock.

55. Engineered fills shall be constructed and compacted in 6" lifts over approved subgrade.

56. Engineered Fill Compaction Standard (within ROW). 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, ASTM D1557)*.

57. Engineered Fill Compaction Standard (within Building Envelope). 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, ASTM D1557)*. Fills outside of building envelopes which are over 12-inches in depth shall also be engineered and compacted.

58. 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.

59. Subgrade & Baserock Proof-Rolls. Contractor is responsible for coordinating with the City for the following proof-rolls *(witnessed by the City, with a fully loaded 10-yard 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 separation geotextile fabric or baserock placement.
--Curbline proof-roll: prior to placement of curb & gutter.
--Finished rock proof-roll: prior to paving.
If the subgrade is disturbed after the subgrade proof-roll, 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.

60. Granular Baserock & Backfill Gradation. Crushed granular baserock shall conform to the requirements of OSSC (ODOT/APWA) 02630.10 (Dense Graded Base Aggregate), including specified percent of fractured faces. In addition, the backfill shall also contain no more than 10% passing the #40 sieve and no more than 5% passing the #200 sieve. Laboratory test results demonstrating compliance shall be approved by the City prior to placement.

61. Granular Baserock Compaction Standard. Compact granular baserock to 95% of the maximum dry density per AASHTO T-180 test method *(Modified Proctor, ASTM D1557)*, based on nuclear density testing.

62. Granular Baserock Compaction Testing & Proof Roll Prior to Paving. 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.

63. Prior to Paving. Paving of public or private streets or maintenance access routes 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 proof-roll of baserock;
--installation and testing of new water, sewer and storm drain lines under paved areas *(including trench compaction testing and submittal of test results to the City)*;
--review and approval of the franchise and/or private utility plans by the Public Works Director or City Engineer; and
--installation of all franchise utilities or sleeves located under or crossing paved areas, curbs or sidewalks.

64. Subgrade Over-Excavation & Backfill. If subgrade fails a proof-roll *(witnessed by the City, with a fully loaded 10-yard rock truck)*, subgrade shall be over-excavated to undisturbed soil and backfilled with baserock over the specified geotextile fabric (**) as required to allow compaction of upper *(design)* baserock section and to maintain structural integrity of native subgrade soils. Typical minimum over-excavation required is 12-inches unless a site specific geotechnical report is submitted and approved by the City Engineer. No rubber tired equipment allowed on subgrade following over-excavation.
**Geotextile Embankment / Reinforcement Fabric under roadways and curbs shall be included on the current ODOT QPL list for OSSC 02320-5 table *(for non-woven or woven fabric)*. Slit Film fabrics are not allowed.

65. Subgrade Separation Fabric. If subgrade passes a proof-roll with no deflection but cannot be compacted to 95% optimum density per AASHTO T-180 *(Modified Proctor, ASTM D1557)*, or if the contractor chooses not to have subgrade compaction density testing performed, geotextile separation fabric *(from the current ODOT QPL for OSSC 02320-4 table)* shall be placed on the subgrade prior to placement of the baserock.

66. Pavement Mix Design. AC Pavement shall conform to OSSC (ODOT/APWA) 00744 (hot mixed Asphalt Concrete Pavements (ACP)), and shall be approved by the City prior to placement. Unless otherwise approved in writing and required by the County or ODOT for streets under their jurisdiction, pavement mix shall consist of 1/2 inch mix for both base course paving and for wearing/leveling course paving *(Level 2 JMF required for City streets, as well as parking lots/fires lanes, etc.)*.

67. Pavement Compaction Standard *(for public & private roads & maintenance access routes, fire lanes, etc.)*. 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.

68. Pavement Joint Locations & Offsets. Per OSSC 744.44, place ACP in panel widths to minimize the number of transverse and longitudinal joints to a minimum. For multi-lift paving, offset the longitudinal joints and transverse *(end)* joints in one panel by at least 6-inches from

the joints in the panel immediately below (OSSC 744.44.a). Longitudinal pavement panel joints/seams shall be at or within 6 inches of the centerline of the street unless otherwise approved by Public Works Director and agency with jurisdiction. Where approved, joints offset from centerline shall be installed at or within 6 inches of lane lines or fog lines. In no case shall longitudinal pavement joints be allowed in travel lanes or adjacent to travel lane wheel paths.

69. Joints with Existing Pavement, or Paving without Offsets. Where offsets between pavement lifts cannot be provided, OR where new paving abuts existing pavement *(for extension or widening of existing streets)*, a bench grind along the joint shall be provided per City standard details, with a strip of pre-tacked paving fabric centered over the joint between the first and second lift *(PetroTac or equal)*.

70. Overlay Fabric *(where overlay paving is approved)*. Unless heavier fabric is specified or noted on the drawings, overlay fabric shall be Petromat MPV500 or approved equal *(including strength, elongation, asphalt retention, minimum melting point, etc.)*.

71. 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.

72. ACP 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 ACP mixtures be placed when the surface temperature is below the minimum established under OSSC (ODOT/APWA) 00744.40 (Season and Temperature Limitations) or the project specifications, whichever is more stringent.

73. Contractor shall protect new pavement against traffic as required, until it has cooled sufficiently to avoid tracking.

74. All existing or constructed manholes, cleanouts, monuments, gas valves, water valves and similar structures shall be adjusted by the Contractor to match finish grade of the pavement, sidewalk, landscaped area or median strip wherein they lie.

75. 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.

76. Curb Grade Verification. Where new curbs *(or curb & gutter)* are installed along existing streets, driveways, vehicular access routes, parking lots or similar areas, the Contractor's surveyor shall be responsible to verify that the curb/gutter grades match with the existing edge of pavement *(or sawcut edges as applicable)*, based on the design cross slopes for the street, driveway, parking lot or vehicular access route as shown on the drawings, and in order to provide the specified curb exposure *(or drainage notch elevation as applicable)* relative to the new surface finish grade. Any discrepancies shall be reported in writing to

the City and Owner prior to installation of curb forms or final setting of string-line, and the curb grades adjusted as required to conform with direction from the City prior to concrete placement. Any such adjustment or replacement required shall be at no additional cost to the City or the Owner.

