
NEWTON COUNTY WATER & SEWERAGE AUTHORITY

Standards & Specifications

Adopted March 2022



TABLE OF CONTENTS

Article 1	Water Distribution Systems, Sanitary Sewer System, and Appurtenances	3
Section 1.01	Purpose	3
Section 1.02	General	3
Section 1.03	Variances	3
Section 1.04	Definitions	3
Article 2	Steps for Connecting to Authority Facilities	4
Section 2.01	Pre-Construction Phase	4
Section 2.02	Construction Phase: Undeveloped Areas	7
Section 2.03	Construction Phase: Dormant Projects	8
Section 2.04	Post-Construction Phase	8
Article 3	Water System	10
Section 3.01	Design Criteria	11
Section 3.02	Materials of Construction	12
Section 3.03	Specifications	18
Article 4	Sewer System	22
Section 4.01	Design Criteria	23
Section 4.02	Locations	23
Section 4.03	Tops of Manholes	25
Section 4.04	Minimum Drop	25
Section 4.05	Manhole Diameter	25
Section 4.06	Sewer System Materials of Construction	26
Section 4.07	Sewer Specifications	31
Article 5	General Specifications	35
Section 5.01	Soil Erosion and Sedimentation Controls	35
Section 5.02	Existing Underground Utilities and Obstructions	35
Section 5.03	Construction Along Highways, Streets, and Roadways	35
Section 5.04	Handling Materials	36
Section 5.05	Stream and Ditch Crossings	37
Section 5.06	Protection and Restoration of Work Area	37
Section 5.07	Thrust Restraint	38
Section 5.08	Concrete Encasement	38

Section 5.09	Backfilling	38
Section 5.10	Trench Excavation	38
Section 5.11	Bedding	39
Section 5.12	Installing Pipe	39
Section 5.13	Removing and Replacing Pavement	39
Section 5.14	Clearing and Grubbing	40
Section 5.15	Roadway Crossings	40
Appendix A	Water Standard Details	A
Appendix B	Sewer Standard Details	B
Appendix C	Water and Sewer Demand Calculations	C
Appendix D	Industrial Pretreatment Program	D
Appendix E	Wastewater Pumping Stations	E
Appendix F	Procedures	F
Appendix G	Checklists	G
Appendix H	External Organizations	H

Article 1 Water Distribution Systems, Sanitary Sewer System, and Appurtenances

Section 1.01 Purpose

- A. This Section of the Specifications describes procedures and design criteria to be incorporated to connect, extend, and enhance the water distribution and sanitary sewer systems. The Developer shall perform all necessary labor to fulfill the requirements of this Section of these Specifications.

Section 1.02 General

- A. When the Standards set forth in this manual are more restrictive than those required by any statute, ordinance, or regulation applicable within the Authority's service area, the requirements of this manual shall govern. When the provisions of any other statute, ordinance, or regulation require more restrictive standards than those imposed by this manual, the more restrictive standards shall apply.
- B. The Executive Director shall make changes to these Standards from time to time to reflect updated or new equipment and materials, revisions or additions to facility installations and other changes which improve the permitting and construction of water and sewer facilities (see letter in Appendix F).

Section 1.03 Variances

- A. Based on unique circumstances, the Authority may grant a variance to the Standards.

Section 1.04 Definitions

Where the following words / pronouns occur herein, they shall have the following meaning:

Authority shall mean Newton County Water and Sewerage Authority (NCWSA), the Owner, and its authorized and legal representative.

Developer shall mean any party wishing to connect, extend, or enhance the Authority's water and sewer systems and any legal representative, contractor, or design professional of such party.

Development Plans shall mean the detailed plans showing the layout and design, site work and construction activities proposed for a project.

Drawings shall mean the plans prepared by the Developer.

Newton County or County shall mean the legal entity governed by the Newton County Board of Commissioners, or its authorized representatives, which is separate from the NCWSA.

Provide shall mean to furnish and install.

Standard Details shall mean those NCWSA Drawings of specific water or sewer construction details

Standards or Specifications shall mean the latest revision of the "Water & Sewer Standards and Specifications" published by the NCWSA.

Article 2 Steps for Connecting to Authority Facilities

Section 2.01 Pre-Construction Phase

- A. Developer shall complete and submit a Water & Sewer Availability and Map Request form (see Appendix G) to determine if the proposed development is within the Authority's service area. Any property within 1,500 linear feet of the water system (see Section 640-020 of Newton County Development Regulations) and 200 linear feet of the sewer system (see Section 645-010 of Newton County Development Regulations), as measured along any existing / proposed public road right-of-way from the system to the nearest point of the property (or easement to the property), is required to connect to the Authority's system. Developer shall verify the feasibility of connection to the existing infrastructure. If infrastructure is available, and a rezone or conditional use permit is required by Newton County Board of Commissioners, said rezone or permit must be obtained from Newton County before plan submission or review will begin. Once availability is confirmed and a rezone or conditional use permit is acquired, Developer shall submit a Development Application to the Authority.
- B. Homeowners may request a variance to the requirements for connection to existing sewer lines be granted, where needed, by submitting a letter to the Authority stating the reason for such variance. The Authority shall review the request and grant the requested variance if in its opinion is in the best interest of the Authority.
- C. The Authority shall review and return submitted Development Application. At the Authority's discretion, the Authority may require a preliminary meeting with the Developer to address any potential concerns / comments from the Development Application submission. Developer shall satisfy all requirements in the Development Application prior to subsequent plan submission.
- D. After approved Development Application, Developer shall submit water and wastewater Development Plans for review. All proposed easement(s), exhibit(s), and other pertinent item(s) must accompany the plans. Drawings shall be reviewed in accordance with the Standards and Specifications herein. NCWSA shall not approve partial / incomplete Drawings. Developer may submit a Request for Information to the Authority, if needed, to address comment(s) from the previous plan review.

Developer shall provide a digital PDF. As a minimum, the following information shall be depicted on the Drawings:

1. Cover Sheet identifying:
 - a) Project name
 - b) Land lot, district, and zoning
 - c) Summarized list of main size(s), length(s), and type(s)
 - d) Name, company name and address, phone number, and email address of Owner, Developer, and Design Engineer

- e) Prepared, stamped, and signed by a currently licensed Georgia Registered Professional Engineer

2. Clearly identify throughout plans:
 - a) Prepared, stamped, and signed by a currently licensed Georgia Registered Professional Engineer
 - b) 1" = 2000' location map with north arrow
 - c) Drawing scale:
 - i. Water: Scale no smaller than 1" = 50 feet.
 - ii. Gravity sewers and force mains: Plan and profile no smaller than 1" = 50 feet horizontal and 1" = 10 feet vertical.
 - iii. Pump Station Site Plan: No smaller than 1" = 20 feet.
 - d) Results of water system flow test
 - e) Topography containing existing and proposed roads, with road names and State Route numbers, streets, lots, owner and street addresses of properties, rights-of-way, land lots, districts, easements, high and low spot elevation, utilities, and existing structures / objects which would affect the construction / design of the water main, sewer, and respective appurtenances.
 - f) The following shall be included on plans and profiles:
 - i. topography with 2-foot contours
 - ii. profile of ground surface
 - iii. slope of the sanitary sewer between adjacent manholes
 - iv. size and material of pipe
 - v. length between manholes
 - vi. all inverts
 - vii. ground surface elevation at each manhole
 - viii. number all manholes with same name on both profile and plans including respective station numbers
 - ix. special manhole covers
 - x. casings under roadways
 - xi. NCWSA Standard Details applicable to the specific project
 - xii. profile of adjacent parallel stream bottoms and of adjacent lake surfaces, low buildings, and lots
 - xiii. connections to existing sanitary sewers
 - xiv. service laterals
 - xv. concrete encasements
 - xvi. collar walls
 - xvii. elevated sanitary sewers
 - xviii. air and vacuum relief valve assemblies
 - xix. stream crossings
 - xx. drop manhole connections
 - xxi. storm sewer locations and invert elevations

- g) Design of proposed infrastructure showing all existing and proposed water and sewer mains, including its respective appurtenances, services, connections, materials, and Standard Details for both water and wastewater systems.
3. NCWSA General Construction Notes (see Appendix G)
- E. The Authority will return comment(s) and copies of all applicable highway and railroad crossing permits to Developer no later than 30 days after receipt of each submitted *Development Plans*. Developer shall submit revised *Development Plans* after adequately addressing comment(s). The Authority reserves the right to cease review and return plans if comment(s) are not addressed in resubmission. Approved plans shall be accompanied by calculated water and / or sewer connection fee calculations, as applicable. Connection fees are calculated at the rate then in effect as established by the current Authority Rate Ordinance. Water and / or sewer connection fees shall be paid as follows:
 1. Subdivisions: Water and / or sewer connection fees shall be paid for by individual homeowners upon development of each property.
 2. Commercial / Institutional / Industrial: Water and / or sewer connection fees shall be paid for by Developer prior to construction.
 - F. Once approved, *Development Plans* shall be referred to as '*Construction Plans*.' Developer shall schedule a Preconstruction Meeting with the Authority. Developer shall provide Land Disturbance Permit, provide Contractors' and Subcontractors' license(s), water and / or sewer connection fees (as applicable), and submit Certificate of Insurance forms prior to the Preconstruction Meeting. The Authority shall stamp approved *Construction Plans* 'approved' and issue water and / or sewer permit(s) at this time, contingent on paid connection fees and submitted documents. Owner, Developer, Contractor, and specialized Subcontractor(s) shall be present at the Preconstruction Meeting.

