CITY OF CASHMERE

WATER SYSTEM DEVELOPMENT STANDARDS

SECTION 1 - GENERAL REQUIREMENTS AND DEFINITIONS

A. INTRODUCTION AND GENERAL REQUIREMENTS

These standards shall apply to all improvements within the public right-of-way and/or public easements, to all improvements required within the proposed public right-of-way of new subdivisions, for all improvements intended for ownership, operations or maintenance by the City and for all other improvements for which the City Code requires approval from the City Public Works Director and/or City Planning Commission and/or the City Council. These standards are intended as guidelines for designers and developers in preparing their plans, studies and/or reports and for the City in reviewing same. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used where practical. The developer/proponent is however cautioned that higher standards and/or additional studies and/or environmental mitigation measures may, and will, in all likelihood, be imposed by the City when developing on, in, near, adjacent, or tributary to sensitive areas to include, but not be limited to, steep embankments, creeks, wetlands, certain wildlife habitat, unstable soils, high water tables, wet areas, etc.

Alternate design standards may be accepted when it can be shown, to the satisfaction of the City, that such alternate standards will provide a design equal to or superior to that specified. In evaluating the alternate design, the City shall consider appearance, durability, ease of maintenance, public safety and other appropriate factors, including the latest edition of the Standard Specification for Road, Bridge & Municipal Construction, State of Washington, and current amendments thereto.

Where improvements are not covered by these details nor by the Standard Specifications nor by the standard details, the City will be the sole judge in establishing appropriate standards. Where these "standards" conflict with any existing City ordinances or discrepancies exist within the body of this text, the higher "standards" shall be utilized as determined by the Public Works Director, or his/her authorized representative.

Plans for major improvements in the public right-of-way or within public easements, or improvements to be "deeded" to the City, shall bear an approval signature from the City.

The designer shall submit calculations or other appropriate materials supporting the design of utilities, pavements and storm drainage facilities. The designer shall submit calculations for structures and other designs when requested by the City.

B. DEFINITIONS

Definitions as used herein are as follows:

(a) "Developer": The party having an agreement with the City to cause the installation of certain improvements, to become a part of the City's utility and/or roadway system upon completion and acceptance. The term shall also include the Developer's contractor employed to do the work or the Contractor's employees.

(b) "Plans" mean drawings, including reproductions thereof, of the work to be done, prepared by an Engineer licensed in the State of Washington.

(c) "Specifications" means the directions, provisions, and requirements designated by an Engineer licensed in the State of Washington for the performance of the work and for the quantity and quality of materials, as contained or referenced herein.

(d) "Performance Bond" means a bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington, guaranteeing that the work will be completed in accordance with the plans and specifications.

(e) "Maintenance Bond" means a bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington, guaranteeing that the Developer will repair any defects found in the work within the time period as further identified herein.

(g) "Work": The labor or materials or both, superintendent, equipment, transportation, and other facilities necessary to complete the Contract.

(h) "City": City of Cashmere, Washington, Chelan County, a municipal corporation, existing under and by virtue of the laws of the State of Washington. Actions designated as taken by the City are the acts of the Council acting through the Mayor.

(i) "Mayor" means mayor of the City of Cashmere or his/her authorized representative.

(j) "Contractor" means the Developer's contractor or subcontractor.

(k) "Engineer" means the City's Engineer, whether a staff engineer or consultant.

(l) "City Public Works Director" means the City's duly appointed City Public Works Director.

(m) "Operations and Maintenance Supervisor" means the City's Utility/Public Works superintendent, and/or operations and maintenance supervisor, and/or the public works director.

C. GENERAL DEVELOPER RESPONSIBILITY

Developer to be Informed: It is the Developer's responsibility to be fully informed regarding the nature, quality, and the extent of the work to be done, and, if in doubt, to secure specific instructions from the City.

Payment for City Services: The Developer shall be responsible for promptly reimbursing the City for all costs and expenses incurred by the City in the pursuit of project submittal, review, approval, and construction. These costs include, but are not limited to, the utilization of staff and consultants as may be necessitated to adequately review and inspect construction of the project(s). All legal, administrative, and engineering fees for project review, meetings, approvals, site visits, construction inspection, etc., shall be subject to prompt reimbursement. The Developer is cautioned that project approval (City acceptance) and occupancy permits will be denied until all bills are paid in full.

SECTION 2 - WATER SYSTEM DESIGN STANDARDS

A. GENERAL

The standards established by this section are intended to represent the minimum standards for the design and construction of water facilities. Greater or lesser requirements may be mandated by the City due to localized conditions.