77. All street signs, traffic control signs, curb & pavement painting/marking or striping *(including driveway/loading zone/parking lot pavement markings or signs as applicable)*, and/or reflectors shall be installed *(in conformance with City and MUTCD standards)* prior to requesting final inspection by the City. Signs or barricades at the end of streets, sidewalks or bike lanes shall conform with City standards and be acceptable to the Public Works Director.

78. Public Street Pavement Markings. Stop bars shall be provided at all stop signs, located behind the pedestrian crossing at a location acceptable to Public Works. All stop bars, crosswalk striping and other roadway marking and emblems shall be 125 mil thick pre-formed skid resistant thermoplastic with intermix glass beads *(Premark BD by Ennis-Flint, or OptaTrac by Geveko Markings)*. Installation shall be by methods and by a contractor approved by Public Works.

79. Fire Lane Signs or Curb Painting. Unless curb painting *(with approved Fire Lane lettering)* is shown on the drawings or approved in writing by the Fire Code Official, all fire lanes shall be marked and designated with signs at 50 foot maximum spacing *(see OFC 503.3 and D103.6 for sign style & side of fire lane)*, whether or not such signs or curb painting is shown or noted on the drawings. Per City details, signs shall be mounted a minimum of 7 feet clear above grade on galvanized steel posts set in concrete.

80. Cut or fill slopes within the public right-of-way and utility easements shall conform with limits noted on City standard details. Unless otherwise shown on the drawings, no cut or fill slopes shall be constructed steeper than 2H:1V maximum.

81. Landscape Block Retaining Structures & Block Adhesive. Landscape blocks shall be installed as necessary *(whether or not specifically shown on the drawings)* to retain soil or backfill along curbs or sidewalks, or around manholes, cleanouts, catch basins, valve boxes, hydrants, meter or backflow boxes or vaults, light poles or other improvements, or around the end of culverts under streets or driveways, along alignments and to heights as determined and directed by the City Engineer or the Public Works Director. All landscape blocks shall be secured together with landscape block adhesive *(Loctite PL500 or equal waterproof and temperature resistant adhesive)* in order to prevent separation, slippage or displacement of blocks after construction.

82. All planter areas shall be backfilled with approved top soil minimum 8" thick. Stripping materials shall **not** be used for planter backfill.

83. Contractor shall seed and mulch all exposed slopes and disturbed areas which are not scheduled to be landscaped, including trench restoration areas. Mulch shall be either hydromulch or finely chopped fescue or rygrass mulch conforming with OSSC (ODOT/APWA) Section 01030.15

As noted in the OSSC, CEREAL GRAIN STRAW *(wheat or similar)* IS NOT AN ACCEPTABLE SUBSTITUTE without specific written approval.

Unless otherwise approved in writing by the City *(based on the seeded areas being irrigated)*, final seeding shall occur between 3/1 and 5/15 or between 9/1 and 11/15, during periods when environmental conditions are conducive to satisfactory growth *(see also OSSC (ODOT/APWA) 01030.43 & 01030.60)*.

84. Grading shown on the drawings is critical to functioning of detention system and shall be strictly followed.

85. Contractor shall coordinate and ensure that detention volumes are inspected and approved by public agencies having jurisdiction prior to paving and landscaping.

- **Curbs, Sidewalks, Etc.**

86. Unless otherwise shown or indicated on the drawings, 6-inches nominal curb exposure used for design of all parking lot and street grades.

87. Unless otherwise approved in writing by the City and any other agency with jurisdiction, monolithic curb & sidewalk *(other than pedestrian ramps)* shall not be placed in the public right-of-way *(ie. curb concrete & sidewalk concrete shall be placed separately)*. Joint material shall be placed at spacing and locations as noted on the City standard details.

88. Construction of all curbs, sidewalks, driveways and other concrete structures shall conform to the applicable requirements of OSSC (ODOT/APWA) Section 00759, Miscellaneous Portland Cement Concrete Structures, including placement, curing, finishing and the repairing of minor defects. Major defects *(as determined by the City)* will require removal and replacement of the defective portions as directed.

89. Unless a different thickness is noted on the drawings and approved in writing by the City, all concrete for sidewalks, driveways or other structures shall be placed on a minimum of 4-inches of compacted granular baserock (3/4"-0 granular baserock unless otherwise specified).

90. Where new curbing connects to existing curbing or is installed along existing streets or pavement, the gutter grade shall match the existing street grades so as to allow drainage from the street to the gutter, as well as through any transitions or connections between old & new curbs. The Contractor shall notify the City in writing of any grade discrepancies or problems prior to curb placement. Curbs that are placed too high or too low shall be removed and replaced as directed by the City.

91. Finish sidewalk grades at transition to existing sidewalks shall match existing sidewalk grades as required to form a continuous, smooth, free draining surface. The Contractor shall notify the City in writing of any grade discrepancies or problems prior to sidewalk placement.

92. 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 *(drain pipe under sidewalks shall extend 12-inches behind back of sidewalk and be capped)*, 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 curb weepholes in conjunction with subdivision or development improvements *(ie. where storm drain laterals from storm mainline is not provided)*, 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.

93. Weep holes installed in existing curbs shall be core drilled and sealed as required by Public Works.

94. New or replacement 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 *(in the top of the curb AND in the gutter pan)*. Letters shall be a minimum of 2-inches high. Existing curbs crossed by new services shall have letters routed or cut into the concrete, unless otherwise approved in writing by the City.

95. Contractor shall construct handicap access ramps at all intersections in accordance with current ADA and PROWAG requirements.

96. All curbs, sidewalks and driveway approaches shall be constructed using batch plant concrete, 3300 psi min @ 28 days, max 5" slump, 4.5% air (±1.5%), 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 *(including wings & approaches)* and sidewalks through standard residential driveways shall be a minimum of 6-inches thick.
--Sidewalks through commercial, industrial, or public use driveways and alley approaches shall be minimum 8-inches thick.
--Multi-Use paths shall be a minimum of 6-inches thick *(any pathways used for maintenance vehicle access to utilities shall be reinforced with #4 bar at 12" OC EW, unless 8" concrete thickness is provided)*.

97. 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.

98. 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.

99. Contractor shall conduct a flood test of all new or replacement 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/her sole expense.

100. Where trench excavation or other work requires removal of *(or causes damage to)* 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. Any sawcut lines shown on the drawings are schematic and not intended to show the exact alignment of such cuts.

101. 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:

102. Contractor shall coordinate and pay all costs associated with connecting to existing water, sanitary sewer and storm sewer facilities.