Any substantial field change(s) made to the approved *Construction Plans* shall first be corrected by Design Engineer and resubmitted to the Authority for review and approval.

Approved *Construction Plans* are valid for 12 months from date of approval. Water / sewer construction shall commence within this period.

Extension of the expiration date must be submitted in writing for review and approval by the Authority at least 30 days prior to the expiration date. Renewal is at the discretion of the Authority. This process must be repeated every 12 months until construction is completed and accepted by the Authority. For each extension request, the Developer shall make all changes to the *Construction Plans* in accordance with any changes made to the NCWSA Standards and Specifications.

Section 2.02 Construction Phase: Undeveloped Areas

- A. Developer shall construct all water and / or sewer lines, with all respective appurtenances, in accordance with manufacturer's guidelines, Standards and Specifications, and *Construction Plans*.

- B. The Authority shall routinely inspect site for conformity to the Standards and Specifications and *Construction Plans* (see *NCWSA Required Water & Sewer Inspections* forms in Appendix F) and coordinate accordingly with the Authority's Inspector. All standards and procedures listed on the *NCWSA Required Water & Sewer Inspections* forms are an extension of these Regulations and Contractor shall follow them accordingly.

Section 2.03 Construction Phase: Dormant Projects

- A. If construction will occur in an abandoned, previously bankrupt or dormant subdivision, the Developer shall perform any required maintenance, chlorine residual testing, bacteriological sampling and Colored Closed-Circuit Television (CCTV) inspection. Initially, the Authority will inspect said infrastructure for any deficiencies, inform Contractor to all deficiencies and Contractor shall address them accordingly. The Authority shall inspect Contractor's repairs to ensure repairs were completed in accordance with these Standards and Specifications. Following all maintenance repair(s), the Contractor shall sample the chlorine residual level and submit a bacteriological sample to Newton County Laboratory through the Authority's Inspector. Once the chlorine residual is within an acceptable range, bacteriological sample tests negative, and video with accompanying report has been submitted from a CCTV for sewer inspections, the Contractor shall continue with construction.

Developer shall construct all water and / or sewer lines, with all respective appurtenances, in accordance with manufacturer's guidelines, Standards and Specifications, and *Construction Plans*.

The Authority will routinely inspect site for conformity to the Standards and Specifications and *Construction Plans*. See *NCWSA Required Water & Sewer Inspections* forms in Appendix F and coordinate accordingly with the Authority's Inspector. All standards and procedures listed on the *NCWSA Required Water & Sewer Inspections* forms are an extension of these Regulations and Contractor shall follow them accordingly.

Section 2.04 Post-Construction Phase

- A. Following completion of construction, testing, and successful start-up, Developer shall schedule a Final Inspection with the Authority. Typically, a punch list is developed at this milestone.

The Final Inspection shall include, but is not limited to, clean up, grassing, and complete compliance with all Specifications. Any deficiencies found, including necessary corrections to meet Specifications and damages caused by construction activities, shall be reported to and corrected by the Developer prior to issuing *Project Closeout Letter* (see Appendix F).

- B. Developer shall submit all pertinent Project Closeout documents upon receiving *Project Closeout Letter*, including, but not limited to, the Final Plat / Certificate of Occupancy, Record Drawings, Easements, Warranty Agreement, and security documents, as applicable. Electronic files shall be the latest AutoCAD .dwg and Adobe .pdf formats. The Final Plat shall not be signed until all aforementioned

documents are submitted to the Authority. The Warranty Period shall begin once an Adobe .pdf copy of the recorded Final Plat is received. Once the Final Plat is received, water meters and sewer connections for subdivision lots can be sold.

Record Drawings shall conform to *Newton County Water & Sewerage Authority As-Built / Record Drawing Specification* form (see Appendix F). All standards and procedures listed on the *Newton County Water & Sewerage Authority As-Built / Record Drawing Specification* form are an extension of these Standards and Specifications and Contractor shall follow them accordingly. The Authority will verify the accuracy of the Record Drawings.

Warranty: Developer shall receive a *Project Closeout Letter* once construction is complete in accordance with Section 2.04.A. Developer shall comply with the requirements stated within the *Project Closeout Letter*. The Developer shall be responsible for, and make any repairs or replacements required as the result of, any breakage, vandalism, or other damage caused to the improvements until the requirements stated within the project closeout letter are completed. Once fulfilled, the Developer shall sign a one-year maintenance agreement and provide a Maintenance Bond, Letter of Credit or Letter of Escrow, found in Appendix G. The warranty shall begin and Developer shall maintain the improvements for one year following the date of completing all requirements stated within the *Project Closeout Letter*.

The Developer shall receive written notice of a list of deficiencies 30 days before the end of the warranty period for correction. When corrections are needed, Developer shall make such repairs within 30 days after receipt of deficiencies list. The Authority shall take necessary and reasonable action(s) to make or cause such repairs within 30 days. During the 1-year warranty period, the Authority shall contact Georgia 811 and locate all water, sewer, and applicable appurtenances and the Developer shall be responsible for all damages if said items are damaged. Once the work is free from all defects, all required repair(s) made to the satisfaction of the Authority, and the Warranty has expired, the Authority shall issue a Release of Warranty to the Developer signifying the end of the warranty period.

The Authority shall accept for ownership and operation all water and sewer facilities only after Final Plat is recorded or a Certificate of Occupancy is issued by Newton County. The Authority shall not accept the installed facilities, nor will the Authority assume any responsibility over said facilities, if Developer does not record or receive a Final Plat and Certificate of Occupancy from Newton County. The Developer shall make all necessary maintenance repairs to any facility not accepted by the Authority to the current specifications in these Standards and Specifications.

Article 3 Water System

Section 3.01 Design Criteria

A. General

1. A separate meter and service line shall be provided for each address.
2. The Authority will not make repairs to site improvements on private property (e.g., pavement installed by property owner).
3. Minimum sizes for water mains shall be sized based on the maximum projected demand of the development, but no less than 6-inch nominal diameter.
4. A sufficient flow, pressure, and supply of water for the proposed development shall be confirmed prior to any preliminary plan approval. Flow test results shall be valid for one (1) year.
5. Water demand for domestic use shall be in accordance with the Authority's water demand projections in Appendix C.

B. Locations

1. Subdivision: Along subdivision streets or inside new developments, water mains shall be located within right-of-way in accordance with Newton County placement ordinance.
2. Existing City & County Right-of-Way: Water mains shall be installed a minimum of 5-feet inside the right-of-way limit. A Land Disturbance Permit and Utility Encroachment Permit shall be obtained from the appropriate authority prior to encroachment on right-of-way.
3. Georgia Department of Transportation (GDOT) Right-of-Way: Along GDOT right-of-way, water mains shall be located nominally 5-feet inside the right-of-way limit. A GDOT Utility Permit shall be obtained from GDOT prior to construction. Permit application shall be submitted with required preliminary drawings.
4. Easements: Any water mains constructed on private property shall have a recorded 20-foot easement. The Authority will not accept ownership of water mains installed along roadways not dedicated for public use without an easement. The Authority will not extend water mains along private roadways, except in cases where such service is in the best interest of the Authority (e.g., crossing shopping centers).
5. Roadway Crossings: Water mains and service lines crossing existing City, County, or Department of Transportation paved streets and roadways shall be bored and cased. Permits are required from the proper authority prior to construction. Every effort shall be made to bore under roads, including moving to different boring locations. Roadways shall only be open-cut with written permission from the proper authority. Repair of open-cut roadways shall conform to the standards set forth by the proper authority or by NCWSA, if more restrictive.

6. Railroad Crossings: Water mains crossing railroad rights-of-way shall be bored and cased. Permits are required from the proper authority prior to construction. Developer shall pay all fees associated with the railroad crossing.
7. Depth: Minimum depth of cover shall be 4-feet on water mains and 2½-feet on service lines.
8. Fire Hydrants:
 - a) The maximum distance between fire hydrants shall be 500-feet.
 - b) Fire hydrants shall be set back to the right-of-way.
 - c) No natural or man-made appurtenance shall be within a 5-foot radius around the fire hydrant.
 - d) Fire hydrants shall be located within 10-feet of the nearest property corner, unless otherwise approved by the Authority.
 - e) Fire hydrants within commercial and industrial developments must be located so that all planned structures are within 300 feet of a fire hydrant.
 - f) A fire hydrant shall be placed on all cul-de-sacs and within 25 feet of the intersection of all roads including alley ways, private streets, and public roads.
 - g) All hydrants placed within private property shall be metered.
9. Valves: Valves shall be located on all mains such that a minimum number of customers would be affected, should maintenance become necessary.
 - a) Valves shall be placed at a maximum distance of 2,000-feet.
 - b) All line valves shall be marked by valve markers. A valve marker is to be placed directly above the plug on all dead-end water mains. The distance between the valve and valve marker shall be stamped on the valve marker.

Section 3.02 Materials of Construction

A. Applicable Standards:

1. Supply all products and perform all work in accordance with applicable American Society for Testing and Materials (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI), or other recognized standards. Latest revisions of all standards are applicable. If requested by the Authority, submit evidence that manufacturer has consistently produced products of satisfactory quality and performance over a period of at least 5 years.

B. Substitutions:

1. Whenever a product is identified in the specifications by reference to manufacturer's or vendor's names, trade names, catalog numbers, etc., the

Contractor should choose from those referenced products. Any item or product other than those shall be considered a substitution. The Contractor shall obtain prior approval from the Authority for all substitutions.

