

CITY OF PASCO



DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS FOR PUBLIC WORKS IMPROVEMENTS

Approved: _____ Date: _____
Daniel Ford, PE – City Engineer

June 2020

Adopted October 7, 2019 Ordinance Number 4457
Revised June 26, 2020

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CITY OF PASCO

DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS FOR PUBLIC WORKS IMPROVEMENTS

City of Pasco
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Pasco, WA 99301

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June 2020

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INDEX

CHAPTER 1 - GENERAL 1-1

1. ENACTING AUTHORITY 1-1

2. PURPOSE 1-1

3. STATE ENVIRONMENT POLICY ACT (SEPA) 1-1

4. CONFLICTING PROVISIONS 1-1

5. SEVERANCE 1-1

6. PROCESS 1-1

7. ENGINEERING DESIGN PLAN REQUIREMENTS 1-1

8. REVIEW AND INSPECTION FEE 1-2

9. RECORD DRAWINGS 1-2

10. TRANSFER OF OWNERSHIP 1-2

11. EASEMENTS 1-2

12. UTILITY OVERSIZING 1-3

CHAPTER 2 - DEVELOPMENT PROCEDURE 2-1

INTRODUCTION 2-1

OWNER RESPONSIBILITY 2-2

PLAN REVIEW 2-2

CONSTRUCTION 2-3

CONSTRUCTION COMPLETION 2-4

CHAPTER 3 - GENERAL PLAN REQUIREMENTS 3-1

GENERAL PLAN FORMAT 3-1

WATER SYSTEM PLAN REQUIREMENTS 3-2

SANITARY SEWER SYSTEM PLAN REQUIREMENTS 3-3

STORMWATER SYSTEM PLAN REQUIREMENTS 3-4

STREET PLAN REQUIREMENTS 3-5

CHAPTER 4 - GENERAL REQUIREMENTS FOR ALL PROJECTS 4-1

FORWARD 4-1

GENERAL 4-1

1-01 DEFINITIONS AND TERMS 4-2

1-04 SCOPE OF THE WORK 4-3

1-05 CONTROL OF WORK 4-4

1-06 CONTROL OF MATERIAL 4-10

1-08 PROSECUTION AND PROGRESS 4-16

1-10 TEMPORARY TRAFFIC CONTROL 4-17

7-08 GENERAL PIPE INSTALLATION REQUIREMENTS 4-18

8-01 EROSION CONTROL AND WATER POLLUTION CONTROL 4-20

CHAPTER 5 - WATER SYSTEM IMPROVEMENTS 5-1

GENERAL REQUIREMENTS FOR WATER SYSTEM IMPROVEMENTS 5-1

SPECIAL PROVISIONS FOR WATER SYSTEM IMPROVEMENTS 5-4

7-09 WATER MAINS 5-5

7-12 VALVES FOR WATER MAINS 5-9

7-14 HYDRANTS 5-11

7-15 SERVICE CONNECTIONS 5-12

8-03 IRRIGATION SYSTEMS 5-14

9-15 IRRIGATION SYSTEMS 5-15

CHAPTER 6 - SANITARY SEWER SYSTEM IMPROVEMENTS 6-1

GENERAL REQUIREMENTS FOR SANITARY SEWER SYSTEM IMPROVEMENTS 6-1

SPECIAL PROVISIONS FOR SANITARY SEWER SYSTEM IMPROVEMENTS 6-2

7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS 6-2

7-17 SANITARY SEWERS 6-4

7-18 SIDE SEWERS 6-6

7-25 SEWER FORCE MAINS (NEW SECTION)..... 6-7

CHAPTER 7 - STORMWATER IMPROVEMENTS 7-1

 GENERAL REQUIREMENTS FOR STORMWATER IMPROVEMENTS 7-1

 DESIGN CRITERIA 7-3

 DESIGN STORMS 7-3

 HYDROLOGIC ANALYSIS 7-4

 TREATMENT BMP SIZING 7-5

 FLOW CONTROL 7-5

 SPECIAL PROVISIONS FOR STORMWATER IMPROVEMENTS 7-6

 7-02 CULVERTS..... 7-6

 7-04 STORM SEWERS 7-6

 7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS 7-8

CHAPTER 8 - STREET IMPROVEMENTS 8-1

 GENERAL REQUIREMENTS FOR STREET IMPROVEMENTS 8-1

 STREET REQUIREMENTS 8-1

 ILLUMINATION REQUIREMENTS 8-3

 TRAFFIC STUDIES 8-4

 SPECIAL PROVISIONS FOR STREET IMPROVEMENTS 8-5

 2-01 CLEARING, GRUBBING, AND ROADSIDE CLEANUP 8-5

 2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS 8-6

 2-03 ROADWAY EXCAVATION AND EMBANKMENT 8-7

 2-07 WATERING 8-8

 2-11 TRIMMING AND CLEANUP 8-8

 4-04 BALLAST AND CRUSHED SURFACING 8-8

 5-04 HOT MIX ASPHALT 8-9

 6-02 CONCRETE STRUCTURES 8-18

 8-02 ROADSIDE RESTORATION 8-19

 8-04 CURBS, GUTTERS, AND SPILLWAYS 8-19

 8-06 CEMENT CONCRETE DRIVEWAY ENTRANCES 8-21

 8-13 MONUMENT CASES 8-21

 8-14 CEMENT CONCRETE SIDEWALKS 8-21

 8-20 ILLUMINATION, TRAFFIC SIGNAL SYSTEMS, AND ELECTRICAL 8-22

 8-21 PERMANENT SIGNING 8-24

 8-22 PAVEMENT MARKING 8-24

 9-03 AGGREGATES 8-24

APPENDIX A – STANDARD DETAILS INDEX

Deleted: CHAPTER 1 - GENERAL 1-1¶

1. ENACTING AUTHORITY 1-1¶

2. PURPOSE 1-1¶

3. STATE ENVIRONMENT POLICY ACT (SEPA) 1-1¶

4. CONFLICTING PROVISIONS 1-1¶

5. SEVERANCE 1-1¶

6. PROCESS 1-1¶

7. ENGINEERING DESIGN PLAN REQUIREMENTS 1-1¶

8. REVIEW AND INSPECTION FEE 1-2¶

9. RECORD DRAWINGS 1-2¶

10. TRANSFER OF OWNERSHIP 1-2¶

11. EASEMENTS 1-2¶

12. UTILITY OVERSIZING 1-3¶

CHAPTER 2 - DEVELOPMENT PROCEDURE 2-1¶

INTRODUCTION 2-1¶

OWNER RESPONSIBILITY 2-2¶

PLAN REVIEW 2-2¶

CONSTRUCTION 2-3¶

CONSTRUCTION COMPLETION 2-4¶

CHAPTER 3 - GENERAL PLAN REQUIREMENTS 3-1¶

GENERAL PLAN FORMAT 3-1¶

WATER SYSTEM PLAN REQUIREMENTS 3-2¶

SANITARY SEWER SYSTEM PLAN REQUIREMENTS 3-3¶

STORMWATER SYSTEM PLAN REQUIREMENTS 3-4¶

STREET PLAN REQUIREMENTS 3-5¶

CHAPTER 4 - GENERAL REQUIREMENTS FOR ALL PROJECTS 4-1¶

FORWARD 4-1¶

GENERAL 4-1¶

1-01 DEFINITIONS AND TERMS 4-2¶

1-04 SCOPE OF THE WORK 4-3¶

1-05 CONTROL OF WORK 4-4¶

1-06 CONTROL OF MATERIAL 4-10¶

1-08 PROSECUTION AND PROGRESS 4-16¶

1-10 TEMPORARY TRAFFIC CONTROL 4-17¶

7-08 GENERAL PIPE INSTALLATION REQUIREMENTS 4-18¶

8-01 EROSION CONTROL AND WATER POLLUTION CONTROL 4-20¶

CHAPTER 5 - WATER SYSTEM IMPROVEMENTS 5-1¶

GENERAL REQUIREMENTS FOR WATER SYSTEM IMPROVEMENTS 5-1¶

SPECIAL PROVISIONS FOR WATER SYSTEM IMPROVEMENTS 5-4¶

7-09 WATER MAINS 5-5¶

7-12 VALVES FOR WATER MAINS 5-9¶

7-14 HYDRANTS 5-11¶

7-15 SERVICE CONNECTIONS 5-12¶

8-03 IRRIGATION SYSTEMS 5-14¶

9-15 IRRIGATION SYSTEMS 5-15¶

CHAPTER 6 - SANITARY SEWER SYSTEM IMPROVEMENTS 6-1¶

GENERAL REQUIREMENTS FOR SANITARY SEWER SYSTEM IMPROVEMENTS 6-1¶

SPECIAL PROVISIONS FOR SANITARY SEWER SYSTEM IMPROVEMENTS 6-2¶

7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS 6-2¶

7-17 SANITARY SEWERS 6-4¶

7-18 SIDE SEWERS 6-6¶

7-25 SEWER FORCE MAINS (NEW SECTION) 6-7¶

CHAPTER 7 - STORMWATER IMPROVEMENTS 7-1¶

GENERAL REQUIREMENTS FOR STORMWATER IMPROVEMENTS 7-1¶

DESIGN CRITERIA 7-3¶

DESIGN STORMS 7-3¶

HYDROLOGIC ANALYSIS 7-4¶

TREATMENT BMP SIZING 7-5¶

FLOW CONTROL 7-5¶

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CHAPTER 1 - GENERAL

1. ENACTING AUTHORITY

These Design and Construction Standards are enacted by the City of Pasco, in accordance with state law, to protect and preserve the public health, safety, and general welfare, consistent with Pasco Municipal Code (PMC) 14.10.010.

2. PURPOSE

The purpose of these Design and Construction Standards is to provide consistent requirements, standards, and specifications for the design and construction of public works infrastructure improvements by the City and by private developers.

3. STATE ENVIRONMENT POLICY ACT (SEPA)

These Design and Construction Standards will not affect any considerations involving issues under the State Environmental Policy Act (SEPA). The City's responsible official will continue to make all necessary SEPA decisions when individual proposals are submitted.

4. CONFLICTING PROVISIONS

The standards, procedures, and requirements of these Design and Construction Standards are the minimum necessary to promote the health, safety, and welfare of the residents of the City of Pasco. The City may adopt more or less rigorous or different standards, procedures, and requirements whenever necessary. If the provisions of these Design and Construction Standards conflict with one another, or if a provision of these Design and Construction Standards conflicts with the provision of the existing City Code, or a previously enacted Ordinance of the City, the most restrictive provision or the provision imposing the highest standard shall control.

5. SEVERANCE

If any provision of these Design and Construction Standards or its application to any person or circumstance is for any reason held to be invalid, the remainder of these Design and Construction Standards or the application of the provisions is not affected.

6. PROCESS

Any project that includes the construction of public infrastructure or represents an impact to public infrastructure shall comply with the procedures listed in CHAPTER 2 and PMC. Public infrastructure includes all construction or impact to public streets, water, sanitary sewer, irrigation, storm drainage, illumination and any other facilities that will be owned, operated and maintained by the City. Additionally, all projects shall be reviewed by the City for regulating on-site stormwater runoff.

7. ENGINEERING DESIGN PLAN REQUIREMENTS

All plans, specifications, engineering calculations, diagrams, details, and other relevant data shall be designed and prepared by a Civil Engineer licensed by the State of Washington (Consultant), in accordance with CHAPTER 3.

8. REVIEW AND INSPECTION FEE

Application, plan review, and inspection fees are hereby established to defray the costs incurred by the City of Pasco, its agents, employees, and elected or appointed officials, for review and approval of the plans and specifications and for inspection of construction of the public works improvements. Fees as presented in the PMC and fee schedule as adopted by ordinance shall include, but not be limited to, application review, plan review, subsequent meetings with the Developer, explanations to the Developer's Consultant, reviews of revised plans, construction inspection, re-inspections, and a final inspection prior to acceptance of the project.

Fee payments shall be made in full by the Developer prior to the City releasing the approved original plans and specifications for construction, or the issuance of a Building Permit as described in CHAPTER 2.

9. RECORD DRAWINGS

The Developer's Consultant shall prepare and maintain a neatly marked, full-sized print set of record drawings showing the final location and layout of all new construction of the public facilities. Record drawings shall be supplied to the City of Pasco consistent with Section 1-05.3(1) Project Record Drawings as presented in CHAPTER 4 of these Construction Standards.

10. TRANSFER OF OWNERSHIP

The City Engineer or his designee shall make final inspection of all constructed public improvements at construction completion. Upon final inspection and approval of all work, the City Engineer shall provide written certification of completed public improvements including the method of construction, workmanship, materials, and quality control testing of the improvements. Public improvements shall be deemed accepted by the City one year from the date of certification and shall be conveyed to the City at that time. The Developer as the owner is responsible for operation, maintenance, and repairs of the public improvements within the one-year period.

11. EASEMENTS

Public utility easements shall be established for the location of new and future public improvements serving new land divisions and land developments. Easements shall also be granted across the front of new lots and existing lots to provide future utility access as required.

All easements required shall be prepared by the Developer on the proper form and format for recording at the Franklin County Auditor's Office. The easement legal description shall be prepared by a land surveyor licensed in the State of Washington. The easement document shall be submitted to the Planning Division for review prior to plan approval. Once approved by the City Engineer, the Developer shall record the executed and notarized easement, and provide proof of recording to the Planning Division prior to project acceptance.

Easements for new and/or future utility lines shall be a minimum of twenty (20) feet wide, with the exception of potable water and irrigation which shall be a minimum of fifteen (15) feet wide, provided the width of easements for buried utilities will be at least twice the depth of the planned excavation. Where utilities share or lie within a single easement, Department of Health separation requirements shall apply as appropriate, and the easement width shall extend eight (8) feet beyond the center of pipe, parallel to the utility.

Utility easements shall be continuous and aligned from block to block within a subdivision and with easements in adjoining subdivisions to facilitate the extension and future extension of public utilities.

12. UTILITY OVERSIZING

In all cases, the City Engineer shall have final determination of the size and depth of water, sewer, and irrigation mains connected to the City utility system. The determination shall be consistent with the City's comprehensive plan and/or the long-range objectives for the associated utility.

For example, if a property owner/developer is required to install a water main with a diameter in excess of the size necessary to serve their development, and greater than the 8" minimum pipe size required for all utilities, and if the purpose of such oversizing is to provide for the future needs of the City, the City may, based upon the conditions established within this policy, reimburse the property owner/developer for the difference in material and/or labor costs incurred solely by reason of the oversizing requirement. No such reimbursement shall be made except upon the following:

- Complete installation of the utility main and approval of the same by the City Engineer;
- Submittal to the City of a bill of sale, warranty, bonding, and proof of insurance for the utility main in accordance with PMC 12.24.110;
- Certification of the oversizing costs, with such verification from the material supplier and contractor as the City Engineer may require;
- Approval of the oversizing costs by the City Engineer; and
- Approval of the reimbursement by the City Engineer.

As an alternative to cash reimbursement, the City Engineer may choose to provide a credit, in the amount of the reimbursement that may otherwise be available, against the corresponding development charges imposed under PMC 3.35 and 12.24. For example, if a water main is oversized, a credit may be granted against the water development charge imposed under PMC 13.45, but not the sewer development charge. Said reimbursement or credit shall not be more than 100% of any and all development charges.

The cost of labor and materials for said oversizing may be reimbursed to the owner/developer by the City. Materials include pipe, imported trench backfill, and asphalt pavement beyond trench/surfacing limits required for the development. The labor cost to install the utility oversizing may be considered when the pipe diameter oversize is greater than 250% different in size than an 8-inch diameter or the pipe diameter required for the development, whichever is greater. For example, if an 8" main is required for the development, then a pipe that is more than 20" in diameter, such as a 24" diameter main, would receive consideration of labor within the calculation for upsize credit as determined by the City Engineer. Said reimbursement or credit shall not be more than 100% of any and all development charges.

An oversizing agreement must be executed by the City Manager and Developer prior to plan approval. A summary of all eligible reimbursable costs and backup itemization must be submitted to the City Engineer, for review and acceptance, within 45 days of substantial completion of the project or phase. Following review of submission, a determination of the total reimbursement amount will be calculated by the City Engineer and provided to the Developer within 45 days of submission receipt. Upon concurrence of the calculated amount by the Developer, the City will provide reimbursement payment within 30 days.

CHAPTER 2 - DEVELOPMENT PROCEDURE

INTRODUCTION

Any project that includes the construction of public infrastructure or represents an impact to public infrastructure shall comply with the following procedures. Public infrastructure includes all construction or impact to public streets, water, sanitary sewer, irrigation, storm drainage, illumination and any other facilities that will be owned, operated, and maintained by the City.

Unless otherwise specifically stated, the term "public improvement" or "public infrastructure" shall mean any improvement constructed within public right-of-way, or one that will be transferred to the City following construction, including, but not limited to, sanitary sewer, storm drainage, water, irrigation, roadway, sidewalk, traffic signals, and street lights. The term "City" shall mean the City Engineer, or his designated representatives; "Developer" shall mean the actual Owner/Developer of the proposed development that includes public improvements or his designated Agent; and, "Consultant" shall mean an individual or firm, licensed to practice Civil Engineering in the State of Washington, who shall have been retained by the Owner/Developer for the purpose of preparing the detailed plans and specifications and doing such other engineering work as shall be specifically identified within the context of these procedures and as approved by the City Engineer.

Improvements for which these procedures shall typically apply include water, sewer, storm, and street impacts. Examples include:

Water: Public water mains, water systems, irrigation mains, irrigation systems and their appurtenances. The required procedures for private, on-site water systems from the City meter to the building, and for private, on-site irrigation systems are addressed through the Building Division.

Sanitary Sewer: Public sanitary sewer interceptors, trunks, collectors and their appurtenances including portions of the building sewers located within the public right-of-way or public easement. The required procedures for private sanitary sewer service laterals and appurtenances located outside of the public rights-of-way or public easements are addressed through the Building Division.

Stormwater: Public stormwater and drain systems and their appurtenances located within the public right-of-way or public easements, and infrastructure for private, on-site stormwater systems, located outside the public right-of-way. On-site stormwater system designs will be reviewed by the City to ensure systems meet the required stormwater regulations.

Street: All public street or roadway facilities and their appurtenances including traffic signals, street lighting, driveways, sidewalks, curb ramps, curb, gutter, bicycle and pedestrian facilities, and parking areas. The required procedures for private on-site sidewalks, private parking and loading facilities, private driveways, and other improvements are addressed through the Building Division.

Minor improvements, such as residential driveway approaches or isolated sidewalk sections, may be exempt from these requirements at the discretion of the City Engineer.

OWNER RESPONSIBILITY

The Owner/Developer shall, if other than himself, name and identify the person who shall be designated to act on his behalf on matters relating to the project. The Consultant may, at the Owner/Developer's discretion and direction, be the Agent. The identified person shall be the single point of contact for the duration of the project.

The Owner/Developer shall retain the services of a Consultant, having the appropriate City of Pasco business license and licensed to practice Civil Engineering in the State of Washington, who is qualified to perform the required engineering services to design and construction stake/survey, as required, of the proposed public improvements. If the project includes installation of domestic water infrastructure, the Consultant shall comply with the requirements of WAC 246-290-125.

If, at any time during the project, the Owner/Developer terminates or reduces the level of the services of the Consultant or the designated Agent as specifically identified and accepted by the City, the Owner/Developer and Consultant/Agent shall immediately notify the City.

The Owner/Developer has the overall responsibility for project management, construction management, contract administration, permit acquisition, compliance, testing, and, if required, right-of-way acquisition. No construction work shall commence prior to a Pre-Construction Conference and plan approval by the City Engineer.

PLAN REVIEW

The Consultant shall prepare, seal, and submit to the City Planning Division four complete sets of detailed construction plans, profiles, cross sections, support data, design calculations, project details, and project specifications as applicable, consistent with PMC 21.35.010. Additionally, a stormwater report shall be prepared, sealed, and submitted to accompany the construction plans. All such plans and specifications shall be in accordance with the requirements of the most current edition of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction, the Manual on Uniform Traffic Control Devices, the Department of Health Water System Design Manual, the Department of Ecology Criteria for Sewage Works Design, the Stormwater Management Manual for Eastern Washington, City of Pasco Standards, and all design of domestic water shall be compliant with WAC 246-290-200, 220, and 230.

Plans shall be prepared in accordance with CHAPTER 3. The City shall review the submitted plans and specifications within 30 business days and shall return one reviewed and noted copy indicating the changes, additions, deletions, or modifications that are required to make the plans and specifications acceptable. When the revised plans, specifications, and other materials are resubmitted to the City, the City shall review and upon acceptance, approve the revised plans and specifications notifying the Consultant of approval and the remainder of the review and inspection fees to be paid. Review of the revised plans and specifications will be on a first-come, first-served basis, and a response will be provided to the applicant within 15 business days. The response will include additional comments or approval notification.

It is the Developer's responsibility to obtain signatures and dates from all outside utilities within the City of Pasco indicating that they have reviewed and approved the plans, as required by CHAPTER 3 of these Construction Standards. The approval from outside utilities must be received prior to final plan acceptance and plan approval consideration by the City. If significant changes are required to the plans following the City's review, after initially receiving outside utility

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approval, the owner may be required to reobtain the signature and date of possible impacted utilities as designated by the City.

Upon acceptance, the City Engineer, or their designee, will approve and sign the plans. Such approved plans and specifications shall not be changed, modified, or altered without written authorization from the City Engineer. The Developer shall provide the City with a minimum of five (5) copies of the approved plan set and specifications for use by City Inspectors and City Departments as required.

CONSTRUCTION

Following selection of a Contractor and prior to construction, the Developer is responsible for scheduling a pre-construction conference with the City's Construction Supervisor. Other jurisdictions, the Developer's Engineer, Developer's contractor, utility companies, subcontractors and other necessary parties to the project shall be present at the preconstruction conference.

The City shall host the Pre-Construction Conference within two weeks of the scheduling request by the applicant. The Developer's contractor will submit his insurance and construction schedule at this conference. Construction may proceed, per the approved schedule, following the completion of the Pre-Construction Conference, provided all of the necessary documentation has been submitted and approved.

It is the responsibility of the Owner/Developer to ensure that construction is in conformance with the approved plans and specifications. The Owner/Developer is ultimately responsible for the work that is done. The City shall be notified not less than three working days before construction is to start.

The City of Pasco will assign a construction inspector to the project at the owner/developer's expense, the cost of which covered by the plan review/inspection fees. In addition to routine observation, the City inspector will inspect specific elements and milestones during the work. All tests, inspections, or reviews to be completed by the City shall be scheduled a minimum of two working days in advance. The City's inspection will not relieve the Owner/Developer's liability of all work being performed in conformance with the approved plans, specifications, and permits.

The Owner/Developer shall independently hire and cover all costs associated with quality assurance sampling and materials testing by a certified testing company and provide documentation of the results of the sampling and testing to the City. The requirements for sampling and testing are contained in the current edition of the WSDOT Standard Specifications for Road, Bridge and Municipal Construction, and these City of Pasco Construction Standards.

The Owner/Developer, or his assigned Agent, shall administer, manage, and supervise the construction and will be readily available to approve design changes, when necessary. The Contractor shall have a representative with authority on site whenever work is being performed. Any problems that are encountered or changes required due to construction conditions will be reviewed with the Consultant and the owner/developer. Changes that require any increase or decrease to the contractor's cost will be the responsibility of the owner/developer and may result in increased City review and inspection fees.

All construction shall meet the requirements of the most current edition of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction, the Manual on Uniform Traffic Control Devices, the Department of Health Water System Design Manual, the Department of Ecology Criteria for Sewage Works Design, the Stormwater Management Manual for Eastern

Washington, City of Pasco Standards, the approved plans, the approved Project Specifications and other applicable regulations. Special Provisions (if any) shall be prepared and submitted to the City for acceptance. All changes, alterations, or revisions to the approved plans or specifications shall be submitted for acceptance by the City Engineer.

Copies of all test records shall be furnished to the City Engineer on a weekly basis, or as deemed necessary by the City Engineer. The City Engineer, or their designee, will visit the project site to review the work related to the required inspection. Such site visits do not relieve the applicant, or the contractor of any responsibilities for performing all work in accordance with the approved plans and this chapter. The City Engineer, or their designee, may also visit the project site from time to time to monitor the overall progress of the project.

Failure to comply with testing requirements may necessitate appropriate or additional testing and certification as directed by the City Engineer. Costs of such testing and certification shall be borne by the contractor and/or applicant. At the time that such action is directed by the City Engineer, no further work will be permitted on the road or subdivision until all tests have been completed and all corrections have been made to the satisfaction of the City Engineer.

The City shall have the authority to cause a suspension of construction when, in the City's opinion, such work is not being done in conformance with the approved plans, specifications, regulations or permit. Any resultant delays, impacts, or added expenses shall not be the City's responsibility.

Upon written notice that the public improvements have been substantially completed, the City will, in the company of the Owner/Developer or his Agent, make a final inspection of the construction. The Owner/Developer shall see that all necessary additions, corrections, repairs, and/or modifications are made.

CONSTRUCTION COMPLETION

At the conclusion of construction and when all corrections and repairs have been made, the Owner/Developer shall submit record drawings together with a Certificate of Work Completion, which shall include, but not be limited to, testing records, material certifications and warranties, and a request for City Engineer certification of completed public improvements.

No building or service connection to sanitary sewers, storm drains, or water lines will be permitted until these systems have received certification by the City Engineer, or unless otherwise approved by the City for connections (including the payment of connection charges).

The completion of all public improvements, including submittal of "As-Built Drawings" shall be required prior to the issuance of a building permit, however, in certain situations, a building permit may be granted prior to the completion of the public improvements provided the Owner/Developer submits a bond for the public improvements, as required by PMC 21.30.050. All public improvements including "As-Built Drawings" must be completed prior to receiving a Certificate of Occupancy.

When all public improvements have been completed in an acceptable manner, and following receipt of a Certificate of Work Completion package, the City Engineer shall provide certification of completed public improvements. Certification by the City shall not relieve the Owner/Developer's, or the Contractor's liability of all work being performed in conformance with the approved plans, specifications and permit. Public improvements shall be deemed accepted by the City within the timeframes set forth within the PMC.