103. To the maximum extent practical, Contractor shall have all fittings, valves, pipe spools, etc. pre-assembled and ready for installation prior to shutdown of existing pipelines.

104. Witnessing & Inspection of Connections at Existing Mainlines Required. Contractor shall arrange to have any and all connections *(including both tapping work and cutting in work)* to existing City utilities *(water, sewer or storm)* witnessed by City Public Works staff during installation, and inspected by Public Works staff prior to backfilling. Failure to coordinate for such inspection will result in a requirement that the connection be exposed for inspection, at no additional cost to the City.

105. Unless otherwise noted, materials and workmanship for water, sanitary sewer and storm sewer shall conform to OSSC (ODOT/APWA) Specifications, most recent edition.

106. Root Protection. Where trees are located adjacent to trench lines and are not scheduled or noted for removal, protect all roots two inches in diameter or larger, unless otherwise approved in writing by Public Works on a case-by-case basis.

107. Smooth Bottom Trenches. 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.

108. **Trench Foundation Stabilization**. If trenches are over-excavated for any reason, over-excavation shall be filled to the design trench subgrade *(ie. to the bottom of the 6" thick pipe bedding layer)* with compacted, well-graded granular backfill as specified *(the use of open-graded rock for trench foundation stabilization is prohibited unless it is completely encapsulated in geotextile fabric & approved in writing by the City)*.

109. **Pipe Bedding and Trench Backfill**. All pipes shall be bedded with minimum 6-inches of 3/4" minus granular backfill *(crushed rock)* bedding and backfilled with compacted 3/4" minus granular backfill in the pipe zone *(granular backfill shall extend a minimum of 12-inches over the top of the pipe in all cases)*. Granular trench backfill shall be used under all improved areas, including sidewalks.

110. Granular Trench Backfill Requirements. Granular backfill shall be ¾"-0 conforming to OSSC (ODOT/APWA) 02630.10 (Dense Graded Base Aggregate), including specified percent of fractured faces. In addition, the backfill shall also contain no more than 10% passing the #40 sieve and no more than 5% passing the #200 sieve. Laboratory test results demonstrating compliance shall be approved by the City prior to placement of granular trench backfill.

111. Granular Trench Backfill Moisture Control. Granular trench backfill shall be moisture controlled *(prior to or during placement)* prior to compaction. Compaction of dry granular backfill without adequate moisture is not acceptable.

112. Granular Trench Backfill Compaction. Granular trench bedding and granular backfill in the pipe zone shall be compacted to be firm and unyielding, even though compaction testing is not required in this zone. Granular trench backfill above the pipe zone shall be compacted in lifts to 92% of the maximum dry density per AASHTO T-180 test method *(Modified Proctor, ASTM D1557)*.

113. Trench Backfill Compaction Testing in Lifts. Trench backfill shall tested in lifts for trenches deeper than 4 foot to top of pipe, as well as at the finish rock grade. As a minimum for deeper trenches, compaction testing shall occur at half the trench depth *(to a maximum of 4 feet down in the trench)*, based on the same compaction methodology being used for the deeper portions of the trench as at the tested depths.

114. Submittal of Trench Backfill Compaction Test Results. Prior to placing AC pavement or concrete trench surfacing, written compaction test results for trench backfill must be received by the City.

115. Trench Pavement Mix Design. Trench restoration AC Pavement shall conform to OSSC (ODOT/APWA) 00744 (hot mixed Asphalt Concrete Pavements (ACP)), and shall be approved by the City prior to placement. Unless otherwise approved in writing and required by the County or ODOT for streets under their jurisdiction, pavement mix shall be 1/2 inch mix *(Level 2 JMF for local streets, as well as parking lots/fires lanes, and Level 3 JMF for*

collector/arterial streets). For paving on state highways, ODOT requires ½" Level 3 mix for all lifts.

116. Pavement Compaction. Trench restoration 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.

117. Submittal of Trench Pavement Compaction Test Results. After paving, written compaction test results for AC trench restoration must be received by the City.

118. Temporary thrust restraint on pressure pipelines shall be provided at all locations where necessary due to construction sequencing shown on the drawings, required by City standards or chosen by the Contractor. The adequacy of the temporary thrust restraint shall be the Contractor's sole responsibility, but shall be acceptable to the City and any other agency with jurisdiction. Any movement of the pipe or fittings during pressurization of the pipeline or connection shall be considered evidence that the temporary thrust restraint is not adequate, and the pipeline or connection shall be depressurized and the thrust restraint increased as necessary. Re-pressure testing or re-chlorination, if deemed necessary at the sole discretion of the City, shall be completed at the Contractor's expense.

119. Contractor shall arrange for and pay all costs to abandon existing sewer and water services not scheduled to remain in service, including disconnection and capping at the mainline.

120. All piped utilities abandoned in place shall have all openings closed with watertight plugs or caps, OR with concrete plugs with a minimum length equal to 2 times the diameter of the abandoned pipe.

121. 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 white for sanitary sewer, green for storm)*. Tracer wire shall be extended *(and attached)* to the top of the 2-x-4 post. Type of utility *(ie. sewer, storm, etc.)* and depth below grade to pipe invert shall be clearly & permanently labeled on the marker post.

122. Contractor shall provide all materials, equipment and facilities required for testing all utility piping in accordance with City construction specifications.

123. **Tracer (Toning) Wire**. All 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 using blue wire for water and green for storm and sanitary 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, or equal)*.
--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.

124. **6-inch Wide Warning Tape**. All underground water, sanitary and storm sewer piping shall have a 6-inch wide warning tape installed in the upper reaches of the trench as shown on Detail 301 *(color & "Caution: Buried ___ Below" wording as required for water, sewer, storm drain, etc.)*. Underground warning tape shall be continuous the entire length of mainlines, and along service laterals installed from the mainline to the back of the PUE as applicable.

125. 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.

126. Trench Compaction Prior to Mandrel Testing or TV Inspection. 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.

127. 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.

128. Timing for Trench Work on Existing Public Streets. Unless authorized in writing by the City prior to the start of the work: trenching within existing paved streets shall be backfilled and repaved within 14 days of the start of excavation unless the trenches are completely plated or repaired with cold patch; trenches within each block or intersection shall be permanently repaved within 21 days of the start of excavation *(including completion of all inspections, testing & corrective work required by City standards prior to paving)*. These timeframes apply independently and separately to each block or intersection where trenching work occurs.