C. Water Mains and Appurtenances:

1. Ductile Iron Pipe

- a) Ductile iron pipe for water mains shall conform to ANSI / AWWA C151 / A21.51 and be Pressure Class 350.
- b) Pipe and fittings shall be furnished with an asphaltic outside coating in accordance with ANSI / AWWA C151 / A21.51. Pipe and fittings shall be cement lined in accordance with AWWA C104
- c) Fittings shall be ductile iron and shall be manufactured in accordance with ANSI / AWWA C153 / A21.53, with a minimum rated working pressure of 350 psi. Joints shall be push-on or mechanical joints.
- d) Push-on and mechanical joints shall conform to ANSI / AWWA C111 / A21.11. Joints shall be push-on type for pipe and push-on or mechanical joints for fittings.
- e) Restrained joint pipe (RJP) and fittings shall be push-on using ductile iron components. Push-on restrained joint gaskets shall be US Pipe Field-Lok 350 or American Fast-Grip.
- f) Flanged ductile iron pipe shall conform to ANSI / AWWA C151 / A21.51. Flanged pipe shall be fabricated by threading plain end pipe, screwing threaded ductile iron flange(s) on and machine-tightening them. Pipe barrels and flanges shall have a taper pipe thread (NPT) in accordance with ANSI B1.20.1, with thread diameters adapted to ductile iron pipe standard outside diameters.
- g) Where called for on drawings or specified, ductile iron retainer glands for mechanical joints shall be EBAA Iron Mega-Lug, Sigma, or Uni-Flange.
- h) Flanged Joints shall conform to ANSI / AWWA C115 / A21.15. Nuts shall conform to ANSI B18.2.2 and bolts shall conform to ANSI B18.2.1. Gaskets shall be 1/8-inch thick, red rubber, either ring or full face and conform to the recommended dimensions of AWWA C115.
- i) Pipe shall be manufactured by U.S. Pipe, American Cast Iron Pipe Company, or McWane Ductile.
- j) Acceptance: Acceptance will be based on the manufacturer's written certification that the pipe was manufactured and tested in accordance with the applicable standards.

2. Gate Valves

- a) Valves shall be mechanical joint ends, resilient wedge type, ductile iron body gate valves with non-rising stem and 2-inch square operator nut. Body bolts shall be 304 or 316 stainless steel. Valves

shall be provided with “O” ring packing with two “O” rings located above the thrust collar and one “O” ring below. The thrust collar shall have an anti-friction washer on top and be permanently lubricated. Valves shall open left. The valve shall be designed for a minimum working pressure of 200 psi. Gate valves shall conform to ANSI / AWWA C515.

- b) Valves shall be provided with operators as specified or indicated on the Drawings in the case of hand wheel operators.
- c) Valves shall be manufactured by Mueller, U.S. Pipe, or M & H Valve.

3. Tapping Sleeves and Valves (TS&V)

- a) TS&V shall be sized to fit the intercepted pipe without leaking. TS&V shall have a minimum working pressure of 250 psi. Valves shall be gate valves furnished in accordance with the specifications shown above, with flanged connection to the tapping sleeve and mechanical joint connection to the branch pipe. The tapping sleeve and valve shall be supplied by the same manufacturer. The joint on the outlet end of the valve shall be appropriate for the type of pipe used for the new water main.
- b) For pipe sizes 12-inches or larger, TS&V shall be ductile iron of the split-sleeve, mechanical joint type model H-615 by Mueller. For pipe sizes smaller than 12-inches, TS&V shall be clamp around stainless-steel model H-304 by Mueller.

4. Valve Boxes

- a) Valve boxes shall be manufactured with ductile or cast iron, adjustable shaft with a minimum diameter of 5¼-inches. Shall have an asphaltic bituminous coating with a minimum thickness of 1.5-mil. The valve boxes shall be adjustable to 6-inches up or down from the nominal required cover over the pipe. Valve boxes shall be of sufficient length that bottom flange of the lower belled portion of the box is below the valve operating nut. The valve box cover shall display “WATER”.
- b) All valves shall be furnished with extension stems, as necessary, to bring the operating nut to within 30-inches of the top of the valve box. Connection to the valve shall be with a wrench nut coupling and a set screw to secure the coupling to the valve's operating nut. The coupling and square wrench nut shall be welded to the extension stem. Extension stems shall be Mueller A-26441 or M & H Valve Style 3801.

5. Fire Hydrants

- a) General: Fire hydrants shall comply in all respects with AWWA Standard C502. Fire hydrants shall be of the compression type, with the main valve opening against the pressure and closing with the pressure. The main valve opening shall be 5 ¼-inches in diameter.

Fire Hydrant shall be of a dry barrel, dry top design. The nozzle section shall consist of 2 hose nozzles and 1 pumper nozzle.

- b) Fire hydrants shall be rated at 250-psi water working pressure, tested at 500-pounds hydrostatic for structural soundness in the following manner. 500-pound hydrostatic test supplied from the inlet side, first with the main valve closed for the testing of the valve seat. Second, with the main valve open for testing of the drain valves and the hydrant barrel. Testing to be complete in accordance with AWWA C502 and UL & FM requirements.
- c) Bonnet: The bonnet may be oil filled, with "O" ring packing enclosing all operating parts in a sealed oil bath with an oil filter plug to allow checking of oil level and adding oil when necessary, or dry reservoir, with a lubricating hole or nut for convenience. All parts of hydrant shall be removable through the top without moving barrel section from safety flange.
- d) Nozzles and Caps: Each hydrant shall be equipped with one 4½-inch pumper connection and two 2½-inch connections with National Standard threads. Nozzles shall be bronze and furnished with interlocking lugs to avoid blowout. Non-kinking type chain shall be used to secure caps to fire hydrant with chain loop on cap ends to allow free turning of caps.
- e) Seat Ring: Shall be bronze.
- f) Drain Valves and Openings: Drain of fire hydrant when main valve is closed shall be provided by positive operating drain valves. Bronze bushings shall be in the drain openings.
- g) Main Valve: Valve shall be constructed of material that resist rocks or other foreign matter, closes with pressure, remains closed and have a full 5 ¼-inches opening.
- h) Barrel and Safety Flanges: Hydrants shall have a safety-type vertical lower barrel sized for 4½-foot bury. Hydrants shall be fabricated with safety flanges and / or bolts to prevent damage to the barrel and stem and flooding if the hydrant is struck.
- i) Operating Stop and Nut: Hydrant shall be constructed with a positive stop feature to permit opening of hydrant without over travel of the stem. The operating nut shall have the following features: bronze, 1½-inch, point to flat, and pentagon.
- j) Bolts and Nuts: All bolts, washers, and nuts shall resist corrosion.
- k) Inlet: The inlet at the bottom of the hydrant shall have a nominal diameter of 6-inches and a mechanical joint connection as specified.
- l) Direction of Opening: Hydrant shall open counterclockwise.
- m) Coatings and Color: Hydrant shoes shall have an interior and exterior thermosetting epoxy coating of 5 to 6 mils meeting AWWA C550. Exterior of upper barrel section shall be painted with two coats of zinc chromate primer and painted Safety Yellow with two coats of approved hydrant enamel in accordance with NFPA Standard 291.

- n) The manufacturer shall provide a 10-year warranty on materials and workmanship.
- o) Hydrant shall be Mueller Super Centurion 350, American-Darling B-84-B, or M & H Model 129.

6. Water Service Connections

- a) Service Saddles and Clamps:
 - i. Saddles for connections to ductile iron pipe shall be of the double-strapped type and sized as indicated on the Drawings and contain AWWA C800 - CC threads. Service saddles shall be Ford Style 202, JCM 402, or Mueller DR2A.
 - ii. Clamps for connections to PVC pipe shall be of the bronze / stainless, full-circle type. Clamps shall be Ford Style 202 BSD, JCM 404, or Mueller DR2S.
- b) Corporation Stops: Corporation Stops shall be made of bronze conforming to ASTM B61 or B62, shall be suitable for 20-psi working pressure and shall be ground key type with ends appropriate for compression type joints. Corporation stops shall have CC inlet threads and AWWA C800 outlet threads. Corporation Stops shall be Ford F-1000, Mueller 300, or A.Y. McDonald 74701.
- c) Wyes: Bronze Service Wyes shall be Ford Model Wye (Y44 Series), Mueller, or A.Y. McDonald.
- d) Curb Stops: Curb Stops shall be Ford, Mueller, or A.Y. McDonald with all parts manufactured from bronze. The stop shall open when turned counterclockwise with operation by a combined cap and tee. The cap on the stop shall have locking capabilities.
- e) Service Tubing: Shall be copper or high-density polyethylene with fittings and appurtenances as follows:
 - i. Copper: Shall be type "K", soft temper, and seamless copper tubing in compliance with ASTM B88. Compression joints shall be used. Where copper or brass pipe connect to steel, dielectric adapters shall be provided. Joints shall not be permitted beneath paved roadways.
 - ii. Polyethylene: Shall be copper tubing size high density polyethylene tubing conforming to or exceeding the requirements of ASTM D2737. Working pressure shall be minimum of 20 psi with minimum burst pressure of 630 psi at 73.4°F.
 - iii. Accessories and fittings specified herein shall be compatible with the outer diameter (OD) of the tubing.
- f) Meter Boxes: To be supplied by NCWSA.
- g) PVC Casing for Long Side Services: Long side services shall be encased in Schedule 40 PVC casing with a minimum 1½-inch diameter.