CHAPTER 3 - GENERAL PLAN REQUIREMENTS

All plans, details, specifications, engineering calculations, diagrams, and other relevant data shall be designed and prepared by a Civil Engineer currently licensed by the State of Washington.

GENERAL PLAN FORMAT

1. Plan sheets and profile sheets or combined plan and profile sheets and detail sheets shall be on a sheet size of 22" x 34" (ANSI D).
2. The Cover sheet shall contain the following:
 - a. Title of the project;
 - b. Name, address, and phone number of the owner/developer;
 - c. Name, address, and phone number and stamp of the Civil Engineer preparing the plans (Consultant);
 - d. A minimum clear area of 2.5" ~~Hx3.5"L~~ for final acceptance stamp for City final approval of the plans;
 - e. ~~Signature block for outside utilities listed below with the statement "By signing, the indicated utility is acknowledging receipt of plans and notification of the project, including public improvements." The developer is responsible to coordinate with each utility, and their established system requirements and review/approval processes separate from the City plan submission requirements.~~
 - i. Franklin County Irrigation District
 1. John Burns, (509) 727-0168, jburn@pocketinet.com
 - ii. Franklin County PUD
 1. Duane Sams, (509) 546-5969, dsams@franklinpud.com
 - iii. Cascade Natural Gas
 1. Arnie Garza, (509) 736-5563, arnie.garza@cngc.com
 - iv. South Columbia Irrigation District
 1. Eric Dixon, (509) 547-1735, edixon@scbid.org
 - v. Bonneville Power Administration
 1. Deborah Rodgers, (509) 544-4749, dxrodgers@bpa.gov
 - vi. Charter Communications
 1. Dan Catron, (509) 728-2865, dan.catron@charter.com
 - vii. CenturyLink
 1. Tobias Mears, (509) 542-0351, tobias.mears@centurylink.com
 - viii. Big Bend Electric
 1. Mark Hay, (509) 659-1700, mhay@bbec.org

Please note, the approval from outside utilities must be received prior to final plan acceptance and plan approval consideration by the City. Contacts are subject to change. The Developer shall be responsible for providing current contact information.

- f. Vicinity map showing the project site location;
- g. Survey benchmark used for the project;
- h. An overall site plan with contours;
- i. Sheet Index;
- j. Legend;
- k. Applicable project information; and
- l. The utility locate call # ~~811~~.

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3. Each sheet shall contain the following:
 - a. Project title and City project number, work order number, or LID number, if appropriate;
 - b. Quarter section, Section - Township – Range;
 - c. Sheet title;
 - d. Page (of page) numbering;
 - e. Revision block;
 - f. Subdivision or short plat name;
 - g. Signed stamp by a Civil Engineer currently licensed by the State of Washington; and
 - h. A minimum clear area of 2.5" ~~H~~3"x 5" ~~L~~ for final acceptance stamp for City final approval of the plans.
4. All plan sheets must have a NORTH arrow preferably pointing to the top of the sheet or to the left and must indicate the drawing scale. All engineering plans must be drawn to an appropriate engineer's scale. For profiles, the vertical scale shall be 1"=2', 1"=5' or 1"=10'. The horizontal scale shall be the same for both plan and profile and shall normally be 1" = 20'. Plan and profile stationing shall generally read left to right.
5. Match lines are required at breaks between sheets.
6. The Horizontal Datum for all plan submittals must be based on the City of Pasco datum, NAD 83 (2011). The Vertical Datum for all plan submittals must be based on the City of Pasco datum, NAVD 88. The benchmark used shall be referenced on the plans. An assumed datum will not be accepted.
7. Existing features and topography within the project construction limits must be shown on the plans. This shall include existing road width and surfacing, utility poles, existing underground utilities and surface appurtenances, significant trees, landscaping, and other elements that may affect design/construction.
8. All existing and proposed underground utilities and pipes shall be shown in the profile. The location and depth of existing facilities should be verified if there is a potential conflict with proposed facilities.
9. All street, water, sewer and storm drainage work shall be drawn on standard plan and profile sheets. Street, water, sewer, storm drainage, irrigation, and electrical design information shall all be shown on the same plan and profile sheets.
10. Plan sheets shall indicate all existing and proposed property lines, right-of-way lines, and easements.
11. Plan sheets shall show all horizontal survey control as required to properly locate and tie the improvements in horizontal location.
12. An erosion/sedimentation control plan sheet shall be included in the plan set.

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WATER SYSTEM PLAN REQUIREMENTS

See CHAPTER 5 for specific design requirements.

1. Show all existing and proposed water system features if known, including but not limited to:
 - a. Water mains;
 - b. Water valves;
 - c. Water meters;
 - d. Water service lines;
 - e. Fire hydrants;
 - f. Blow offs;
 - g. Air and vacuum release valve assemblies;
 - h. Pressure reducing valves;
 - i. Fire sprinkler system lines;
 - j. Double check valves;
 - k. Post indicator valves; and
 - l. Thrust blocking/mechanical restraints.
2. Indicate all easements required for the water main extensions and future extensions.
3. Show the water system, irrigation system, and the sanitary sewer system on the same plan and profile view for verification of minimum separation requirements. The design information for each system may be on individual drawings for that system.
4. Show the length, size, and pipe type for all main extensions, fire sprinkler system services, and domestic services where applicable.
5. Identify all joint connections; provide detail of all non-standard joints.
6. Show by station or dimension the location of all fire hydrants, tees, crosses, and services relative to centerline or property lines.
7. A profile view shall be shown for all City water main extensions, aligned if practical with the plan view. Clearly indicate the horizontal and vertical scales.
8. Show the minimum cover and minimum separation on each sheet.
9. In the profile view, show all utilities crossing the proposed water main.

SANITARY SEWER SYSTEM PLAN REQUIREMENTS

See CHAPTER 6 for specific design requirements.

1. Show all existing and proposed sanitary sewer system features including, but not limited to, the following:
 - a. Sewer mains, gravity and force mains;
 - b. Side service, proposed locations;
 - c. Manholes;
 - d. Clean outs; and
 - e. Lift stations.
2. Indicate all easements required for the sanitary sewer main extensions and laterals.

3. Provide an overall site plan of development with contours, to show that all lots/parcels will be served by the proposed sewer system at design depth for all new development.
4. Show the sanitary sewer system and water system on the same plan and profile for verification of minimum separation requirements. The design information for each may be on individual drawings for that system.
5. Slope, length, size, and pipe type shall be indicated for all lines and side sewers. Pipe length shall be measured from centerline of manholes.
6. Provide a profile for each sanitary sewer main extension. Clearly indicate the vertical and horizontal scale. Show the profile on the same sheet with, and aligned underneath, the plan view as practical.
7. The plan and profile must show the location of all existing and proposed gas, water, irrigation, storm drain, and other utility lines and crossings.
8. Show all vertical data in the profile view and all horizontal data in the plan view. It is not desirable to repeat the vertical data in the plan view unless it does not show in a profile.
9. Each manhole shall be uniquely numbered and shall be stationed off of a referenced centerline. Indicate rim and invert elevations in and out at all manholes.
10. Indicate the length of each side sewer stub, the centerline stationing for each side sewer, and the size.

STORMWATER SYSTEM PLAN REQUIREMENTS

See CHAPTER 7 for specific design requirements.

1. Show all existing features if known and all proposed storm sewer (drain) system features, including but not limited to:
 - a. Storm drain mains and lines;
 - b. Catch basins;
 - c. Inlets;
 - d. Drywells;
 - e. Infiltration trenches;
 - f. Retention systems;
 - g. Biofiltration swales;
 - h. Culverts;
 - i. Streams;
 - j. Ditches;
 - k. Natural drainage swales;
 - l. Headwalls;
 - m. Oil/water separator assembly; and
 - n. Other requirements of the Department of Ecology's Stormwater Management Manual for Eastern Washington.
2. Indicate all easements required for the storm drainage system.

3. The plans shall clearly indicate the location of the storm drainage items stationed from a referenced centerline.
4. Show all horizontal measurements and control in the plan view.
5. Show slope, length, size, and pipe material for all storm drain mains and lines.
6. All catch basins and inlets shall be uniquely numbered and shall be clearly labeled. Stationing and offsets shall be indicated from referenced centerline. Show all proposed storm drain features within the right of way in a profile.
7. Indicate all grate, rim, and invert elevations in the profile view.
8. Provide a stormwater report consistent with Chapter 3 of the Stormwater Management Manual for Eastern Washington, with an emphasis on runoff and drainage facilities sizing calculations as described in CHAPTER 7. Additionally, the stormwater report shall include a maintenance plan for all drainage facilities, both public and private.

STREET PLAN REQUIREMENTS

See CHAPTER 8 for specific design requirements.

1. Show all existing and proposed roadway improvements, including but not limited to:
 - a. Contours
 - b. Pavement and edge of pavement;
 - c. Concrete curb and gutter;
 - d. Sidewalk(s);
 - e. Utilities (manholes, utility poles, pedestals, valves, water meters, etc.);
 - f. Sidewalk ramps;
 - g. Signs and Barricades;
 - h. Channelization and pavement markings
 - i. Driveways;
 - j. Rockery or retaining walls;
 - k. Mailboxes;
 - l. Monuments;
 - m. Streetlights, conduits, junction boxes, and service cabinet;
 - n. Compliance with ADA requirements including design elevations at all pedestrian ramps; and
 - o. Traffic control plans.
2. Show all Right of Way (R/W) lines, centerlines, and roadway widths for all rights of way.
3. Clearly differentiate between areas of existing pavement, areas of new pavement, and areas to be overlaid.
4. Provide a cross section or typical section of all rights of way indicating right of way width, centerline, pavement width, super-elevation or crown, sidewalk, street lights, curb and gutter, pavement, and base thickness of proposed section.
5. Provide a Plan and Profile of all new public roadways or extensions of existing roadways. Provide topography within the R/W including utilities. Indicate all horizontal and vertical

curve data, percent of grade, bearings, centerline stationing every 50 feet, finish grade elevations, and existing ground line. The profile of the existing centerline ground should extend a minimum of 100 feet before the beginning and at the end of the proposed improvements to show the gradient blend.

6. Align the profile view with the plan view, if practical. Clearly indicate the horizontal and the vertical scale.
7. Clearly label all profiles with respective street names and plan sheet reference numbers if drawn on separate sheets.
8. Provide survey monuments along the road centerline at all ends of curves, intersection points, angle points, and center of cul-de-sacs.
9. For developments where road work is required on an existing street, development plans are required to include cross section of the existing street and spot elevations at proposed intersections and appurtenances to the project.

CHAPTER 4 - GENERAL REQUIREMENTS FOR ALL PROJECTS

FORWARD

The City of Pasco has adopted the latest edition of the *Standard Specifications for Road, Bridge, and Municipal Construction* (Standard Specifications) prepared by the Washington State Department of Transportation (WSDOT), and the American Public Works Association (APWA) General Special Provisions (GSP's) for Division One General Requirements as the standard specifications governing all design and construction of public works improvements by the City and by private developers.

All references hereinafter made to the "Standard Specifications" shall refer to the latest edition of the Standard Specifications described above. Except as may be amended, modified, or supplemented hereinafter, each section of the Standard Specifications shall be considered as much a part of these requirements as if they were actually set forth herein.

The Standard Specifications, General and Project Special Provisions, and City Standard Details contained in these Design and Construction Standards shall apply in their entirety to all City of Pasco public works projects. These Design and Construction Standards have been prepared to form a compiled document intended to assist and inform developers, consultants, and contractors of the construction requirements to be used on proposed public works improvements.

The Standard Specifications, General and Project Special Provisions, and City Standard Details shall periodically be amended, revised, and updated. It shall be the responsibility of each user of this information to verify that he has the latest revisions prior to submitting any work covered by these specifications and details.

Copies of the Standard Specifications are available for review and inspection at the City of Pasco Engineering Division or electronically at:

<http://www.wsdot.wa.gov/Publications/Manuals/M41-10.htm>.

Copies of the Standard Specifications may be purchased from:

Washington State Department of Transportation (WSDOT)
Engineering Publications
Post Office Box 47408
Olympia, WA. 98504-7408

Copies of the APWA GSP's are available electronically at:

http://www.wsdot.wa.gov/Partners/APWA/Division_1_Page.htm.

Developers and contractors are encouraged to obtain a copy of these standards. Electronic copies of the City of Pasco Design and Construction Standards and Specifications for Public Works Improvements are available at:

<http://pasco-wa.gov/index.aspx?NID=409>.

GENERAL

All work shall be completed in accordance with the approved Plans, the latest edition of the *Standard Specifications for Road, Bridge, and Municipal Construction* prepared by the Washington State Department of Transportation, amendments to the Standard Specifications, referenced codes and organizations, and these Special Provisions.

Pasco Design and Construction Standards Chapter 4 - General Requirements for All Projects

The American Public Works Association (APWA) General Special Provisions (G.S.P.'s) to Division One of the WSDOT Standard Specifications shall amend Division One of the *Standard Specifications for Road, Bridge, and Municipal Construction*.

All materials incorporated into a proposed public works improvements project shall meet the requirements of Division 9 of the Standard Specifications or City of Pasco Design and Construction Standards as shown in the Standard Details and Special Provisions.

1-01 DEFINITIONS AND TERMS

1-01.3 Definitions

The terms defined in Section 1-01.3 of the Standard Specifications shall be further described by the following:

- Consultant: Means an engineer licensed in the State of Washington, employed by the Developer to design the improvement and prepare plans and specifications, perform construction staking, or similar services.
- Construction Documents: Means the project plans, specifications, and special provisions prepared by the Developer's Consultant for the public works improvements contemplated and approved by the City.
- City: Means the City of Pasco, a municipal corporation, as represented by its authorized officials, employees or agents. The term "Contracting Agency" and "City" are synonymous.
- Contractor: Means the person or firm employed by the Developer or under Contract with the City to do the construction of the public works improvements.
- Developer: Means the person or firm constructing the new development and engaging the services of and employing consultants, and/or contractors and paying for the design and construction of the public works improvements to be transferred to the City.
- Drawings: Means the construction plans prepared by the Developer's Consultant for the public works improvements contemplated. The terms "Construction Documents," "Contract Documents," "Plans," "Engineer's Plans," "Engineer's Drawings," "Working Drawings," and "Project Manual" are synonymous.
- City Engineer: Means the appointed City Engineer for the City of Pasco or his/her duly authorized agent or representative.
- Owner: Means the City of Pasco acting through its legally established officials, boards, commissions, etc., as represented by its authorized officers, employees, or agents.
- Public Works Director: Means the appointed official for the City, responsible for managing the Department of Public Works.

Pasco Design and Construction Standards Chapter 4 - General Requirements for All Projects

Standard Plans and Details: Means specific drawings adopted by the City of Pasco and revised from time to time which show frequently recurring components of work which have been standardized for use.

Standard Specifications: The latest edition of *Standard Specifications for Road, Bridge, and Municipal Construction* prepared by the Washington State Department of Transportation, and amendments, and the APWA GSP's for Division One that are, by this reference, made part of the Contract Documents. Except as may be amended, modified, or supplemented hereinafter, each section of the Standard Specifications shall be considered as much a part of these Construction Documents as if they were actually set forth herein.

Special Provisions: The Special Provisions supplement or modify the Standard Specifications and supersede any conflicting provisions of the *Standard Specifications for Road, Bridge, and Municipal Construction* and the appended amendments to the Standard Specifications and are made a part of a Construction Document.

Should any conflicts be encountered, the following inter-relationships shall govern: The Special Provisions shall supersede the APWA GSP's, which shall supersede the WSDOT Amendments, which shall supersede the Standard Specifications.

Supplement this section with the following:

All references in the Standard Specifications, Amendments, or WSDOT General Special Provisions, to the terms "Department of Transportation", "Washington State Transportation Commission", "Commission", "Secretary of Transportation", "Secretary", "Headquarters", and "State Treasurer" shall be revised to read "Contracting Agency".

All references to the terms "State" or "state" shall be revised to read "Contracting Agency" unless the reference is to an administrative agency of the State of Washington, a State statute or regulation, or the context reasonably indicates otherwise.

All references to "State Materials Laboratory" shall be revised to read "Contracting Agency designated location".

All references to "certification of completed public improvements" shall be interpreted to mean the Contracting Agency form(s) by which final completion is granted. Public improvements shall be deemed accepted by the City one year from the date of certification.

1-04 SCOPE OF THE WORK

1-04.4 Changes

Supplement this section with the following:

No changes in the work covered by the approved Construction Documents shall be made without having prior written approval of the Developer and the City.

1-04.11 Final Cleanup

Delete this section and replace it with the following:

The Contractor shall perform final cleanup as provided in this section to the Developer's and City's satisfaction. The date of acceptance will not be established until this is done. The material sites and all ground the Contractor occupied to do the work shall be left neat and presentable. The Contractor shall:

1. Remove all rubbish, surplus materials, discarded materials, falsework, temporary structures, equipment, and debris, and
2. Deposit in embankments, or remove from the project, all unneeded, oversized rock left from grading, surfacing, or paving.

Partial cleanup shall be done by the Contractor when he feels it is necessary or when, in the opinion of the City or Developer, partial clean-up should be done prior to either major cleanup or final inspection.

1-04.12 Waste Site (New Section)

The following new section shall be added to the Standard Specifications:

Where there is additional waste excavation in excess of that needed for the project and in excess of that needed for compliance with requests of the Developer or City, the Contractor shall secure and operate his own waste site at his own expense. The Contractor shall also be required to secure and operate his own waste site at his own expense for the disposal of all unsuitable material, asphalt, concrete, debris, waste material, and any other objectionable material which is directed to waste.

The Contractor shall comply with the State of Washington's regulations regarding disposal of waste material as outlined in WAC 173-304, Subchapter 461.

1-05 CONTROL OF WORK

1-05.1 Authority of the Engineer

Supplement this section with the following:

Unless otherwise expressly provided in the approved Construction Drawings, Specifications and Addenda, the means and methods of construction shall be such as the Contractor may choose; subject, however, to the Consultant and the City's right to reject the means and methods proposed by the Contractor which (1) will constitute or create a hazard to the work, or to persons or property; or (2) will not produce finished work in accordance with the terms of the approved Construction Documents. Approval of the Contractor's means and methods of construction or his failure to exercise his right to reject such means or methods shall not relieve the Contractor of the obligation to accomplish the result intended by the Construction Documents; nor shall the exercise of such right to reject create a cause for action for damages.

1-05.3(1) Project Record Drawings (New Section)

The following new section shall be added to the Standard Specifications:

In consideration of the following Pasco Municipal Code section;

21.30.050 Approval Requirements. Prior to approval of a final plat, all required infrastructure improvements including as-built drawings and data of all underground utilities necessary to serve said plat must be constructed and accepted by the City Engineer. In lieu of actually completing all improvements, the developer may provide the City with a bond, cash or irrevocable letter of credit in an amount equal to 125 percent of the City Engineer's estimate of the cost to complete the required infrastructure improvements. No certificate of occupancy will be issued for any structure in a subdivision until all infrastructure improvements are completed. [Ord. 3398 § 2, 1999; Code 1970 § 26.28.050.]

This portion of PMC shall apply to all privately developed parcels, including commercial, within the City of Pasco and the expected as-built documentation will follow the procedures and requirements contained herein for final acceptance of work. Drawings shall be kept current weekly, with all field instruction, change orders, and construction adjustment. Drawings shall be subject to the inspection of the Developer and the City at all times.

In conjunction with the Public Works Engineering Plan Review Process, post construction record drawings are required for all Private Development projects. The intent of this document is to guide the designing Engineer, the Developer and their Consultants in providing the City with acceptable record drawings and survey information.

When the improvements are complete and intended for acceptance by the City, including landscaping, the developer shall prepare "as-built" record drawings for the City using the current set of approved construction drawings, including all revisions and contractor's field mark-ups. The record drawings shall incorporate all changes made by both the Engineer and in the field during the construction process. Changes to be noted shall include changes in material, size, grade and location of utilities.

Bonding or Phased Improvements

The Developer can bond for remaining improvements per PMC 21.30.050. In cases where the remaining improvements are bonded, the Developer is responsible to provide complete record drawings for constructed improvements, both paper and electronic, prior to receiving bonding acceptance consideration for remaining improvements or phases.

Future phases will not receive bonding acceptance without written acceptance of the Record Drawings from completed phases per this section.

Preliminary (Paper) Record Drawing Procedures

1. A licensed Engineer representing the Developer will ensure that all improvements associated with the approved construction plans are obtained and create an accurate as-built topographical representation of the data.
2. The data, differing from initial plan acceptance, will be incorporated into the preliminary record drawings and the Engineer will adjust the features in the record drawings to match the actual data. All revised and verified elevations for sewer,

storm, water, and irrigation will be shown on the record drawings by striking a single line through the design elevations and adding the surveyed "as-built" elevations. Horizontal locations will be indicated by using centerline station and offsets. All revised and verified station and offsets will be shown on the record drawings by striking a single line through the design station and offsets and adding the surveyed station and offsets. The stationing will be based on the approved construction drawings. The Engineer will update both the plan and profile layouts with the revised and verified data. Revised information shall be "clouded" as appropriate to indicate revisions.

3. Prior to final walk-through, the Engineer will compile the data and submit two copies of the preliminary (paper) record drawings to the City. The walk-through will not be scheduled until the paper record drawings are received.

Preliminary Record Drawing Submittals

- Two (2) paper copies (22"x34") including all field changes made.
- The preliminary record drawing will have all changes from the approved construction drawings clouded.
- The preliminary record drawing submittal will include the final field information as-built.

Upon receipt of the paper record drawings, the City shall have 10 business days to review the documents. Should the paper record drawings be found to be inaccurate or incomplete, the City shall have an additional 10 business days to review all subsequent submissions.

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Final (Mylar and Electronic) Record Drawing Procedures

After receiving approval of the preliminary paper record drawing from the City, the developer/designing Engineer will submit the following:

Final Record Drawing Submittals

- One (1) full size Mylar copy of the corrected record drawing. The final record drawing shall be signed and sealed by a licensed Engineer and licensed surveyor. The clouding of changes will be removed before the Mylar is submitted.
- One (1) PDF copy of the final record drawing.
- One (1) electronic copy of data conforming to the standards set forth by the City of Pasco Geographic Information System (GIS) as part of the Information Services (IS) Department.

Electronic Record Drawing Requirements:

<http://data-cityofpasco.opendata.arcgis.com/search?tags=ABSP>

Electronic Record Drawings are to be delivered to:

PascoGIS@pasco-wa.gov

Additional questions:

Deshawn Robins, GIS Administrator @ 509-543-5750 or
robinsd@pasco-wa.gov

Upon receipt of the electronic data, the City shall have 10 business days to review the information. Should the electronic data be found to be inaccurate or incomplete, the City shall have an additional 10 business days to review all subsequent submissions. The project will not be considered Substantially Complete until both the Mylar and Electronic as-builts have been deemed acceptable by the City.

1-05.5 Construction Staking (New Section)

The following new section shall be added to the Standard Specifications:

A land surveyor licensed in the State of Washington, retained by the Developer, shall establish the line and grade of proposed construction by offset stakes. Said surveyor shall establish the centerline for minor structures and bench marks at convenient locations for use by the Contractor and City inspectors. GPS systems may be used by the Contractor, but physical reference points shall be available for City inspectors.

The Contractor shall establish grades from the surveyor's stakes at suitable intervals in accordance with industry standards and acceptable to the City. Where new construction adjoins existing construction, the Contractor shall make such adjustments in grade as are necessary, and approved by the City.

1-05.6 Inspections of Work and Materials

Supplement this section with the following:

The City Engineer or his representative may not be on the job site full-time. The Contractor shall follow the approved construction plans and specifications, schedule, and request inspections and testing at the appropriate times as required herein. The Engineer will try to provide inspections on short notice, but if unable to, the requirements for proper notice shall apply. The project schedule prepared by the Contractor and approved by the Engineer shall also be used as a guide for the Contractor to schedule inspections. The Contractor shall provide a minimum 48 hours notice to request inspections and testing, but in no case shall there be more than 72 hours notice. The request shall state the date and approximate time the inspection or test is requested. If the Contractor has requested two (2) inspections or tests and is not prepared for said inspection or test, the Contractor shall pay the costs for any additional improperly scheduled requests.

At the beginning of the project, or each applicable construction activity, the Contractor shall meet with the City Engineer or his representative and establish a minimum 100 feet of product, in the field, which meets the specifications. This work includes: Survey staking and control, pavement cuts, utility trenches, trench bedding, pipe installation, backfill, patches, curb and gutter alignment, grade and finish, sidewalk finish, paving finish, and any other activities determined by the Engineer to be important to the project. No major amount of work shall proceed until this is established. This does not waive the Contractor's requirements in the specifications for quality control or materials used.

Inspections and testing are mandatory for acceptance of backfilling any utility trenches; placing base course and top course for streets; paving; placing sidewalks, curbs and gutters; storm, sewer and water line installation.

1-05.7 Removal of Defective and Unauthorized Work
(October 1, 2005 APWA GSP)

Supplement this section with the following:

If the Contractor fails to remedy defective or unauthorized work within the time specified in a written notice from the City Engineer, or fails to perform any part of the work required by the Contract Documents, the City Engineer may correct and remedy such work as may be identified in the written notice, with Contracting Agency forces or by such other means as the Contracting Agency may deem necessary.

If the Contractor fails to comply with a written order to remedy what the City Engineer determines to be an emergency situation, the Engineer may have the defective and unauthorized work corrected immediately, the rejected work removed and replaced, or have work the Contractor refuses to perform completed by using Contracting Agency or other forces. An emergency situation is any situation when, in the opinion of the Engineer, a delay in its remedy could be potentially unsafe, or might cause serious risk of loss or damage to the public.