129. Interior Debeading. Where butt-fused HDPE is used for gravity flow applications, fusion joint bead projections shall be removed from the interior of all fused pipe as each joint is fused, by means of a mechanical cutting head, for all pipe 18-inches in diameter (IPS) or less. The de-beading cut shall be flush with inside circumference of the pipe.

- **Water**

130. **Interruption of Water Service**. All work shall be performed in a manner designated to maintain water service to buildings supplied from existing waterlines, and to maintain fire flows to existing hydrants & fire service lines. In no case shall service to any main line or building be interrupted for more than four (4) hours in any one day, subject to prior written authorization by the City *(authorized a minimum of 1 week prior to the work)*, as well as notifying the fire department/district of any interruption to hydrants or fire service lines a minimum of 1 week prior to the work. In addition, Contractor shall notify the City and all affected residents and businesses *(and the fire department/district if applicable)* a minimum of 24 business hours *(1 business day)* prior to any actual interruption of service.

131. Operation of Existing Valves. City forces to operate all valves on existing public water mains,

on the public side of water meters, or at the connection of fire service lines to public water mains.

132. City Public Works Staff to Be Present During Flow Testing. No person other than Public Works staff shall operate or flow test fire hydrants without first obtaining written authorization from the Public Works Director. This hydrant use restriction shall not apply to fire department/fire district staff in the performance of their regular duties. All hydrant flow tests shall be performed with Public Works staff present unless otherwise approved by the Public Works Director. Opening or operating fire hydrants with any tool other than a standard hydrant wrench designed for that purpose is prohibited.

133. All water mains shall be C-900 PVC (DR 18) or Class 52 ductile iron.

134. 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.

135. Water Pipe Minimum Cover. All water mains to be installed with a minimum 36 inch cover to finish grade unless otherwise noted or directed by the Public Works Director. 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.

136. Pre-Testing Required When Connecting to Existing Valves. When drawings require that a new waterline be connected to and tested against an existing valve, it shall be the Contractor's responsibility to pre-test the existing valve to ensure that it is able hold pressure tight against the test pressure required for the new waterline. Contractor shall install a short, capped pipe segment on the existing valve in order to perform a pressure test against the existing valve. All pipe, fittings, restrained caps, connections, test ports & appurtenances, temporary thrust restraint, labor, etc. required to perform this valve pre-testing shall be of the Contractor's design, subject to approval by the City. The Contractor shall clean and disinfect the short, capped pipe segment during installation, and shall use chlorinated potable water for filling and for pressurizing the pipe test segment. If the existing valve fails this preliminary pressure test, the Contractor shall report this condition to the City, and shall replace the existing valve with a new valve approved by the City.

137. Non-Valved Waterline Connections Prohibited. Non-valved connections to public waterlines are prohibited *(ie. waterline connections, domestic service or fire service connections, blowoffs, etc.)*.

138. Unless otherwise approved by the City Engineer, 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.

139. All buried valves *(except for corporation stop ball valves)* shall be provided with new valve boxes, including new valves installed by the Contractor, or existing valves which are excavated

around as part of the work, and existing valves which are located within newly paved, newly concreted or newly graveled surfaces. Valve boxes shall conform to City standard details. Reuse of existing valve boxes will only be allowed if they fully conform with current City standard details, are accurately centered on the valve nut, are clean of excess rock or debris around the valve nut, and are approved in writing by the City on a case-by-case basis.

140. Permanent 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. Plastic shall be placed around all fittings & pipe prior to placement of concrete. All concrete shall conform to the requirements of OSSC (ODOT/APWA) 00440, Commercial Grade Concrete, 3300 psi min @ 28 days, max 5" slump, 4.5% air (±1.5%). 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 by the Contractor and approved by the Public Works Director on a case-by-case basis *(for each location proposed)*, it shall be a 4000 psi minimum crack-resistant mix *(Quikrete 1006 or equal QPL listed mix must be 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.

141. It shall be the Contractor's responsibility to coordinate with the City for visual inspection and verification of all thrust restraint and thrust blocking *(including but not limited to size, configuration, plastic placement, etc.)* prior to placing concrete, covering or backfilling. Failure to coordinate for such inspection will result in a requirement that the thrust restraint or thrust block be exposed for inspection, at no additional cost to the City.

142. 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 third calendar day following installation of the temporary thrust restraint.

143. Water service pipe on the public side of the meter shall be Driscopipe 5100 Ultra-Line (PE 3408) high density polyethylene pipe, copper tube size OD, SDR 9 *(200 psi working pressure rated)* conforming to ASTM D-2737 with 2-3/8"long style compression insert stiffeners *(AY McDonald 6133T CTS insert stiffener or equal)* and compression fittings.

144. Unless otherwise noted, water service pipe on the private side of the meter shall be Schedule 40 PVC or as approved by the OPSC.

145. **Primer Required**. For all PVC pipe with all solvent cement joints, use of purple primer *(IPS Weld-On P70 Industrial Grade or equal)* is mandatory *(see also OPSC 605.12.2)*. For 1½" or larger PVC, use gray medium body PVC cement *(IPS Weld-On 711 Industrial*

Grade or equal). For 1" & smaller PVC, use Christy's Red Hot Blue Glue, IPS 721 or approved equal.

146. Domestic, irrigation and fire backflow prevention devices and vaults shall conform to requirements of public and/or private agencies having jurisdiction. It is the responsibility of the premise owner and/or water user to provide a thermal expansion tank or other means approved by the Oregon Plumbing Specialty Code (OPSC) to address thermal expansion concerns in the private water system piping downstream of any backflow device or pressure regulator where applicable *(see PWDS 5.22.c & OPSC 608.2&3)*. The premise owner and water user are hereby notified of these thermal expansion concerns, and that it is the responsibility of the premise owner and/or water user to address these concerns.

147. The Contractor shall be responsible for having backflow devices tested and certified *(and copies test/certification reports submitted to the City)* prior to final acceptance of the work.

148. Conduit & Wire Installation. The Contractor shall coordinate with the owner(s) of property being served for permits and installation of conduit(s) and wire as necessary to power required sump pumps in meter vaults and/or in backflow vaults or enclosures and for any required freeze protection, or as necessary to monitor any tamper switches required in backflow vaults or enclosures *(whether or not such conduits or wire routes/alignments are noted or shown on the plan view drawings)*. Installation and activation of any such power and/or signal wires is required prior to acceptance by the City.