B. DESIGN STANDARDS

The design of water systems shall be dependent on local site conditions. The design elements of water systems shall conform to the following minimum City Standards set forth herein.

1. General

a) If future extensions of the system are deemed probable by the City, the proposed systems shall be designed and sized to service future customers and also be extended to "far" property line(s) so as to provide access to future development. Easements shall be provided to facilitate same. Water lines shall be extended to the boundaries of the property being served providing access for future service of adjacent properties.

b) Whenever water lines are located outside of public streets, the right-of-way or easement shall be of sufficient width to allow for future replacement of the facility without damage to permanent adjacent improvement. In general, if the water line is located in the center of the right-of-way or easement, its minimum width shall be 15 feet. Special circumstances may require additional widths such as for deep water lines.

c) Detailed plans shall be submitted for the City's review which provide the location, size, type and direction of flow of the proposed water mains and the connection with existing mains. Horizontal locations and elevation information shall be to the City datum.

d) Construction of new water systems or extension of existing systems will be allowed only if enough water is available to meet fire flow requirements per the City of Cashmere and the Uniform Fire Code.

e) Water mains shall be designed and constructed for the ultimate development of the service areas and as may be further established in the City's Water Comprehensive Plan. The location and size of oversized water lines shall be designated by the City Administrator.

f) Computations and other data used for the design of the water system shall be submitted to the City for approval.

g) The water facilities shall be constructed in conformance with standards herein and current amendments thereto, and other applicable standards as allowed by the City.

h) Material and installation specifications shall contain appropriate requirements that have been established by the industry in its technical publications, such as ASTM, WSDOT, WEF, and APWA standards. Requirements shall be set forth in the specifications for the pipe and methods of bedding and backfilling so as not to damage the pipe or its joints; impede cleaning operations and future tapping, nor create excessive side fill pressure or deformation of the pipe, nor seriously impair flow capacity.

i) All water mains shall be designed to prevent damage from superimposed loads. Proper allowance for loads on the water main due to the width and depth of the trench should be made. When standard-strength water pipe is not sufficient, extra-strength pipe shall be used.

j) Prior to final inspection, all pipelines shall be tested, flushed and cleaned and all debris removed and disposed of at a location approved by the City. A pipeline "cleaning ball" of the proper diameter for each size of pipe shall be flushed through all pipelines prior to final inspection. Hydrant meters shall be acquired from the City and utilized by the Contractor for all water withdrawn from the City's system for flushing, construction, cleaning, and testing purposes.

k) After all other work is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections for a new roadway consistent with the original section.

l) The Developer shall be required, upon completion of the work and prior to acceptance by the City, to furnish the City with a written guarantee covering all material and workmanship for a period of two years after the date of final acceptance and the Developer shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as the result of furnishing poor materials and/or workmanship. The Developer shall obtain warranties from the contractors, subcontractors and suppliers of material or equipment where such warranties are required, and shall deliver copies to the City upon completion of the work.

2. Design Elements

a) Water pipelines shall be laid only in dedicated streets, alleys, or easements which have been or will be prior to acceptance exclusively granted to the City.

b) The water pipelines shall be located in roadways when at all possible 6 feet northerly or easterly of street centerline. The water main shall be placed such that a minimum of 10 foot horizontal separation from proposed or existing parallel sewer mains and 5 foot horizontal separation from all other parallel underground utilities is maintained at all times.

c) Ductile iron pipe shall be Class 50 and conform to AWWA C151 and C104. PVC pipe shall be a minimum Class S.D.R 21 and be manufactured in accordance with ASTM D2241. Use of PVC pipe requires approval by City prior to use and may only be used in limited conditions.

d) The allowable cover (finished grade) for the various types of pipe are:

- PVC Pipe: 4' to 25' (subject to Design Engineer approval)
- D.I. Pipe (Class 50): 4' to 25' (subject to Design Engineer approval)

The City reserves the right to require a minimum of four feet of cover unless topography, existing facilities or other future improvements prohibit this minimum cover for installation.

e) Standard 5-1/4 inch MVO fire hydrants are required approximately every 500 feet in the residential areas. Standard 5-1/4 inch MVO hydrants or larger are required every 300 feet in commercial areas. Conform to fire code requirements.

f) Pipe runs from main line to standard hydrants less than 50 feet in length must be a minimum of 6 inches. Pipe runs from main line to standard hydrants more than 50 feet in length must be a minimum of 8 inches.

g) One-inch minimum air and vacuum release valves shall be installed at principal high points in the system. High points should be avoided, to the extent possible.

h) Dead-end lines are not permitted, except in certain cul-de-sac streets, in which case, hydrants must be provided at the end of the main.

i) Service connections shall be installed with pipe saddles. Double strap saddles are required on 12 inch and larger diameter mains.

j) System valves shall be installed at intervals of no more than 1,200 feet.

k) Blow-off assemblies are required at all dead ends and all low points in the water distribution system.

l) Pressure reducing systems must be installed when static pressures exceeds 80 psi.