Direct or indirect costs incurred by the Contracting Agency attributable to correcting and remedying defective or unauthorized work, or work the Contractor failed or refused to perform, shall be paid by the Developer/Contractor. Such direct and indirect costs shall include in particular, but without limitation, compensation for additional professional services required, and costs for repair and replacement of work of others destroyed or damaged by correction, removal, or replacement of the Contractor's unauthorized work.

The rights exercised under the provisions of this section shall not diminish the Contracting Agency's right to pursue any other avenue for additional remedy or damages with respect to the Contractor's failure to perform the work as required.

Supplement this section with the following:

For new roadway/street construction and overlays, HMA work rejected shall require the replacement of the entire road or street width from block to block or as approved in writing from the City Engineer. For trench patching, HMA work rejected shall require the replacement of the entire patch width from block to block or as approved in writing from the City Engineer.

1-05.8 Means and Methods (New Section)

The following new section shall be added to the Standard Specifications:

Unless otherwise expressly provided in the Contract Drawings, Specifications and Addenda, the means and methods of construction shall be such as the Contractor may choose; subject, however, to the Consultant's or City's right to reject means and methods proposed by the Contractor which (1) will constitute or create a hazard to the work, or to persons or property; or (2) will not produce finished work in accordance with the terms of the Contract. The Consultant's or City's approval of the Contractor's means and methods of construction or his failure to exercise his right to reject such means or methods shall not relieve the Contractor of the obligation to accomplish the result intended by the Contract; nor shall the exercise of such right to reject create a cause for action for damages.

1-05.10 Guarantees

Delete this section and replace it with the following:

If defective and unauthorized materials or work is discovered within the guarantee timeframe after the certification of completed public improvements date, the Developer/Contractor shall promptly, upon written request, return and in accordance with the instructions either correct such work, or if such work has been rejected, remove it from the Project Site and replace it with non-defective and authorized work, all without cost to the City. If the Contractor does not promptly comply with the written request to correct defective and unauthorized work, or if an emergency exists, the City reserves the right to have defective and unauthorized work corrected or rejected, removed, and replaced pursuant to the provisions of Section 1-05.7 of the Standard Specifications.

1-05.13 Superintendents, Labor, and Equipment of Contractor
(August 14, 2013 APWA GSP)

Delete the sixth and seventh paragraphs of this section.

1-05.14 Cooperation With Other Contractors

Supplement this section with the following:

No additional compensation will be given to the Contractor for any coordination or delays caused by other nearby construction projects.

1-05.16 Water and Power (New Section)

The following new section shall be added to the Standard Specifications:

Water Supply: The Developer shall make necessary arrangements and shall bear the costs for water necessary for the performance of the work. Water for use on the projects may be purchased from the City of Pasco, and the Contractor shall arrange for and convey the water from the nearest convenient hydrant or other source at his own expense. The hydrants shall be used in accordance with the City of Pasco Water Department regulations.

If City water is used for any work related to a project, a fire hydrant meter and gate valve will need to be obtained from the City of Pasco to be used specifically for this project. The City will charge the Contractor for any water used during construction. The Contractor shall not operate the hydrant as a gate valve, nor shall the Contractor be allowed to operate any other City owned valve. The Contractor shall provide the necessary back flow prevention device when connecting to the water service. The Fire Hydrant Meter requirements and the Fire Hydrant Meter Application are available at the Customer Service Window and the Engineering Department.

The City reserves the right to deny the use of fire hydrants where deemed inappropriate by the City.

Power Supply: The Developer shall make necessary arrangements and shall bear the costs for power necessary for the performance of the work.

1-05.17 Oral Agreements (New Section)

The following new section shall be added to the Standard Specifications:

No oral agreement or conversation with any officer, agent, or employee of the Contracting Agency, either before or after construction, shall affect or modify any of the terms or obligations contained in any of the City-approved documents. Such oral agreement or conversation shall be considered as unofficial information and in no way binding upon the Contracting Agency, unless subsequently put in writing and signed by the Contracting Agency.

1-06 CONTROL OF MATERIAL

1-06.1 Approval of Materials Prior to Use

Revise the first paragraph to read:

Prior to use, the Contractor shall notify the City Engineer of all proposed materials. The Contractor shall use the Request for Approval of Material (RAM) form, WSDOT Form 350-071. Materials included in the WSDOT Qualified Products List (QPL) but not in the City's Construction Standards will be taken under consideration by use of the RAM form. The Contractor shall note all deviations from the governing specifications and/or drawings and shall reference the appropriate paragraph of the section or sheet of the drawing. If the reason for the deviation from the specifications is not readily apparent, a written explanation shall be included. The City Engineer's review of the Contractor's submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimension. The Contractor shall assume all responsibility and risk for any misfits due to any errors in information submitted by the Contractor. Any fabrications or other work performed in advance of the receipt of approved submittals shall be entirely at the Contractor's risk and expense. The Contractor shall be responsible for the dimensions and the design of adequate connections and details.

1-06.2(1) Samples and Tests for Acceptance

Supplement this section with the following:

The Contractor/Developer shall be responsible for scheduling and paying for all material and compaction testing required by these Design and Construction Standards for new public works Improvements. All testing services shall be performed by an independent, certified testing firm and/or laboratory meeting the approval of the City Engineer. The Contractor shall submit information relating to the qualifications of the proposed testing firm to the City for review and approval prior to the preconstruction conference. The testing firm shall provide copies of all test results to the City within 24 hours after completion of any test. Test reports shall become the property of the City. Testing frequencies listed below may be modified to assure compliance with the Specifications.

Trench Backfill

Copies of moisture-density curves for each type of material encountered and copies of all test results shall be provided to the City as construction progresses.

Three (3) compaction tests, at varying depths, shall be performed within the first one hundred (100) feet of pipeline installed to establish compaction method. Once a

satisfactory method has been established, one test shall be performed for each one hundred (100) linear feet of pipeline installed. Tests shall be taken at varying depths along the trench. Compaction method shall be reestablished each time backfill material, compaction equipment, or method of operation changes.

The City Engineer may request additional tests be performed at the Contractor's/Developer's expense, if test results do not meet the required trench backfill densities.

Roadway Subgrade

Copies of the moisture density curves for each type of material encountered and copies of all test results shall be provided to the City Engineer as construction progresses.

Two (2) compaction tests shall be taken for the first ten thousand (10,000) square feet and one (1) test for each additional ten thousand (10,000) square feet.

The City Engineer may request additional tests be performed at the Contractor's expense, if test results do not meet the required subgrade densities. Subgrade compaction shall be as specified for Roadway Embankment in Section 2-03.3(14)C, Method C.

Embankment

Copies of the moisture density curves for each type of material encountered and copies of all test results shall be provided to the City Engineer as construction progresses.

Two (2) compaction tests shall be taken for the first one thousand (1,000) square feet and one (1) test for each additional one thousand (1,000) square feet. Tests will be taken at varying depths within the embankment.

The City Engineer may request additional tests be performed at the Contractor's expense, if test results do not meet the required subgrade densities. Subgrade compaction shall be as specified for Roadway Embankment in Section 2-03.3(14)C, Method C.

Ballast and Crushed Surfacing

Copies of the moisture density curves and gradation for each type of material incorporated into the project and copies of all test results shall be provided to the City Engineer as construction progresses.

Two (2) compaction tests shall be taken for the first ten thousand (10,000) square feet and one (1) test for each additional ten thousand (10,000) square feet.

The City Engineer may request additional tests be performed at the Contractor's/Developer's expense, if test results do not meet the required subgrade densities.

Compaction of ballast and crushed surfacing shall be as specified in Section 4-04.3(5).

Asphalt Pavement

Asphalt paving may not occur until successful compaction test results are provided to the City Engineer for trench backfill, subgrade, embankment, ballast and crushed surfacing,

as applicable. Copies of the reference maximum density test for each class of Hot Mix Asphalt pavement and copies of all test results shall be provided to the City Engineer as construction progresses.

The City Engineer may request additional tests be performed at the Contractor's/Developer's expense, if test results do not meet the required densities.

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Compaction of Hot Mix Asphalt pavement shall be as specified in Section 5-04.3(10).

Cement Concrete Curb, Gutter, and Sidewalk

A copy of the cement concrete design mix or certification from the concrete supplier that the concrete provided has been prepared to the strength requirement as specified elsewhere in these specifications.

All testing procedures shall be conducted in accordance with applicable Sections of Division 6-02 of the Standard Specifications and Sections 8-04 and 8-14 of these Construction Standards.

Copies of all test results shall be provided to the City Engineer as construction progresses.

1-06.2(2) Statistical Evaluations of Materials for Acceptance

Delete Section 1-06.2(2).

1-07 LEGAL RELATION AND RESPONSIBILITIES TO THE PUBLIC

1-07.1 Laws to be Observed
(October 1, 2005 APWA GSP)

Supplement Section 1-07.1 with the following:

In cases of conflict between different safety regulations, the more stringent regulation shall apply.

The Washington State Department of Labor and Industries shall be the sole and paramount administrative agency responsible for the administration of the provisions of the Washington Industrial Safety and Health Act of 1973 (WISHA).

The Contractor shall maintain at the project site office, or other well-known place at the project site, all articles necessary for providing first aid to the injured. The Contractor shall establish, publish, and make known to all employees, procedures for ensuring immediate removal to a hospital, or doctor's care, persons, including employees, who may have been injured on the project site. Employees should not be permitted to work on the project site before the Contractor has established and made known procedures for removal of injured persons to a hospital or a doctor's care.

The Contractor shall have sole responsibility for the safety, efficiency, and adequacy of the Contractor's plant, appliances, and methods, and for any damage or injury resulting from their failure, or improper maintenance, use, or operation. The Contractor shall be solely and completely responsible for the conditions of the project site, including safety for all persons and property in the performance of the work. This requirement shall apply continuously, and not be limited to normal working hours. The required or implied duty of

the Engineer to conduct construction review of the Contractor's performance does not, and shall not, be intended to include review and adequacy of the Contractor's safety measures in, on, or near the project site.

Amend the second sentence of the first paragraph to read:

The Contractor/Developer shall indemnify and save harmless the City of Pasco (including any agents, officers, employees, and representatives) against any claims that may arise because the Contractor (or any employee of the Contractor or subcontractor or materialman) violated a legal requirement.

1-07.5(1) General

Supplement this section with the following:

- 4. Dumping of material removed from catch basins and other storm drain structures into the right of way, sanitary sewer or storm drain system is prohibited. Contractor's caught disposing of materials in this manner will be assessed damages and may have their prequalification status revoked.

1-07.5(3) State Department of Ecology

Add the following:

- 9. Comply with the requirements and special general conditions of the *Construction Stormwater General Permit* issued by the Washington State Department of Ecology for this project.

1-07.6 Permits and Licenses

Supplement this Section with the following:

The Contractor shall obtain a City of Pasco right-of-way permit for all work within the right-of-way prior to the start of work consistent with the City of Pasco Municipal Code Title 12.

The Contractor and all subcontractors are responsible for obtaining and paying for business licenses in the City of Pasco.

1-07.13 Contractor's Responsibility for Work

1-07.13(1) General

Supplement this section with the following:

The Contractor is responsible for constructing and completing all work included in the approved Construction Documents and any other work directed by the Developer in a professional manner with first-class workmanship.

The Contractor shall keep the City of Pasco, the Developer, and the Consultant informed in writing of the address to which official correspondence is to be directed, the address and phone number of the person in charge of his field personnel, and the address and telephone number of the Contractor's representative who will be responsible and available

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outside of normal working hours for emergency repairs and the maintenance of traffic control and safety devices.

The Developer shall be responsible for the satisfactory operation and condition of all public improvements for a period consistent with that specified in CHAPTER 1, under Transfer of Ownership.

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1-07.17 Utilities and Similar Facilities

Supplement this section with the following:

It shall be the Contractor/Developer's responsibility to notify all non-City of Pasco utility companies of project including coordination of any impacts.

It shall be the Contractor's responsibility to investigate and verify the presence and location of all utilities prior to construction.

The Contractor/Developer shall call for field location, not less than two nor more than ten business days before the scheduled date for commencement of excavation which may affect underground utility facilities, unless otherwise agreed upon by the parties involved. A business day is defined as any day other than Saturday, Sunday, or a legal local, state, or federal holiday. The phone number for the Northwest Utility Notification Center for Pasco is 1-800-424-5555 (or 811). If no one-number locator service is available, notice shall be provided individually by the Contractor to those owners known to or suspected of having underground facilities within the area of proposed excavation.

The Contractor/Developer is alerted to the existence of Chapter 19.122 RCW, a law relating to underground utilities. Any cost to the Contractor/Developer incurred as a result of this law shall be at the Contractor's/Developer's expense.

No excavation shall begin until all known facilities, in the vicinity of the excavation area, have been located and marked.

In addition to the requirements of RCW 19.122, the Contractor shall use surface features and other evidence in determining the approximate utility location prior to excavation. The Contractor shall hand dig to expose known utilities.

Where the location of the work is in proximity to overhead wires and power lines, the Contractor shall coordinate all work with the utility and shall provide for such measures as may be necessary for the protection of workmen.

Only City personnel shall operate water system valves.

1-07.18 Public Liability and Property Damage Insurance

Supplement this section with the following:

The Contractor shall obtain and maintain in full force and effect during the duration of the work public liability and property damage insurance in accordance with this section and as modified herein.

Prior to start of construction, the Contractor/Developer shall furnish the City of Pasco a Certificate of Insurance and the additional insured endorsements as evidence of compliance with these requirements. This certificate shall name the City of Pasco, its employees, agents, elected and appointed officials, consultants, and all subcontractors as "additional insureds" and shall stipulate that the policies named thereon cannot be canceled unless at least forty-five (45) days written notice has been given to the City of Pasco. The certificate shall not contain the following or similar wording regarding cancellation notification: "Failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents, or representatives."

1-07.23 Public Convenience and Safety

Supplement this section with the following:

All signs, barricades, traffic control devices, and labor for traffic control required by construction activities for the control of traffic shall be supplied, placed, and maintained by the Contractor. This shall apply to detours and traffic control both within and outside the limits of the project.

All work shall be done under a plan which shall have the approval of the City of Pasco Engineering Division and create a minimum of interruption or inconvenience to pedestrian and vehicular traffic. All arrangements to care for such traffic will be the Contractor's responsibility and shall be made at his expense. All work shall be carried out with due regard for public safety. Open trenches shall be provided with proper barricades and at night they shall be distinctly indicated by adequately placed lights. At entrances to business properties and other private roads, driveways, bridges, or other such means as to provide access shall be provided by the Contractor. The Contractor shall maintain vehicular and pedestrian access to businesses at all times that businesses are open for business.

Upon failure of the Contractor to immediately provide and maintain adequate suitable barricades, lights and detour signs, when ordered to do so, the City shall be at liberty, without further notice to the Contractor or the Surety, to provide the same and request payment for providing proper barricades, lights, and signs, and the City assumes no liability connected therewith.

Any traffic restriction must have prior approval of the City of Pasco Engineering Division. Appropriate traffic control measures and signing are required during such temporary road closures.

It shall be the responsibility of the Contractor to secure the City's approval for any desired road closure and associated traffic control plan including detours. Following approval, the Contractor shall notify the Developer, City of Pasco, and the Police and Fire Departments, Pasco School District, Basin Disposal, and Benton Franklin Transit at least 24 hours prior to closing any street. When the street is re-opened, it shall again be the responsibility of the Contractor to notify the above named departments and persons.

1-07.23(1) Construction Under Traffic

Delete the sixth and seventh sentences of this section.

1-07.28 Safety Standards (New Section)

The following new section shall be added to the Standard Specifications:

All work shall be performed in accordance with all applicable local, state, and federal health and safety codes, standards, regulations, and/or accepted industry standards. It shall be the responsibility of the Contractor to ensure that his work force and the public are adequately protected against any hazards.

The City of Pasco or Developer shall have the authority at all times to issue a stop work order at no penalty if, in their opinion, working conditions present an undue hazard to the public, property, or the work force. Such authority shall not, however, relieve the Contractor of responsibility for the maintenance of safe working conditions or assess any responsibility to the City or Developer for the identification of any or all unsafe conditions.

1-07.29 Notifying Property Owners (New Section)

The following new section shall be added to the Standard Specifications:

When construction activities will affect ingress and egress to a property along the project alignment, the Contractor shall be responsible for notifying the occupant/occupants of the property 72 hours prior to the construction activity beginning. If personal contact with the occupant is not possible, the Contractor shall leave written notification. A copy of all notifications shall be provided to the City.

1-08 PROSECUTION AND PROGRESS

1-08.3 Progress Schedule

Supplement this section with the following:

Prior to the commencement of any work, a preconstruction conference shall be held. The Contractor or Developer shall contact the City of Pasco Engineering Division and set a date and time for the meeting. It shall be the responsibility of the Contractor/Developer to notify and invite all parties having an interest in the project to the meeting, including the major subcontractors, Engineering Division, Irrigation Districts, and all applicable private utilities.

At this conference, all points of the approved Plans and Specifications will be open to discussion including scope, order and coordination of work, equipment lead time required, means and methods of construction, inspection and reporting procedures, etc. The Contractor should satisfy himself that all provisions and intentions of the work are fully understood.

The Contractor shall prepare and submit to the City and Developer at the preconstruction conference a Construction Progress and Completion Schedule using a bar graph format. Items in the Schedule shall be arranged in the order and sequence in which they will be performed. The schedule shall be drawn to a time scale, shown along the base of the diagram, using an appropriate measurement per day with weekends and holidays indicated. The Construction Progress Schedule shall be continuously updated and, if necessary, redrawn upon the first working day of each month or upon issuance of any Change Order which substantially affects the scheduling. Copies (2 prints or 1

reproducible) of newly updated Schedules shall be forwarded to the City Engineer, as directed, immediately upon preparation.

Any proposed road or sidewalk closures shall be presented to City Engineering at the preconstruction conference for consideration, including duration of closure. If approved, closures shall not extend beyond permitted duration. Should closures extend beyond the duration, road user delay costs shall be assessed to the Developer and paid to the City of Pasco, as calculated by the City Engineer using the spreadsheet adopted by Ohio DOT, available at City Hall Engineering Division.

At the discretion of the City Engineer, a weekly meeting between representatives of the City (inspector and/or engineer) and contractor (foreman, supervisor, and/or project manager) shall be held at the project site or at City Hall at a pre-determined time. The contractor shall present an update on project status, project schedule, and any problems that have arisen.

1-10 TEMPORARY TRAFFIC CONTROL

Supplement this section with the following:

The provisions of the latest edition of the *Manual on Uniform Traffic Control Devices* (MUTCD) for Streets and Highways and amendments thereto published by the U.S. Department of Transportation, Federal Highway Administration, and WSDOT by this reference are made a part of these Documents.

1-10.2(2) Traffic Control Plans

Delete the entire section and replace with the following:

The Contractor shall prepare a signing plan showing the necessary Class A and B construction signing, barricades, and traffic control devices required for the project and submit it to the City, no later than the preconstruction conference date. When the Class B signing for a particular area will be provided as detailed on one or more of the figures included in the MUTCD without modification, the Contractor may reference the applicable MUTCD figure at the appropriate location on the Plan. When this procedure is used, variable distances such as minimum length of taper must be specified by the Contractor.

The signing plan prepared by the Contractor shall provide for adequate warning within the limits of the project and on all streets, alleys, and driveways entering the project so that approaching traffic may turn left or right onto existing undisturbed streets before reaching the project. The Plan shall be prepared to create a minimum of inconvenience for pedestrian and vehicle traffic.

All modifications to the accepted signing plans shall be reviewed by the City Engineering Division.

1-10.3(3)A Construction Signs

The first sentence of the first paragraph is revised to read:

All signs, barricades, flashers, cones, traffic safety drums, barricades, and other traffic control devices required by the approved traffic control plan(s), as well as any other

appropriate signs prescribed by the City or County, shall be furnished and maintained by the Contractor.

Open trenches shall be provided with proper barricades and at night they shall be distinctly indicated by adequately spaced lights.

7-08 GENERAL PIPE INSTALLATION REQUIREMENTS

7-08.1 General

Add the following:

All construction work shall be inspected by the City of Pasco prior to backfilling. At least 48 hours notice shall be given to the City Engineering Division prior to backfilling.

The Contractor shall notify the Utility Notification Center (One Call Center) at least 48 hours prior to start of excavation so that underground utilities may be marked. Telephone number is 1-800-424-5555.

7-08.3 Construction Requirements

7-08.3(1)A Trenches

Supplement this section with the following:

Existing pavement shall be neatly saw-cut on both sides of the trench parallel consistent with the dimensions presented on the Trench Surfacing Repair standard detail, including a saw-cutting prior to surface repair.

7-08.3(1)C Bedding the Pipe

Add the following:

Gravel Backfill for Pipe Zone (including Bedding): Pipe zone material shall be Crushed Surfacing Top Course meeting the requirements of section 9-03.9(3), and shall be placed and compacted in layers as designated by the City. With prior approval by the City Engineer, suitable native material may be an acceptable alternate for pipe zone bedding above the bottom of the pipe.

Trench Backfill: All longitudinal pipeline trenches (parallel to curb) may be backfilled full depth above the pipe zone with native material (free of organic material, wood, rocks, or pavement chunks larger than 6-inches in maximum dimension), unless otherwise directed by the City of Pasco. Street crossings, transverse trenches, and other locations as directed by the City of Pasco may be required to be backfilled full depth with imported select backfill. Imported select backfill shall be crushed surfacing top course or crushed surfacing base course meeting the requirements of section 9-03.9(3), placed and compacted in layers.

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7-08.3(2)B Pipe Laying – General

Supplement this section with the following:

Potable domestic water mains shall maintain a 10-foot horizontal and 18-inch vertical separation above non-potable pipelines (sewer, irrigation, and storm) consistent with the Department of Health Water System Design Manual.

When parallel to existing utilities, new domestic water mains shall be installed a minimum of 10 feet horizontally (outside pipe wall to outside pipe wall, typical) and 18 inches vertically above other non-potable pipelines. Where this is not possible at the discretion of the Engineer, a water main may be installed a minimum of five feet horizontally and 18 inches vertically above other non-potable pipelines, as long as the water main is placed in a separate trench and on a bench of undisturbed earth.

When crossing existing utilities, new domestic water mains shall be installed a minimum of 18 inches vertically above non-potable pipelines. Where this is not possible, or the water main passes under a non-potable pipeline, the water main shall be installed in a pressure rated pipe casing extending 10 feet each side of the crossing. In addition, where the water main passes under an existing non-potable pipeline, support shall be provided for the non-potable pipeline by backfilling the non-potable pipeline trench with controlled density backfill or other approved methods. A minimum of 6 inches of separation between the crossing pipelines must be maintained in all cases.

When parallel to existing potable water mains, new non-potable pipelines shall be installed a minimum of 10 feet horizontally and 18 inches vertically below existing water mains. Where this is not possible at the discretion of the Engineer, a non-potable pipeline may be installed a minimum of five feet horizontally from an existing water main, as long as the non-potable pipeline is installed a minimum of 18 inches vertically below the water main and the non-potable pipeline is placed in a separate trench. If the vertical separation cannot be met, then the non-potable pipeline shall be constructed of or encased in materials equal to water main standards with a minimum pressure rating of 165psi (C900 PVC DR 25, ductile iron, etc.).

When crossing existing potable water mains, new non-potable pipelines shall be installed a minimum of 18 inches vertically below existing water mains. Due to difficulties in compacting under existing utilities, controlled density backfill or other City Engineer-approved materials shall be placed as backfill at the crossing locations, to a depth of the water main spring line. Where the minimum clearance is not possible, or the non-potable pipeline passes above a water main, a full length of non-potable pipeline shall be centered at the crossing. In addition, the non-potable pipeline shall either be installed in a pressure rated pipe casing extending 10 feet each side of the crossing, or be constructed of one standard length of pipe material equal to waterline standards with a minimum pressure rating of 165psi (C900 PVC DR 25, ductile iron, etc.). A minimum of 6 inches of separation between the crossing pipelines must be maintained in all cases.

Magnetic detectable marking tape shall be installed above the pipe. The tape shall be placed approximately two feet above the top of the pipe and shall extend its full length. The horizontal location of the tape shall vary no more than one foot from the centerline alignment of the pipe. Detectable marking tape shall meet the requirements of Section 9-15.18 of the Standard Specifications. Tape width shall be a minimum of 3 inches wide, or wider as recommended by the manufacturer for the installation depth.

Revise the third paragraph of this section to read:

Pipe shall be laid to a true line and grade at the invert of the pipe and the Contractor shall exercise care in matching pipe joints for concentricity and compatibility. In no case shall two pipes be joined together with ends having the maximum manufacturer's tolerance. The invert line may vary from the true line and grade within the limits stated to develop uniformity, concentricity, and uniform compression of jointing material provided such variance does not result in a reverse sloping invert. The limit of variance at the invert elevation of the pipe shall be plus or minus 3/4-inch for a completed, backfilled pipe. Checking of the invert elevation of the pipe shall be done by remote operated CCTV camera utilizing a 3/4-inch measuring device (lead ball).

7-08.3(3) Backfilling

Revise the second paragraph of this section to read:

Gravel Backfill for Pipe Zone (including Bedding): Pipe zone material shall be Crushed Surfacing Top Course meeting the requirements of section 9-03.9(3), and shall be placed and compacted in layers as designated by the City. With prior approval by the City Engineer, suitable native material may be an acceptable alternate for pipe zone bedding above the bottom of the pipe.

Trench Backfill: All longitudinal pipeline trenches (parallel to curb) may be backfilled full depth above the pipe zone with native material (free of organic material, wood, rocks, or pavement chunks larger than 6-inches in maximum dimension), unless otherwise directed by the City of Pasco. Street crossings, transverse trenches, and other locations as directed by the City of Pasco may be required to be backfilled full depth with imported select backfill. Imported select backfill shall be crushed surfacing top course or crushed surfacing base course meeting the requirements of section 9-03.9(3), placed and compacted in layers.

Supplement this section with the following:

The City Engineer may require the use of Controlled Density Fill (CDF) for trench backfill in certain circumstances. The requirements for CDF are set forth in CHAPTER 8, Section 8-30 of these Special Provisions.