149. The Contractor installing each vault or enclosure shall be responsible to install *(or coordinate the installation of)* the conduit and wires required to serve each such vault or enclosure.

150. Water Meter Installation. Unless otherwise required or approved by Public Works, all meters 1½-inches and larger shall be installed by the contractor, under the on-site inspection and subject to the approval of Public Works Director.

151. Water Meter Depth. All meter service connections shall be installed or adjusted such that water meters are set below the meter box lid at the depth listed on the City standard details. If a deeper set meter is approved in writing by Public Works Director on a case-by-case basis, the stacked upper meter box shall be the next meter box size larger than the standard meter box shown on the standard details *(to facilitate future maintenance access)*, as approved by the Public Works Director *(ie. a 17"x30" box stacked on top of a standard smaller ¾" meter box, etc.)*.

152. Calibration Testing for Larger Meters. 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 contractor's expense. All test results shall be submitted to Public Works Director for review and approval.

153. Detector Loop Meter. For each DCDA or RPDA, the Contractor is responsible for coordinating with Public Works as necessary in order to obtain, provide and install an

approved water meter on the detector loop which includes transmitter accessories compatible with the City's existing meter reading system.

154. Removal of Abandoned Water Services. Unless otherwise required or approved by Public Works, any water service abandoned as part of a project shall be removed by the contractor and capped at the mainline, under the on-site inspection of Public Works.

155. Water Mainline Couplings. Where shown on the drawings or required by the City, restrained sleeve couplings shall be Krauz Hymax Grip Couplings or approved equal (Romac Alpha Coupling). Unrestrained mainline couplings shall be long-style epoxy coated DI sleeve couplings, or Romac Macro HP Coupling *(short body couplings not allowed)*.

156. Fire Hydrant Orientation. The Contractor shall coordinate and orient the hydrant steamer/pumper port as directed and approved in writing by the local Fire District/Fire Dept. Hydrants installed in advance of such coordination and written direction shall be adjusted and reoriented without additional cost to the City.

157. **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 *(D2241 PVC-DR 32.5, C-900 PVC-DR 18 or 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 flexible reinforced couplings *(MaxAdaptor Coupling by Gripper Gasket LLC or approved equal)*. 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.

158. Temporary Appurtenances. Contractor shall provide temporary appurtenances and install temporary chlorination & sample taps, restrained caps/plugs and blowoffs on new waterlines as required for flushing, pressure testing, chlorination and bacteriological testing *(configuration to be acceptable to the City or other agency with jurisdiction)*. Chlorination and sample taps shall be located within 12-inches of the end of each mainline segment to be chlorinated & tested, and configured to ensure that all portions of the pipelines are adequately disinfected. All temporary appurtenances shall be removed by the Contractor as specified prior to final surface restoration.

159. Pressure Testing. All waterlines, services and appurtenances shall be pressure tested for leakage *(hydrostatic testing at 150% of working pressure, 150 psi minimum, for 2 hours)*. All testing shall conform to requirements as outlined on City testing forms contained in the PWDS Appendix A. 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 verified. All tests shall be witnessed by Public Works staff.

160. 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.

161. Disinfection & Bacteriological Testing. All water mains and service lines shall be chlorine disinfected per local jurisdiction requirements, or OAR 333-061-0050(10)(b) *(25 mg/L minimum chlorine solution, 24 hours contact time)*, whichever is more stringent. Water distribution mains shall be disinfected by pumping a concentrated hypochlorite solution into the pipeline as it is being filled, through a tap provided by the Contractor. Unless otherwise approved by the Public Works Director, a City representative shall witness the application of the chlorine solution and verification that 25 mg/L is provided at all points in the pipeline, service lines and hydrant leads, as well as witnessing 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 16 hours apart shall be collected from the waterline for microbiological analysis *(ie. one sample immediately after flushing, and another sample a minimum of 16 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. Contractor shall coordinate with Public Works to ensure that both a high level chlorine test kit and a chlorine residual test kit is available at the site during testing.

162. 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.

163. Disposal of Chlorinated Water. The chlorine residual in water from testing, disinfection or flushing activities shall be neutralized in accordance with DEQ standards prior to discharge to the storm system or ditch discharging to surface waters. Care should be exercised to balance the amount of dechlorinating chemical against the chlorine present. Where required by Public Works, the Contractor shall provide a field chlorine residual test kit to verify adequate dechlorination of water being discharged.

164. Capping of Chlorination Taps, Pressure Test Taps, Temporary Sample Taps, Abandoned Water Services, etc. Unless otherwise approved or required by the City, all extra pipe and fittings attached to chlorination, pressure test or temporary sampling taps *(or existing water services required to be abandoned)* shall be removed and a threaded brass corporation cap *(Ford CAP-x-x-NL or equal)* installed on the corporation stop at the mainline tap or saddle *(to avoid depressurizing the mainline after disinfection)* after the new waterline is placed in service where applicable. Wrap each capped corporation stop in plastic prior to backfilling.

165. Inspection of Abandoned & Capped Water Services. Contractor shall arrange to have each abandoned & capped water service connection inspected by Public Works staff prior to

backfilling. The location of all such capped corporation stops shall be shown on the Contractor's record drawings *(ie. horizontal ties to two permanent landmarks, and depth below grade)*.

166. Disconnection of Abandoned Water Facilities. 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 prior to repaving or surface restoration.

- **Sewer & Storm Manholes**

167. All precast sanitary sewer manholes shall be provided with integral rubber boots. Lockdown lids shall be used on manholes outside of public right-of-way only where specifically required by Public Works.

168. All connections to existing manholes shall be made by core-drilling the existing manhole structure and installing a rubber boot. 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.

169. Core-Hole Separation from Manhole Barrel Joints. The standard minimum separation between the edge of a core-hole and the nearest manhole barrel joint is 6 inches for manholes 48 to 72 inch in diameter. For manholes greater than 72 inch diameter, the minimum separation shall increase to 8 inches.

170. Grouting & Channels to be Smooth. All interior joints, penetrations & any exposed lifting holes shall be grouted following manhole assembly. The grouting and channels of all manholes shall be smooth and uniform, and shall not retain water or debris. Any grout or concrete splatters *(in channels, on channel benches, on walls or on steps)* shall be removed by the Contractor.