7. Underground Markings
 - a) Warning Tape
 - i. Warning Tape shall be provided over all buried water mains and service lines. Tape shall meet the requirements of ASTM D2103-08: Standard Specification for Polyethylene Films and Sheeting. Tape will be "APWA Blue" in color, 5-mils minimum thickness, at least 2-inches wide and shall bear the printed identification "Caution - Buried Water Line Below" (reverse printed), to be readable through the film.
 - ii. Warning tape shall be Terra Tape by Reef Industries, Inc. or Proline Safety Products, Inc.
 - b) Tracer Wire
 - i. Tracer Wire shall be taped to all buried lines at 8- to 10-foot intervals.
 - ii. For water lines, provide APWA Blue uniform color High Density Polyethylene or High Molecular Weight Polyethylene coatings or jacket for the tracer wire. Nylon jacket is not allowed.
 - iii. Solid copper or copper clad steel shall be the conductor.
 - iv. Provide connectors manufactured by Copperhead SnakeBite or 3M DBR.
 - v. Run the tracer wire in the same orientation as the installed pipe.
 - vi. Ground / terminate and loop the wires at locator posts, fire hydrants, or meter boxes.
8. Visible Markings
 - a) Valve markers
 - i. A marker is required for each buried valve.
 - ii. Shall be 2½-inches wide and 66-inches long and constructed of wide fiber-reinforced composite materials. Decal labels on the markers shall be UV stable, color-coded APWA Blue, identified as "Water Valve" with distance, in feet, between valve and marker. Contractor shall install marker at a uniform anchoring depth of 18- to 24-inches.
 - iii. Marker shall be 3-Rail Fiberglass Post by Blackburn Manufacturing Company.
9. Pipe Connection Couplings
 - a) For pipe sizes 2-inches and smaller, pipe connections between new and existing pipes shall be made with Dresser Style 90 long steel couplings.

- b) For pipe sizes larger than 2-inch, ductile iron MJ solid sleeves shall be used for connections between new and existing pipes.
- c) Spacer rings, a short section of pipe cut to fit within the gap between two plain ends of pipe at the sleeve location, shall be used at all solid sleeve locations.

10. Polyethylene Wrap

- a) Shall have a thickness of a minimum of 8-mils.
- b) Shall comply with ANSI / AWWA C105.
- c) Shall consist of three layers of linear low-density polyethylene film to protect pipe from microbiologically influence corrosion and possess a volatile corrosion inhibitor.

11. Flange Adapter

- a) The flange adapter shall allow for the connection of unthreaded, ungrooved, open-ended ductile iron pipe to ANSI 125-pound flanged pipe and fittings. The adapter shall be made from high strength steel and be rated for a working pressure of not less than 150 psi or the rated pressure of the pipeline, whichever is greater.
- b) The flange adapter shall be Dresser Piping Specialties Style 128 or Smith-Blair, Inc. Style 912.

Section 3.03 Specifications

A. Connections to Existing Water System

- 1. Connect to existing water mains with approved tapping sleeves, solid sleeves, saddles, and valves with NCWSA's approval. Disinfect and prepare lines for connection in accordance with the most current AWWA C651 and C600.
- 2. For private dedicated fire lines or fire suppression systems, the Owner / Developer must provide an approved backflow prevention device in accordance with the "Newton County Water & Sewerage Authority Cross Connection Control Standard Operating Procedures" found in Appendix F.
- 3. See "Required Inspections - Water" form in Appendix F for requirements for connection to existing NCWSA water lines.

B. Pressure and Leakage Test

- 1. All sections of water line subject to internal pressure shall be pressure tested in accordance with AWWA C600. A section of line will be considered ready for testing after completion of all thrust restraint. Backfilling at fitting locations is optional.
- 2. Each segment of water main between in-line valves shall be tested individually.

3. Test Preparation

- a) Flush pipeline section thoroughly at flow velocities adequate to remove debris from pipe and valve seats. Partially operate valves and hydrants to clean out seats. Provide correctly sized temporary outlets in number adequate to achieve flushing velocities.
- b) Provide temporary blocking, bulkheads, flanges, and plugs as necessary, to assure all new pipe, valves, and appurtenances will be pressure tested.
- c) Before applying test pressure, air shall be completely expelled from the pipeline and all appurtenances. Unless permanent air vents are in place, insert temporary corporation stops at highpoints to expel air as line is filled with water.
- d) Before installing tapping sleeves, lines shall be cleaned with soap and water then rinsed with 5% chlorine solution. Air shall be released from tapping valve through tapped plug. Sleeve and valve shall pass pressure test with water at 200-psi for 10 minutes before cutting operation can start.
- e) Fill pipeline slowly with water. Provide a motor driven test pump with an accurate water meter to pump the line to the specified pressure. Differential pressure at valves and hydrants shall not exceed manufacturer's pressure rating.

4. Test Pressure

- a) Test the pipeline at 200 psi measured at the highest point for at least 2 hours.
- b) Should the pressure drop more than 5-psi at any time during the test period, the pressure shall be restored to the specified test pressure. The test pressure shall not vary by more than 5-psi for the test duration. Developer shall provide an accurate pressure gage with graduations not less than 5-psi.

5. Leakage

- a) Leakage shall be defined as the quantity of water that must be pumped into the test section, to maintain pressure within 5-psi of the specified test pressure for the test duration plus water required to return line to test pressure at the end of the test. Leakage shall be the total cumulative amount measured on a water meter.
- b) Leakage through existing valves shall not prevent the contractor from successfully testing all new work. The Contractor shall be responsible for testing all new work beyond existing valves. Provide temporary plugs as required.

- c) Test Results: No test section shall be accepted if the leakage exceeds the limits determined by the following formula*:

$$L = \frac{SD(P)^{1/2}}{133,200} \quad * \text{ For ductile iron pipe only (per AWWA C600)}$$

Where: L = allowable leakage, in gallons per hour
 S = length of pipe tested, in feet
 D = nominal diameter of the pipe, in inches
 P = average test pressure during the leakage test, in pounds per square inch (gauge)

If the water main section being tested contains lengths of various pipe diameters, the allowable leakage shall be the sum of the computed leakage for each diameter.

- d) The leakage test shall be repeated until the test section is accepted. All visible leaks shall be repaired regardless of leakage test results.
6. The Authority shall provide water for all flushing and testing of the water lines at no cost to the Developer. All water shall be metered by a NCWSA-supplied hydrant meter. Developer shall coordinate the delivery of the hydrant meter with the NCWSA inspector.
7. Completion: Relieve test pressure only after the Authority's Inspector accepts the section. Record type, size, and location of all outlets on Record Drawings.

C. Disinfection

1. After successfully pressure testing, disinfect and sample pressure-tested area in accordance with the most current AWWA C651 standard for the continuous-feed method and these Specifications.
2. Chlorination
 - a) Apply chlorine solution to achieve a concentration of at least 25-milligrams per liter free chlorine in new line. Retain chlorinated water for 24-hours.
 - b) Chlorine concentration shall be recorded at every outlet along the line at the beginning and end of the 24-hour period.
 - c) After 24-hours, all samples of water shall contain at least 10-milligrams per liter free chlorine. Re-chlorinate if required results are not obtained on all samples.
3. Disposal of Chlorinated Water: Reduce chlorine residual of disinfection water to that of existing distribution system prior to disposal. Treat water with sulfur dioxide or other reducing chemicals to neutralize chlorine residual. Flush all lines until residual is equal to existing system.

4. **Bacteriological Testing:** After final flushing and before the water main is placed in service, the Contractor shall collect samples from the line and submit to Authority Inspector. The Authority shall be responsible for testing samples for bacteriological quality in accordance with the rules of the Georgia Department of Natural Resources, Environmental Protection Division. Testing shall be performed by a laboratory certified by the State of Georgia. Developer shall re-chlorinate lines until required results are obtained.

Article 4 Sewer System

Section 4.01 Design Criteria

- A. Gravity sewers shall be designed in accordance with the Authority's wastewater flow projections in Appendix C.
- B. No sewer main shall be less than 8-inches. No service lateral shall be less than 6-inches.
- C. Minimum Slopes: The following are the minimum slopes which should be provided; however, slopes greater than these are desirable:

<u>Sewer Size</u> [in]	<u>Minimum Slope</u> [foot per 100 feet]
8	0.70
10	0.50
12	0.40

- D. Sewer Capacity: Sewer laterals shall be limited to one housing unit per connection or street address (including suite numbers). A separate sewer lateral shall be provided for each service address.
- E. Gravity sewer piping between each manhole-to-manhole reach shall be constructed of the same material.
- F. Force mains shall be minimum 4-inches in diameter and designed for a minimum velocity of 3.0-feet per second and a maximum velocity of 6.0-feet per second.

Section 4.02 Locations

- A. Subdivisions
 - 1. Along subdivision streets of new developments, sewers shall be laid straight along the road centerline.
 - 2. Where crossing through proposed yards, the sewer shall be laid straight along property lines, creeks, draws, etc.
- B. Existing City & County Right-of-Way: Sewer shall be installed a minimum of 5-feet inside the right-of-way limit. A Land Disturbance Permit shall be obtained from the appropriate authority prior to encroachment on right-of-way.
- C. GDOT Right-of-Way: Along GDOT right-of-way, sewer shall be located a maximum of 5-feet inside the right-of-way limit. A GDOT Utility Permit shall be obtained from GDOT prior to construction. Permit application shall be submitted with required preliminary drawings.
- D. Easements: Any sewers constructed on private property shall have a recorded 20-foot easement submitted as aforementioned. Any sewers constructed on private property in vicinity of storm sewers shall have a recorded 30-foot easement submitted as aforementioned. The Authority will not accept ownership of sewers

installed along roadways not dedicated for public use. The Authority will not extend sewers along private roadways.