Backfill above the pipe zone may be placed in horizontal lifts up to 18 inches with written approval of the Engineer.

The Contractor shall be responsible for scheduling, conducting, and paying for all testing required.

8-01 EROSION CONTROL AND WATER POLLUTION CONTROL

8-01.3(1) Construction Requirements

Supplement this section with the following:

Exposed and unworked soils shall be temporarily or permanently stabilized as soon as practicable, unless otherwise approved by the City of Pasco. Contractor shall follow the requirements in the most current publication of the Stormwater Management Manual for Eastern Washington.

CHAPTER 5 - WATER SYSTEM IMPROVEMENTS

GENERAL REQUIREMENTS FOR WATER SYSTEM IMPROVEMENTS

All extensions and additions to the City of Pasco's domestic water system shall conform to the Design and Construction Standards of the City of Pasco, the Washington State Department of Health (DOH), American Water Works Association, and designed by a Civil Engineer currently licensed by the State of Washington.

All new lots and developments shall be served by a public domestic water supply line to be maintained by the City of Pasco and located adjacent to the lot or development site. The water supply line shall be capable of providing sufficient flow and pressure to satisfy the fire flow and domestic service requirements of the proposed lots and development requirements. If determined necessary by the City Engineer, hydraulic analysis including modeling shall be performed by the City or its agents, and all costs shall be borne by the Developer.

Water lines shall be extended by the Developer to the point where the adjoining property owner's responsibility for further extension begins. This typically requires an extension across the entire frontage of the property to the property line of the adjoining owner. In some cases, it will require dedication of an easement and a line extension across the property or extension across two or more sides of the developing property. Extensions will be consistent with and implement the City's adopted Water System Plan.

All new public domestic water mains shall be a minimum diameter of 8 inches, or larger diameters as specified in the City's Water System Plan, or larger as required to meet the fire flow demand of the development. Fire hydrants located within 50 feet of the water main shall be a minimum diameter of 6 inches. Hydrants beyond 50 feet of the water main shall be a minimum diameter of 8 inches, or larger as necessary to achieve required fire flows. Cover over new watermains shall be a minimum depth of 42 inches and a maximum of 72 inches.

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New water mains shall be located in existing or proposed streets within City right-of-way and shall be offset from the street centerline, not located within a vehicle wheel path.

Larger public water mains may be required depending upon fire flow requirements as determined by the City and City Engineer.

All domestic water mains shall be looped, where possible, as determined by the City Engineer. Temporary dead-end mains over 300 feet in length will only be allowed where future water main looping via public right of way will be assured. No permanent dead-end water mains over 300 feet in length will be allowed to be part of the City of Pasco's public water system.

Permanent dead-end water mains may become private water mains owned and maintained by the Developer. All dead-end water mains shall be isolated from the public water main with a reduced pressure double check valve assembly and vault furnished and installed by the Developer in accordance with the City of Pasco Cross-Connection Control Policy. All services must extend from a water main owned and operated by the City.

The Cross-Connection Control Policy requires all commercial/industrial properties to have a reduced pressure backflow assembly (RPBA) for premises isolation of the building water supply. Backflow prevention assemblies shall be installed at the water meter and shall be shown on the plans. Required backflow prevention assembly types shall be as specified in Section 170 of the City's Cross-Connection Control Policy. Yearly test reports shall be provided to the City's Water

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Quality Inspector. The backflow device shall be on the state approved list, available through the Washington State Dept. of Health.

All double detector check valve assemblies shall conform to City of Pasco standards. Initial and annual testing will be required at the expense of the property owner.

Maximum valve spacing in public water mains will be 750 linear feet. Valves shall be installed on all ~~but one of the~~ legs of new water main intersections. Valve operating nut extensions approved by the City will be required on valves where the operating nut is deeper than 36 inches below finished grade.

All new water main installations shall be satisfactorily tested per Section 7-09 prior to being placed into service including hydrostatic pressure and bacteriological testing, all at the expense of the Developer.

All new water service lines shall be a minimum of 1-inch, for 3/4- and 1-inch meters, ~~and shall be a minimum of 2-inch, for 1 1/2- and 2-inch meters.~~ The Developer/Contractor shall furnish and install all water service components (except hot tap and water meter) from the water main to the property line including service saddle, corporation stop, service pipe, meter stop, meter check valve, customer piping, and meter box, all at the Developer's expense. Only one meter shall be served from each main tap. All service hot taps shall be made by the City of Pasco Public Works Crews.

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~~New water main connections to existing water mains shall be installed with cut-in tees/crosses, unless a hot tap is approved by the City Engineer. If the existing water main is less than 6-inch diameter, a cut-in tee shall be required, and a hot tap will not be considered for approval.~~ All hot taps of water mains 12" and smaller shall be performed by City of Pasco Public Works Crews or a contractor approved by the City Engineer, using a full circle stainless steel sleeve with tapping gate valve. The contractor shall provide traffic control, excavate the connection location, provide adequate sloping/shoring, and install tapping sleeve and valve prior to City Crew arrival. All work (including City Crew tap) will be at the expense of the Developer.

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Minimum 2-inch air and vacuum release valves shall be furnished and installed at high points in the water system.

Maximum spacing of fire hydrants shall be 500 feet ~~for residential-zoned areas, and 300' for all other zoned-areas~~, on alternating sides of the street, and shall be located at intersections. Additional hydrants may be required to protect structures as determined by the Fire Chief and City Engineer. Additional fire hydrants required on a site may require a looped, on-site water main. Easements shall be provided for all on-site, public, looped water mains, in accordance with CHAPTER 1, Section 11. Fire hydrants shall be located at the ends of curb returns or at property lines between lots, and not be located within driveways, driveway ramps, or handicap ramps.

When additional fire hydrants are required or the required fire flow of a new site is greater than the existing fire flow capacity, the public water main shall be extended and looped around the site, reconnecting to the public distribution supply main, at the Developer's expense. Fire hydrants shall be located along the looped public water main as determined by the Fire Chief. The looped water main will remain public and will not require check valves. The looped water main shall be located within an easement centered on the water main, free of any other parallel-aligned private utilities, see CHAPTER 1, Section 11. All water main components shall be located within the easement including valves, hydrants, thrust blocks, fittings, etc. such that the City can maintain the public utility.

City-approved backflow prevention devices are required on all fire line connections to public water mains when the line is not required to be looped.

Where the water system pressures are outside of acceptable ranges as identified in the City's Water System Comprehensive Plan, a pressure reducing valve (PRV) station may be required as determined by the City Engineer. The PRV station shall be designed by a Civil Engineer currently licensed by the State of Washington and shall be submitted to the City for review. All costs for design, review, approval, procurement, installation, and construction shall be borne by the Developer, see PRV section below.

Water mains installed beneath railroad tracks, State highways, irrigation canals, building structures, etc. shall be encased in a continuous welded steel casing (or as approved by permitting agencies) and provided with casing spacers in accordance with these Standards. Requirements by other agencies involved in crossings shall supersede these Standards.

Water mains shall maintain a 10-foot horizontal and 18-inch vertical separation above non-potable pipelines (sanitary sewers, reclaimed water, irrigation pipelines, stormwater pipes, and other uses) in accordance with Section 8.4.4 of the *Water System Design Manual, December 2009*, by the Washington State Department of Health. Additionally, water and sewer mains shall be separated in accordance with Section C1-9.1 of the *Criteria for Sewage Works Design, August 2008*, by the Washington State Department of Ecology. Gas, power, telephone, and other dry utilities shall maintain a minimum 3-foot horizontal clearance from water mains.

The design of water mains and appurtenances is subject to review and approval consideration by the City of Pasco Public Works Director and City Engineer. The Public Works Director may, at his discretion, adjust these Design and Construction Standards as necessary to facilitate installation of water lines and appurtenances for the health, safety, and protection of the general public.

New water systems shall be placed in service, including all successful testing, prior to placement of asphalt.

Irrigation Systems

Where the City of Pasco Irrigation Water Utility is available and/or as determined by the City Engineer, new subdivisions and developments shall be served by a separate irrigation water distribution system with an individual service for each lot. The irrigation system shall be designed by a professional engineer and constructed in accordance with applicable City of Pasco Construction Standards. All new public irrigation mains shall be a minimum diameter of 8 inches, or larger diameters as required by the City of Pasco. In the event irrigation water is not available in the vicinity of the subdivision, the irrigation system shall be tested, sealed, and buried with ends clearly marked to facilitate a connection when irrigation water is available. Refer to Section 8-03 for material requirements.

Domestic water and non-potable irrigation services should be extended to opposite lot corners in new construction. Where it is impossible to install them in that manner, 10-feet of separation needs to be supplied between the service points (meter boxes).

Pressure Reducing Valve (PRV) Stations

The City's Water System Comprehensive Plan and Irrigation Masterplan define the minimum and maximum pressures admissible in the system. In locations not covered by the Plan, the City may determine a study is necessary to determine a development's impacts on the system, at the

expense of the Developer. The topography of the service area dictates the division of the water system into different pressure zones. PRVs are needed where connections between different pressure zones are proposed or required for the extension of the water system. PRVs are deemed necessary when otherwise the potable water or irrigation water would be delivered at pressures non-compliant with the established threshold.

When a PRV is deemed necessary by the City, the Developer shall be responsible for providing a design in accordance with the City's Water System Comprehensive Plan and City Standards. Said design will be reviewed by the City Engineering Department as part of the development plan review process.

The PRV design and all associated flow calculations and thrust block/restraint calculations must be performed by a Professional Engineer licensed in the State of Washington.

The PRV design must comply with the following criteria:

- All necessary calculations and drawings for any related design shall be submitted to the City for approval. Calculations of flow must be performed by the Developer's engineer based on the Peak Hourly Demand (PHD), plus provisions for required fire flow.
- Pressure zones must adhere to the provisions included in the Comprehensive Plan and Masterplan for the respective utility.
- All PRVs will be placed in vaults that are large enough to provide ample work space for field inspection and valve repair.
- Vaults shall be designed with a gravity drain or sump pump into an adjacent drainage structure, to prevent vault flooding.
- Pressure relief valves will be considered for closed pressure zones to prevent over pressurization if a PRV fails in the open position. A pressure relief valve can be incorporated into the PRV Package Station or can be design in stand-alone configuration. Pressure relief valves shall feature full flow piping to a turned down riser 18" to 36" above ground, for visible detection of relief flow. Relief flow shall be routed to a nearby retention basin of appropriate size.
- The pressure reducing valve shall be set to open at any pressure below its preset setpoint and to close at any pressure above an adjustable deadband, to maintain downstream pressure within 2.5 psi of the pressure setpoint. Downstream pressure control shall not be based on changing upstream pressures. Valve shall be provided with a valve position indicator assembly.
- The upstream pressure shall be sustained at a predetermined minimum, to be established by the City.

SPECIAL PROVISIONS FOR WATER SYSTEM IMPROVEMENTS

The following sections of the WSDOT Standard Specifications have been amended or supplemented as described below and apply to the construction of public works water system improvements within the City of Pasco.

7-09 WATER MAINS

7-09.2 Materials

Pipe for main line approved for use shall be as follows:

Pipe for Main Line:

Ductile Iron Pipe

Supplement this section with the following:

Ductile Iron Pipe: Ductile iron pipe shall conform to the requirements of Section 9-30.1(1) of the Standard Specifications, except that it shall be Standard Thickness Class 52. Joints shall be rubber gasket, push-on type (Tyton Joint). Fittings shall be mechanical joint or flanged, as shown on the Plans, and shall conform to Section 9-30.2(1) of the Standard Specifications and NSF 61.

Tracer Wire: Tracer wire shall be 12-gauge heavy insulated (60 mil) copper wire with UF insulation colored for the utility being installed in accordance with Section 9-15.18. Direct bury splice kits shall be 3M DBY-6.

Fittings for Main Lines:

Fittings: Fittings shall be cement lined, ductile iron, rubber gaskets and glands, and bolts meeting the requirements of AWWA C110, C111, or C153. Fittings shall comply with NSF 61 requirements.

Hardware: Bolts and studs shall be carbon steel, grade B meeting the requirements of ASTM A 307 and nuts meet the requirements of ASTM A 563.

Lubricant: Lubricant shall be nontoxic and water-soluble.

Aggregates:

See Section 7-08.3 of these Specifications.

7-09.3 Construction Requirements

7-09.3(5) Grade and Alignment

Replace the first sentence of the third paragraph with the following:

The depth of trenching for water mains shall be such to provide a minimum cover of 42 inches and a maximum cover of 72 inches, unless otherwise approved by the City Engineer.

7-09.3(7) Trench Excavation

Supplement this section with the following:

The Contractor shall neatly sawcut all areas of existing pavement within the trench excavation area, then remove and haul all waste materials from the project and dispose

of at an approved site provided by the Contractor. Should any undermining occur on adjacent pavement, the Contractor shall neatly cut the pavement six (6) inches beyond the undermined area.

All trench excavations shall have adequate safety systems for the trench excavation that meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW. The Contractor shall be fully responsible for providing the necessary back sloping, cribbing, trench boxes, etc., as required to meet the specified safety requirements for the trench. When City crews will be making the main line taps or other work in the trench, the Contractor shall provide all trench safety measures, prior to City personnel entering the trench.

7-09.3(9) Bedding the Pipe

Supplement this section with the following:

All construction work shall be inspected by the City or its representative before pipe installation and backfilling.

7-09.3(11) Compaction of Backfill

Delete the first paragraph and supplement this section with the following:

Mechanical compaction shall be required for all trenches. The Developer/Contractor shall be responsible for scheduling and paying for all testing required.

The density of the compacted material shall be at least 95% of the maximum density as determined by ASTM D 698 Tests (Standard Proctor). Density tests shall be taken at various depths in the trench. All costs associated with testing shall be the responsibility of the Contractor. Placement of courses of aggregate shall not proceed until density requirements have been met.

The first 500 feet of trench backfill operations shall be considered a test section for the Contractor to demonstrate his backfilling and compaction techniques. The Contractor shall notify the City at least 3 working days prior to beginning trench excavation and backfill operations. The Contractor shall arrange for in-place density tests to be taken on the completed test section in accordance with the above requirements. No further trenching will be allowed until the specified density is achieved in the test section. Passing in-place density tests in the test section will not relieve the Contractor from achieving the specified densities throughout the project.

At locations where paved streets, roadway shoulders, driveways, or sidewalks will be constructed or reconstructed over the trench, the backfill shall be spread and compacted in layers to achieve specified density requirements throughout the trench depth, by means and methods as proposed by the Contractor.

7-09.3(15)A Ductile Iron Pipe

Revise the first paragraph of this section to read:

Long radius curves, either horizontal or vertical, may be laid with standard pipe lengths by deflecting the joints. If the pipe is shown curved on the Plans and no special fittings are shown, the Contractor can assume that the curves can be made by deflecting the joints

with standard lengths of pipe. If shorter lengths are required, the Plans will indicate maximum lengths that can be used. The amount of deflection at each pipe joint when pipe is laid on a horizontal or vertical curve shall not exceed one-half (1/2) of the manufacturer's printed recommended deflections. If the deflection required to maintain the line shown on the approved construction drawings exceeds 1/2 of the manufacturer's printed recommended deflection, then the contractor shall utilize fittings to maintain the approved line. Additional labor and materials will be at the developer's expense.

7-09.3(19)A Connections to Existing Mains

Delete the third paragraph of Section 7-09.3(19)A in its entirety.

Supplement this section with the following:

Requests for water line shutdowns and water taps shall utilize the City of Pasco Procedure for Scheduling Water Crews, Performing Taps, and Placing New Water Lines in Service. New water mains shall be tested, flushed, and disinfected per Section 7-09.3(23) and 7-09.3(24) with passing results, prior to making connection to existing main and being placed into operation.

No existing line valves shall be closed without permission by the City. In no case shall any existing water main valve be closed for a period of greater than eight (8) hours. Only City personnel or those authorized by the City may operate City valves.

The anticipated schedule for the connections shall be discussed and scheduled at the preconstruction conference, and indicated on the weekly schedule. The City reserves the right to adjust the schedule of the connections, as required, subject to a minimum of 24-hour notice of schedule change to the Contractor. No connections will be scheduled for the first working day after a weekend or holiday.

Deleted:

Revise the title of Section 7-09.3(20) to read:

7-09.3(20) Detectable Marking Tape and Tracer Wire

Delete this section and replace it with the following:

Detectable marking tape and tracer wire shall be installed over all water lines, including service lines. The tape shall be placed approximately 2-feet above the top of the line and shall extend its full length. Care must be taken to ensure that the marking tape shall be continuous and unbroken during the backfill process. The tracer wire shall be fastened to the top of the pipe with duct tape at 6-foot intervals and shall be routed up into valve boxes with adequate length for connection to location equipment.

7-09.3(21) Concrete Thrust Blocking

Supplement this section with the following:

Thrust blocks shall be formed and placed in conformance with the City of Pasco Standard Details for the appropriate pipe size and fitting type.

Mechanically restrained pipe and fittings may be used in lieu of thrust blocking. The Engineer shall provide appropriate restraint calculations, indicating the length of pipe and fittings to be restrained for each particular diameter and type of fitting to be installed. Thrust

restraint calculators such as those provided by Ductile Iron Pipe Research Association, EBAA Iron, or similar may be used to determine required restraint lengths.

7-09.3(22) Blow-off Assemblies

Supplement this section with the following:

All permanent dead-end lines must end with a blow-off, unless there is a hydrant connection within the last 30 feet of the water main.

7-09.3(23) Hydrostatic Pressure Test

Delete this section and replace it with the following:

Water main appurtenances and service connections to the meter setter shall be tested in sections of convenient length under a hydrostatic pressure equal to 150-psi. Pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished and operated by the Contractor.

Sections to be tested shall normally be limited to 1,500 feet. The Engineer may require that the first section of pipe, not less than 1,000 feet in length, installed by each of the Contractor's crews, be tested in order to qualify the crew and the materials. Pipe laying shall not be continued more than an additional 1,000 feet until the first section has been tested successfully.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. Mechanical restraints and/or thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Contractor shall furnish and install temporary blocking and remove it after testing.

The mains shall be filled with water and allowed to stand under pressure a sufficient length of time to allow the escape of air and allow the lining of the pipe to absorb water. The Contracting Agency will furnish at the developer's expense the water necessary to fill the pipelines for testing purposes at a time of day when sufficient quantities of water are available for normal system operation.

The test shall be accomplished by pumping the main up to the required pressure and stopping the pump and holding pressure for one (1) hour. During the test, the section being tested shall be observed to detect any visible leakage.

There shall not be a loss in pressure during the one-hour test period.

Pressure gauges used in the test shall be in good working condition and have a zero-pressure reading prior to use. Erroneous or damaged gauges may be rejected at the discretion of the Engineer and shall be replaced with new gauges at the Contractor's expense.

Tests shall be made with the hydrant auxiliary gate valves open and pressure against the hydrant valve. Each valve shall be tested by closing each in turn and relieving the pressure beyond. This test of the valve will be acceptable if there is no immediate loss of pressure on the gauge when the pressure comes against the valve being checked. The Contractor

Deleted: Any visible leakage detected shall be corrected by the Contractor. Should the tested section fail to meet the pressure test successfully as specified, the Contractor shall, at no additional expense to the Contracting Agency, locate and repair the defects and then retest the pipeline.¶

shall verify that the pressure differential across the valve does not exceed the rated working pressure of the valve.

Prior to calling out the Engineer to witness the pressure test, the Contractor shall have all equipment set up completely ready for operation and shall have successfully performed the test to ensure that the pipe is in satisfactory condition.

Defective materials or workmanship, discovered as a result of hydrostatic field test, shall be replaced for subsequent testing. Whenever it is necessary to replace defective material or correct the workmanship, the hydrostatic test shall be re-run until a satisfactory test is obtained.

Deleted: by the Contractor at no expense to the Contracting Agency...

Deleted: at the Contractor's expense

7-09.3(24) Disinfection of Water Mains

Supplement this section with the following:

AWWA Standard C651 shall be used as a guideline for disinfecting water mains.

7-09.3(24)J Preventing Reverse Flow

Supplement this section with the following:

All water lines shall be pressure tested and sanitized with a satisfactory report received from the Benton Franklin Health District prior to the backflow assembly installation. Backflow preventers shall NOT be pressure tested against.

Deleted: Washington State Department of Health

7-09.3(24)K Retention Period

Revise this section to read:

Treated water shall be retained in the pipe at least 24 hours but not more than 28 hours. After the 24-hour period, the chlorine residual at pipe extremities and at other representative points shall be at least 25 mg/l.

7-12 VALVES FOR WATER MAINS

7-12.2 Materials

Supplement this section with the following:

Gate Valves: All valves sizes 2-inch through 10-inch shall be resilient wedge gate valves with ductile iron bodies and shall conform to the latest revision of AWWA Resilient Seated Gate Valves Standard C515 or AWWA C509.

Deleted: and

Deleted: 104

All gate valves shall have non-rising stems, open counterclockwise, and shall be provided with a 2-inch square AWWA operating nut.

Butterfly Valves: All valves sizes 12 inches and larger shall be butterfly valves suitable for direct burial and shall be rubber seated and conform to the latest revision of AWWA Standard C504 Class 150B. All valves shall open counterclockwise and shall be provided with a 2-inch square AWWA operating nut.

Deleted: and C104

Valves shall be of the same size as the line on which they are located.

Tapping Sleeve and Valve Assemblies: Tapping sleeves shall be full circle stainless steel with ductile iron flanged outlet, conforming to the latest AWWA Standard C223. Tapping gate valves shall meet the requirements for Gate Valves in Section 7-12.2. The following stainless steel tapping sleeves are approved for use: Ford FAST style, Romac model SST, and Smith-Blair.

Valve Boxes: Valve boxes shall be two-piece adjustable, Olympic Foundry model 931.

Combination Air Release/Air Vacuum Valves: Valves shall meet the requirements of C512 and shall be APCO 140 Series or Val-Matic VM-200 Series.

Deleted: 146

7-12.3 Construction Requirements

Supplement this section with the following:

Tapping Sleeve and Valve Assemblies: City of Pasco Public Works will perform all taps for tapping sleeve and valve assemblies up to 12-inch diameter, sleeve and valve to be installed by the Contractor. For taps greater than 12-inch diameter, the Contractor or Subcontractor completing the work shall have at least five (5) years' experience with a minimum of ten (10) water main taps of pipes with diameters equal to or larger than that specified. Contractor shall notify City at least 72 hours prior to proposed taps and provide work experience references if requested. Work to complete the tap shall not commence without City's written approval. If the Contractor or Subcontractor does not have sufficient experience in the sole opinion of the City, a qualified Subcontractor as approved by the City, shall be used to complete the tap at no cost to the City.

Valves: Upon completion of all work, the Developer/Contractor shall contact the City of Pasco Public Works for opening water valves. Valves shall only be operated by City Public Works staff.

Valves shall not be installed in Sidewalks, Pedestrian Curb Ramps, Driveway Approaches or any other exposed concrete surface.

Valve Boxes: Valve boxes should be set to position during backfilling operations so they will be in a vertically centered alignment to the valve operating stem. The top of the box will be at final grade.

The Contractor shall adjust all water valve boxes to the final grade of the surrounding area including new concrete sidewalk, asphalt paving, gravel surfacing, or topsoil surfacing, in accordance with the details shown on the Drawings.

The Contractor shall keep the valve boxes free from debris caused by the construction activities. All valve boxes will be inspected during final walk-thru to verify that the valve box is plumb and that the valve wrench can be placed on the operating nut. Misaligned valve boxes shall be excavated, plumbed, and backfilled at the Contractor's expense.

7-14 HYDRANTS

7-14.2 Materials

Supplement this section with the following:

All hydrants shall be dry-barrel, compression type, with a Main Valve Opening (MVO) of 5-1/4" and suitable for working pressures up to 150 psi meeting the requirements of C502. Hydrants shall have a 1-1/2" pentagon operating nut, opening left. All hydrants shall include a 5"x4-1/2" NH connector and cap, Storz HPHA50-45NH and HBC-50. Threads on all ports shall be National Standard Thread.

Approved manufacturers include Mueller (Centurion), Clow (Medallion), and Waterous (Pacer WB-67).

7-14.3(1) Setting Hydrants

Delete the first and second paragraphs and replace with the following:

The hydrant shoe shall be set to the correct elevation on a concrete block base, which has been placed on undisturbed earth. Around the base of the hydrant and weep hole, the Contractor shall place washed drain rock, to allow free drainage of the hydrant. The drain rock shall be completely surrounded with construction geotextile filter fabric.

The contractor shall set all hydrants plumb and nozzles parallel with, or at right angles to, the curb, with the pumper nozzle facing the curb. Hydrants shall be set so that the flange is 2"-8" above the back of curb, sidewalk, or finished grade to clear nuts and bolts. Hydrants shall be ordered with the bury depth required to meet the flange elevation requirements. The Contractor shall be responsible for verifying the hydrant flange elevations and no extensions will be allowed.

Fire hydrants shall be painted with two coats of high visibility yellow paint.

Fire hydrants shall be located 1-foot behind the back of sidewalk to the face of hydrant where the sidewalk is adjacent to the curb and 7-feet behind the back of curb where the sidewalk is not adjacent to the curb. Hydrants adjacent to roadside swales shall be located 1-foot behind the swale on the property line side.

No bends are allowed in fire hydrant runs. If a bend cannot be avoided, the elbow fittings shall be mechanically restrained with EBAA Megalugs or approved equal.

Hydrants installed outside of paved areas where there will not be maintained landscaping shall install a 4' x 4' concrete pad around the hydrant.

7-14.3(2) Hydrant Connections

Replace this section with the following:

Fire hydrants located within 50 feet of the water main shall be a minimum diameter of 6 inches. Hydrants beyond 50 feet of the water main shall be a minimum diameter of 8 inches, or larger as necessary to achieve required fire flows. Each hydrant lateral shall include an isolation valve at the water main connection point. The valve size shall equal the hydrant lateral diameter and shall be of the type specified in Section 7-12.2. Where

Deleted: Hydrant runs of less than 50 feet shall be connected to the main with 6-inch minimum diameter water main. ...

