

SECTION 4 – WATER AND SEWER INSPECTION AND ACCEPTANCE FOR MAINTENANCE

(Last revised 6/24/05)

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4.1 EASEMENT REQUIRED

- A. Where possible, all water and sewer mains shall be placed within the right-of-way. When this is impractical, or where, due to depth or slope, additional easements are required, then easements shall be dedicated and recorded on plats prior to acceptance for maintenance. When utilities are located outside the public street rights of way, the developer and his/her Engineer shall verify that the final location of the public utilities is located within a platted easement. The City will verify that the easements shown on the preliminary plat are also duplicated on the final plat.
- B. All public easements including (sewer, water, and storm sewer) **are to remain clear of obstructions**. No building or other obstruction shall be erected and no trees shall be planted on any easement other than fences and hedges of a type approved by the City, and only with the understanding that such fences, trees, or shrubbery are subject to removal at such time as access to the easement becomes necessary for maintenance or repair of utility. Driveways, walkways, asphalt and parking lots may be permitted in easements; however, the City reserves the right to remove such asphalt, concrete, base course and sod as necessary to access its facility in the case of emergency. Pavement or concrete will be replaced with a patch. Sod will be replaced with Fescue or rye seeding. The City will not be responsible for replacing a property owners sod after repairing a utility line.

4.2 INSPECTIONS:

4.2.1 WATER

- A. The following items must be inspected during and after installation of water mains and appurtenances for compliance with City Specifications and Standard Details:
- 1) All materials for acceptable make and model in compliance with City of Fairfax approved product list.
 - 2) All bends, fittings, tees, valves, valve boxes, tapping sleeves and valves, for proper installation, bedding, blocking and restraining.

- 3) Fire hydrant installation for proper blocking and rodding, clearance and location, depth, painting and flow.
- 4) All services from corporation to meter box including saddles, for proper installation and connection.
- 5) Vaults, air release valves, vacuum valves, blowoffs for proper installation.
- 6) New main pressure test including service laterals per [Section 02510 – Water Distribution](#).
- 7) Bacteriological test.
- 8) Flushing logs shall be provided to the inspector for all water flushed including durations and operations of valves and fire hydrants.
- 9) The City's construction inspector must be informed in advance of flushing and testing. The City of Fairfax shall be the sole operator of all existing valves and hydrants.

4.2.2 SEWER

- A. The following items must be inspected during and after the installation of sewer lines for compliance with City Specifications and Standard Details.

- 1) Gravity Lines
 - a. All materials for acceptable make and model in compliance with City of Fairfax approved product list.
 - b. Sewer service from the main to the right-of-way cleanout.
 - c. A TV inspection shall be performed on all gravity sanitary sewer lines. Only the initial TV inspection will be performed at City expense. If additional inspections are necessary, the cost shall be borne by the Contractor/Developer.
 - d. Sewer line pressure test (completed after installation of all cleanouts), per [Section 02530 – Sanitary Sewer](#).
 - e. Deflection Test: Mandrel pull-through test (95% certified mandrel).
 - f. Manhole integrity, invert (construction, etc.).
 - g. Manhole vacuum test.
 - h. Check for removal of debris from manholes and sewer mains.
 - i. Testing logs shall be provided to the inspector. The City's construction coordinator must be informed in advance of testing.

- 2) Force Mains:
 - a. Pressure Test & Leakage.
 - b. All bend fittings, tees, valves, tapping sleeves and valves, for proper installation, bedding, blocking, and restraining.

4.2.3 ACCEPTANCE OF WATER & SEWER MAINS

- A. **Pre-final Inspection:** All inspections are to be coordinated with the Utilities Engineer. A pre-final inspection will be made at the request of the Contractor upon satisfactory completion of construction and required tests for the entire project or approved phase. Streets shall have subgrade in place and curb & gutter, if applicable. Landscaping shall be to rough grade. A representative of the Contractor (foreman or supervisor) shall be present or no inspection will be given. A punch list will be prepared stating any deficiencies found. A copy of the punch list can be picked up from the City during the next working day. When all deficiencies have been corrected, the Contractor may request a final inspection.
- B. **Final Inspection:** At the request of the Contractor, a final inspection shall be made. If in the course of the inspection any deficiency is found that was on the punch list give at the pre-final inspection, the inspection shall stop at that point. When the Contractor has satisfactorily corrected all deficiencies on the punch list, he may request another final inspection. One weeks notice is to be given in scheduling all repeat final inspections.
- C. **Issuance of a Building Permit prior to completion of development:**
 - 1) A building permit shall not be issued, nor shall combustibles be brought on to any site, until the following improvements have been installed by the developer and inspected, approved, and placed into service by the City:
 - a. Storm water facilities
 - b. Water mains and appurtenances
 - c. Sewer mains and appurtenances
 - d. Fire hydrants on and operable.
 - 2) A Certificate of Occupancy (CO) shall not be issued until all of the improvements to be constructed by the developer are completed and approved by the City. Exception: If a condition exists which is beyond the control of the developer, such as weather or frozen ground, and prevents completion of the development, then a Certificate of Occupancy may be issued provided the following items are completed:
 - a. Curb, gutter, and sidewalk are installed.
 - b. Street grading and base construction are complete.
 - c. The developer places in escrow with the City an amount equal to 125% of the cost of completing the development; such cost to be determined by the developer and acceptable to the Utilities Engineer.
 - d. The developer agrees in writing to complete the required development within 180 days of placing the funds in escrow with the City. If the