C. CONSTRUCTION DRAWING FORMAT

The City desires to maintain a consistent format to its construction drawings and, therefore, requires that all construction drawings conform the following format unless exceptions are approved in advance by the City Public Works Director and/or City's Engineer.

The following format and requirements are a minimum for normal type system extensions. Unusual or special facilities or construction requirements may dictate additional drawings and drawing requirements.

1. **Sheet size:** 24" x 36"

2. Plan

A separate construction plan is required at an appropriate scale but not more than 1" = 50', showing all existing or proposed utilities, existing or proposed street surfacing and improvements, street centerline and stationing, street right-of-way margins, street names, legal identifications of properties such as lot number or tax lot number, section subdivision lines, all property lines and all water and sewer easements and rights-of-way.

Show the following:

a) Locations of streets, right-of-ways, existing utilities, driveways, and water mains.

b) All associated right-of-way, adjacent property lines, easements and/or proposed property lines. All utility easements, including County recording numbers.

c) Site topography at a minimum of one-foot (1') intervals, to include a minimum of five-foot (5') within adjacent areas.

d) Vicinity and site location map.

e) All known existing structures, both above and below ground, which might interfere with the proposed construction, particularly sewer lines, gas mains, storm drains, overhead and underground power lines, telephone lines, and television cables.

f) Show all valves, fire hydrants, fittings, and other appurtenances. Each shall be called out and located by stationing along the centerline of the street or baseline of the easement.

g) Show the size, material, and length of each water line.

h) Show details as necessary to direct the contractor in making connections to the existing system and to protect existing facilities during construction of the new water line. Details shall be to scale drawings which clearly show special water pipeline joints, connections, cross-sections, water appurtenances, and all other items as required by the City to clearly identify construction items, materials, and/or methods.

3. Profile

A separate drawing showing the vertical profile of the proposed water is required. The scale of these drawings shall be at an appropriate scale but not more than 1" = 50' horizontal and 1" = 5' vertical with horizontal grid of 50' and vertical grid of 5'.

Show the following:

a) Show the water line in profile and the existing and proposed ground lines. Identify the size, slope and horizontal length of the water line on the profile.

b) Above the ground line indicate the profile location by street name or other right-of-way designation.

c) Show all crossing utilities and designate special materials or construction procedures that may be required.

D. GENERAL CONSTRUCTION REQUIREMENTS

1. Prior to construction, the water plans shall be reviewed and approved by the City's Public Works Department

2. Prior to construction, the Contractor shall schedule and attend a pre-construction meeting with the City and any other affected utility representative. Provide the City a minimum five (5) working days advance notice for meetings.

3. Work shall be performed only by Washington State licensed and bonded contractors with demonstrated experience in constructing public water systems of the type being proposed for construction. No contractor shall perform work prior to obtaining a City business license.

4. Prior to any work being performed, the Contractor shall contact the City Operations and Maintenance Supervisor or City Engineer to set forth his proposed schedule.

5. Contractor shall obtain approval of materials to be used from the City prior to ordering or delivery of materials.

6. Provide the City's Engineer and Operations and Maintenance Supervisor a copy of the cut sheets prior to construction.

7. Pipe trenches shall not be backfilled until pipe and bedding installation has been inspected and approved by the City's Inspector.

8. "As constructed" drawings shall be individually stamped by a Washington State licensed professional engineer which shall attest to the fact that the information is correct. As-builts shall be to City datum, and must be submitted in a format as outlined in the water standard, set forth herein, and approved by the City prior to the project

SECTION 3 - WATER SYSTEM TECHNICAL SPECIFICATIONS

A. INTRODUCTION

These Technical Provisions cover the furnishing of materials, labor and equipment for the installation and construction of Developer Extensions for the City of Cashmere, and shall also cover materials, workmanship, and testing.