~~hydrant runs are in excess of 6 inches in diameter, an additional 6-inch auxiliary gate valve shall be installed just prior to the hydrant installation.~~

Deleted: an auxiliary gate valve and valve box.

7-14.3(2)A Hydrant Restraints

Replace this section with the following:

All hydrants shall be securely connected to the water main as shown on the City's Standard Detail, and each joint shall be mechanically restrained.

7-14.3(2)C Hydrant Guard Posts

Replace this section with the following:

The City Engineer may determine that four (4) 6-inch diameter Sch. 40 steel guard posts shall be installed at a hydrant location. Hydrant guard posts shall be painted the same color as the hydrants.

7-15 SERVICE CONNECTIONS

7-15.1 Description

Replace this section with the following:

~~All new water service lines shall be a minimum of 1-inch, for 3/4- and 1-inch meters, and shall be a minimum of 2-inch, for 1 1/2- and 2-inch meters,~~ and shall conform to the City Standard Detail. The Developer/Contractor shall furnish and install all water service components (except hot tap and water meter) from the water main to the property line including service saddle, corporation stop, service pipe, meter stop, meter check valve, customer piping, and meter box, all at the Developer's expense. Only one meter shall be served from each main tap. All service hot taps shall be made by the City of Pasco Public Works Crews.

Deleted: All new water service lines shall be a minimum of 1-inch, for 3/4- and 1-inch meters

7-15.2 Materials

Supplement this section with the following:

All fittings shall be lead free.

Service Saddles: New service saddles less than 12" diameter shall meet the requirements of AWWA C800 and have CC threads. Approved manufacturers include Romac (202S, 101S), Mueller DS2S, McDonald (384x, 382x), and Smith-Blair (315, 317). New service saddles 12" and larger shall meet the requirements of AWWA C800 and have CC threads. Approved manufacturers include Romac (305, 306).

Corporation Stops: New 1" corporation stops shall be Ford FB1000, Mueller B-25008N, B-20013N, or McDonald 74701B. New 2" corporation stops shall be Ford FB400(CC), FB500(IP), Mueller B-2996N(CC), H-2969(IP), or McDonald 74701B .

Service Pipe: New service pipe shall be copper per Section 9-30.6(3)A. Approved service pipe manufacturers include Cerro, Muller, and Cambridge Lee.

Service Pipe Fittings: New copper to copper fittings shall be compression type Ford C-44, Mueller H-15403, and McDonald 4758-22. Grip fittings are not acceptable.

Locating Wire: Locate wire shall meet the requirements of Section 7-09.3(12)A and be continuous from the water main to the meter box. Locating wire shall be 12-gauge heavy insulated (60 mil) copper wire with UF insulation colored for the utility being installed in accordance with Section 9-15.18. Direct bury splice kits shall be 3M DBY-6.

Angle Meter Valve: New 1" compression valve shall be Ford BA43, Mueller B-24258N, or McDonald 74602B. New 2" threaded valves shall be Ford BFA13, Mueller B-24286N, or McDonald 74604B. ~~All angle meter valves shall be quarter turn.~~

Deleted: Meter

Meter: New 3/4" to 2" meters shall meet the requirements of AWWA C700. Approved meters shall be any of the following: Badger (LP35, LP55, LP120), Neptune (T-10, Tru/Flo), and Sensus (SR11, SRH).

Meter Check Valve: New 1" compression valve shall be Ford HA34, Mueller H-14269, ~~or A.Y. McDonald 702-4H-54~~. New 1-1/2" and 2" threaded valves shall be Ford HFA31, ~~Mueller H-14244, or A.Y. McDonald 712-7~~.

Deleted: or

Thread Sealant: Thread sealant shall be used on all threaded pipe fittings. Approved manufacturers include Spears Blue 75, Whitlam Blue Magic, and Teflon Tape.

Meter Boxes (3/4" to 2" meters): New meter boxes shall be Raven RMB 1324-18 or Carson HW Model 1324BCF-18 with 1324R reader lid (3/4" and 1" meters) and Raven RMB 1730-18 or Carson HW Model 1730BCF-18 with 1730R reader lid (1-1/2" and 2" meters).

Backflow Assembly Box (3/4" to 2"): New assembly box shall be Carson 1220 and 1324 (3/4" and 1") and Carson 1730 (1-1/4" to 2"), meeting inside dimension tolerances specified on Details.

Meter Vault (3" to 8" meters): New precast cement concrete vault shall be Oldcastle Precast or H2 Precast meeting inside dimension tolerances specified on Details and shall have diamond plate spring assisted cover with locking latch inside (~~332P for 2" to 3", 2-322P for 4" to 6", and 3-322P for 8" to 12", or H2 Precast equivalent~~).

Deleted: 332P cover

Backflow Assembly Vault: New precast cement concrete vault shall be Oldcastle Precast or H2 Precast meeting inside dimension tolerances specified on Details, and shall have diamond plate spring assisted cover with locking latch inside (332P for 2" to 3", 2-322P for 4" to 6", and 3-322P for 8" to 12", ~~or H2 Precast equivalent~~). Contractor/Developer shall provide to the City Inspector any factory tools, keys, or wrenches required to open vault lid.

Vault Ladder: Ladders installed in vaults shall include a Bilco LadderUp safety post, model LU-2, LU-3, or LU-4.

Pipe Bedding and Backfill: Pipe bedding and select backfill shall be utilized for trench backfill as directed by the City in accordance with Section 7-09.2 of the Special Provisions.

7-15.3 Construction Requirements

Supplement this section with the following:

The Contractor shall set the water meter box to the finished grade of the area, typically flush with the top back of sidewalk. The Contractor will be required to reset the meter box if it is not at finished grade at the completion of the project. The completed water service shall be tested at system operating pressure by the Contractor and must show no signs of leakage.

The location of water services at the property line or easement line shall be marked per the Standard Detail. Fiberglass markers may be proposed for approval consideration by the City Engineer.

The fresh concrete curb above all water service lines shall be stamped on the curb face with a 2" high "W".

Service saddle shall not be placed within one (1) foot of pipe joint, couplings, or other clamps without approval from the Engineer.

No joints are allowed between the corporation stop and the angle meter stop.

8-03 IRRIGATION SYSTEMS

Supplement this section with the City of Pasco Irrigation Standards.

8-03.2 Materials

Supplement this section with the following:

Pipe for main line approved for use shall be as follows:

Pipe for Main Line:

All irrigation pipelines under roadways shall meet the requirements of Section 9-30.1 (Ductile Iron) or Section 9-30.1(5)A (AWWA C900). Fittings shall be cast or ductile iron. All irrigation pipe shall be installed with a minimum cover of 30 inches, and pipe zone bedding and backfill per Section 7-09.2.

Supplement this section with the following:

Meter Angle Valve: New meter angle valve shall have **1" compression inlet x 1" outlet with female** iron pipe threads and padlock wings, Ford **BA41-444W-NL or BA41-444W-Q-NL**, A.Y. McDonald **74606B-22 or 74606BQ**, Mueller **P24274N or B24274N**.

Deleted: 3/4"x3/4" with
Deleted: BA11-333WNL or A.Y. McDonald 74604BF.

Irrigation Service Box: New irrigation service box shall be Carson L-1220-12 (green) with T-Cover 1220-4.

Isolation Valve (3/4" to 2"): New isolation valves shall be lead free curb stops. Approved valves shall be any of the following:

<i>Ford:</i>	<i>Mueller:</i>	<i>A. Y. McDonald:</i>
FIPxFIP	300 Ball Curb Stop	76101NL
B11-333-NL (3/4")		

- B11-44
- 4-NL (1")
- B11-666-NL (1-1/2")
- B11-777-NL (2")
- CTSxPEP
- B46-333-NL (3/4")
- B46-444-NL (1")
- B46-666-NL (1-1/2")
- B46-777-NL (2")

Backflow Assembly Isolation Valve Box: New valve box shall be Carson 708 TrussT (3" to 4") and Carson 910 Spec Grade (6" and larger).

Irrigation Spigot: New spigot shall be a bronze, THD, NRS gate valve, NIBCO Class 125 T113.

Backflow Assembly Above Ground Enclosure: Enclosures shall be provided for freeze protection. Acceptable enclosures include Aquashield, Watts Safe-T-Cover, and Hot Box (fiberglass, stainless steel, ornamental rock, and ornamental stump).

Tracer Wire: Tracer wire shall be 12-gauge heavy insulated (60 mil) copper wire with UF insulation colored for the utility being installed in accordance with Section 9-15.18. Direct bury splice kits shall be 3M DBY-6.

9-15 IRRIGATION SYSTEMS

Supplement this section with the City of Pasco Irrigation Standards.

9-15.18 Detectable Marking Tape

Revise this section to read:

Detectable marking tape shall consist of inert polyethylene plastic that is impervious to all known alkalis, acids, chemical reagents, and solvents likely to be encountered in the soil, with a metallic foil core to provide the most positive detection and pipeline location.

The tape shall be color coded and shall be imprinted continuously over its entire length in permanent black ink. The message shall convey the type of line buried below and shall also have the word "Caution" prominently shown. Color coding of the tape shall be as follows:

Utility	Tape Color
Water	Blue
Sewer	Green
Electrical	Red
Gas/Oil	Yellow
Telephone/CATV	Orange
Irrigation	Purple

Tape width and placement shall meet the requirements Sections 7-08.3(2)B Pipe Laying – General.

CHAPTER 6 - SANITARY SEWER SYSTEM IMPROVEMENTS

GENERAL REQUIREMENTS FOR SANITARY SEWER SYSTEM IMPROVEMENTS

All extensions and additions to the City's sanitary sewer system shall conform to the Design and Construction Standards of the City of Pasco, the Washington State Department of Ecology, and designed by a Civil Engineer currently licensed by the State of Washington.

All sanitary sewer improvements shall be designed in accordance with the Washington state Department of Ecology's Criteria for Sewage Works Design (Orange Book).

All new lots and developments shall be served by a public sanitary sewer line adjacent to the lot or development site.

Sewer lines shall be extended by the Developer to the point where the adjoining property owner's responsibility for further extension begins. This typically requires an extension across the entire frontage of the property to the property line of the adjoining owner. In some cases, it will require dedication of an easement and a line extension across the property or extension across two or more sides of the developing property. Extensions will be consistent with and implement the City's adopted General Sewer Plan, including alignments, sizes, and depths necessary to serve future areas within the Urban Growth Area (UGA) boundary.

Sewer lines shall be located in streets to serve abutting properties. Lines located in streets will be offset from the street centerline and not located within a vehicle wheel path. When necessary, sewer lines may be located within public easements, see CHAPTER 1, Section 11. Sewer lines located in easements shall generally be located in the center of the easement, but may, with the approval of the City Engineer, be offset to accommodate the installation of other utilities or to satisfy special circumstances.

The minimum size for public sewer lines is eight (8) inches in diameter. The developer's sewer system must provide capacity for the proposed development but must also provide capacity for future extensions consistent with the General Sewer Plan.

Manholes shall be installed at intervals of no greater than 400 feet and at all vertical and horizontal angle points in the sewer main. Curved or deflected pipelines will not be permitted. Sewer lines shall be terminated with a manhole. In special circumstances, a flush-end (cleanout) may be installed on the end of a sewer main extension, provided the end is no further than 150 feet from the last manhole and the sewer main line and grade will permit further extension.

Sewer mains generally should not exceed a slope of 5%, unless site constraints require steeper slopes. Should the sewer main slope exceed 5%, the Developer's Engineer shall provide calculations to determine if energy dissipaters and/or pipe restraints are necessary. The City Engineer will make the final determination if dissipaters and restraints are required. Sewer mains with a slope of 20% or greater shall be secured with concrete anchors, with spacing requirements determined by the City Engineer.

All new sewer line installations shall be satisfactorily tested and inspected per Section 7-17 prior to being placed into service including low pressure air and deflection testing, and television inspection, all at the expense of the Developer.

Each building containing sanitary sewer facilities shall be served by a separate private side sewer line. Branched side sewers serving multiple buildings and properties shall not be permitted. A single side sewer serving multi-unit buildings is permitted.

Sewer services to residential single-family lots shall be 4-inch diameter, and commercial properties shall be a minimum of 6-inch diameter.

Side sewers services shall be installed in accordance with these Construction Standards and as shown on the City Standard Details. Water service and side sewer service lines shall not be laid in the same trench, except if approved materials (those listed in Section 7-17.2 of the *Standard Specifications for Road, Bridge, and Municipal Construction*) are used and the following requirements are met:

1. The bottom of the water pipe shall not be less than 12 inches above the top of the sewer or drain line.
2. The water pipe shall be placed on a solid shelf excavated at one side of the common trench with a clear horizontal distance of not less than 12 inches from the sewer or drain line.

Side sewers shall extend 10-feet beyond the right-of-way and the pipe end shall be capped and marked for future connection. Services shall be located a minimum of 10-feet from water services and on the low side of the lot.

Sewer lines shall be designed for gravity flow operation and in accordance with the General Sewer Plan.

Sewer force mains may be necessary in specific City locations as determined by the City Engineer. Lift stations and force mains shall be limited to those locations and circumstances where they are consistent with the General Sewer Plan and are the only viable solution to serve the proposed development and other properties in the vicinity. Lift stations and force mains shall be designed by a Professional Civil Engineer licensed in the State of Washington in accordance with the direction and requirements given by the City Engineer, for review and approval by the City of Pasco Public Works Director and City Engineer. Hydraulic analysis including modeling shall be performed by the Developer's Civil Engineer as determined necessary by the City Engineer.

The design of sewer lines and appurtenances is subject to review and approval by the City Engineer. The City Engineer may, at his discretion, adjust these Design and Construction Standards as necessary to facilitate installation of sewer lines and appurtenances for the health, safety, and protection of the general public.

SPECIAL PROVISIONS FOR SANITARY SEWER SYSTEM IMPROVEMENTS

The following sections of the WSDOT Standard Specifications have been amended or supplemented as described below and apply to the construction of public works sewer system improvements within the City of Pasco.

7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS

7-05.2 Materials

Supplement this section with the following:

Manholes: Sanitary sewer manholes shall be constructed of 48-inch or larger diameter reinforced precast concrete manhole sections in conformance with the requirements of this Section. The base and first barrel section shall be precast monolithically with

preformed channels. Manholes shall have a minimum depth of six (6) feet and include an eccentric cone section with 24" opening.

A-Lok boot connectors or approved equal shall be provided for all inlets and outlets.

Joints in the manhole sections shall be watertight complying with ASTM C443 (confined groove joint) or ASTM C990 (tongue and groove joint).

Adjustment Rings: Manhole adjustment rings shall be precast concrete. Approved manufacturers include RADA, Inc., Reese Concrete, and Wilbert Precast, Inc.

Frames and Covers: Frames and covers shall be class 30 cast iron meeting the requirements of ASTM A48. 24" round covers shall read "SEWER" and "CITY OF PASCO" embossed in top (2" raised letters), cover weight 150 lbs, frame weight 185 lbs. Approved manufacturers include East Jordan Iron Works (3705Z), D&L Foundry, Neenah Foundry, and Olympic Foundry. When required by the City, locking covers shall be provided as manufactured by East Jordan Iron Works (3704C) and D&L Foundry.

Mortar/Grout: Approved manufacturers include American All Patch 20, Jet Set Complete Repair, and Target expanding non-shrink.

7-05.3 Construction Requirements

Supplement this section with the following:

The design and construction of all manholes shall provide for a 0.10-foot vertical drop through the manhole.

7-05.3(1) Adjusting Manholes and Catch Basins to Grade

Delete and replace with the following:

Manholes, valve boxes, catch basins, and similar utility appurtenances and structures shall not be adjusted until the pavement is completed, at which time the center of each structure shall be relocated from references previously established by the Contractor. All existing manhole castings shall be replaced with new castings at time of adjustment.

The asphalt concrete pavement shall be cut and removed to a neat circle, the diameter as specified on the Standard Details. The frame shall be placed on cement concrete blocks or adjustment rings and brought up to the desired grade. The base materials shall be removed and Class 3000 cement concrete shall be placed to the depth specified on the Standard Detail.

On the following day, a tack coat of asphalt shall be applied to the concrete, the edges of the asphalt concrete pavement, and the outer edge of the casting. HMA CI. 3/8-Inch asphalt concrete shall then be placed and compacted with hand tampers and a patching roller.

The completed patch shall match the existing paved surface for texture, density, and uniformity of grade. The joint between the asphalt patch and the existing pavement shall then be sealed with emulsified asphalt and shall be immediately covered with dry paving sand before the tack has broken.

Utility appurtenances outside paved areas shall be adjusted to match the finish grade of the area surrounding the structure. The utility cover shall be cleaned of all concrete prior to acceptance.

7-05.3(2) Abandon Existing Manholes

Replace the entire section with the following:

Where shown on the Plans, existing sanitary sewer manholes shall be abandoned in place after the new sanitary sewer collection system is in place and all side sewers have been transferred to the new sanitary sewer pipeline.

At least the top three feet of each manhole, or the top conical section in precast concrete manholes, shall be removed, including the cast iron ring and cover and concrete pad, if any. Debris resulting from breaking of the upper portion of the manhole may be mixed with backfill subject to the approval of the City Engineer. Ring and cover shall become the property of the City and all other surplus material shall be disposed of by the Contractor.

The existing pipe openings shall be plugged watertight with Class 3000 concrete and the manhole bottom slabs shall be crushed to promote drainage. The remaining manhole structure shall be backfilled with granular material conforming to Section 9-03.9(3) Crushed Surfacing Base Course. Place backfill in uniform layers and compact to 95% maximum dry density, as determined by ASTM D 698 (Standard Proctor).

Excavations resulting from manhole abandonment shall be backfilled with suitable, job-excavated material to top of subgrade. Compact to 95% maximum dry density as determined by ASTM D 698 (Standard Proctor). Restore surface to the condition existing prior to excavation with native material, gravel surfacing, or asphalt concrete pavement, as shown for trench repair on the Plans.

7-17 SANITARY SEWERS

7-17.1 Description

Supplement this section with the following:

The term "sewer(s)" and "sanitary sewer(s)" shall mean the same.

7-17.2 Materials

Supplement this section with the following:

Pipe approved for use shall be as follows:

PVC Sanitary Sewer Pipe (Gravity): Polyvinyl Chloride Pipe with flexible gasketed joints (Ring-Tite) shall conform to the requirements of Section 9-05.12(1) of the Standard Specifications (ASTM D3034, SDR 35 for pipe sizes up to 15 inches in diameter, and SDR 26 for all sewer pipe with any portion of the sewer main greater than 12 feet of cover). When restrained pipe is required, Certa-Lok restraints shall be used.

PVC fittings for PVC sewer pipe such as tees, wyes, elbows, plugs, caps, etc., shall be flexible gasket joint fittings acceptable for use and connection to PVC sewer pipe.

Transition Coupling: Couplings shall be longitudinally bolted with gasketed joints. Approved manufacturers include Romac, Dresser, Rockwell, Ford, and Smith-Blair.

Detectable Marker Tape: Marker tape shall be a detectable type and shall be marked "SEWER," and shall conform to Section 9-15.18 of the Standard Specifications.

7-17.3 Construction Requirements

Supplement this section with the following:

Sanitary sewer mains shall be at least 8" in diameter. All dead-end runs longer than 200 feet shall terminate in a sanitary sewer manhole. Dead-end runs less than 200 feet long may terminate with a clean out.

7-17.3(1) Protection of Existing Sewerage Facilities

Supplement this section with the following:

When connecting to an existing sewer, the downstream system shall be protected from construction debris by placing a 90 degree, SRECO, UEMSI or equal "stove pipe" sand trap, the same size as the sewer main line, in the first existing manhole downstream of the connection. It shall be the Contractor's responsibility to maintain this trap until the new system is placed in service and then to remove it. Any construction debris, excavation or backfill material which enters the existing downstream system shall be removed. When the first manhole is set, the outlet shall be plugged until the entire system is accepted by the Engineer.

7-17.3(2) Cleaning and Testing

7-17.3(2)A General

Delete the first paragraph and replace it with the following:

All sewer pipes and appurtenances shall be cleaned, and low-pressure air tested after backfilling. Both infiltration (if applicable) and exfiltration testing of the gravity sewer pipeline will be required. Deflection testing of the pipeline may be required should video inspection review identify any irregularities or concerns at the discretion of the City Engineer.

All testing shall be performed by the Contractor and witnessed by the City.

Supplement this section with the following:

Contractor shall keep the pipeline clean and free of debris. The pipeline shall be cleaned prior to the contractor requesting inspections.

7-17.3(2)H Television Inspection

Delete the first paragraph and replace it with the following:

The costs incurred in making the initial inspection shall be borne by the Contractor.

Supplement this section with the following:

All recordings shall be in color and in DVD format, playable on standard DVD players. Television inspection shall begin at the downstream manhole and end at the next upstream manhole. The camera speed shall not exceed one-half (1/2) foot per second. A pivot head camera shall be used with detailed inspection of all laterals showing the entire lateral with a 360-degree pan around the opening. Panning of each lateral shall be a minimum of 15 seconds.

The Contractor shall add colored dye that contrasts with the pipe color and clean water to the cleaned sewer line before Television inspection. The recording shall be free from static and a minimum distance of 10 feet shall be clearly visible in front of the camera.

All recordings shall show on the screen the correct time and date of the inspection, the name of the camera operator, the manhole numbers being inspected, an accurate footage count, and all lateral locations using a 12-hour clock position.

All inspections shall be performed by Pipeline Assessment and Certification Program (PACP) trained personnel. The Contractor shall provide a copy of the inspection, with all appurtenant written logs, within 24 hours of the inspection.

[See Section 7-08.3\(2\)B for invert elevation confirmation and measuring device specifications.](#)

7-18 SIDE SEWERS

7-18.2 Materials

Supplement this section with the following:

Saddles: Side sewer saddles shall be Romac CB with a 3-1/2" stainless steel single strap. Saddles are limited to side sewer connections on existing sewer mains and shall have prior approval by City Engineer. CDF encasement shall be installed around tapping saddle and existing sewer main, such that all exposed sections of the sewer main are bedded full depth with CDF to minimize settling. Tapping sleeves for deep sewer service (greater than 12 feet) shall provide a flange for connection. Tapping Sleeves: Tapping sleeves shall be full circle stainless steel with ductile iron flanged outlet, conforming to the latest AWWA Standard C223. The following stainless-steel tapping sleeves are approved for use in deep side sewer applications: Ford FAST style, Romac model SST, and Smith-Blair.

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7-18.3 Construction Requirements

7-18.3(1) General

Supplement this section with the following:

Side sewers shall be a minimum of four (4) inches in diameter. Larger sizes, if required, will be approved by the City Engineer on a case-by-case basis.

The fresh concrete curb above all side sewer laterals shall be stamped on the curb face with a 2" high "S".

Deep side sewer outlets shall be installed consistent with Standard Detail SS-6.

7-18.3(5) End Pipe Marker

Revise this section to read:

The location of side sewer at the property line shall be marked per the Standard Detail. Fiberglass markers may be proposed for approval consideration by the City Engineer.

7-25 SEWER FORCE MAINS (NEW SECTION)

The following new section shall be added to the Standard Specifications:

7-25.1 Description

This work shall consist of constructing sewer force mains in accordance with the Plans and Standard Specifications.

7-25.2 Materials

Materials shall meet the requirements of section 7-09 Water Mains of the Standard Specifications except as follows:

Pipe for Main Line:

Polyvinyl Chloride (PVC) Pressure Pipe (4 inches and over): Polyvinyl Chloride (PVC) pipe shall conform to the requirements of Section 9-30.1(5)A of the Standard Specifications. Joints outside of casing shall be rubber gasket push-on type with thickened bell. Joints within casing shall be restrained using mechanical restraints, Field Lok gaskets, or approved equal.

Polyvinyl Chloride (PVC) Pressure Pipe: PVC pipe (over 12-inch diameter) shall conform to the requirements of AWWA C 905 DR 25. Fittings shall be mechanical joint and/or flanged in accordance with the Plans and Section 9-30.2(1) of the Standard Specifications.

Ductile Iron Pipe: Ductile iron pipe shall conform to the requirements of Section 9-05.13 of the Standard Specifications.

Polyethylene (PE) Pressure Pipe: PE pipe shall conform to the requirements of Section 9-30.2(10) of the Standard Specifications.

High Density Polyethylene Pipe (HDPE): HDPE pipe shall be extra high molecular weight, high density ethylene/hexane copolymer, PE 4710 polyethylene resin. The Standard Dimension Ratio shall be SDR 13.5 for pipe sizes 12-inch diameter and smaller.

Fittings for Main Lines:

Connection Couplings: Couplings for Ductile Iron or PVC pipe, either transition or straight couplings, shall be compression type flexible couplings conforming to Section 9-30.2(7) of the Standard Specifications.

Aggregates:

See Section 7-08.3 of these Specifications.

7-25.3 Construction Requirements

7-25.3(2) Pipe Installation

Sewer force main installation shall conform to the requirements of Section 7-08 General Pipe Installation Requirements of the Standard Specifications or as modified by these Special Provisions.

7-25.3(23) Hydrostatic Pressure Test

Testing shall be consistent with the water main hydrostatic pressure test standards and special provisions of Section 7-09.3(23).

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All sewer force mains shall be tested under a hydrostatic pressure of 150 psi for a fifteen (15) minute period. The Developer shall make all provisions for transporting water and filling the force main and shall be responsible for all costs. No leakage will be allowed during the test.¶

CHAPTER 7 - STORMWATER IMPROVEMENTS

GENERAL REQUIREMENTS FOR STORMWATER IMPROVEMENTS

All extensions and additions to the City of Pasco's storm sewer (storm drain) system shall conform to the Design and Construction Standards of the City of Pasco, the Washington State Department of Ecology, and designed by a Civil Engineer currently licensed by the State of Washington. Private systems, where required by applicable provisions of the Pasco Municipal Code, shall also comply with these requirements.