development is not completed within the specified time period, the City shall use the escrowed funds for completion.

- e. The required developments under this section shall be inspected and approved by the City prior to issuance of a Certificate of Occupancy.
- 3) The provisions of this section should not be construed as requiring development of an entire subdivision prior to obtaining a building permit or Certificate of Occupancy. A subdivision may be developed in phases with the following provisions of this section being applied to each phase:
 - a. A minimum phase shall be a total development of the length of one street between intersection streets.
 - b. The approach to each phase shall be previously, and wholly, completed street (see section 1 a through d, and section 2 a through e).
 - c. The minimum water main loop sizes, or applicable performance specifications required by the Utilities Engineer and Fire Department must be completed, inspected, and approved and placed in service.
- D. **Tentative Acceptance:** Tentative Acceptance will be given upon completion of paving for the related streets and landscaping (including off site construction), receipt of Recorded Easements, Certificate of Completion for Sewer System, As-Built Drawings, and Recorded Plat with street addresses. Mains and related appurtenances will be reviewed to assure that no damage has been done during paving and landscaping. Any problems found will have to be corrected. Tentative Acceptance will be made in writing upon completion of the above items. The 12-month Warranty Period will begin at the date of Tentative Acceptance.

The Inspector will make the appropriate recommendation for Tentative Acceptance to the Utilities Engineer.

If approved, meters will be installed upon payment of applicable fees and issuance of a Work Order by the City.

- E. **Final Acceptance:** One month before the 12-month warranty period is over, the project will be inspected for any failures or defects (including TV inspections of sewer lines if deemed necessary). Any problems found will have to be corrected within 30 days. Final Acceptance will be made in writing at this point.

4.2.4 ITEMS APPLICABLE TO BOTH WATER AND SEWER:

- A. **Check for buried items:** It is the responsibility of the developer and not the contractor to ensure that all water meter boxes, valves, manholes, and sewer cleanouts are not buried.

4.2.5 ROAD CONSTRUCTION INCLUDING CURB AND GUTTER, SIDEWALK, AND DRAINAGE FACILITIES

- A. The following items must be inspected during and after installation of Road Construction and appurtenances for compliance with City Specifications and Standard Details:

- 1) All materials for acceptable make and model (i.e. catch basin grates and frames) in compliance with City of Fairfax approved product list.
- 2) Curb and gutter shall be inspected for broken or cracked curb sections, uneven joints, misalignments, honeycombing, crazing, spalding, graffiti, grader blade scars, sealing of expansion/score joints, backfilling, etc.
- 3) Sidewalk, flumes, concrete ditches, steps, islands and driveways will be inspected for cracks, uneven joints, scaring, graffiti, crazing, spalding, proper scoring patterns, sealing of expansion joints, surface abrasions, etc.
- 4) Concrete for air content and air entrainment (for exposed concrete only).
- 5) Test cylinders for each strength mix design shall be taken.
- 6) Asphalt density and thickness.
- 7) Median barriers, piers for stream crossings, retaining walls, and headwalls will be inspected for form marks, cracks, abrasions, honeycombing, graffiti, finish, etc.
- 8) Catch Basins and junction boxes shall be inspected for integrity, invert (construction, etc.).
- 9) Storm drainage lines shall be inspected for integrity including proper alignment and grade.
- 10) Removal of debris from manholes and junction boxes, storm drainage lines flushed clean,
- 11) Erosion control structures removed and disturbed areas seeded and stabilized.
- 12) Ditches, swales, and streams stabilized and sediment removed.
- 13) Streets swept clean and debris removed from street.
- 14) Where applicable, streets are to have pavement markings and signs placed in accordance with the plans and Standard Details.

4.3 ITEMS APPLICABLE TO ALL:

4.3.1 Record/As-Built Drawings: Record drawings are required to be submitted upon completion of the project prior to final acceptance or issuance of a CO. Record drawings shall conform to the following:

A. General

- 1) Deed book references of easements prepared by a surveyor or engineer duly authorized by the State of Virginia to prepare same, shall be submitted to the

Department as a condition precedent to use of the facilities. The drawings shall be referenced to the Virginia State Plane Coordinate System.