- E. **Roadway Crossings:** Sewers and sewer laterals crossing existing City, County or Department of Transportation paved streets and roadways shall be bored and cased. Permits are required from the proper authority prior to construction. Every effort shall be made to bore under roads, including moving to different boring locations. Roadways shall only be open-cut with written permission from the proper authority. Lines installed by open-cut without written permission shall not be accepted. Department of Transportation roadways shall not be open-cut under any circumstances. Repair of open-cut roadways shall conform to the standards set forth by the proper authority that gave the written permission.
- F. **Railroad Crossings:** Prior to construction, an approved permit shall be required when sewer(s) are to cross rights-of-way owned by any railroad. Permit shall be submitted with preliminary drawings. Developer shall pay all fees associated with the railroad crossing.
- G. **Depth:** Minimum depth of cover shall be 4-feet in all places. Where this depth cannot be provided, the sewer shall be constructed of ductile iron pipe. Where a sewer parallels a creek / river, the crown of the sewer shall be designed a minimum of 2-feet below the bottom of the creek / river.
- H. **Protection of Water Supply:**
 - 1. There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenances, which would permit the passage of any sewage or polluted water into the potable supply. No water pipes shall pass through or contact any part of a sewer manhole.
 - 2. Water mains shall maintain a minimum of 10-feet edge-to-edge horizontal separation from sewer lines. In cases where the main cannot be installed within the prescribed easement or right-of-way and maintain 10-foot separation, NCWSA may reduce this distance provided that the water main be placed in a separate trench or undisturbed earth shelf.
 - 3. Where water lines cross or are installed parallel to sewer lines, a minimum of 18-inches of separation between the bottom of the water main and the top of the sewer is required.
 - 4. When neither of the horizontal or vertical separation criteria is possible, the water main shall be installed below the sewer with a minimum vertical separation of 18-inches. The water main, when installed below the sewer, shall be encased either in a watertight casing pipe or in concrete with a minimum 6-inch concrete depth to the first joint in each direction. The encasement shall extend 10-feet on both sides of the crossing. Where water mains cross the sewer, one full length of water pipe shall be located so that both joints will be as far from the sewer as possible.
- I. **Location of Sewers:** Sewers and manholes shall be laid at a minimum depth of 6-feet below the centerline of public streets. Service laterals shall have 6-feet of cover. In areas where this is not possible, the sewers and manholes shall be installed within the confines of the curb. When laid along creeks, sewers and

manholes shall be designed and installed a minimum of 10-feet outside the 25-foot stream buffer or 10-feet from the top of the creek bank, whichever is greater, or a buffer variance shall be obtained.

- J. Manhole Location: The maximum distance between manholes shall be 400-feet. A manhole shall be installed at the end-of-line of each sewer. Manholes shall be installed at the intersection of all sewers.
- K. Manhole Junctions
 - 1. Where sewers of dissimilar sizes connect to a manhole, the crown of all influent sewers must be at or above the crown of the effluent sewer.
 - 2. No sewers shall be connected to a manhole which requires a horizontal deflection angle greater than 90° between an influent sewer and the effluent sewer.
 - 3. No manholes shall be constructed with more than one effluent sewer.
 - 4. Outside drop connections shall only be constructed where the difference in elevation of the crowns of an influent sewer and effluent sewer is greater than 2-feet.
- L. Force Mains: Force mains shall be designed and constructed with a minimum of 4-feet of cover from the top of the pipe. Grade and depth of cover shall be adjusted as needed to minimize the number of high points on the force main as well as to maintain a positive grade upstream and negative grade downstream of each high point.
- M. Aerial Crossings: Aerial crossings for gravity sewers are permitted only in cases where there is no practical option to install the crossing under the creek or drainageway. Specific design criteria shall be evaluated on an individual basis by the Authority.

Section 4.03 Tops of Manholes

- A. Tops of manholes constructed outside of paved areas shall be minimum 18-inches above finished grade unless otherwise approved by NCWSA. Tops of manholes constructed within paved surfaces shall be set flush with the pavement surface in accordance with Standard Detail B-1.

Section 4.04 Minimum Drop

- A. A minimum drop of 0.2-feet shall be provided between manhole inlet and outlet lines.

Section 4.05 Manhole Diameter

- A. Manholes shall be minimum 4-feet in diameter.
- B. Manholes of 5-feet in diameter or larger shall be provided on all gravity sewer lines greater than 14-feet in depth.

Section 4.06 Sewer System Materials of Construction

A. Ductile Iron Pipe

1. Ductile iron pipe shall be used:
 - a) For all aerial / exposed sewer lines
 - b) For all road and railroad crossings
 - c) Where depth of cover is less than 4-feet
 - d) At crossings of bodies of water
 - e) At crossings of storm sewers
2. Ductile iron pipe for sewer service shall conform to ANSI / AWWA C151 / A21.51 and be Pressure Class 350.
3. Pipe and fittings shall be furnished with an asphaltic outside coating in accordance with ANSI / AWWA C151 / A21.51. The interior of ductile iron pipe and fittings for wastewater service shall be lined with an amine cured novolac epoxy containing at least 20% by volume of ceramic quartz pigment. The epoxy lining shall be chemically cured and two-component material applied to sand blasted surfaces with minimum thickness 40-mils D.F.T. A 2500-volt (min.) test shall be conducted to ensure total coverage. The epoxy lining material shall be PROTECTO 401™ Ceramic Epoxy.
4. Fittings shall be ductile iron and shall be manufactured in accordance with ANSI / AWWA C153 / A21.53, with a minimum rated working pressure of 350-psi. Joints shall be push-on or mechanical joint.
5. Push-on and mechanical joints shall conform to ANSI / AWWA C111 / A21.11. Joints shall be push-on type for pipe and push-on or mechanical joints for fittings.
6. Restrained joint pipe (RJP) and fittings shall be push-on using ductile iron components. Push-on restrained joint gaskets shall be US Pipe Field-Lok 350 or American Fast-Grip.
7. Flanged ductile iron pipe shall conform to ANSI / AWWA C151 / A21.51. Flanged pipe shall be fabricated by threading plain end pipe, screwing threaded ductile iron flange(s) on and machine-tightening them. Pipe barrels and flanges shall have a taper pipe thread (NPT) in accordance with ANSI B1.20.1, with thread diameters adapted to ductile iron pipe standard outside diameters.
8. When called for on drawings or specified, ductile iron retainer glands for mechanical joints shall be EBAA Iron Mega-Lug, Sigma, or Uni-Flange.
9. Flanged Joints shall conform to ANSI / AWWA C115 / A21.15. Nuts shall conform to ANSI B18.2.2 and bolts shall conform to ANSI B18.2.1. Gaskets shall be 1/8-inch thick, red rubber, either ring or full face and conform to the recommended dimensions of AWWA C115.
10. Pipe shall be manufactured by U.S. Pipe, American Cast Iron Pipe Company, or McWane Ductile.

11. Acceptance: Acceptance will be based on the manufacturer's written certification that the pipe was manufactured and tested in accordance with the applicable standards.

B. Polyvinyl Chloride Pipe (PVC)

1. PVC Gravity Sewer Pipe:
 - a) PVC pipe for gravity sewer shall meet the requirements of ASTM D3034 / F679, with SDR 26.
 - b) Fittings for gravity sewer shall be injection molded sewer fittings containing elastomeric gaskets, available in 4- to 12-inch diameters with an SDR of 26. Injection molded fittings shall be certified by NSF and UPC to meet the requirements of ASTM D3034 and F1336.
2. Alternate PVC for Gravity Sewer:
 - a) Alternate PVC for gravity sewer service shall be C900 and meet the same requirements with minimum DR 25.
 - b) Fittings for Alternate PVC gravity sewers shall be AWWA C907, DR 25, Pressure Class 165.
3. PVC Force Main Pipe
 - a) PVC pipe for force mains shall meet the requirements of AWWA C900. The standard dimension ratio for wall thickness / design pressure shall be DR 14.
 - b) The color shall be green and the word "SEWER" printed continuously on the outside of the pipe.
 - c) PVC force main shall be supplied in 20-foot nominal lengths.
 - d) Fittings:
 - i. Fittings for PVC force mains shall be ductile iron meeting NCWSA specifications herein.
 - ii. Special adapters or gaskets shall be provided as recommended by the Manufacturer.
 - iii. Manufacturer to adapt the PVC pipe to mechanical joints with ductile iron pipe, fittings, or valves.
4. Joints: Joints for pipe and fittings shall be of the bell and spigot type in compliance with ASTM D3139 with a confined elastomeric gasket meeting ASTM F477 and having the capability of absorbing expansion and contraction without leakage.
5. Acceptance: Acceptance will be based on the manufacturer's written certification that the pipe and fittings are manufactured and tested in accordance with the applicable standards.

C. Plug Valves

1. Valves shall be 90 degree turn, non-lubricated, eccentric type with resilient faced plugs. Valves shall provide drip-tight shut-off up to the full pressure

rating with pressure in either direction. Valves shall be rated at a minimum of 150 psi.