The following Technical Provisions shall be used in conjunction with the applicable sections of the latest edition of the "***Standard Specifications for Road, Bridge and Municipal Construction***", as prepared by the Washington State Department of Transportation and the Washington State Chapter of the American Public Works Association (hereinafter referred to as the "Standard Specifications") except as may be amended, modified, or revised herein. Division 1 of the "Standard Specifications" relating to the General Conditions are hereby deleted

The Standard Specifications, except as they may be modified or superseded by these specifications, shall govern all phases of work under this contract, and they are by reference made an integral part of these specifications and contract as if herein fully set forth.

The City of Cashmere Standard Details following these specifications are an integral part of these specifications and shall be complied with.

B. REFERENCE SPECIFICATIONS

Certain referenced sections to the following publications are used in this specification and in the Standard Specifications and are from the latest edition of:

AWWA	American Water Works Association
ANSI	American National Standards Institute
ASA	American Standards Association
ASTM	American Society for Testing and Materials

C. HEADINGS

Headings to parts, sections, forms, articles and sub-articles are inserted for convenience or reference only and shall not affect the interpretation of the contract documents.

D. TECHNICAL PROVISION STRUCTURE

The specifications noted herein are in addition to, or as a replacement for, the Standard Specifications. Where sections are marked "Replacement Section" or "Partial Replacement Section," the specifications herein are to replace, or partially replace, the Standard Specifications noted. Where sections are marked "Additional Section," the specifications herein will be an addition to the Standard Specifications noted. Where sections are marked "Supplemental Section," the specifications herein are to be a supplement to the Standard Specifications.

Where the word "Developer" is used, the term shall also include the Developer's agents, employees, and subcontractors.

Division 5

SURFACE TREATMENT AND PAVEMENTS

5-04 ASPHALT CONCRETE PAVEMENT

5-04.3(5)A Preparation of Existing Surfaces (Supplemental Section)

All edges of existing asphalt concrete pavement shall be saw cut or jackhammered full depth. The cut shall be a minimum of 12 inches beyond the edge of the trench.

5-04.3(22) Pavement Patching (Additional Section)

When constructing within existing paved areas the Developer shall patch the existing paved areas in accordance with the Construction Plans. Asphalt concrete paving, Class B as defined in Section 9-03.8 shall be placed in a maximum of 2-inch compacted lifts.

The asphalt concrete patch shall be rolled to a smooth riding surface, flush with the surface of the existing asphalt. Immediately thereafter, all joints between the new and original asphalt shall be painted with hot asphalt emulsion and be covered with dry paving sand before the asphalt solidifies.

At the end of each working day a temporary patch shall be placed over unfinished portions of work that affect traffic in any way. Material for these temporary patches shall be cold asphalt mix.

5-04.3(23) Pavement Overlay (Additional Section)

When constructing within existing paved areas, the Developer shall provide a half street 1-inch overlay of the traveled road and paved shoulders in accordance with the construction plans. Material shall be HMA Class 3/8 inch PG 64-28 as defined in Section 9-03.8.

All utility and survey monument access covers shall be adjusted to the new grade. Storm catch basin grates shall be adjusted 0.1 foot below the new grade.

Division 7

DRAINAGE STRUCTURES, STORM WATERS, SANITARY WATERS, WATER MAINS, AND CONDUITS

7-08 GENERAL PIPE INSTALLATION REQUIREMENTS

7-08.3(3) Backfilling

Supplement 7-09.3(21) with:

In backfilling the trench, the Developer shall take all necessary precautions to protect the pipe from damage, or shifting of the pipe. In general, backfilling shall be performed by pushing the material from the end of the trench into, along, and directly over the pipe so that the material will be applied in the form of a rolling slope rather than by side filling, which may damage the pipe.

After backfilling and placement of the base course, the Developer shall immediately place HMA trench patch or cold patch (if HMA is unavailable due to plant shutdowns) over all trenches in paved areas until such time that a permanent overlay or patch can be completed. The Developer shall grade all roads and shall maintain them during the period required by the general provisions of this contract in such a manner as to provide safe travel by the public, free of settlement, mud holes, ruts, and high centers. Streets shall be repainted upon completion of construction in conformance with current striping.

7-09 PIPE AND FITTINGS FOR WATER MAINS

7-09.2 Materials (Partial Replacement Section)

Replace Paragraph 1 with:

Materials shall meet the requirements of the following sections:

Pipe

Ductile iron pipe 9-30.1

Except that Class 50 ductile iron pipe shall be used throughout the project.