- 2) The Contractor shall provide the City with a digital and 1 readable polyester film base (Mylar or equal) original or reproducible of “As-Built” drawings of water and sewer installation. In addition, the as-built drawings shall be provided to the Department in an electronic format, compatible with AutoCAD drawing file format.
- 3) As-built drawings shall accurately show only those lines installed at time of submittal and in the correct location. Lines not installed shall not appear on the as-built drawings. “Omit” or “Omitted” is not an acceptable method of indication that lines were not installed. All changes on the Mylar shall be made with ink.
- 4) Any changes made in grade, alignment, or placement of manholes, valve hydrants, etc. because of problems encountered during installation shall be accurately shown on the as-built drawings.
- 5) When the as-built information differs from the approved construction plans, a justification for the modified conditions may be required.
- 6) The exact location of taps/service connections shall be shown on the as-built drawings in the following manner:

Lot or House #	Water			Sewer		
	Station	Offset R/L	Length	Station	Offset R/L	Length

Footnotes:

- a. Station on water or sewer main to the corporation or service saddle to the nearest 0.1 feet.
 - b. Right or left is off of main looking up station.
 - c. Horizontal distance is from the corporation to meter box or service saddle to curb cleanout.
 - d. Depth of sewer service connection at clean-out plug.
 - e. The sketch shall indicate whether mains are PVC, ductile iron, etc.
- 7) Measurements shall be made to the nearest 0.1 foot.

B. Water Construction:

Record drawings must include the following information:

- 1) **Water Piping:** Location of main, depth of line, type and size of line, air release valves, blowoffs, valves, tees, bend, sleeves, type of restraints, etc.
- 2) **Water Services:** Locations of meter boxes, distances between meter boxes, length of service line from main to meter including size and type of service.
- 3) **Fire Hydrants:** Location of fire hydrants, distance from main to valve, valve to fire hydrant, and height of fire hydrant.
- 4) **Tie-downs:** all valves, fittings, fire hydrants and any branches and dead ends which may require location at a future date, shall be located by a minimum of 2 tie-downs to fixed permanent objects for all valves except the hydrant lateral guard valve which may be measured from the hydrant operation nut. Measurements may be made to:
 - a. The center of other valve boxes,
 - b. The center of manhole covers,
 - c. Hydrant operating nuts,
 - d. Corner of storm sewer curb inlets,
 - e. Perpendicular to curb face.

Temporary structures or objects, such as traffic signs, pavement markings, valve markers, etc. are unsatisfactory as tie downs reference points.

- 5) **Tie-in to existing system:** Reference location of tie-in, provide sketch showing components including tees, nipple lengths, sleeves, valves, Megalugs, anchors, etc.
- 6) **Check for buried items:** It is the responsibility of the Developer and not the Contractor to ensure that all water meter boxes, valves, manholes, and sewer cleanouts are not buried.

C. Sewers Construction:

As-built drawings of sewers shall include the following obtained from an actual field survey: Cleanout station, invert in and invert out elevations at each manhole and the actual field-measured distance between centerlines of manholes, grades, manhole top elevations, distances from one clean out to another, and horizontal and vertical lengths for cleanouts.

- 1) **Acceptable Grade variation from required minimum slope:** The line is to be inspected for conformance with line and grade shown on the plans. The maximum allowable drift between structures from the proposed alignment is:
 - a. **Horizontal alignment:** 0.50 foot (applies to manholes)

b. **Vertical alignment:**

- c. **Minimum Slope:** No tolerance below the minimum slopes will be allowed unless otherwise approved by the Utilities Engineer. When permitted by the Utilities Engineer, drift in vertical grade between as-built manholes shall not decrease the slope of the sewer line below the minimum permitted slopes based on the following tolerance:

Pipe size (inches)	Variation (%)
8 through 12	No flatter than 75% of the specified slope
12 through 24	No flatter than 90% of the specified slope

- d. When permitted, if the slope in the pipe is found to be less than the approved variation, the Contractor shall relay the pipe. Errors in vertical grade between manholes shall be compensated for by adjusting the manhole inverts or by resetting the manhole as required by the Utilities Engineer. Pipe removed due to faulty grade shall be replaced with new pipe.

D. **Storm Drainage Construction**

Location of storm lines, manholes and inlets; grades; invert elevations; length of pipe runs.

- E. **Inspection scheduling:** All inspections must be scheduled 24 hours prior to when inspection is needed and 48 hours in advance of when testing is needed. Inspections will be performed in the order received. Every effort will be made to accommodate the time of request, however, this cannot be guaranteed.
- F. Upon completion of project, staging/storage areas restored and portable toilet facilities removed from project.
- G. **Re-inspection fees:** All inspections that fail or are not ready for inspection are will be subject to a re-inspection fee.