2. Bodies shall be cast iron conforming to ASTM A 126, Class B. All exposed nuts, bolts, springs, washers, etc. shall be zinc coated in accordance with ASTM A 153.
3. Valves shall have flanged or mechanical joint ends as required for either buried or non-buried service. Flanged valves shall have ANSI 125-pound standard flanges. Mechanical joint valves shall have bell ends conforming to applicable requirements of ANSI 21.11. Flanged valves with flange to MJ adapters shall not be acceptable in lieu of MJ valves.
4. Valves shall have totally enclosed worm gear actuators, 2-inch square AWWA operating nuts and valve boxes. Valve operators shall be extended to within 6 inches of grade. Valves and operators shall have seals on all shafts and gaskets on valve operator covers to prevent the entry of water. All exposed nuts, bolts, springs and washers for buried valves shall be stainless steel. Valve shall conform to AWWA C504 and C507.
5. Acceptable manufacturers shall be Dezurik or Keystone.

D. Automatic Air and Vacuum Valves (AVV)

1. Valves shall be designed to allow escape of air, close watertight when liquid enters the valve, and allow air to enter in the event of a vacuum. The valve body shall be composite material, designed to facilitate disassembly for cleaning and maintenance. The float, the valve seat and all working parts shall be of corrosion resistant materials. Valves shall be recommended by the manufacturer for wastewater service.
2. Acceptable manufacturers shall be A.R.I. Flow Control Accessories.

E. Gravity Sewer Adapter Couplings

1. Adapters shall be elastomeric or rigid PVC plastic sleeves designed to connect pipes of dissimilar materials. Adapters shall provide a positive seal against infiltration and exfiltration, be root proof and remain leak proof up to 4.3-psi.
2. Shall be by HARCO or GPK Products in accordance with Standard Detail B-14.

F. Valve Boxes

1. Valve boxes shall be manufactured with ductile or cast iron, adjustable shaft with a minimum diameter of 5¼-inches. Shall have an asphaltic bituminous coating with a minimum thickness of 1.5-mil. The valve boxes shall be adjustable to 6-inches up or down from the nominal required cover over the pipe. Valve boxes shall be of sufficient length that bottom flange of the lower belled portion of the box is below the valve operating nut. The valve box cover shall display "SEWER".
2. All valves shall be furnished with extension stems, as necessary, to bring the operating nut to within 30-inches of the top of the valve box. Connection to the valve shall be with a wrench nut coupling and a set screw to secure the

coupling to the valve's operating nut. The coupling and square wrench nut shall be welded to the extension stem. Extension stems shall be Mueller A-26441 or M & H Valve Style 3801.

G. Underground Markings

1. Warning Tape

- a) Warning Tape shall be provided over all buried sewers, force mains, and laterals. Tape shall meet the requirements of ASTM D2103-08: Standard Specification for Polyethylene Films and Sheeting. Tape will be "APWA Green" in color, 5-mils minimum thickness, at least 2-inches wide, and shall bear the printed identification "Caution - Buried Sewer Line Below" (reverse printed), to be readable through the film.
- b) Warning tape shall be Terra Tape by Reef Industries, Inc. or Proline Safety Products, Inc.

2. Tracer Wire

- a) Tracer Wire shall be taped to all buried lines at 8- to 10-foot intervals.
- b) For sewer lines, provide APWA Green uniform color High Density Polyethylene or High Molecular Weight Polyethylene coatings or jacket for the tracer wire. Nylon jacket is not allowed.
- c) Solid copper or copper clad steel shall be the conductor.
- d) Provide connectors manufactured by Copperhead SnakeBite or 3M DBR.
- e) Run the tracer wire in the same orientation as the installed pipe.
- f) Ground / terminate the wires at locator posts or manholes.

3. Visible Markings

- a) Valve markers
 - i. A marker is required for each buried valve.
 - ii. Shall be 2½-inches wide and 66-inches long and constructed of wide fiber-reinforced composite materials. Decal labels on the markers shall be UV stable, color-coded APWA Green, identified as "Sewer Valve" with distance, in feet, between valve and marker. Contractor shall install marker at a uniform anchoring depth of 18- to 24-inches.
 - iii. Marker shall be 3-Rail Fiberglass Post by Blackburn Manufacturing Company.

H. Manholes

- 1. Brick: Brick used in manhole construction shall be either solid or cored, medium hard or better, Grade MS brick conforming to the requirements of ASTM C32 for sewer and manhole brick.

2. Mortar: Mortar shall be made of one-part Portland cement and two-parts clean sharp sand. Cement shall be Type II and shall conform to ASTM C150. Sand shall meet the requirements of ASTM C144.
3. Round Precast Concrete Manholes: Provide manholes and other precast concrete products in accordance with the following:
 - a) Precast concrete manholes shall consist of precast reinforced concrete sections, a conical or flat slab top section, and a base section conforming with the Standard Details.
 - b) Precast concrete sections shall meet the requirements of ASTM C478. The minimum compressive strength of the concrete in precast sections shall be 4,000-psi.
 - c) The minimum wall thickness shall be 1/12 of the inside diameter of the base, riser, or the largest cone diameter. Additionally, the wall thickness shall be sufficient for the proper installation of the rubber manhole seal (rubber boots).
 - d) Transition slabs, which convert bases larger than 4-foot in diameter to 4-foot diameter risers, shall be designed by the manhole manufacturer to carry the live and dead loads exerted on the slab.
 - e) Seal joints between precast sections by means of flexible butyl rubber sealant. Sealant shall be Ram-Nek, Mastic, or Saran Wrap.
 - f) Holes in manhole bases to receive sewer pipes shall be precast at the factory at required locations and heights. Knocking out of holes in the field will not be permitted.
 - g) Manhole inverts shall be precast meeting ASTM C478 or monolithic pour. Invert shall have the same cross section as the invert of the sewer with which they connect. Invert shall be carefully formed to required size and grade by gradual and even changes in sections. Changes in direction of flow through sewer shall be made to a curve with as large a radius as size of manhole will permit.
4. Manhole Frames and Covers
 - a) Cast iron frames and covers shall meet the requirements of ASTM A48 for Class 30 gray iron and all applicable local standards. All castings shall be tough, close grained, smooth, and free from blow holes, blisters, shrinkage, strains, cracks, cold shots, and other imperfections. No casting will be accepted which weighs less than 95% of the design weight. Shop drawings must indicate the design weight and provide sufficient dimensions to permit checking. All castings shall be thoroughly cleaned in the shop and given two coats of approved bituminous paint before rusting begins.
 - b) Manhole frames and covers shall be equal to the following:

Type	Design Weight	Manufacturer's Reference
Standard	270#	Neenah R-1695
Traffic	400#	Neenah R-1642
Watertight	400#	Neenah R-1916-F

- c) All frames and covers shall have machined horizontal bearing surfaces.
 - d) All manholes shall have standard frames and covers except where specifically shown otherwise on the Drawings.
 - e) Watertight covers shall be bolt-down type and shall be equipped with four ½-inch stainless steel bolts and a ⅛-inch red rubber or rubber O-ring gasket. Covers shall be rotatable and interchangeable. Bolt holes shall be bored through so that debris entering the bolt hole will fall into the manhole. Bolt holes shall have the full 360° circle within the cover’s radius when bored through the cover.
 - f) Covers shall have the legend “Sanitary Sewer” cast into the face.
5. Plastic Steps: Manhole steps shall be polypropylene molded around a steel rod manufactured by M.A. Industries.
 6. Rubber Boots: Provide preformed rubber boots and fasteners equal to those manufactured by Kor-N-Seal or Press-Seal Corporation.
 7. Manhole Protective Coating
 - a) Where required for protection in corrosive environments, manhole interiors shall be coated with the following system:

Surfacer for Repair/Rehabilitation (as needed)	Induron EFS 707 Epoxy Surfacer or MortarChem
Intermediate Coat	Induron E-Bond 100
Top Coat	Induron Ceramasafe 90
 - b) All coatings shall be installed in accordance with the manufacturer's recommendations.

Section 4.07 Sewer Specifications

A. Location and Slope

1. The Construction Plans shall show alignments and slopes of the sewer and locations of all respective appurtenances. The slope indicated on plans shall be the slope of the invert of the pipe.
2. Clear easement only after locating centerline of sewer. Developer shall take all necessary precautions to protect and preserve the centerline.
3. A temporary benchmark shall be provided at intervals along sewer route, a hub at the centerline of each manhole, and at all other locations where the alignment of the sewer changes for verification of sewer grade.
4. Construction shall begin at the lower end of the sewer and proceed upstream without interruption. Multiple construction sites shall not be permitted without written authorization from the Authority for each site.
5. Protect and preserve benchmarks, reference points, and centerlines of manholes and provide all other controls necessary to construct sewer.