- *Polyethylene (PE) Service Pipe*

  PE pipe shall be Copper Tube Size (CTS). PE pipe shall be manufactured from high molecular weight polyethylene (average molecular weight of 1,750,000) defined by ASTM 1248 as Polyethylene Type III (3306) (PE). Pipe shall be made of all virgin

material and conform to CS-255-63. PE pipe shall meet all requirements of ASTM D2241-67. The pipe shall be municipal service line size. The pipe shall have a working pressure of 200 psi at 73.4° F for 1,000 hours. The pipe must carry the NFS Seal of Approval.

7-09.3(19)A Connections to Existing Mains

Supplement 7-09.3(19)A with:

Developer shall give City customers whose service may be disrupted, no less than twenty-four (24) hours notice prior to the interruption.

Water containing chlorine residuals shall not be disposed into the storm drainage system or any waterway. Should the Developer wish to discharge chlorinated water into a storm sewer system or waterway, dechlorination of this water per AWWA Standards will be required

7-09.3(21) Concrete Thrust Blocking

Supplement 7-09.3(21) with:

Provide concrete blocking at all fittings, and horizontal or vertical angle points. Conform to the City standard details for general blocking and vertical blocks. All fittings to be blocked shall be wrapped with 4-mil polyethylene plastic. Concrete blocking shall be properly formed with plywood or other acceptable forming materials and shall not be poured around joints. The forms can be stripped prior to backfilling. All shackle rods and nuts shall be stainless steel and coated with two coats of asphalt varnish.

7-09.3(23) Hydrostatic Pressure Test

REPLACE the first sentence with the following:

All water mains and appurtenances (hydrants, service lines, etc) shall be tested in sections of convenient length, under a hydrostatic pressure equal to 250 psi, unless otherwise directed by the Owner's Inspector.

Supplement this section as follows:

Valve clusters shall be assembled outside of the trench and pressure tested separately prior to installation. All valves which will be installed on or adjacent to existing water mains shall be pre-tested on both sides of the closed valve seat with zero pressure loss. Failing valves shall be replaced at the Contractor's expense.

Pressure gauges shall be in good working order and scaled appropriately for the test. Scale range shall not exceed 160% of the test pressure. For example, for a 250 psi test, the gauge scale shall not exceed 1.6 x 250 = 400 psi. The Owner has the right to reject any gauges that are suspect in their accuracy.

Sections of pipe that cannot be pressure tested, such as connections to the existing system, shall be left exposed for a visual inspection under system pressure.

The following test method will be used unless otherwise directed by the Owner's Inspector. Length of time for test will be 60 minutes or at the discretion of the Owner's Inspector. Pressure drop shall not exceed 5 psi during a 60 minute period, regardless of water loss quantity. Owner Inspector shall have the authority to require more stringent criteria if he determines that field conditions warrant such measures.

At the City's discretion, the calculated water loss method described in the Standard Specifications 7-09.2(23), paragraphs 5 through 9 may be used. Using this method, the term "appreciable loss in pressure" is defined as 2 psi or more in 15 minutes.

7-09.3(25) Pipe Abandonment (New Section)

The pipes to be abandoned in place shall be drained, flushed, plugged, and completely filled with a light-weight concrete mixture which can be pumped into the existing line. This mixture shall be self-consolidating, free-flowing, which will result in a hardened, dense, non-settling fill.

7-12 VALVES FOR WATER MAIN

7-12.2 Materials (Supplemental Section)

Water Valves – 4-10"

Gate valves shall conform to the standards of AWWA C-509/C-515. Gate valves shall be iron body, bronze mounted, double disc, non-rising stem, operating stems equipped with standard 2-inch operation nut, and o-ring stem seals, suitable for installation with the type and class of pipe installed. Ends to be as specified. Must be equal to Dresser or Kennedy.

Water Valves – 12"

Gate vales shall be of the resilient-wedge type non-rising stem and shall meet or exceed the performance requirements of AWWA Standard C-509 with a design working water pressure of 200 psig. Valve shall be furnished with a standard 2-inch operating nut and open by turning counter-clockwise. Stem seal shall be o-ring type. Valve operating nut extensions are required when the valve nut is more than 3 feet below finished grade.

All exterior ferrows parts, including the interior of the gate or wedge, shall be coated with fusion bonded epoxy, with a minimum thickness of 8 mils. Said coating shall be non-toxic, impart no taste to water and shall conform to AWWA C-550 of the latest revision.

The Developer shall provide an Affidavit of Compliance Stating that the valve furnished fully complies with AWWA C-509. Gate valves shall be used for 12-inch and manufactured by American Darling #84; Waterous #500; CLOW R/W; M & H #3067; Mueller A-2370; or approved equal.

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