4.4 **WARRANTY:**

- A. **Warranty and Defects Guarantee:** Any work or materials not in accordance with these specifications will be rejected. All work that has been rejected or condemned shall be repaired or, if it cannot be satisfactorily repaired, shall be removed and replaced at the Contractor's expense. Materials not conforming to the requirements of these specifications shall be removed immediately from the site of the work and replaced with satisfactory material by the Contractor at his own expense.

Upon the failure of the Contractor to repair satisfactorily or to remove and replace, if so directed, rejected, unauthorized, or condemned work or materials immediately after receiving formal notice from the Engineer, the Owner may

recover for such defective work or materials on the Contractor's bond or by action in court having proper jurisdiction over such matters, or may employ labor and equipment and satisfactorily repair or remove and replace such work and charge the cost of same to the Contractor, which cost will be deducted from any monies due him.

The approval of material and workmanship by the Utilities Engineer, Public Works Director, Construction Coordinator, or any employee of the City, does not under any consideration preclude the right of the Utilities Engineer or Public Works Director to reject all or any part of the same at any time previous to final payment, if found not to be in accordance with these specifications, nor does any inspection of work release the Contractor from any of his obligations to fulfill his Contract as herein specified and defective work and materials shall be made good or rejected notwithstanding such work and material that may have been previously accepted for payment.

- B. Upon the acceptance of facilities, utilities or streets for permanent maintenance, a one-year warranty for all improvements shall become effective. This warranty must be satisfactory to the City of Fairfax. A bond in the amount of the total construction costs (to guarantee the correction of all defects in such facilities, utilities, or streets) shall be required on developments and projects which include public infrastructure (water, sewer, storm drainage, and roads).
- C. **Reference Point for commencement of warranty period:** Upon completion of construction the developer shall request a final inspection. In addition to preceding requirements, the following items must be completed prior to final inspection:
- 1) All punch list items,
 - 2) The provision of a set of acceptable record drawings,
 - 3) Copies of asphalt density and core thickness test results and of concrete strength test results.
 - 4) Operation and Maintenance manuals,
 - 5) List of subcontractors, manufacturers and suppliers who participated in this project,
 - 6) Statement of payment of taxes,
 - 7) Affidavit of Payment of Debts and Claims
 - 8) Affidavit of Release of Liens, and
 - 9) The submission of the design engineer's water and/or sewer certifications,
 - 10) All flushing and testing logs.

Upon completion of the above, a one-year warranty period shall commence. The City issued Acceptance Letter will state warranty date.

- D. For the purposes of this section, the term "defects" refers to any condition in publicly dedicated facilities, utilities or streets that requires the City to make repairs to such improvements over and above the normal amount of maintenance that they would require. If such defects appear, the warranty may be enforced regardless of whether the facilities, utilities, or streets were constructed in accordance with the requirements of the Public Facilities Manual.

- E. **Latent Defects:** During the one-year warranty period the developer shall repair any latent defects that occur.
- F. **End of Warranty Period:** At the end of the one-year warranty period the developer shall request a cursory inspection. Upon successful completion of all warranty items, the developer shall be released from maintenance responsibilities for the warranted construction and construction bonds will be released.
- G. Warranty repairs to the following common problems shall be as follows:
- 1) Trench failures in pavement shall be repaired in accordance with the requirements of [Section 02275 – Trenching, Backfilling & Compaction of Utilities](#).
 - 2) If more than 3 trench failures occur within a longitudinal distance of 800 feet on any segment of a street, the City may require a 1-inch overlay once repairs have been completed.
 - 3) Cracks in sidewalk and/or curb and gutter shall be repaired by removing and repouring such sections as necessary.
 - 4) Concrete sidewalks, driveways, and curb and gutter, which fall below the specified strength shall be removed and replaced as necessary.
 - 5) Pavement, sidewalk or curb and gutter failures caused by latent subsurface problems shall be repaired in accordance with the recommendations of an approved Geotechnical engineer.
 - 6) All water, sewer, storm sewer, drainage and street appurtenances impacted by the water and/or sewer construction shall be in acceptable condition and properly exposed (particularly water meters and sewer cleanouts);
 - 7) Overseeding and reseeding may be required if an acceptable stand of grass has not been achieved by the end of the warranty period.
 - 8) All other defects shall be corrected in accordance with the recommendations of the Utilities Engineer or Public Works Director or his/her representative;
- H. If a developer fails to complete warranty items, future projects of the developer shall not be reviewed by the Utilities Engineer or Public Works Director. In addition, the City may take additional legal action against the developer.

END OF SECTION 4

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