6. Contractor shall be responsible for any damage to and cost of reestablishment of reference points, baselines, centerlines, and / or temporary benchmarks.
- B. Inspection and Testing
1. Contractor shall flush out, clean, and test all lines and manholes before Final Inspection and Final Acceptance.
 2. Testing Gravity Sewers
 - a) Mandrel Test (PVC Sewers Only)
 - i. Mandrel test shall be performed on all gravity sewers. Mandrel test shall be performed in the presence of Authority Inspector.
 - ii. Mandrel shall be sized to allow 7.5% maximum deflection in pipe direction in accordance with ASTM D3034. Mandrel shall have at least 6 points.
 - iii. Verify line is clean and free of debris.
 - iv. Pull a line through the pipe with which to pull the mandrel.
 - v. Pull the mandrel by hand through the pipe. The pulling motion should be smooth and easy to avoid jamming the mandrel if an obstruction is encountered. The mandrel should have a line on each end to facilitate removal should the mandrel become obstructed in the direction of pull. Do not use mechanical equipment to force the mandrel through the pipe.
 - vi. Pipe found to be deflected by more than 7.5% shall be replaced at the Developer's expense.
 - b) Low-Pressure Air Test:
 - i. During the progress of the work and prior to making any house connection, the Developer shall perform test on all sanitary sewer lines.
 - ii. Air tests shall be accepted only after backfilling and compaction of sewer lines have been completed.
 - iii. When allowed by NCWSA Inspector, installed wyes, tees, and service laterals shall be plugged with either mechanical or pneumatic joint caps, or acceptable alternate, securely fastened to withstand the internal test pressures.
 - iv. Prior to air testing, the section of sewer between manholes shall be thoroughly cleaned and wetted.
 - v. Low-pressure air tests shall conform to the applicable requirements of ASTM F1417 and UBPPA UNI-B-6.
 - vi. Air shall be slowly supplied to the plugged sewer section until internal air pressure reaches approximately 4.0 psi. After this pressure is reached and the pressure allowed to stabilize, the pressure may be reduced to 3.5 psi before

starting the test. Minimum test times for various pipe sizes, in accordance with UBPPA UNI-B-6, are as follows:

Pipe Size (inches)	Minimum Time (min:sec)	Length for Minimum Time (LF)	Time for Longer Length, L (min:sec)
8	7:34	298	1.520L
10	9:26	239	2.374L
12	11:20	199	3.418L

- vii. If the pressure drops more than 1.0 psi during the required test time, the line is presumed to have failed the test, and the Developer will be required to locate the failure, make necessary repairs, and retest the line until it passes the test.

3. Testing Force Mains

- a) Developer shall furnish, install, and remove all necessary equipment required to perform the pressure test.
- b) A section of line will be considered ready for testing after completion of all thrust restraint and backfilling. Each segment of pipeline between line valves shall be tested individually.
- c) Flush pipeline section thoroughly at flow velocities adequate to remove debris from pipe and valve seats. Partially operate valves and hydrants to clean out seats.
- d) Provide temporary blocking, bulkheads, flanges and plugs as necessary, to assure all new pipe, valves and appurtenances will be pressure tested.
- e) Before applying test pressure, air shall be completely expelled from the pipeline and all appurtenances. Unless permanent air vents are in place, insert temporary corporation stops at highpoints to expel air as line is filled with water.
- f) Pressure test force mains at the pump shutoff head plus 50-psi measured at the lowest point. Test for a minimum of 2 hours. Leakage shall not exceed 0.12 gph/in OD diameter/1000-feet.
- g) If any leaks are detected, Developer shall locate, repair, and retest the system. The Authority shall approve all repair methods.

4. Testing Manholes

- a) Developer shall vacuum test all sanitary sewer manholes for leakage. Vacuum testing shall be performed in accordance with ASTM C1244.
- b) Prior to vacuum testing, all lift holes shall be plugged with a non-shrink grout, all joints between precast sections shall be properly sealed, and all pipe openings shall be temporarily plugged and properly braced.
- c) Developer shall furnish all necessary equipment required to perform this test. Vacuum testing equipment shall be by Cherne Air-Loc or P.A. Glazier, Inc.

- d) After proper preparation as noted above, the manhole shall be vacuum tested. The test head shall be placed at the inside of the top of the cone section and the compression head inflated to 40 psi to create a seal between the vacuum base and the manhole structure. Connect the vacuum pump to the outlet port with the valve open. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum pump to drop to 9 ½-inches.
- e) The Manhole shall pass if the time for the vacuum reading to drop from 10-inches to 9 ½-inches of mercury meets or exceeds the values below:

Minimum Test Time for Various Manhole Diameters in Seconds					
Depth (ft)	Diameter				
	48 in.	54 in.	60 in.	66 in.	72 in.
8	20	23	26	29	33
10	25	29	33	36	41
12	30	35	39	43	49
14	35	41	46	51	57
16	40	46	52	58	67
18	45	52	59	65	73
20	50	53	65	72	81
22	55	64	72	79	89
24	59	64	78	87	97

- f) If the manhole fails the initial test, necessary repairs shall be made with non-shrink grout while the vacuum is still being drawn. Re-testing shall proceed until a satisfactory test is obtained.

5. Video Inspection

- a) Contractor shall submit a Colored Closed-Circuit Television (CCTV) inspection of any sewer system larger than 6-inches. The CCTV inspection shall consist of a detailed digital written report along with a DVD recording. The 'start screen' of the recording shall have the project's name, date, pipe size, Contractor's name(s), and Developer's name(s). The inspection shall start at the most upstream manhole and work towards the most downstream or existing manhole. The report and recording station numbers shall start with STA 00+00 and match what is depicted on the as-built. Station numbers shall be provided for all manholes, pipe material changes, taps (along with lot number / address tap is intended to serve), dead ends / abandonments, and tie-in(s) into the existing sewer system.

C. Concrete Piers

- 1. Developer shall be responsible for the design of piers needed for support of aerial sewer crossings where approved by the Authority.

Article 5 General Specifications

Section 5.01 Soil Erosion and Sedimentation Controls

- A. The Developer shall submit a concise soil erosion and sedimentation controls drawing(s), with all pertinent information, to the Local Issuing Authority. The drawing(s) and additional information shall conform to the most current standards and laws established by the Georgia Soil and Water Conservation Commission (GSWCC) and local soil erosion and sedimentation control ordinances.
- B. Construction activity shall not commence until a Land Disturbance Permit is issued.
- C. All drawing(s) shall indicate all controls and devices used to protect all naturally existing or artificially established stabilization from jobsite drainage. Developer shall use device(s) in accordance with GSWCC standards. Developer shall maintain all controls and devices in-place and removed when no longer needed. If controls and devices deteriorate and / or degrade, Developer shall replace with new materials.

Section 5.02 Existing Underground Utilities and Obstructions

- A. The approved Construction Plans shall indicate all underground utilities and obstructions that are known to exist according to the best information available. As required by Georgia Law, the Developer shall call the Georgia 811 Utilities Protection Center. Where unforeseen underground utilities and / or underground obstructions are encountered, only written approval of the Design Engineer shall change the location and alignment.
- B. The Developer may change the proposed alignment or grade of the new water or sewer line as needed to avoid horizontal and/or vertical conflicts after a written request to and subsequent approval by the NCWSA. New alignments shall remain within the available right-of-way or easement and comply with regulatory agency requirements. Grade changes shall maintain adequate cover and comply with regulatory agency requirements.
- C. Where such relocation of new water or sewer lines is denied by the NCWSA, the Developer shall arrange to have the utility, main, or service relocated.

Section 5.03 Construction Along Highways, Streets, and Roadways

- A. Install water and sewer lines, with respective appurtenances, along highways, streets, and roadways in accordance with the applicable regulations of and permits issued by the Department of Transportation, Newton County, and applicable municipalities with reference to construction operations, safety, traffic control, road maintenance, and repair.
- B. Traffic Control
 - 1. The Developer shall take all necessary precautions for the protection of the work and safety of the public by providing, erecting, and maintaining all

necessary barricades, lights, and other traffic control devices in conjunction with qualified flagmen, where necessary.

2. The current Georgia Manual on Uniform Traffic Control Devices shall govern construction traffic control devices and their installation, usage, and maintenance.

C. Construction Operations

1. Perform all work along highways, streets, and roadways to minimize interference with traffic.
2. Stripping: Where the pipeline is laid along the right-of-way, strip and stockpile all sod, topsoil, and other material suitable for right-of-way restoration.
3. Trenching, Laying, and Backfilling: Do not open the trench any further ahead of pipe laying operations than necessary. Backfill and remove excess material immediately behind laying operations. Complete excavation and backfill for any portion of the trench in the same day.
4. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace sod, topsoil, and any other materials removed from shoulders.
5. Construction operations shall be limited to 400-feet along roads and other traffic areas, including clean-up and utility exploration.

- D. Do not place excavated material along highways, streets, and roadways that may obstruct traffic. Remove all scattered excavated material from pavement in a timely manner.

- E. Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material. Developer shall provide positive drainage to avoid ponding / concentration of runoff.

F. Maintenance

1. Maintain highways, streets, and roadways in suitable condition for traffic until completion and Final Acceptance of the work.
2. During period between pavement removal and permanent replacement, Developer shall abide by all standards set forth by GDOT.
3. Immediately repair all cut or damaged driveways and maintain them in a suitable condition for use until completion and Final Acceptance of the Work.

Section 5.04 Handling Materials

- A. Unloading: Furnish equipment and facilities for unloading, handling, distributing, and storing pipe, fittings, valves, accessories. Make equipment available at all times for use in unloading. Materials and equipment shall be handled in accordance with the manufacturer's instructions.

- B. Handling: Handle pipe, fittings, valves, and accessories carefully to prevent damage. Materials and equipment shall be handled in accordance with the manufacturer's instructions. Do not use material damaged in handling.
- C. Distribution: Distribute and place pipe and materials to not interfere with traffic. Do not string pipe more than 1,000-feet beyond area where pipe is being laid. Do not obstruct drainage ditches.
- D. Storage: Developer shall store all pipe, fittings, valves, and accessories not actively utilized. Developer shall make arrangements for the use of suitable storage area(s).

Section 5.05 Stream and Ditch Crossings

- A. Developer shall operate in accordance with all applicable United States Army Corps of Engineers and environmental laws, standards, and regulations.