171. All concrete for manhole channeling shall conform to the requirements of OSSC (ODOT/APWA) 00440, Commercial Grade Concrete, 3300 psi min @ 28 days, max 5" slump, 4.5% air (±1.5%). Concrete mix design shall be submitted to Public Works and/or the City Engineer for review and approval prior to use. If hand mixed sack-crete type concrete is proposed by the Contractor and approved by the Public Works Director on a case-by-case basis, 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)*.

172. Manhole channel 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. Flow channels in manholes shall be of such shape *(semi-circular bottoms)* and slope to provide smooth transition between inlet and outlet sewer size/ invert to minimize turbulence and to ensure

that the manhole channels are self-cleaning. Channels, as well as shelves between the channels and the manhole walls, shall be sloped to drain per plan details.

173. Unless otherwise approved in writing by the Public Works Director and the City Engineer, manhole steps shall be installed in any manhole which does not have existing steps, and which is connected to or otherwise altered in any way.

174. For all sanitary sewer manholes, external mastic wrap joint seal *(9-inch minimum width)* shall be installed on all manhole barrel joints & pickholes after assembly, prior to backfilling *(Bidco External Joint Wrap BW-9T by Trelleborg, or equal)*. The exterior of the manhole barrels adjacent to each joint shall be clean *(under the mastic wrap)* to ensure a good seal *(use wire brush to clean the exterior surface under the mastic wrap to remove all dirt, loose particles or deleterious material)*. The mastic wrap shall be held in place with plastic stretch wrap *(ie. pallet wrap plastic, 3 layers minimum)* during backfilling *(ie. to protect the external mastic wrap from displacement during backfill installation &/or compaction)*. Plastic wrap shall be installed immediately after the mastic wrap is placed. Coordinate with Public Works for inspection of exterior joint wrap prior to backfilling.

175. MH Frame & Cover Style. All manhole frames & covers shall be standard non-lockdown style except where explicitly called out on the drawings *(2 hole lids for sanitary sewer, 16 hole lids for storm)*. Incorrect frame or cover styles shall be replaced at no additional cost to the City.

176. MH Rim Elevations. Contractor shall be responsible to verify manhole finish rim elevations match with finish grade or are set above finish grade as required to conform with City standard details. Manhole rim elevations shall be adjusted as required to conform with this requirement.

177. MH Inflow Inserts. All sanitary sewer manholes in low areas which are subject to flooding or water ponding *(including all lawn, landscape or gravel areas, or low areas of parking lots, or manholes closer than 4 feet clear of parking lot curblines or existing/future street curbs, adjacent to ditches, etc.)* shall be provided with inflow protector lid inserts *(whether or not such MH inserts are specifically noted on each applicable drawing sheet)*. 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. Unless waived in writing by Public Works *(case by case basis)*, a clog-free vent-valve valve *(rubber check by Tideflex)* shall be provided on each unit. Inserts shall be ManPan manhole inserts or approved equal.

178. Sanitary Sewer Manhole Vacuum Testing & Witness. All manhole testing shall conform to requirements as outlined on City testing forms contained in the PWDS. Unless otherwise approved in writing by the Public Works Director, Public Works staff shall be present for all sanitary sewer manhole testing. Visible groundwater infiltration or leakage constitutes a failed sanitary sewer manhole test, whether or not the vacuum test is successful. Any sewer manholes which exhibit visible leakage after assembly shall be injection grouted by a qualified grouting subcontractor *(retained by the Contractor)* acceptable to the City *(surface plugging of manhole leaks with non-shrink grout is not a permanent repair, and is not acceptable)*.

179. Vacuum Testing *(New SS MHs)*. All sanitary sewer manholes shall be vacuum tested following completion of paving or final surface restoration.

180. Vacuum Testing *(Existing SS MHs)*. Existing sanitary sewer manholes to which new pipes are connected *(or where existing pipe connections are modified)* shall be sealed as required and pass a vacuum test prior to final approval.

181. Vacuum Testing *(Resurfacing around Existing SS MHs)*. Existing sanitary sewer manholes where pavement or surfacing is replaced around the manhole shall be sealed as required and pass a vacuum test following completion of paving or final surface restoration.

182. Manhole Cleaning. All manholes shall be thoroughly cleaned prior to being placed in service and/or accepted by the City, including removal of any debris, excess grout in manhole channels or on manhole steps, etc.

- **Sanitary Sewer**

183. **Interruption of Sewer Service**. Sewer service from buildings, upstream and affected properties shall be maintained during construction unless prior written City approval is granted *(authorized a minimum of 1 week prior to the work)*. In addition, Contractor shall notify the City and all affected residents and businesses a minimum of 24 business hours *(1 business day)* prior to any actual interruption of service.

184. **Sewer Bypass System**. Bypass pumping or other methods used to maintain sewer flows shall be the Contractor's design, subject to approval by the City *(City approval required a minimum of 48 hours prior to initiation of the bypass operations)*. The bypass system shall be capable of conveying flows peak flows in the sewers during the time that the works is done, as applicable. Normal unrestricted flows shall be restored at the end of each work day. Bypass pump systems left in place or operated outside normal working hours shall be monitored continuously by the Contractor personnel unless alternate arrangements proposed by the Contractor are acceptable to the City *(ie. high level & pump fail alarm callouts, etc.)*. The Contractor shall provide for City review all submittal information required to demonstrate *(to the satisfaction of the City)* compliance with these requirements. Contractor shall be responsible for any and all costs related to cleanup, damages and fines resulting from any sewerage spill or overflow associated with any methods used to convey sewage flows during construction.

185. Unless otherwise shown, gravity sanitary sewer pipe shall be PVC in conformance with ASTM D3034, SDR 35, including sewer service laterals from the mainline to the right-of-way or easement boundary. All other appurtenances and installation to conform to the City specifications.

186. Gravity Sewer Lateral Size. Gravity sanitary sewer laterals for single family residential & each side of duplexes shall be a minimum of 4-inches in diameter *(6-inch minimum for all multi-family, industrial, commercial or public type laterals)*, and shall include toning wire and warning tape per City standard details.