All stormwater and drainage improvements shall be planned, designed, permitted, constructed and maintained in accordance with the requirements of the latest edition of the Washington Department of Ecology (Ecology) *Stormwater Management Manual for Eastern Washington* (SWMMEW). The Technical Requirements outlined in Appendix 1 of the *Eastern Washington Phase II Municipal Stormwater Permit* shall apply to all new development and redevelopment sites.

All new storm drainage facilities, public or private, shall be designed by a Professional Engineer licensed in the State of Washington. Complete stormwater runoff and drainage facilities sizing calculations shall be submitted to the Engineering Division for review and comment. Storm sewer facilities and pipelines shall be designed to meet a minimum 25-year storm criteria, and both the 24-hour and short-duration storms shall be considered in the design.

All storm runoff occurring on all new lots and developments (private property) shall be retained and disposed of on-site. No private storm runoff will be permitted to enter public right-of-way or the public storm drainage system. The property owner shall maintain all stormwater Best Management Practices (BMPs) that are installed on private property.

Where existing stormwater from adjacent properties enters the proposed site, the Developer shall be responsible for including the additional stormwater in the proposed system including retention and treatment as applicable.

Storm runoff for new public streets shall be designed and constructed as required to the point where the adjoining property owner's responsibility for further extension begins. This typically requires an extension across the entire frontage of the property to the property line of the adjoining owner.

All storm sewer designs for new public streets shall be based upon an engineering analysis by the Developer's Consultant that considers total drainage areas, runoff rates, pipe and inlet capacities, treatment capacity, and any other factors pertinent to the design.

All illicit discharges as defined by the Washington State Department of Ecology are not permitted to enter any storm sewer system.

All subsurface infiltration facilities used for the treatment and disposal of stormwater shall meet the requirements of and be registered with the Ecology Underground Injection Control (UIC) program. Developer/Applicant must register UIC wells with Ecology in the applicant's name, 60 days prior to construction as required by Ecology. **The developer/applicant shall only submit the latest approved City of Pasco standards to Ecology. Attempts to gain approval for non-compliant infrastructure will result in the developer/applicant resubmitting the approved facilities at their expense and may result in delays.** Following construction completion and at the time of public improvements certification, the developer/applicant shall process an ownership transfer request with Ecology, to transition UIC ownership to the City of Pasco. ▼

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The SWMMEW requires that a water quality storm (6-month, 24-hour event) be treated as part of the stormwater system. Basins designed as infiltration facilities shall require a percolation test of the native soils to determine treatment ability. The SWMMEW and City of Pasco require a maximum infiltration rate of 9 inches per hour for soil treatment. In many cases, existing soil classifications provide much higher infiltration rates requiring amendments to drop this rate. The SWMMEW provides guidelines for producing an acceptable soil type to meet treatment criteria necessary to comply with State water quality standards. If the existing soil conditions have an infiltration rate higher than 9 inches per hour, then the soil does not meet the necessary treatment criteria and must be amended as outlined in the SWMMEW to create acceptable soil conditions.

Inlet spacing shall be designed in accordance with the WSDOT Hydraulics Manual, Chapter 5. Generally, inlet spacing shall not exceed 300 feet. There shall be a manhole or Type II catch basin installed at the intersection of two collector storm sewers. A collector storm sewer is a sewer servicing more than one catch basin. Stormwater flow shall be kept in the gutter and shall flow across intersections. Catch basin "bubble up" installations will not be permitted.

Catch basins and inlets shall be located at the ends of curb returns or at property lines between lots. Catch basins and inlets shall not be located within driveways, driveway transitions, or pedestrian ramps.

All public stormwater pipes or culverts shall be a minimum of 12 inches in diameter. Pipes shall have a minimum slope of 0.5% and be designed with a minimum velocity of 2-feet per second. Pipes shall be sized so that they do not surcharge under design storm conditions.

Manholes shall be installed at all vertical and horizontal angle points in the stormwater pipes, and at intervals of no greater than 400 feet. Curved or deflected pipelines will not be permitted. All stormwater manholes with solid lids shall have a channeled base and all catch basin manholes with grated lids shall have a sump.

A Storm Water Site Plan is required for any project subject to Core Elements #2, #3, #4, #5, #6, or #8 per Chapter 2 of the SWMMEW. Upon approval of the Storm Water Site Plan, a Storm Water Construction Permit shall be issued upon payment of the Storm Water Construction Permit Fee as provided in the City Fee Summary Ordinance 4309.

The applicant's project may require coverage under the Washington State General NPDES Permit for construction projects. The Developer shall be responsible for compliance with the State stormwater permit conditions and shall provide the City with a copy of the Ecology approved Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), or Erosivity Waiver Certification as applicable.

A temporary erosion and sedimentation control (TESC) plan shall be included with all plan submittals and should show how existing storm systems and adjacent properties will be protected from storm runoff.

For commercial and industrial sites, the Developer's Consultant shall provide both the total square footage of the entire property under review, and the total square footage of all impervious surfaces, including but not limited to; the proposed building, any concrete or asphalt paving, sidewalk, and roof surface, etc. Information shall be shown in a table on the cover sheet, or on the site plan sheet. This information is required of all new commercial development (or of any structure undergoing modification or addition).

DESIGN CRITERIA

The SWMMEW allows different methodologies to apply design storms to stormwater facility design. For purposes of consistency, specific design storm amounts of precipitation are provided below and summarized in Table 6-1. Precipitation amounts are taken from the figures and calculation methods provided in the SWMMEW. Once the rainfall amount is known, hydrographic methods are used to determine the rate and volume of runoff from the selected design storm, and to mathematically route a storm through proposed facilities. Hydrographic methods are discussed below along with their application to different design conditions in Pasco.

DESIGN STORMS

Design storms are used to establish the amount of precipitation to be used in calculating the runoff from a parcel or basin. Based on rainfall records and methods outlined in the SWMMEW, the storm events described below are applicable to Pasco. Note that all 24-hour storm precipitation amounts have been adjusted by a factor of 1.0 for use in the SCS Type IA storm for Eastern Washington Region 2.

Water Quality 3-Hour Storm – 0.26 inches of precipitation. This short-duration water quality storm event is intended to provide treatment for the “first flush” events and is representative of a summer thundershower. The “first flush” can be thought of as the first amount of water that enters the system during a storm, which typically contains the highest concentration of pollutants such as roadway grit, dust and oils.

Water Quality 24-Hour Storm – 0.53 inches of precipitation. This 24-hour water quality storm event is intended to provide treatment for the “first flush” events.

25-Year, 3-Hour Storm (Short-Duration Storm) – 0.92 inches of precipitation. This short-duration storm has a 25-year return frequency, or a 4 percent chance of occurring in any one year. This unique storm is representative of the summer thunderstorm where a significant amount of rainfall occurs over a 3-hour period and should generally be used for design of flow-based stormwater BMPs.

25-year, 24-Hour Storm (SCS Type IA Storm) – 1.6 inches of precipitation (uses 25-year, 24-hour storm intensity). This storm has a 25-year return frequency, or a 4 percent chance of occurring in any one year. Volume-based BMPs should generally be designed for this SCS Type IA storm. The intensity of this storm is lower since the rainfall occurs more slowly over an extended time within the 72-hour period. Therefore, the runoff rate is lower, but the volume is greater than the 3-hour storm.

The 25-year design storm warranting the largest storm sewer facility size shall be the controlling storm.

Storm Event	Precipitation (Inches)
6-Month, 3-Hour Storm Event	0.26
6-Month, 24-Hour Storm Event	0.53
2-Year, 24-Hour Storm Event	0.8
10-Year, 24-hour Storm Event	1.3
25-Year, 3-Hour Storm Event	0.92
25-Year, 24-Hour Storm Event	1.6
50-Year, 24-Hour Storm Event	1.8
100-Year, 24-Hour Storm Event	1.8

Source: *Stormwater Management Manual for Eastern Washington*, Ecology, Aug. 2019
 Note: 24-hour precipitation amounts have been adjusted for use in the SCS Type IA storm distribution.

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HYDROLOGIC ANALYSIS

Hydrologic analysis determines the amount of runoff from a given storm for a given drainage area. Available methods range from simple calculations such as the Rational Method to complex computer models, requiring significant data input and knowledge of hydrologic effects.

The following hydrographic methods are considered acceptable for the watersheds within Pasco and its urban growth area.

- The Santa Barbara Urban Hydrograph (SBUH) method may be used for all analyses regardless of the size of the drainage area. Input parameters shall be as described by Ecology or WSDOT for the design storms described above. Other computer models may also be used with prior approval by the City.
- For drainage areas less than or equal to 20 acres, the rational formula and modified rational method, as described in older WSDOT and Soil Conservation Service publications, may be used for flow-rate-based applications. Inputs shall be as described in those publications, or other engineering texts. The SCS Unit Hydrograph Method may also be used.
- For drainage areas greater than 20 acres, and when it is necessary to route flows through detention facilities, the SCS Unit Hydrograph Method may be used. Inputs shall be as described in WSDOT and Soil Conservation Service publications, or other engineering texts.

The SBUH method uses a hyetograph to depict the intensity (amount) of rainfall versus time. A hyetograph may also be required for routing design storms through some BMPs. Design storm hyetographs applicable to Pasco stormwater facilities are as follows:

- Water Quality Volume-Based Treatment BMPs – 24-hour SCS Type IA storm with a 6-month return frequency.

- Water Quality Flow-Rate-Based Treatment BMPs – 3-hour short-duration storm with a 6-month return frequency.
- Volume-Based BMPs – SCS Type IA Storm with a 25-year return frequency. Storm intensity is based on the 25-year, 24-hour storm event.
- Flow-Rate-Based BMPs – 3-hour short-duration storm with a 25-year return frequency as described in the SWMMEW.
- Critical facilities required to carry 50- and 100-year storms – 24-hour SCS Type II storm.

TREATMENT BMP SIZING

The City of Pasco is located in Ecology's Region 2 of Eastern Washington. Therefore, all calculations shall be based on Region 2 methods recommended in Ecology's SWMMEW for the sizing of stormwater BMPs. The following are design guidelines for volume-based treatment BMPs and flow-rate-based treatment BMPs.

Volume-based treatment BMPs are sized the same whether they are located upstream or downstream of a detention facility. The volume of runoff predicted for the proposed developed condition of a site will be calculated using the 24-hour SCS Type IA storm with a 6-month return frequency (the 0.53-inch water quality design storm). The BMP will be sized to treat this amount of water and will also be sized to pass the 25-year short-duration storm, either through or around the BMP, without damaging the BMP or dislodging pollutants from within it.

Flow-rate-based treatment BMPs are sized differently depending on whether they are located upstream or downstream from a detention facility. If the BMP is located upstream of a detention facility, or if there is no detention facility, the runoff flow rate predicted for the proposed developed condition of a site will be calculated using the 3-hour short-duration storm with a 6-month return frequency (the 0.26-inch water quality design storm). If the BMP is located downstream of a detention facility, it must be sized for the full 2-year release rate of the detention facility.

Stormwater and drainage design within the 200-foot shoreline buffer shall utilize the 24-hour SCS Type II storm with a return period of 100 years.

FLOW CONTROL

The criteria listed below shall apply to control stormwater runoff flow and the designated design storms shall apply:

- Flow-rate-based stormwater BMPs such as storm sewer facilities and pipelines shall be designed to carry at a minimum the 25-year, 3-hour short-duration design storm described in the SWMMEW (0.92 inches of precipitation). Depending on the size of the basin, time of concentration and infiltration rates, some infiltration facilities shall be designed using the 25-year, 24-hour storm (1.6 inches of precipitation, SCS Type IA). The 25-year design storm warranting the largest storm sewer facility size shall be the controlling storm. At the City's discretion, if the facilities are critical to public health and safety, or significant property damage could occur, they shall be designed to successfully pass the 50-year or 100-year storm. Storm runoff from any new construction will not be permitted to enter the City's existing storm sewer pipelines.

- Volume-based stormwater BMPs such as retention and detention basins shall be designed based on the 25-year, 24-hour storm (1.6 inches of precipitation, SCS Type IA). A secondary outlet or emergency spillway shall be provided to pass the 100-year, 24-hour storm (2.0 inches of precipitation, SCS Type II) without damage to the facility.

SPECIAL PROVISIONS FOR STORMWATER IMPROVEMENTS

The following sections of the WSDOT Standard Specifications have been amended or supplemented as described below and apply to the construction of public works storm sewer or drainage improvements within the City of Pasco.

7-02 CULVERTS

7-02.2 Materials

Add the following:

Culvert pipe approved for use on a City project shall be as follows:

Aluminum Culvert Pipe: Aluminum Culvert Pipe shall meet the requirements of Section 9-05.5 of the Standard Specifications.

Steel Culvert Pipe: Steel Culvert Pipe shall meet the requirements of Section 9-05.4 of the Standard Specifications.

Corrugated Polyethylene Culvert Pipe: Corrugated Polyethylene (CPE) pipe, couplings, and fittings shall meet the requirements of Section 9-05.19 of the Standard Specifications.

7-04 STORM SEWERS

7-04.1 Description

Supplement this section with the following:

The term "storm drain(s)" shall mean the same as storm sewer(s).

7-04.2 Materials

Supplement this section with the following:

The storm sewer (drain) pipe approved for use shall be as follows:

STORM DRAIN PIPE

Solid Wall PVC Storm Sewer Pipe
4"-15" PVC, ASTM D3034-SDR35
18"-27" PVC, ASTM F679

PVC Storm Sewer Pipe shall have Ring-Tite joints.

Where specified on the Plans, storm drain pipe shall be PVC pressure pipe conforming to the requirements of Section 9-30.1(5)A and Ductile Iron conforming to the requirements of Section 9-30.1(1).

UNDERDRAIN INFILTRATION SYSTEM MATERIALS

Pipe: Perforated Corrugated Polyethylene Underdrain pipe, couplings, and fittings shall comply with all the requirements of Section 9-05.2(8) of the Standard Specifications.

Drain Rock: Drain rock for use as backfill for the perforated underdrain pipe in the infiltration trench system shall be clean coarse aggregate conforming to the requirements of Gravel Backfill for Drywells, as specified in Section 9-03.12(5) of the Standard Specifications.

Construction Geotextile: Geotextile fabric for underground infiltration systems shall be non-woven fiber pore size 0-13mm, maximum water permeability 0.05 cm/sec, minimum grab strength 100 lbs, minimum fabric toughness 10,000 lbs, and meeting the requirements of ASTM D1682.

7-04.3(1) Cleaning and Testing

7-04.3(1)A General

Supplement this section with the following:

All storm piping, with the exception of infiltration trench perforated pipe, shall have television inspection. Cost of television inspection shall be included in the pipe installation cost.

All recordings shall be in color and in DVD format, playable on standard DVD players. Television inspection shall begin at the downstream structure and end at the next upstream structure. The camera speed shall not exceed one-half (1/2) foot per second. A pivot head camera shall be used with detailed inspection of all laterals showing the entire lateral with a 360-degree pan around the opening. Panning of each lateral shall be a minimum of 15 seconds.

The Contractor shall add colored dye that contrasts with the pipe color and clean water to the cleaned storm line before television inspection. The recording shall be free from static and a minimum distance of 10 feet shall be clearly visible in front of the camera.

All recordings shall show on the screen the correct time and date of the inspection, the name of the camera operator, the manhole numbers being inspected, an accurate footage count, and all lateral locations using a 12 hour clock position.

All inspections shall be performed by Pipeline Assessment and Certification Program (PACP) trained personnel. The Contractor shall provide a copy of the inspection, with all appurtenant written logs, within 24 hours of the inspection.

[See Section 7-08.3\(2\)B for invert elevation confirmation and measuring device specifications.](#)

7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS

7-05.2 Materials

Section 7-05.2 of the Standard Specifications shall be revised as follows:

Drain Rock: Backfill for drywells shall be Gravel Backfill for Drywells as specified in Section 9-03.12(5) of the Standard Specifications.

Precast Concrete Catch Basin: Catch basins shall be WSDOT Type 1, 1L, or 2 and constructed as shown on WSDOT Standard Plans.

Catch Basin Metal Castings: All frames and grates shall be capable of withstanding, with a reasonable margin of safety, a concentrated load of 20,000 pounds and shall be as specified in Section 9-05.15(2) of the Standard Specifications and WSDOT Standard Plan B-30.30 or B-30.40, or B-30.80 (circular for manholes). The grate shall be ductile iron and "bicycle safe." The contact surfaces of the frame and grate shall be machine finished to a common plane and shall be so cast as to prevent rocking.

Type 2 Catch Basin Frames and Covers: Frames and covers shall be class 30 cast iron meeting the requirements of ASTM A48. 24" round covers shall read "STORM" and "CITY OF PASCO" embossed in top (2" raised letters), cover weight 150 lbs, frame weight 185 lbs. Approved manufacturers include East Jordan Iron Works, D&L Foundry, and Olympic Foundry.

Precast Concrete Pretreatment Manhole: Stormwater pretreatment manholes shall be approved by the Washington State Department of Ecology (Ecology) with a General Use Level Designation (GULD), capable of 50% removal of fine (50 micron mean size) and 80% removal of coarse (125 micron mean size) total suspended solids (TSS) for influent concentrations greater than 100 mg/L, but less than 200 mg/L, as required by Ecology.

Pretreatment manholes shall be constructed of pre-cast concrete manhole sections, flat top slab, and adjustment sections (similar to WSDOT Catch Basin Type 2, Standard Plan B-10.20), with cast iron covers as described above. The pretreatment insert shall be constructed of fiberglass and/or steel materials that are corrosion resistant. Manhole safety steps shall be provided as shown on the Plans and the pretreatment insert shall act as a platform for maintenance purposes.

The pretreatment manhole shall be capable of handling the specified water quality flows and shall incorporate a bypass within the unit to handle the specified peak flows. The pretreatment manhole shall be capable of incorporating multiple inlets/outlets, with the inlet and outlet pipes at 90 degrees to each other. Access to pretreatment insert ports and openings for maintenance shall be achieved through the cast iron cover(s).

Catch Basin Oil/Water Separators: Oil/Water separators shall be installed in catch basins upstream of infiltration trenches. Approved manufacturers include Raven Products OWS-LP-4-15 BMP 12 R or Ground Water Rescue, Inc. "The Eliminator."

7-05.3 Construction Requirements

Delete the tenth paragraph of this section.

7-05.3(1) Adjusting Manholes and Catch Basins to Grade

Delete and replace with the following:

Manholes, valve boxes, catch basins, and similar utility appurtenances and structures shall not be adjusted until the pavement is completed, at which time the center of each structure shall be relocated from references previously established by the Contractor. All existing manhole castings shall be replaced with new castings at time of adjustment.

The asphalt concrete pavement shall be cut and removed to a neat circle, the diameter as specified on the Standard Details. The frame shall be placed on cement concrete blocks or adjustment rings and brought up to the desired grade. The base materials shall be removed, and Class 3000 cement concrete shall be placed to the depth specified on the Standard Detail.

On the following day, a tack coat of asphalt shall be applied to the concrete, the edges of the asphalt concrete pavement, and the outer edge of the casting. HMA CI. 3/8-Inch asphalt concrete shall then be placed and compacted with hand tampers and a patching roller.

The completed patch shall match the existing paved surface for texture, density, and uniformity of grade. The joint between the asphalt patch and the existing pavement shall then be sealed with emulsified asphalt and shall be immediately covered with dry paving sand before the tack has broken.

Utility appurtenances outside paved areas shall be adjusted to match the finish grade of the area surrounding the structure. The utility cover shall be cleaned of all concrete prior to acceptance.

7-05.3(3) Connection to Existing Manholes

Supplement this section with the following:

The Contractor shall be required to core drill into the structure, shape the channel to accommodate the new pipe, and grout the opening.

CHAPTER 8 - STREET IMPROVEMENTS

GENERAL REQUIREMENTS FOR STREET IMPROVEMENTS

All new street design and construction must conform to these Design and Construction Standards of the City of Pasco, the Manual on Uniform Traffic Control Devices, the Pasco Municipal Code, and the latest edition of the Standard Specifications.

STREET REQUIREMENTS

Arterial streets serve as the high-volume corridors that connect the major traffic generators and shall be designed to meet the minimum right-of-way and roadway dimensions as shown on the City Standard Details. Face of curb radii at intersections shall be a minimum of fifty (50) feet, or as approved by the City Engineer. Arterial streets shall be designed for a WB-50 vehicle and HS-25 loadings.

Collector streets shall be designed to meet the minimum right-of-way and roadway dimensions as shown on the City Standard Details. Face of curb radii at intersections shall be a minimum of thirty-five (35) feet, or as approved by the City Engineer. Collector streets shall be designed for a WB-50 vehicle and HS-25 loadings.

Local Access (Residential) streets shall be designed to meet the minimum right-of-way and roadway dimensions as shown on the City Standard Details. Face of curb radii at intersections shall be a minimum of twenty-five (25) feet, or as approved by the City Engineer.

The street centerline radius shall be designed to meet minimum standards for applicable design speeds as presented in the Policy on Geometric Design of Highways and Streets (Green Book) published by the American Association of State Highway and Transportation Officials, or as approved by the City Engineer.

The maximum length of a cul-de-sac street shall be 600 feet measured along the street centerline from the nearest street intersection to the throat of the cul-de-sac. Where it is not feasible to construct a cul-de-sac turnaround, the City may allow the use of an "L" or "Hammerhead" turnaround upon approval by the City Engineer and Fire Department. The cul-de-sac shall have a minimum right-of-way radius of 55 feet and a minimum driving radius of 50 feet, which may include depressed curb and six-inch thick concrete sidewalk.

A subdivision of 30 or more lots shall have two or more access points consistent with the International Fire Code. All street intersection angles shall not be less than 80 degrees, including private roads. Offset street intersections shall not be less than 200 feet for Arterial and Collector streets and 100 feet for Local Access streets. A tangent at least 200 feet long shall be introduced between reverse curves on Collectors and Arterials.

Street grades shall be kept to a maximum of six (6) percent for Arterials, eight (8) percent for Collectors, and ten (10) percent for Local Access streets, unless otherwise approved by the City Engineer. The minimum grade for all streets shall be five-tenths (0.5) percent. Vertical curves shall be designed when the profile point of intersection grade difference is greater than one (1) percent. AASHTO requirements for sight-distance shall apply.

Cement concrete barrier curb and gutter and sidewalks shall be installed along both sides of all new streets, or as approved by the City Engineer. Sidewalk widths shall be five (5) feet along Local Access streets and seven (7) feet along Arterial and Collector streets. Pedestrian ramps shall be designed to City Standard Details and shall meet ADA requirements. Crosswalks

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TRAFFIC STUDIES¶**

¶ In order to provide sufficient information to assess a development's impact on the transportation system and level of service, a traffic study may be required, prepared by the City, and/or its agents, at the Developer's expense. The City will provide to the Developer a scope and fee estimate for the traffic study on a project basis. If 100 or more peak hour trips are generated by the development, a traffic study is mandatory. If less than 100 peak hour trips, the City Engineer may require a traffic study to be completed on a project basis, at the Developer's expense. This decision will be based upon the size of the proposed development, existing roadway condition, existing and expected traffic volumes, trip distribution, accident history, property rezoning, truck traffic percentage, event-based traffic, expressed community concern, and other factors relating to transportation. The level of detail and scope of the traffic study may vary with the size, complexity, and location of the proposed development. A traffic study shall, at a minimum, be a thorough review of the immediate and long-range effects of the proposed development on the City's transportation system. ¶

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between pedestrian ramps shall be designed meet ADA requirements with cross slopes less than 2%.

Driveways shall be located on the lowest classification of roadway abutting the development. Driveway widths and locations are limited to one per lot or as approved by the City Engineer. A "Corner" lot driveway shall be located as far as possible from the street intersection. Driveway widths shall be as specified on the City Standard Details.

The sight distance triangle clearview shall remain clear of anything erected, placed, planted, or allowed to grow in such a manner as to materially impede vision between the heights of 2.5' and 10' above the intersection centerline elevation. At the discretion of the City Engineer, City infrastructure may be located within the clearview including but not limited to regulatory signage, illumination, and utility poles.

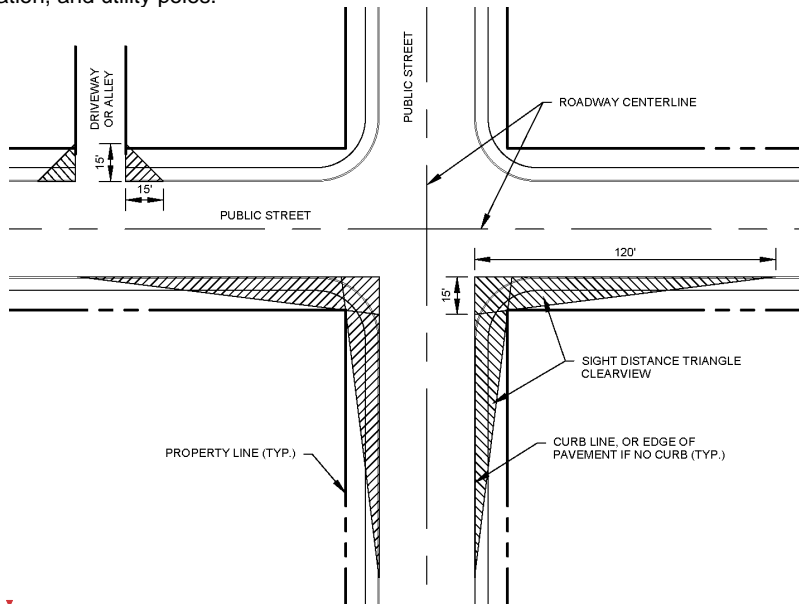


Figure 8.1 Sight Distance Triangle Clearview

Street lights shall be installed in accordance with Franklin PUD requirements and City Standard Details. Typical street light locations include intersections, outside of curves, and along straight roadway segments. Actual locations shall be approved by Franklin PUD.

In all new developments, monuments with cover caps and cases shall be installed at the centerline of street intersections, angle point and points of curves, and at other locations as determined by the City Engineer.