Section 5.06 Protection and Restoration of Work Area

- A. General: Developer shall return all items and all areas disturbed, directly or indirectly by work, to their original condition, as quickly as possible after work has begun.
- B. Man-made Improvements: With the Authority's approval, Developer shall either protect or remove and replace all fences, piers, docks, walkways, mailboxes, water lines, sewers, drain culverts, power and communication lines and cables, and other improvements which Developer may encounter during the Work.
- C. Cultivated Growth: Developer shall not disturb cultivated trees or shrubbery unless approved by Newton County. Developer shall heel in and replant, under the direction of a licensed Arborist, any such trees / shrubbery which must be removed.
- D. Cutting of trees: Unless absolutely necessary, Developer shall not cut trees for the performance of the Work. Developer shall protect all trees in the vicinity of the work and shall not store excavated material over the root system nor store excavation spoil against trunks. Under the direction of a licensed Arborist, Developer shall repair any damaged tree over 3-inches in diameter. All trees and brush that require removal shall be promptly and completely removed from the site and disposed of by the Developer. No stumps, wood piles, or trash piles will be permitted on the site.
- E. Grassing: In residential areas, Developer shall replant damaged or removed grass with the same variety of grass during the first appropriate season. The Manual for Erosion and Sediment Control in Georgia shall govern all grassing activities. The Developer shall submit a grassing plan, including species, dates, and rate of application, for NCWSA approval.
- F. Erosion Control: Developer shall abide by all standards and regulations established by Georgia Soil Water Conservation Commission and all activities shall comply with Georgia's NPDES General Permit No. GAR100000 for storm water discharge associated with construction activities.

- G. Rubbish Disposal: Developer shall dispose of all cleaned and grubbed materials, during the construction of the project, in accordance with the applicable codes and rules of the appropriate regulatory agencies, county, state, and federal.
- H. Swamps and other Wetlands: Developer shall not construct any permanent structures which shall alter the original topography within the easement. Temporary construction will be permitted as necessary. All temporary construction shall follow all standards and regulations established by Georgia Soil Water Conservation Commission and Georgia NPDES.

Section 5.07 Thrust Restraint

- A. Provide thrust restraint at all fittings, valves, dead-ends, and any points where hydraulic thrust may develop.
- B. Acceptable thrust restraint includes push-on restrained joint glands, field lock gaskets, threaded rods, and concrete blocking. The Developer / Design Engineer shall be responsible for calculating the thrust restraint requirements. Calculations shall be submitted to NCWSA.
- C. Use Standard Details A-16 and A-17.

Section 5.08 Concrete Encasement

- A. Concrete shall conform to ASTM C94 and possessed a minimum compressive strength of 3,000 psi. Reinforcing steel shall conform to ASTM A615.
- B. Use Standard Detail A-11.

Section 5.09 Backfilling

- A. Backfill and compact to prevent settlement and displacement of the pipe.
- B. Material: Use earth only. If necessary, furnish suitable earth material in order to backfill.
- C. Compaction: Place initial backfill material uniformly and carefully around pipe to a depth of 18-inches above pipe barrel. Layer depths shall be between ½- to 1-foot. Compact each layer thoroughly with suitable and appropriate equipment on both sides of the pipe, simultaneously, to prevent side pressures and lateral displacement. If trench settles, repeat process until reach normal grade.
- D. Backfill within DOT Right-of-Way: Backfill in accordance with the most current Utility Accommodation Policy and Standards.
- E. Backfill under concrete / pavement: Backfill in accordance with ASTM D698.

Section 5.10 Trench Excavation

- A. Excavate trenches by open cut. Perform all excavation in accordance with the current Occupational Safety and Health Act (OSHA) 29 CFR 1926.650, 29 CFR 1926.651, and 29 CFR 1926.652.

- B. Excavate trenches to depths indicated on the Standard Details for each class of bedding, manholes, and other structures.
- C. Dewater excavated area continuously to maintain a water level below the bottom of the trench.
- D. Excavate rock with best means and practices utilizing the proper equipment.
- E. Developer shall operate in accordance and comply with all applicable OSHA, GDOT, and all other necessary federal, state, and local regulations and laws when blasting.

Section 5.11 Bedding

- A. Bed pipelines and other appurtenances as indicated on the Standard Details and the following Specifications.
- B. At each joint, excavate bell holes of ample depth and width to relieve pipe bell of any load and aid in proper installation.
- C. Geotextile filter fabric shall be placed in wet trenches between native soil at the trench bottom and the crushed stone.

Section 5.12 Installing Pipe

- A. Install all pipe, fittings, and appurtenances to accurately conform to the Construction Plans and alignment and grade indicated on the Standard Details.
- B. Install all material within manufacturer's recommendations.
- C. Excavate the trench, lay the pipe, and backfill the trench as closely together as possible. Compact the trench as soon as backfilling is complete. Backfill all trenches and pipes when work is not in progress. Do not backfill over the end of an uncompleted pipe; close the end with a plug prior to backfilling.
- D. Remove all burrs and smooth the end of cut pipe before jointing.
- E. Install all water and sewer house connections in accordance with the Standard Details.

Section 5.13 Removing and Replacing Pavement

- A. When necessary to install water or sewer lines within existing County roads, Developer shall remove and replace pavement in accordance with Standard Detail A-10.
- B. For installation of water or sewer lines within State highways or other jurisdictions, Developer shall abide by all standards set forth by GDOT and local traffic agencies for removing pavement, maintenance during construction, and replacing pavement.

Section 5.14 Clearing and Grubbing

- A. Developer shall abide by all clearing and grubbing standards set forth by GDOT and local traffic agencies.

Section 5.15 Roadway Crossings

- A. Developer shall furnish and install casing pipe in accordance with Standard Details, the approved Construction Plans, and GDOT and local laws and ordinances.

- B. Construction

- 1. Developer shall provide a detailed plan for the proposed construction of the casing for the Authority’s approval.
- 2.

Under Railroads		
Pipe Diameter (in)	Casing Diameter (in)	Wall Thickness (in)
6	14	0.250
8	18	0.250
10	20	0.281
12	22	0.312
16	30	0.406

Under Highways		
Pipe Diameter (in)	Casing Diameter (in)	Wall Thickness (in)
6	12	0.250
8	16	0.250
10	16	0.250
12	18	0.250
16	24	0.250

Appendix A Water Standard Details

A-1	Water Main Location - Subdivision Street (4-Way Intersection)
A-2	Water Main Location - Subdivision Street (Tee Intersection)
A-3	Water Main Location - Subdivision Street (Cul-De-Sac)
A-4	Water Main Location - Roadways
A-5	Water Main Pipe Bedding
A-6	Casing Requirement
A-7	Water Main Stub-Out Details
A-8	Temporary Dead End in Subdivision
A-9	New Connection to and Abandonment of Existing Water Main
A-10	Pavement Replacement
A-11	Concrete Encasement
A-12	Fire Hydrant Installation - Subdivision Street
A-13	Fire Hydrant Installation - Roads and Highways
A-14	Gate Valve
A-15	Blow Off
A-16	Typical Blocking Detail
A-17	Typical Blocking Sizes
A-18	Restrained Joint Pipe
A-19	Thrust Collars
A-20	Tie Rod Restraint
A-21	Water Meter Location - Subdivision Street
A-22	Connections to Water Mains
A-23	Residential Water Meter and Box
A-24	3/4"-2" Water Meter and DCV Backflow Prevention Device (Low Hazard Application)
A-25	3/4"-2" Commercial Water Meter and RPZ Backflow Prevention Device (High Hazard Application)
A-26	3"-10" Commercial RPZ Backflow Prevention Device (High Hazard Application)
A-27	Low Hazard Application - Large Water Meter Connection for Combined Potable and Fire Flow
A-28	High Hazard Application - Large Water Meter Connection for Combined Potable and Fire Flow
A-29	Fire Line Service Connection and Potable Water Meter 2" and Under

Appendix B Sewer Standard Details

B-1	Precast Concrete Manhole
B-2	Manhole Outside Drop
B-3	Shallow Manhole
B-4	Precast Manhole 5' Diameter or Larger
B-5	Precast Manhole Over Existing Sewer (Doghouse)
B-6	Manhole Frame and Cover
B-7	Manhole Inverts
B-8	Sewer Pipe Bedding
B-9	Force Main Connection at Terminal Manhole
B-10	Force Main Connection at Main Line Manhole
B-11	Service Connection
B-12	Cleanout
B-13	Waterstop Collar
B-14	Gravity Sewer Adapter Coupling
B-15	Air Release Valve Manhole
B-16	Grease Trap

Appendix C Water and Sewer Demand Calculations

Appendix D Industrial Pretreatment Program

Appendix E Wastewater Pumping Stations

Appendix F Procedures

- Project Review and Approval Process
- Water System Flow Test Policy and Procedures
- Required Inspections - Water
- Required Inspections - Sewer
- As-Built / Record Drawing Specifications
- Project Closeout Letter Template
- Connecting to Sanitary Sewer in Unincorporated Newton County
- Connecting Refuse Containers to NCWSA Sewer System
- Cross Connection Control Standard Operating Procedures

Appendix G Checklists

- Construction Plans Checklist Packet Cover Sheet
- Water & Sewer Availability and Map Request
- Water and Sewer Development Application
- Construction Plans Preliminary Checklist
- Construction Plans Checklist
- Water System Flow Test Application
- Standard Easement Application
- Maintenance Bond
- Letter of Credit and Letter of Escrow
- Maintenance Agreement
- General Construction Notes

Appendix H External Organizations

- Georgia Environmental Protection Division Inspection Checklist for Permanent Facility Car Washes
- Georgia Department of Transportation Area Utility Permit Checklist
- Georgia Department of Transportation District Utility Permit Checklist