187. Gravity Sewer Pipe Couplings. Couplings for new PVC sewer pipe connecting to other PVC or solid wall HDPE pipe shall be gasketed solid sleeve PVC slip couplings. Couplings for connection of PVC to other pipe types *(including concrete pipe)* shall be MaxAdaptor Coupling *(by Gripper Gasket LLC)* for sizes up to and including 16-inch diameter *(standard non-reinforced Fernco style rubber couplings are not allowed on mainline pipe joints or connections, or on sewer service laterals between the mainline and the back of the street frontage PUE, without specific prior written approval by the Public Works Director)*.

188. Sewer Service Lateral Connection to Existing Gravity Sewers. Unless otherwise approved in writing by Public Works and the City Engineer, connections to existing gravity sewer mainlines shall be with Insert-a-Tee fittings (Fatboy style) per City standard details. The coring machine and Insert-a-Tee drilling guide shall be anchored to the pipe in strict conformance with the manufacturer's recommendations. If lateral connections are larger than 2 pipes sizes smaller than the mainline pipe, cut-in tees will be required *(utilizing PVC slip couplings or MaxAdaptor Couplings as applicable)* unless otherwise approved in writing by the City Engineer and Public Works Director.

189. **Gravity Sewer Cleaning.** After manhole channeling and prior to 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.

190. **Gravity Sewer Pipe Leakage Testing (Air Test).** Sanitary sewer pipe and appurtenances shall be tested for leakage by low pressure air testing, after installation of all mainlines, laterals and cleanout risers for each manhole-to-manhole segment. Leakage tests shall include an air test of all sewer mains and laterals prior to paving. A separate air test shall be performed on any sewer mains and laterals where all utilities which cross sewer laterals were not complete prior to initial air testing *(following excavation and backfilling of any franchise utility trenches or other utility work that crosses sanitary sewer laterals)*. All testing shall conform to requirements as outlined on City testing forms contained in the PWDS. Unless otherwise approved in writing by the Public Works Director, Public Works staff shall be present for all sewer leakage testing.

191. **Gravity 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 after the trench backfilling and compaction is completed and tested. Unless otherwise approved in writing by the Public Works Director, Public Works staff shall be present for all sewer mandrel testing.

192. **Gravity Sewer TV Inspection.** Upon completion of all sewer construction, testing and repair *(including channeling of sanitary sewer manholes)*, 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 *(no deviation greater than 1/32-inch per inch of pipe diameter [1/2-inch max for pipes >16-inch*

diameter], AND no reverse sloping pipe), AND to verify pipelines are adequately cleaned. The TV inspection shall be conducted by an approved technical service, using a track or wheel propelled self-leveling auto-focus pan-head camera which is equipped to make audio-visual recordings of the TV inspections on a USB storage device. Unless otherwise approved in writing by the Public Works Director, 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 USB storage device and written report shall be delivered to the City Engineer.

193. Prior to or concurrent with connection of a building sewer 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.

194. Plug Abandoned Sewer Laterals Watertight at Mainline Connection. If existing sewer service laterals are abandoned or not used, the sewer service lateral shall be disconnected and sealed watertight at the mainline connection in a manner acceptable to Public Works Director *(if there is evidence of leakage at the existing mainline tee connection, the existing connection shall be sealed with a repair band or other approved method to seal the mainline tap watertight)*. All such abandoned and sealed sewer service lateral connections shall be inspected by Public Works prior to backfilling, and shall be TV inspected during the following winter to verify that the plug, cap or repair remains watertight. Any repairs necessary will be required to be completed at the expense of the Contractor. The remaining portion of the disconnected lateral pipe shall be either be removed entirely, or shall be capped or plugged watertight at both ends if it is abandoned in place.

195. Sewer service from upstream and affected properties shall be maintained during construction unless prior written City approval is granted. Bypass pumping or other methods used to maintain sewer flows shall be the Contractor's design, subject to approval by the City. The bypass system shall be capable of conveying flows when the sewers are flowing full. Normal unrestricted flows shall be restored at the end of each work day. Bypass systems left in place or operated outside normal working hours shall be monitored continuously by the Contractor personnel unless alternate arrangements proposed by the Contractor are acceptable to the City *(ie. high level & pump fail alarm callouts, etc.)*. The Contractor shall provide for City review all submittal information required to demonstrate *(to the satisfaction of the City)* compliance with these requirements. Contractor shall be responsible for all costs related to cleanup, damages and fines resulting from any sewerage spill or overflow associated with any methods used to convey sewage flows during construction.

196. Thrust restraint shall be provided on all pressure pipelines meeting the same standards and requirements as for water mainlines.

- **Storm Drain**

197. Storm drain pipe materials shall conform to the construction drawings and City requirements, based on cover depth. 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%).

198. Storm drainage laterals for single family residential properties shall be a minimum of 4-inches in diameter *(6-inch minimum for all multi-family, industrial, commercial or public type laterals)*, and shall include toning wire and warning tape per City standard details.

199. 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.

200. Unless otherwise approved by the City Engineer, all storm drain connections shall be by manufactured tee or wye fittings.

201. 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.

202. CB Grouting to be Smooth. All joints, penetrations & any exposed lifting holes shall be grouted smooth, so as not to retain debris. Base/sump shall be smooth to facilitate cleaning.

203. Unless otherwise specified or directed, install storm drain pipe in accordance with manufacturer's installation guidelines.

204. Gravity Storm Couplings. Couplings for connection of PVC to other pipe types *(including concrete or other non-compatible pipe)* shall be MaxAdaptor Coupling *(by Gripper Gasket LLC)* for sizes up to and including 16-inch diameter *(standard non-reinforced Fernco style rubber couplings are not allowed on mainline pipe joints or connections, or on sewer service laterals between the mainline and the back of the street frontage PUE, without specific prior written approval by the Public Works Director)*.

205. **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.

206. **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.

207. **Storm TV Inspection.** Upon completion of all storm drain construction, testing and repair *(including channeling of storm manholes)*, 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 *(no deviation greater than 1/32-inch per inch of pipe diameter [1/2-inch max for pipes >16-inch diameter], AND no reverse sloping pipe)* AND to verify pipelines are adequately cleaned. The TV inspection shall be conducted by an approved technical service which is equipped to make audio-visual recordings of the TV inspections on a USB storage device. *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 USB storage device and written report shall be delivered to the City.

- **Sewer & Storm Warranty Inspections**

208. Re-inspection of the gravity sanitary sewer systems by cleaning & TV inspection shall be performed during the last month of the warranty period, as well as visual inspection of all sanitary sewer manholes during the wet weather season *(any visible groundwater infiltration or leakage constitutes a failed manhole test, and will require warranty correction)*. 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 Public Works 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 warranty/maintenance bonds will not be released until after all warranty inspections are finished and any resulting corrective work is completed.