Traffic signs, posts, sleeves, pavement markings, and channelization devices shall be provided and installed by the developer in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD) and City Design and Construction Standards. Center line markings shall be installed on all paved arterials and collectors, and any lower classified roadways having an ADT of 6,000 vehicles per day or greater.

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Fencing, transformers, pedestals, and other above ground utilities shall not inhibit intersection sight triangles or access to any City utility.

The City Fire Chief may require an emergency vehicle access in addition to other access points. If required, the access shall be designed to meet the standards as approved by the Fire Chief.

ILLUMINATION REQUIREMENTS

Illumination may include roadways within a development and/or illumination as required as part of development frontage improvements. Existing lighting on public rights of way that does not currently meet these standards is required to be upgraded at the Developer's expense including relocation as applicable, in accordance to City Standards. The owner/developer is solely responsible for the design and installation of all lighting infrastructure required for said development.

Lighting analysis utilizing AGI software shall be completed by the Developer's Consultant for all new lighting installations or as deemed necessary by City staff. The analysis shall conform to IES RP-8-00 illuminance requirements shown below.

Illumination Requirements at Intersections Based on Pedestrian Classification

<u>City of Pasco Functional Classification</u>	<u>Average Maintained Illuminance (fc)</u>			<u>Uniformity (Avg/Min)</u>
	<u>Pedestrian Classification</u>			
	<u>High</u>	<u>Medium</u>	<u>Low</u>	
<u>Principal Arterial/Principal Arterial</u>	<u>3.4</u>	<u>2.6</u>	<u>1.8</u>	<u>3:1</u>
<u>Principal Arterial/Minor Arterial</u>	<u>2.9</u>	<u>2.2</u>	<u>1.5</u>	<u>3:1</u>
<u>Principal Arterial/Collector</u>	<u>2.6</u>	<u>2.0</u>	<u>1.3</u>	<u>3:1</u>
<u>Minor Arterial/Minor Arterial</u>	<u>2.4</u>	<u>1.8</u>	<u>1.2</u>	<u>4:1</u>
<u>Minor Arterial/Collector</u>	<u>2.1</u>	<u>1.6</u>	<u>1.0</u>	<u>4:1</u>
<u>Collector/Collector</u>	<u>1.8</u>	<u>1.4</u>	<u>0.8</u>	<u>6:1</u>

Illumination Requirements on Roadways

<u>City of Pasco Functional Classification</u>	<u>Average Maintained Illuminance (fc)</u>	<u>Uniformity (Avg/Min)</u>
<u>Principal Arterial</u>	<u>1.3</u>	<u>3:1</u>
<u>Minor Arterial</u>	<u>0.9</u>	<u>4:1</u>
<u>Collector</u>	<u>0.7</u>	<u>6:1</u>

Per PUD Standard Drawing L-2, luminaires shall have a mounting height of 35 feet for arterial streets and 30 feet for residential (collector) streets. Luminaires shall be located a minimum of 2 feet and a maximum of 7.5 feet from the edge of curb. Street lights shall be spaced to meet illuminance requirements shown in the tables above, at a maximum spacing described in PUD Standard Drawing L-2.

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TRAFFIC STUDIES

Definition

Traffic Impact Analysis (TIA) - A traffic study shall, at a minimum, be a thorough review of the intermediate and long-range effects of the proposed development on the City's transportation system and may result in mitigation of those resulting impacts. A TIA is independent from a Traffic Impact Fee, and all mitigation identified in the TIA is in addition to a Traffic Impact Fee.

Procedure

For consistency and adequacy in assessing a development's impact on the transportation system, it is the City's preference the TIA will be performed by the City of Pasco, and/or its agents, but will be done at the Developer's expense. However, the following options are available to the developer, and a selection must be made at the time of application, and cannot be changed once selected:

1. The City and/or its agents will perform the TIA, at the Developer's expense, selecting the appropriate scope, as well as the level of complexity (ie. Tier 1 or Tier 2) and provide the analysis to the developer without further consideration. If the Developer wishes, the City will provide the developer a scope and fee estimate to complete the effort prior to commencing work as it is the City's intent to be as transparent as possible through this process. It is important to understand that if the TIA is being prepared for a plat application, a SEPA determination, accompanied by the City accepted preliminary plat, must be submitted for developing a scope and fee. The TIA scope and fee will be amended each time the plat is modified, and the City is interested in keeping the costs down for the Developer.
2. The Developer may provide a TIA prepared by a licensed Traffic Engineer for the City's review (including City's traffic engineering consultant), all at the Developer's sole expense. Any and all clarifications or modifications to the TIA resulting from the City's review, including work resulting from deeming the TIA incomplete or insufficient, shall be the Developer's sole financial responsibility.

Characteristics

If 25 or more peak hour trips are generated by the development, a traffic impact analysis is mandatory. If less than 25 peak hour trips are generated by the development, the City Engineer may require a TIA to be completed on a project basis, at the Developer's expense. This decision may be based upon the size of the proposed development, existing traffic/roadway conditions, existing and anticipated traffic volumes, trip distribution, accident history, property zoning, truck traffic percentage, event-based traffic, expressed community concern, and other factors relating to complexity, and location of proposed development.

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Transportation Impact Analysis Tiers

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TIER 1 - Tier 1 TIAs shall be performed for smaller developments where major impacts to the transportation system are not expected. Developments that generate fewer than 50 peak hour net new trips may be considered for Tier 1 TIAs depending on the context of the development location. At a minimum, the Tier 1 TIAs should include the following items:

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- Description of development (location, current and proposed land use and zoning) AM, PM, and Daily trip generation
 - Including calculations for removed trips, pass-by trips, internal trip capture, and diverted trips, if applicable
- Site plan review
 - Access locations
 - Bike/ped/vehicle circulation
 - Parking evaluation

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TIER 2 - Tier 2 TIAs shall be performed when the peak hour trip generation has 50 or more net new trips. Tier 2 TIAs should include everything for a Tier 1 TIA, plus the following items at a minimum:

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- Inventory of existing transportation network
 - Pedestrian, bicyclist, transit, and vehicular
- Trip distribution
- Surrounding area land uses and zoning
- Existing Conditions (counts collected within previous 12 months)
 - Peak hours analyzed should be determined on a project-to-project basis
- No Build Conditions (future year of opening)
 - Using background growth and background project trips
- Build Conditions (future year of opening)
- Mitigation Conditions (if necessary)
 - Off-site, such as proportionate share of infrastructure improvements
 - On-site, such as traffic management plan (TMP) or parking management plan (PMP)
- Safety analysis
 - Crash data for all study intersections from last 5 years
 - Discussion on crash trends, if any
 - Recommendations for safety improvements, if any

SPECIAL PROVISIONS FOR STREET IMPROVEMENTS

The following sections of the Standard Specifications have been amended or supplemented as described below.

2-01 CLEARING, GRUBBING, AND ROADSIDE CLEANUP

2-01.1 Description

Supplement this section with the following:

All work beyond the right-of-way line shall be coordinated with affected property owner(s) per Section 1-07.24 Rights of Way.

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 In order to provide sufficient information to assess a development's impact on the transportation system and level of service, a traffic study may be required, prepared by the City, and/or it's agents, at the Developer's expense. The City will provide to the Developer a scope and fee estimate for the traffic study on a project basis. If 100 or more peak hour trips are generated by the development, a traffic study is mandatory. If less than 100 peak hour trips, the City Engineer may require a traffic study to be completed on a project basis, at the Developer's expense. This decision will be based upon the size of the proposed development, existing roadway condition, existing and expected traffic volumes, trip distribution, accident history, property rezoning, truck traffic percentage, event-based traffic, expressed community concern, and other factors relating to transportation. The level of detail and scope of the traffic study may vary with the size, complexity, and location of the proposed development. A traffic study shall, at a minimum, be a thorough review of the immediate and long-range effects of the proposed development on the City's transportation system. ¶

The Contractor shall temporarily remove and later replace to its original condition or relocate nearby as directed, all mail boxes, small trees, shrubs, street signs and posts, culverts, irrigation facilities, concrete or rock walls, or other similar obstructions which lie in or near the line of work and are not intended for removal. Should any damage be incurred, the cost of replacement or repair shall be borne by the Contractor.

2-01.3(5) Fencing (New Section)

Add the following new section:

The Contractor shall carefully remove existing fencing located within or near the work, as required for construction. All fencing materials to be removed and reset shall be temporarily placed on the adjacent properties or stored as directed by the City. Fencing shall be reset along the property lines or as directed by the City. The removal and resetting of all fencing shall be done at the Contractor's expense.

2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

2-02.3 Construction Requirements

2-02.3(2) Removal of Bridges, Box Culverts, and Other Drainage Structures

Supplement this section with the following:

Where structures or installations of concrete, brick, blocks, etc., interfere with the construction, they shall be removed and any pipe openings shall be properly plugged watertight with Class 3000 concrete, or with mortar and masonry, blocks, or brick. The removal and plugging of pipes shall be considered as incidental to the construction.

Where the structures are removed, the voids shall be backfilled with suitable, job-excavated material and compacted, and such work shall be considered as incidental to the removal work. If the City determines the job-excavated material to be unsuitable for backfill, the Contractor shall place ballast or crushed surfacing material as directed by the City.

2-02.3(3) Removal of Pavement, Sidewalks, Curbs, and Gutters

Supplement this section with the following:

In those areas where asphalt pavement removal is required, the Contractor shall, prior to excavation, score the edge of the asphalt concrete pavement with an approved pavement cutter such as a concrete saw. During the course of the work, the Contractor shall take precautions to preserve the integrity of this neat, clean pavement edge. Should the pavement edge be damaged prior to asphalt concrete paving activities, the Contractor shall be required to trim the edge with an approved pavement cutter as directed by the City immediately prior to paving. Sidewalk and/or curb and gutter removal shall be from construction joint to joint. No partial sidewalk panels or curb and gutter sections will be allowed.

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2-03 ROADWAY EXCAVATION AND EMBANKMENT

2-03.1 Description

Supplement this section with the following:

Street excavation shall consist of removing the existing material of whatever nature encountered to the subgrade elevation and shaping the subgrade to conform to the cross-section shown on the Plans or as staked in the field.

Where directed by the Consultant, the Contractor shall excavate beyond the right-of-way in order to adequately slope adjacent properties.

The Contracting Agency will reference all known existing monuments or markers relating to subdivisions, plats, roads, street centerline intersections, etc. The Contractor shall take special care to protect these monuments or markers and also the reference points. In the event the Contractor is negligent in preserving such monuments and markers, the points will be reset by a licensed surveyor at the Contractor's expense.

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The Contractor shall use caution while performing roadway excavation. Heavy, rubber-tired equipment, particularly front end loaders, shall limit their travel over a single area as much as possible. Trucks shall observe a 10 mph speed limit when traveling over exposed subgrade areas. ¶

2-03.3 Construction Requirements

2-03.3(3) Excavation Below Subgrade

Supplement this section with the following:

At the direction of the Consultant, areas within the street subgrade which exhibit instability due to high moisture content shall be:

1. Aerated and allowed to dry,
2. Over-excavated and backfilled with ballast, or crushed surfacing base course. The contractor may be instructed to install construction geotextile for soil stabilization in the excavation,
3. Or a combination of any of the above.

2-03.3(14)D Compaction and Moisture Control Tests

Delete this section and replace it with the following:

Compaction shall be 95% of maximum density as determined by ASTM D 698 (Standard Proctor). The Contractor shall notify the City when ready for in-place subgrade density tests. Placement of courses of aggregate shall not proceed until density requirements are met. The Developer/Contractor shall be responsible for scheduling and paying for all testing. All costs associated with failed tests/testing shall be the responsibility of the Contractor.

If the product fails any test, the City Engineer will require additional testing to determine the extent of the failure and more frequent tests may be required on additional work. Testing shall be in accordance with Section 1-06.2(1).7

2-07 WATERING

2-07.1 Description

Supplement this section with the following:

The Contractor shall be solely responsible for dust control on the Developer's project and shall protect motoring public, adjacent homes and businesses, orchards, crops, and school yards from damage due to dust, by whatever means necessary. The Contractor shall be responsible for any claims for damages and shall protect the City, Franklin County, and Consultant from any and all such claims.

When directed by the City, the Contractor shall provide water for dust control within two hours of such order and have equipment and manpower available at all times including weekends and holidays to respond to orders for dust control measures. Should the Contractor fail to comply within two hours, the City may utilize its own staff at the prevailing Engineering Staff wage rate plus equipment rental charges, and/or contracted watering services. The Contractor will be responsible for reimbursement of all dust control costs including labor, equipment, water, and contractor costs. Subsequent building permits will not be processed until reimbursement is paid in total.

2-11 TRIMMING AND CLEANUP

2-11.3 Construction Requirements

Add the following to the first paragraph:

- 7. Restore all grass area affected by construction with sod and in accordance with the City of Pasco Construction Standards.
- 8. Restore all landscaping rock, mulch, and bark with the same materials as existed prior to construction.
- 9. Restore all shoulders, from edge of pavement to right of way line, with the same material as existed prior to construction, except that earth shoulders shall be restored with 2 inches of compacted crushed surface top course.
- 10. Restore the site and offsite areas damaged by the Work to their original condition or better and to the satisfaction of the Engineer and the adjoining homeowners.

4-04 BALLAST AND CRUSHED SURFACING

4-04.3 Construction Requirements

4-04.3(5) Shaping and Compaction

Supplement this section with the following:

The Contractor shall notify the City when he is ready for in-place ballast, base course, or top course density tests. Placement of successive courses of aggregate or asphalt concrete shall not proceed until density requirements are met. The Developer/Contractor shall be responsible for scheduling and paying for all testing. All costs associated with failed tests/testing shall be the responsibility of the Contractor.

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5-04 HOT MIX ASPHALT
(July 18, 2018 APWA GSP)

Delete Section 5-04 and amendments, Hot Mix Asphalt and replace it with the following:

5-04.1 Description

This Work shall consist of providing and placing one or more layers of plant-mixed hot mix asphalt (HMA) on a prepared foundation or base in accordance with these Specifications and the lines, grades, thicknesses, and typical cross-sections shown in the Plans. The manufacture of HMA may include warm mix asphalt (WMA) processes in accordance with these Specifications. WMA processes include organic additives, chemical additives, and foaming.

HMA shall be composed of asphalt binder and mineral materials as may be required, mixed in the proportions specified to provide a homogeneous, stable, and workable mixture.

5-04.2 Materials

Materials shall meet the requirements of the following sections:

Asphalt Binder	9-02.1(4)
Cationic Emulsified Asphalt	9-02.1(6)
Anti-Stripping Additive	9-02.4
HMA Additive	9-02.5
Aggregates	9-03.8
Recycled Asphalt Pavement	9-03.8(3)B
Mineral Filler	9-03.8(5)
Recycled Material	9-03.21
Portland Cement	9-01
Sand	9-03.1(2)
(As noted in 5-04.3(5)C for crack sealing)	
Joint Sealant	9-04.2
Foam Backer Rod	9-04.2(3)A

The Contractor may choose to utilize recycled asphalt pavement (RAP) in the production of HMA. The RAP may be from pavements removed under the Contract, if any, or pavement material from an existing stockpile.

The Contractor may use up to 20 percent RAP by total weight of HMA with no additional sampling or testing of the RAP. The RAP shall be sampled and tested at a frequency of one sample for every 1,000 tons produced and not less than ten samples per project. The asphalt content and gradation test data shall be reported to the Contracting Agency when submitting the mix design for approval on the QPL. The Contractor shall include the RAP as part of the mix design as defined in these Specifications.

The grade of asphalt binder shall be PG 64S-28. Blending of asphalt binder from different sources is not permitted.

The Contractor may only use warm mix asphalt (WMA) processes in the production of HMA with 20 percent or less RAP by total weight of HMA. The Contractor shall submit to the Engineer for approval the process that is proposed and how it will be used in the manufacture of HMA.

Production of aggregates shall comply with the requirements of Section 3-01.

Preparation of stockpile site, the stockpiling of aggregates, and the removal of aggregates from stockpiles shall comply with the requirements of Section 3-02.

5-04.2(1) How to Get an HMA Mix Design on the QPL

If the contractor wishes to submit a mix design for inclusion in the Qualified Products List (QPL), please follow the WSDOT process outlined in Standard Specification 5-04.2(1).

5-04.2(1)A Vacant

5-04.2(2) Mix Design – Obtaining Project Approval

No paving shall begin prior to the approval of the mix design by the Engineer.

Nonstatistical evaluation will be used for all HMA not designated as Commercial HMA in the contract documents.

Commercial evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores, pre-level, and pavement repair. Other nonstructural applications of HMA accepted by commercial evaluation shall be as approved by the Project Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Project Engineer. The Proposal quantity of HMA that is accepted by commercial evaluation will be excluded from the quantities used in the determination of nonstatistical evaluation.

Nonstatistical Mix Design. Fifteen days prior to the first day of paving the contractor shall provide one of the following mix design verification certifications for Contracting Agency review;

- The WSDOT Mix Design Evaluation Report from the current WSDOT QPL, or one of the mix design verification certifications listed below.
- The proposed HMA mix design on WSDOT Form 350-042 with the seal and certification (stamp & signature) of a valid licensed Washington State Professional Engineer.
- The Mix Design Report for the proposed HMA mix design developed by a qualified City or County laboratory that is within one year of the approval date.

The mix design shall be performed by a lab accredited by a national authority such as Laboratory Accreditation Bureau, L-A-B for Construction Materials Testing, The Construction Materials Engineering Council (CMEC's) ISO 17025 or AASHTO Accreditation Program (AAP) and shall supply evidence of participation in the AASHTO: resource proficiency sample program.

Mix designs for HMA accepted by Nonstatistical evaluation shall:

- Have the aggregate structure and asphalt binder content determined in accordance with WSDOT Standard Operating Procedure 732 and meet the requirements of Sections 9-03.8(2), except that Hamburg testing for ruts and stripping are at the discretion of the Engineer, and 9-03.8(6).
- Have anti-strip requirements, if any, for the proposed mix design determined in accordance with AASHTO T 283 or T 324 or based on historic anti-strip and aggregate source compatibility from previous WSDOT lab testing.

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At the discretion of the Engineer, agencies may accept verified mix designs older than 12 months from the original verification date with a certification from the Contractor that the materials and sources are the same as those shown on the original mix design.

Commercial Evaluation. Approval of a mix design for “Commercial Evaluation” will be based on a review of the Contractor’s submittal of WSDOT Form 350-042 (For commercial mixes, AASHTO T 324 evaluation is not required) or a Mix Design from the current WSDOT QPL or from one of the processes allowed by this section. Testing of the HMA by the Contracting Agency for mix design approval is not required.

For Commercial HMA, the Contractor shall select a class of HMA and design level of Equivalent Single Axle Loads (ESAL’s) appropriate for the required use.

5-04.2(2)B Using Warm Mix Asphalt Processes

The Contractor may elect to use additives that reduce the optimum mixing temperature or serve as a compaction aid for producing HMA. Additives include organic additives, chemical additives and foaming processes. The use of Additives is subject to the following:

- Do not use additives that reduce the mixing temperature more than allowed in Section 5-04.3(6) in the production of mixtures.
- Before using additives, obtain the Engineer’s approval using WSDOT Form 350-076 to describe the proposed additive and process.

5-04.3 Construction Requirements

5-04.3(1) Weather Limitations

HMA shall not be placed on any traveled way beginning October 1st through March 31st of the following year without written approval from the City Engineer.

Asphalt for prime coat shall not be applied when the ground temperature is lower than 50°F without written approval of the Engineer.

HMA shall not be placed on any wet surface, or when the average surface temperatures are less than those specified in the following table, or when weather conditions otherwise prevent the proper handling or finishing of the bituminous mixtures. Any exceptions to the above and following limitations will not be allowed without the written approval of the Engineer.

Wind (mph)	Ambient °F (Minimum)	Surface °F (Minimum)	Precipitation
0-5	45°	40°	Not Measurable
5-10	50°	40°	Not Measurable
10-15	55°	40°	Not Measurable
15+	60°	45°	Not Measurable

1. If the weather criteria are met, the paving contractor shall complete the entire panel or lane with no transverse joints.
2. If meteorological conditions change after starting, construction shall be monitored by the Engineer and require their approval.

3. HMA shall not be placed on ground that is frozen.

The weather guide shall be the “National Weather Service” zone forecast for the Lower Columbia Basin, Washington at www.wrh.noaa.gov/. The wind speed shall be the current conditions at the Tri-Cities Airport, available at the website above.

5-04.3(2) Paving Under Traffic

When the Roadway being paved is open to traffic, the requirements of this Section shall apply.

The Contractor shall keep intersections open to traffic at all times except when paving the intersection or paving across the intersection. During such time, and provided that there has been an advance warning to the public, the intersection may be closed for the minimum time required to place and compact the mixture. In hot weather, the Engineer may require the application of water to the pavement to accelerate the finish rolling of the pavement and to shorten the time required before reopening to traffic.

Before closing an intersection, advance warning signs shall be placed, and signs shall also be placed marking the detour or alternate route.

During paving operations, temporary pavement markings shall be maintained throughout the project. Temporary pavement markings shall be installed on the Roadway prior to opening to traffic. Temporary pavement markings shall be in accordance with Section 8-23.

5-04.3(3) Equipment

5-04.3(3)B Hauling Equipment

Trucks used for hauling HMA shall have tight, clean, smooth metal beds and shall have a cover of canvas or other suitable material of sufficient size to protect the mixture from adverse weather. Whenever the weather conditions during the work shift include, or are forecast to include, precipitation or an air temperature less than 45°F or when time from loading to unloading exceeds 30 minutes, the cover shall be securely attached to protect the HMA.

The contractor shall provide an environmentally benign means to prevent the HMA mixture from adhering to the hauling equipment. Excess release agent shall be drained prior to filling hauling equipment with HMA. Petroleum derivatives or other coating material that contaminate or alter the characteristics of the HMA shall not be used. For live bed trucks, the conveyer shall be in operation during the process of applying the release agent.

Sufficient numbers of trucks shall be provided by the Contractor to assure a continuous paving operation at proper HMA mix temperatures. Paving operations shall not proceed until hauling equipment sufficient to assure continuous operations is provided.

5-04.3(3)C Pavers

HMA pavers shall be self-contained, power-propelled units, provided with an internally heated vibratory screed and shall be capable of spreading and finishing courses of HMA plant mix material in lane widths required by the paving section shown in the Plans.

The screed shall be operated in accordance with the manufacturer’s recommendations and shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, segregating, or gouging the mixture. A copy of the manufacturer’s recommendations

shall be provided upon request by the Contracting Agency. Extensions will be allowed provided they produce the same results, including ride, density, and surface texture as obtained by the primary screed. Extensions without augers and an internally heated vibratory screed shall not be used in the Traveled Way.

If the paving machine in use is not providing the required finish, the Engineer may suspend Work as allowed by Section 1-08.6. Any cleaning or solvent type liquids spilled on the pavement shall be thoroughly removed before paving proceeds.

5-04.3(3)E Rollers

Rollers shall be of the steel wheel, vibratory, oscillatory, or pneumatic tire type, in good condition and capable of reversing without backlash. Operation of the roller shall be in accordance with the manufacturer's recommendations. When ordered by the Engineer for any roller planned for use on the project, the Contractor shall provide a copy of the manufacturer's recommendation for the use of that roller for compaction of HMA. The number and weight of rollers shall be sufficient to compact the mixture in compliance with the requirements of Section 5-04.3(10). The use of equipment that results in crushing of the aggregate will not be permitted. Rollers producing pickup, washboard, uneven compaction of the surface, displacement of the mixture or other undesirable results shall not be used.

5-04.3(4) Preparation of Existing Paved Surfaces

When the surface of the existing pavement or old base is irregular, the Contractor shall bring it to a uniform grade and cross-section as shown on the Plans or approved by the Engineer.

Pre-leveling of uneven or broken surfaces over which HMA is to be placed may be accomplished by using an asphalt paver, a motor patrol grader, or by hand raking, as approved by the Engineer.

Compaction of pre-leveling HMA shall be to the satisfaction of the Engineer and may require the use of small steel wheel rollers, plate compactors, or pneumatic rollers to avoid bridging across pre-leveled areas by the compaction equipment. Equipment used for the compaction of pre-leveling HMA shall be approved by the Engineer.

Before construction of HMA on an existing paved surface, the entire surface of the pavement shall be clean. All fatty asphalt patches, grease drippings, and other objectionable matter shall be entirely removed from the existing pavement. All pavements or bituminous surfaces shall be thoroughly cleaned of dust, soil, pavement grindings, and other foreign matter. All holes and small depressions shall be filled with an appropriate class of HMA. The surface of the patched area shall be leveled and compacted thoroughly. Prior to the application of tack coat, or paving, the condition of the surface shall be approved by the Engineer.

A tack coat of asphalt shall be applied to all paved surfaces on which any course of HMA is to be placed or abutted; except that tack coat may be omitted from clean, newly paved surfaces at the discretion of the Engineer. Tack coat shall be uniformly applied to cover the existing pavement with a thin film of residual asphalt free of streaks and bare spots at a rate between 0.02 and 0.10 gallons per square yard of retained asphalt. The rate of application shall be approved by the Engineer. A heavy application of tack coat shall be applied to all joints. For Roadways open to traffic, the application of tack coat shall be limited to surfaces that will be paved during the same working shift. The spreading equipment shall be equipped with a thermometer to indicate the temperature of the tack coat material.

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Equipment shall not operate on tacked surfaces until the tack has broken and cured. If the Contractor's operation damages the tack coat it shall be repaired prior to placement of the HMA.

The tack coat shall be CSS-1, or CSS-1h emulsified asphalt. The CSS-1 and CSS-1h emulsified asphalt may be diluted once with water at a rate not to exceed one part water to one part emulsified asphalt. The tack coat shall have sufficient temperature such that it may be applied uniformly at the specified rate of application and shall not exceed the maximum temperature recommended by the emulsified asphalt manufacturer.

Overlays and Utility Patches

Edges of asphalt and curb edge shall be tack coated.

Prior to paving utility trenches, the edges of the trenches shall be saw-cut parallel to the center of the street leaving long straight edges. Should any undermining occur on existing adjacent pavement, the contractor shall neatly cut the pavement 6 inches beyond the undermined area. The City Engineer may waive all or a portion of the saw cutting requirement if the original street cut is straight and not damaged.

All utility patching and/or pre-leveling of damaged areas must be completed prior to overlay. A minimum depth of 2 inches is required for overlays.

5-04.3(4)B Soil Residual Herbicide

Contractor shall apply one application of an approved soil residual herbicide on areas where hot mix asphalt is applied. The requirements of Section 8-02.3(2)A shall apply to this application. The application of herbicide shall precede paving by no more than 24 hours.

5-04.3(4)C Pavement Repair

The Contractor shall excavate pavement repair areas and shall backfill these with HMA in accordance with the details shown in the Plans and as marked in the field. The Contractor shall conduct the excavation operations in a manner that will protect the pavement that is to remain. Pavement not designated to be removed that is damaged as a result of the Contractor's operations shall be repaired by the Contractor to the satisfaction of the Engineer at no cost to the Contracting Agency. The Contractor shall excavate only within one lane at a time unless approved otherwise by the Engineer. The Contractor shall not excavate more area than can be completely finished during the same shift, unless approved by the Engineer.

Excavated materials will become the property of the Contractor and shall be disposed of in a Contractor-provided site off the Right of Way or used in accordance with Sections 2-02.3(3) or 9-03.21.

Asphalt for tack coat shall be required as specified in Section 5-04.3(4). A heavy application of tack coat shall be applied to all surfaces of existing pavement in the pavement repair area.

After the completion of trench and patch repairs, the Contractor shall seal all joints with CSS-1 and dry paving sand.

5-04.3(7) Spreading and Finishing

The mixture shall be laid upon an approved surface, spread, and struck off to the grade and elevation established. HMA pavers complying with Section 5-04.3(3) shall be used to distribute

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the mixture. Unless otherwise directed by the Engineer, the nominal compacted depth of any layer of any course shall not exceed 0.30 feet.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

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5-04.3(8) Aggregate Acceptance Prior to Incorporation in HMA

For HMA accepted by nonstatistical evaluation the aggregate properties of sand equivalent, uncompacted void content and fracture will be evaluated in accordance with Section 3-04. Sampling and testing of aggregates for HMA accepted by commercial evaluation will be at the option of the Engineer.

5-04.3(9) HMA Mixture Acceptance

Acceptance of HMA shall be as provided under nonstatistical, or commercial evaluation.

Nonstatistical evaluation will be used for the acceptance of HMA unless Commercial Evaluation is specified.

Commercial evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores, pre-level, temporary pavement, and pavement repair. Other nonstructural applications of HMA accepted by commercial evaluation shall be as approved by the Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Engineer.

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5-04.3(9)C2 Mixture Nonstatistical Evaluation Sampling

Samples for acceptance testing shall be obtained by the Contractor when ordered by the Engineer. The Contractor shall sample the HMA mixture in the presence of the Engineer and in accordance with AASH-TO T 168. A minimum of three samples should be taken for each class of HMA placed on a project.

5-04.3(9)C3 Mixture Nonstatistical Evaluation – Acceptance Testing

Testing of HMA for compliance of V_a will at the option of the Contracting Agency. If tested, compliance of V_a will use WSDOT SOP 731.

Testing for compliance of asphalt binder content will be by WSDOT FOP for AASHTO T 308.

Testing for compliance of gradation will be by FOP for WAQTC T 27/T 11.

Testing costs shall be the responsibility of the Contractor.

5-04.3(10) HMA Compaction Acceptance

HMA mixture accepted by nonstatistical evaluation that is used in traffic lanes, including lanes for intersections, ramps, truck climbing, weaving, and speed change, and having a specified compacted course thickness greater than 0.10-foot, shall be compacted to a specified level of relative density. The specified level of relative density shall be a minimum of 92 percent of the maximum density. The maximum density shall be determined by WSDOT FOP for AASHTO T 729. The specified level of density attained will be determined by the evaluation of the density of the pavement. The density of the pavement shall be determined in accordance with WSDOT FOP

for WAQTC TM 8, except that gauge correlation will be at the discretion of the Engineer, when using the nuclear density gauge and WSDOT SOP 736 when using cores to determine density.

Tests for the determination of the pavement density will be taken in accordance with the required procedures for measurement by a nuclear density gauge after completion of the finish rolling. The test procedures FOP for WAQTC TM 8 and WSDOT SOP T 729 will be used on the day the mix is placed and prior to opening to traffic.

Two (2) density tests shall be taken within the first one hundred (100) tons of asphalt delivered to the site each day and one (1) every 100 tons thereafter for the remainder of the day. If the asphalt fails any test, the Engineer will require additional testing to determine the extent of the failure and more frequent tests may be required on additional asphalt. Testing and samples shall be in accordance with Section 1-06.2(1).

In addition to randomly selected density test locations, the City may also isolate any area that is suspected of being defective in relative density and may require additional testing at the Contractor's expense.

HMA for pre-leveling shall be thoroughly compacted. HMA that is used for pre-leveling wheel rutting shall be compacted with a pneumatic tire roller unless otherwise approved by the Engineer.

Test Results

HMA testing shall be pre-arranged and oil content results reported within two (2) hours of sampling. Initial reports may be by phone, subsequent written documents shall be submitted to the City prior to the next day's paving shift.

5-04.3(10)A HMA Compaction – General Compaction Requirements

Compaction shall take place when the mixture is in the proper condition so that no undue displacement, cracking, or shoving occurs. Areas inaccessible to large compaction equipment shall be compacted by other mechanical means. Any HMA that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt, or is in any way defective, shall be removed and replaced with new hot mix that shall be immediately compacted to conform to the surrounding area.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided the specified densities are attained. Unless the Engineer has approved otherwise, rollers shall only be operated in the static mode when the internal temperature of the mix is less than 175°F. Regardless of mix temperature, a roller shall not be operated in a mode that results in checking or cracking of the mat. Rollers shall only be operated in static mode on bridge decks.

5-04.3(11) Reject Work

5-04.3(11)A Reject Work General

Work that is defective or does not conform to requirements shall be rejected. The Contractor may propose, in writing, alternatives to removal and replacement of rejected material. Acceptability of such alternative proposals will be determined at the sole discretion of the Engineer. HMA that has been rejected is subject to the requirements in Section 1-06.2(2) and this specification, and the Contractor shall submit a corrective action proposal to the Engineer for approval.

5-04.3(11)B Rejection by Contractor

The Contractor may, prior to sampling, elect to remove any defective material and replace it with new material. Any such new material will be sampled, tested, and evaluated for acceptance. Supplement this section with the following:

5-04.3(12) Joints

5-04.3(12)A1 Transverse Joints

The Contractor shall conduct operations such that the placing of the top or wearing course is a continuous operation or as close to continuous as possible. Unscheduled transverse joints will be allowed, and the roller may pass over the unprotected end of the freshly laid mixture only when the placement of the course must be discontinued for such a length of time that the mixture will cool below compaction temperature. When the Work is resumed, the previously compacted mixture shall be cut back to produce a slightly beveled edge for the full thickness of the course.

A temporary wedge of HMA constructed on a 20H:1V shall be constructed where a transverse joint as a result of paving or planing is open to traffic. The HMA in the temporary wedge shall be separated from the permanent HMA by strips of heavy wrapping paper or other methods approved by the Engineer. The wrapping paper shall be removed and the joint trimmed to a slightly beveled edge for the full thickness of the course prior to resumption of paving.

The material that is cut away shall be wasted and new mix shall be laid against the cut. Rollers or tamping irons shall be used to seal the joint.

5-04.3(12)A2 Longitudinal Joints

The longitudinal joint in any one course shall be offset from the course immediately below by not more than 6 inches nor less than 2 inches. All longitudinal joints constructed in the wearing course shall be located at a lane line or an edge line of the Traveled Way. A notched wedge joint shall be constructed along all longitudinal joints in the wearing surface of new HMA unless otherwise approved by the Engineer. The notched wedge joint shall have a vertical edge of not less than the maximum aggregate size or more than 1/2 of the compacted lift thickness and then taper down on a slope not steeper than 4H:1V. The sloped portion of the HMA notched wedge joint shall be uniformly compacted.

All joints shall be hand raked prior to rolling. The final joint shall be straight, level with the abutting edge, free of coarse material at the surface, and neat in appearance. The Contractor shall use panel widths that minimize longitudinal pavement joints.

5-04.3(13) Surface Smoothness

The completed surface of all courses shall be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds. The completed surface of the wearing course shall not vary more than 1/8 inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline. The transverse slope of the completed surface of the wearing course shall vary not more than 1/4 inch in 10 feet from the rate of transverse slope shown in the Plans.

When deviations in excess of the above tolerances are found that result from a high place in the HMA, the pavement surface shall be corrected by one of the following methods:

1. Removal of material from high places by grinding with an approved grinding machine, or

2. Removal and replacement of the wearing course of HMA, or
3. By other method approved by the Engineer.

Correction of defects shall be carried out until there are no deviations anywhere greater than the allowable tolerances.

5-04.3(14)B Paving and Planing Under Traffic

5-04.3(14)B1 General

In addition, the requirements of Section 1-07.23 and the traffic controls required in Section 1-10, and unless the Engineer approves, the Contractor must comply with the following:

1. Intersections:
 - a. Keep intersections open to traffic at all times, except when paving or planing operations through an intersection requires closure. Such closure must be kept to the minimum time required to place and compact the HMA mixture, or plane as appropriate. For paving, schedule such closure to individual lanes or portions thereof that allows the traffic volumes and schedule of traffic volumes required in the approved traffic control plan. Schedule work so that adjacent intersections are not impacted at the same time and comply with the traffic control restrictions required by the Traffic Engineer. Each individual intersection closure or partial closure must be addressed in the traffic control plan, which must be submitted to and accepted by the Engineer, see Section 1-10.2(2).
 - b. When planing or paving and related construction must occur in an intersection, consider scheduling and sequencing such work into quarters of the intersection, or half or more of an intersection with side street detours. Be prepared to sequence the work to individual lanes or portions thereof.
 - c. Should closure of the intersection in its entirety be necessary, keep such closure to the minimum time required to place and compact the HMA mixture, plane, remove asphalt, tack coat, and as needed.
 - d. Any work in an intersection requires advance warning in both signage and a number of Working Days advance notice as determined by the Engineer, to alert traffic and emergency services of the intersection closure or partial closure.
 - e. Allow new compacted HMA asphalt to cool to ambient temperature before any traffic is allowed on it. Traffic is not allowed on newly placed asphalt until approval has been obtained from the Engineer.
2. Temporary centerline marking, post-paving temporary marking, temporary stop bars, and maintaining temporary pavement marking must comply with Section 8-23.
3. Permanent pavement marking must comply with Section 8-22.

6-02 CONCRETE STRUCTURES

6-02.3(14) Finishing Concrete Surfaces

Supplement this section with the following:

The completed surface shall be of uniform texture, smooth, uniform as to grade, and free from defects of all kinds. The completed surface shall not vary more than 1/8-inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline.

The finish shall be a light broom finish, or as noted in the City of Pasco Standard Plans, or as approved by the Engineer. A non-uniform finish, an overworked finish, a finish where

a cement layer has formed, discolored, is spalling, or a finish damaged by the weather, will not be accepted, and shall be replaced at the Contractor's expense.

8-02 ROADSIDE RESTORATION

8-02.1 Description

Supplement this section with the following:

Landscape plan approval is administered by the Administrative & Community Services (AC&S) Department. Landscape plans are subject the standards for installation and material specifications as supplied by this department. The developer shall submit final landscape plans and specifications for approval consideration at the time that the Civil Engineering Plans are submitted for approval. Landscape plan review will run concurrent with civil plan review. The landscape plan will be discussed at the preconstruction conference and it is recommended that the developer's landscape contractor attend.

All landscape correspondence, plan and specification submittals, and question should be directed to:

Dan Dotta
Facilities Manager
DOTTAD@pasco-wa.gov
(509)543-5759
(509)430-6516

Approval of landscape plan(s) and specifications, and receipt of the final as-builts are required before the City of Pasco will consider the project substantially complete and/or certification of completed public improvements.

8-04 CURBS, GUTTERS, AND SPILLWAYS

8-04.3 Construction Requirements

Supplement this section with the following:

Testing requirements shall be as follows:

Table with 2 columns: Project Quantity, Test Requirement. Rows include: Less than 5 CY (None), 5 CY - 10 CY (1 Slump, 4 Cylinders), 10+ CY (2 Slump, 4 Cylinders per 25 CY)

For project quantities above five (5) cubic yards, test requirements shall be based on concrete placed during one (1) working day. If the concrete fails any test, the Engineer will require additional testing to determine the extent of the failure and more frequent tests may be required on additional concrete being placed. Testing and samples shall be in accordance with Section 1-06.2(1).

Regardless of quantity, a Certification of Compliance shall be provided for all concrete delivered to the site in accordance with Section 6-02.3(5)B.

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8-04.3(1) Cement Concrete Curbs, Gutters, and Spillways

Revise the fourth paragraph of Section 8-04.3(1) to read:

Expansion joints in the curb or curb and gutter shall be spaced at 50-foot intervals, the beginning and ends of curb returns, drainage structures, bridges, and cold joints with existing curbs and gutters. The expansion joint shall be filled to full cross-section with ½-inch premolded joint filler. When curb or curb and gutter is placed adjacent to Portland Cement Concrete Pavement, a 3/8-inch thick, 6-inch deep premolded joint filler shall be installed between the 2 vertical surfaces to prevent cracking. Joint material shall be set flush or trimmed flush with the finished concrete surface. Construction joints shall be at accurate ten (10) foot spacing and shall consist of a two (2) inch cut or slice into the concrete pour, and an additional two (2) inch cut into the heel of the pour. Joints shall be formed neatly and perpendicular to the line of the curb.

Supplement this section with the following:

Cement concrete traffic curb and gutter shall be as shown on the City's Standard Plans. Full Height or "Type A" cement concrete traffic curb and gutter shall be used on the roadway. Depressed or "Drop" cement concrete traffic curb and gutter shall be used at all driveway entrances and sidewalk ramp locations and as directed in the field by the City. Depressed "Type D" cement concrete traffic curb and gutter shall be used on cul-de-sacs from curb return to curb return. Cement concrete curb and gutter which does not comply with the City's details shall be removed and replaced at the Contractor's expense.

A template shall be required to be placed at the back of curb for construction of driveway transitions from Type A to Type D curb and gutter. The template shall extend from the bottom of curb to the top of the curb and shall have a minimum length to provide a maximum slope of 8.3%. The transition shall be no less than six (6) feet long. When the transition is on a street with a steep grade making the 8.3% maximum slope unachievable, the transition length shall be 15 feet.

The new concrete curb and gutter shall be cured in accordance with Section 5-05.3(13)A of the Standard Specifications. Application of the curing compound shall be in accordance with the manufacturer's recommendations.

First-class workmanship and finish will be required on all portions of concrete curb and gutter work. Quality of workmanship and finish will be evaluated continuously and will be based solely upon the judgment of the City. The Contractor shall be required to construct a minimum 20 linear foot section of curb and gutter which demonstrates quality which is acceptable by the City. This "model" section will be referenced during construction for comparison to newly poured curb. If at any time it is found that quality is unacceptable, work shall be immediately stopped, and no additional curb and gutter shall be placed. Cement concrete curb and gutter which does not comply with the section details on the Plans, or in the City's opinion does not demonstrate first-class workmanship and finish, shall be removed and replaced at the Contractor's expense. Should the Contractor's equipment or methods be unable to produce curb and gutter meeting the requirements of the Details and Specifications, no further curb and gutter construction will be allowed until corrections have been made to said equipment or methods.

8-06 CEMENT CONCRETE DRIVEWAY ENTRANCES

8-06.3 Construction Requirements

Supplement this section with the following:

The concrete driveway entrance/sidewalk shall be six (6) inches in thickness. Both the curb and gutter as well as the sidewalk portion must comply the requirement of 8-04.3(1). Class 4000 air entrained concrete conforming to the Section 6-02 shall be required.

8-13 MONUMENT CASES

Supplement this section with the following:

8-13.1 Description

(March 13, 1995 WSDOT GSP)

Delete this section and replace it with the following:

This work shall consist of furnishing and placing monument cases, covers, and pipes in accordance with the Standard Plans and these Specifications, in conformity with the lines shown in the Plans.

8-13.2 Materials

Supplement this section with the following:

The monument frame and cover shall be East Jordan Iron Works model 3680.

8-13.3 Construction Requirements

The last paragraph of this section is revised to read:

The Contractor will be responsible for placing the concrete core and tack or wire inside the pipe.

8-14 CEMENT CONCRETE SIDEWALKS

8-14.3 Construction Requirements

Supplement this section with the following:

Testing requirements shall be as follows:

Project Quantity	Test Requirement
less than 5CY	None
5CY - 10CY	1 Slump, 4 Cylinders
10+CY	2 Slump, 4 Cylinders per each 25CY

For project quantities above five (5) cubic yards, test requirements shall be based on concrete placed during one (1) working day. If the concrete fails any test, the Engineer will require additional testing to determine the extent of the failure and more frequent tests

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may be required on additional concrete being placed. Testing and samples shall be in accordance with Section 1-06.2(1).

Regardless of quantity, a Certification of Compliance shall be provided for all concrete delivered to the site in accordance with Section 6-02.3(5)B.

8-14.3(3) Placing and Finishing Concrete

Supplement this section with the following:

Expansion joints, using 1/2" thick pre-molded material (AASHTO M213) at full depth, shall be perpendicular and provided at a maximum spacing of thirty (30) feet, at cold joints and at each side of driveway. See WSDOT Standard Plans F-40 for joints at pedestrian ramps. Sidewalk construction joints shall be provided at five (5) foot intervals, or as required to match existing improvements. All work shall be perpendicular to the curb and straight. Joint material shall be set flush or trimmed flush with the finished concrete surface.

Concrete finish shall be in accordance with Section 6-02.3(14).

All sidewalks not located in driveway entrance areas shall be four (4) inches in thickness. All concrete approaches located behind a Type D curb and gutter section or at any driveway location shall be six (6) inches in thickness.

Concrete sidewalk shall be cured in accordance with Section 5-05.3(13)A of the Standard Specifications. Application of the curing compound shall be in accordance with the manufacturer's recommendations. Failure to properly secure or seal the cement concrete sidewalk will require the Contractor to remove and replace the sidewalk section at his expense.

Sidewalk ramps shall be constructed as shown on the Plans in accordance with the City's Standard Plans.

First-class workmanship and finish will be required on all portions of cement concrete sidewalk work. Quality of workmanship and finish will be evaluated continuously and will be based solely upon the judgment of the City. If at any time it is found that quality is unacceptable, work shall be immediately stopped, and no additional sidewalk shall be placed. Cement concrete sidewalk which does not comply with the section details on the Plans, or in the City's opinion does not demonstrate first-class workmanship and finish, shall be removed and replaced at the Contractor's expense. Should the Contractor's equipment or methods be unable to produce sidewalk meeting the requirements of the Plans and Specifications, no further sidewalk construction will be allowed until corrections have been made to said equipment or methods.

8-20 ILLUMINATION, TRAFFIC SIGNAL SYSTEMS, AND ELECTRICAL

8-20.1 Description

Supplement this section with the following:

All work shall be coordinated and in conformance with current Franklin PUD standards.

8-20.2 Materials

Supplement this section with the following:

Materials shall meet the requirements of the City of Pasco Standard Details and Franklin PUD standards.

Luminaires shall be cobra-head configuration meeting IES type II or III distribution pattern depending on the cross-section of the roadway or intersection. See PUD Standard Drawing L-3.2 for additional luminaire requirements. Luminaires shall be manufactured by CREE, or approved equivalent, and include:

- XSPLG-D-HT-2LG-18L-40K7-UL-SV-N-04
- XSPMD-D-HT-2LG-12L-40K7-UL-SV-N-Q5
- SXPSM-D-HT-2LG-5L-40K7-UL-SV-N-08

The Developer is responsible for verifying specifications are current with Franklin PUD standards.

8-20.3 Construction Requirements

8-20.3(1) General

Supplement this section with the following:

The Contractor is responsible for coordinating with the Department of Labor and Industries, the Engineer, and Franklin PUD for all required inspections and service.

8-20.3(2) Excavation and Backfill

Delete the first paragraph and replace it with the following:

The excavation required for the installation of conduit, cement concrete anchor bases, and pullboxes shall be performed in such a manner as to cause the least possible damage to streets, sidewalks, and other improvements. Anchor base excavation shall be augered or dug by hand with proper care to avoid damage to other utilities. Excavation shall not be performed until immediately prior to installation of conduit and/or structures. Backfilling shall be as shown on the Plans and shall conform to the provisions specified herein. Compaction of conduit trenches and structure backfill shall be accomplished by a method which will result in backfill compacted to at least 95 percent of maximum density.

8-20.3(5) Conduit

Supplement this section with the following:

The ends of conduits for future connection shall be marked with an 8' treated 2x4 inside of an 8' steel stud, painted red, extending 24"-36" above finished ground surface. Fiberglass markers may be proposed for approval consideration by the City Engineer.

Commented [RH1]: Franklin PUD call for type II in some documents and type III in other documents. This should really be based on cross-section.

Commented [RH2]: Dan: Franklin PUD calls for Cree. You may want to say or approved equivalent. You will need a PIF for this for any federally funded projects. Not a big deal but I wanted to make you aware.

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8-20.3(6) Junction Boxes, Cable Vaults, and Pull boxes

Replace the first paragraph with the following:

The terms "pullbox" and "junction box" are considered interchangeable.

Junction boxes shall be installed at each pole and at each end of all crossings. Junction boxes shall be QUAZITE PG-1324.

8-20.3(10) Electrical Service

Supplement this section with the following:

All of the work shall meet the requirements of Franklin PUD and the National Electric Code.

8-21 PERMANENT SIGNING

8-21.2 Materials

Supplement this section with the following:

Sign posts for permanent traffic control signing shall be 2"x2" 12-gauge perforated steel tubing. Socket sleeves for the sign post shall be 2-1/4"x 2-1/4"x30" 12-gauge perforated steel tubing.

Street name sign brackets shall be Zumar.

8-21.3 Construction Requirements

Supplement this section with the following:

Socket sleeves for sign posts shall be set in 12" diameter x 18" deep base of class 3000 cement concrete at finish grade so that erected signs will be plumb with roadway/sidewalk. The Contractor shall correct any misaligned socket sleeves at his own expense.

8-22 PAVEMENT MARKING

8-22.1 Description

Supplement this section with the following:

This work includes temporary pavement markings as described in the Plans.

8-22.2 Materials

Supplement this section with the following:

Arrows, letters, symbols, stop lines, and crosswalks shall be Type B – Pre-formed Fused Thermoplastic. All lines shall be Type A – Liquid Hot Applied Thermoplastic. Striping material type may vary only with written approval from the City Engineer.

9-03 AGGREGATES

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9-03.12(3) Gravel Backfill for Pipe Zone Bedding

Revise this section to read:

Backfill shall be as follows:

Gravel Backfill for Pipe Zone (including Bedding): Pipe zone material shall be Crushed Surfacing Top Course meeting the requirements of section 9-03.9(3), and shall be placed and compacted in layers as designated by the City. With prior approval by the City Engineer, suitable native material may be an acceptable alternate for pipe zone bedding above the bottom of the pipe.

Trench Backfill: All longitudinal pipeline trenches (parallel to curb) may be backfilled full depth above the pipe zone with native material (free of organic material, wood, rocks, or pavement chunks larger than 6-inches in maximum dimension), unless otherwise directed by the City of Pasco. Street crossings, transverse trenches, and other locations as directed by the City of Pasco may be required to be backfilled full depth with imported select backfill. Imported select backfill shall be crushed surfacing top course or crushed surfacing base course meeting the requirements of section 9-03.9(3), placed and compacted in layers.

APPENDIX A

STANDARD DETAILS INDEX

PASCO STANDARD DETAILS INDEX

STORM DRAINAGE

- SD-1 Type 1 Catch Basin
- SD-2 Type 2 Catch Basin
- SD-3 Infiltration Trench

SANITARY SEWER

- SS-1 Standard Manhole
- SS-2 Manhole Frame and Cover (Locking & Non-Locking)
- SS-3 Standard Drop Manhole
- SS-4 Manhole Adjustments
- SS-5 Typical Sewer/Storm Drain Trench Section
- SS-6 Sewer Stub Installation (New and Existing Main)
- SS-7 Doghouse Manhole
- SS-8 Sewer Cleanout

STREETS

- ST-1 Monument Case & Cover
- ST-2A Typical Street Sections Local Access
- ST-2B Typical Street Sections Partial
- ST-2C Typical Street Sections Arterial and Collector
- ST-3 Trench Surfacing Repair
- ST-4 Cement Concrete Sidewalk
- ST-5 Driveway Approaches
- ST-6 Cement Concrete Curbs
- ST-7 Cul-De-Sac

WATER

- W-1 Tapping Water Main
- W-2 Residential and 1" Commercial Water Service
- W-3 2" Service Installation
- W-4 Cast Iron Valve Box
- W-5 Blow-Off Assembly
- W-6 Air/Vacuum Relief and Vault
- W-7 3" to 8" Water Services
- W-8 Concrete Thrust Blocking
- W-9 Saddle Thrust Blocking
- W-10 Fire Hydrant Installation
- W-11 Fire Lines/Backflow
- W-12 Guard Post
- W-13 PVBA/SVBA Installation 1/2" to 2"
- W-14 DCVA Installation 1/2" to 2"
- W-15 DCVA & DCDA Dual Installation Larger Than 2"
- W-16 DCDA & DCVA Installation Larger Than 2"
- W-17 RPBA Installation 3/4" to 2"
- W-18 RPDA & RPBA Installation Larger Than 2"
- W-19 RPDA & RPBA Dual Installation Larger Than 2"
- W-20 Typical Water Trench Section
- W-21 Irrigation Service (Front Yard)
- W-22 City Owned or Acquired Irrigation Services