STREET LIGHTS

209. 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.

210. 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.

211. Street light poles shall be installed within one degree (±1°) of plumb.

212. All public street lights shall be energized and fully operational prior to requesting final inspection by the City.

FRANCHISE & PRIVATE UTILITIES

213. Contractor shall coordinate with gas, power, telephone, communication companies and/or applicable agencies as required for relocation of conduits, wires, pedestals, vaults, poles, etc., which are in conflict with new City utilities shown on the drawings, as well as arranging for

utility company inspectors to be present for critical crossings, work close to critical utilities, etc. as may be required utility company or agency standards.

214. 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.

215. Franchise utility plans shall be submitted to Public Works and the City Engineer 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 service lines/laterals shall be as close to perpendicular as feasible.

216. Where franchise utilities are installed along new public or private 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.

217. Developer and/or Contractor shall coordinate with gas, power, telephone, and cable TV company for installation/location of utilities and/or conduits in common trenches, as well as location of vaults, pedestals, etc., as required to serve all existing homes and new lots within the development. 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 for installation of franchise utilities as required to serve each lot within the development or along offsite improvements *(even though how or whether the homes will connect to such franchise utility service lines will be up to the homebuilder or homeowner)*.

218. 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)*.

219. Horizontal Separation. Installation of private utilities *(including either franchise utilities or private water, sewer or storm services)* in a common trench with public water, sanitary sewer or storm drain mainlines is prohibited. Any parallel utilities *(including private or franchise utilities or private water, sewer or storm services)* shall be installed with a minimum of 5 feet horizontal separation *(ie. clear separation)* from parallel public water, sanitary sewer or storm drains, except at crossings *(all crossings to be as close to perpendicular as possible)*.

220. 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.

221. All franchise utility structures *(vaults, pedestals, light poles, etc.)* shall be set a minimum of 1 foot from any property corner or survey monument.

STREET TREES, LANDSCAPING & IRRIGATION:

222. Street tree species and spacing shall be approved by the City prior to planting, based on City code provisions *(whether or not street trees are shown on the drawings)*.

223. Tree Wells Required. All street trees shall be provided with root barrier tree wells per City details.

224. Street trees and landscaping shall not conflict with sight distance standards.

225. Tree Separation from Power Infrastructure. Unless otherwise approved in writing by both the Public Works Director and the power company, trees shall not be planted or allowed to grow within 10 feet of a transformer, or within 20 feet of a street light *(new transformer or street light installations shall meet these same setbacks from existing trees)*. Tree separation from overhead power lines shall comply with requirements of the local power company.

226. All landscape plantings *(including street trees, bushes or anything other than low ground cover)* shall maintain a minimum of eight (8) feet clear from all fire hydrants (JMC 6.20.030). Maintenance of this clearance is an ongoing obligation of the property owner.

227. 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:

228. 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.

229. 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)

Contractor shall notify Public Works prior to all testing, to allow Public Works staff to be present. Non-witnessed testing may be required to be repeated with Public Works staff present, at the City's discretion.

		Notes
Streets, Fire Lanes, Common Driveways, Parking Lots, Building Pads, Fills, etc.		
Subgrade	1 Test/4000 S.F./Lift (4 min), locations acceptable to Public Works (typically alternate sides of road or access aisles)	See note 2 & note 3
Engineered Fills	1 Test/4000 S.F./Lift (4 min), locations acceptable to Public Works	See note 2 & note 5
Baserock	1 Test/4000 S.F./Lift (4 min), locations acceptable to Public Works (typically alternate sides of road or access aisles)	See note 2 & note 3
Asphalt	1 Test/6000 S.F./Lift (4 min), locations acceptable to PW (typ. alternate as above)	See note 2
Piped Utilities, All (including backfill in lifts & AC restoration at manholes, etc.)		
Trench Backfill	1 Test/200 Foot Trench/Lift (4 min)	See note 2
Trench AC Restoration	1 Test/300 Foot Trench (4 min)	See note 2
Locate testing of each tracer wire system installed prior to paving (water, sewer & storm drainage mains & services)		See note 7
Water		
Pressure Test	(to be witnessed by City representative)	See note 4
Bacterial Water Test	Per OHA-Drinking Water Services	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	Vacuum test each 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	

Concrete, Block, etc.	
Slump, Air & Cylinders for all structures, reinforced or structural 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

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.

Note 2: Testing must be performed by an approved independent testing laboratory/firm.

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 testing and proofroll to be as approved or directed by said authorized Representative of approving agency.

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.

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.

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.

Note 7: Tracer wire testing will be conducted by City staff, employing methods & locate equipment acceptable to the City. Contractor responsible to pretest all tracer wire and verify (in writing) successful pretest prior to scheduling City locate test.

Mar 19, 2024 - 11:30am
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EROSION CONTROL NOTES

The erosion control notes and details contained in these PWDS also apply to work under separate building permits issued without the need for a Public Works Construction Permit. City Code requires that erosion control measures be provided for work under such building permits, to minimize runoff, siltation and pollution both during and after construction.

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. Sediment fence may be used as the flagging for the clearing limits at the discretion of the Contractor.

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 ensure 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 as 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 or erosion control blanket is indicated on the drawings or required by Public Works)*, the erosion blanket/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 blanket/matting shall be SC150 Erosion Control Blanket by North American Green, or approved equal *(consisting of a full layer of 70% straw and 30% coconut fiber stitched with degradable thread between a heavyweight UV stabilized polypropylene top net and a lightweight photodegradable polypropylene bottom net)*.

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.

11. Soil or native fill stockpiles placed or left in place during wet weather periods shall be covered with UV resistant plastic or tarps anchored and weighted in place. Stockpile covering shall also include installation of sediment fences or other sediment barrier around the stockpile on all sides. Inactive stockpiles shall not be left uncovered for more than 7 days during dry weather periods.

Sediment Fences

12. 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.

13. 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. The support post ends of each sediment fence section shall be twisted together by at least 2 turns and both stakes installed into the ground together.

14. 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.

15. 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.

16. 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

17. 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 ensure 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.

18. 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.

19. The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public right-of-way.

20. 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.

21. 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.

22. 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/her designee.