SECTION 11.0

SANITARY SEWER AND WATER DISTRIBUTION DESIGN CRITERIA

11.0 SANITARY SEWER AND WATER DISTRIBUTION SYSTEM DESIGN CRITERIA

11.1 Plan Submittal, Extensions, Standard Details, Standard Notes, As Built Submittal, Final Plat Submittal, and Final Package SUBMITTAL.

BOC: Columbia County Board of Commissioners

CCWU: Columbia County Water Utility

CCWUED: Columbia County Water Utility Engineering Department

CCWUMD: Columbia County Water Utility Mechanical Department

GDOT: Georgia Department of Transportation

SCADA: Supervisory Control and Data Acquisition

NAVD: North American Vertical Datum

GPC: Georgia Power Company

11.1.1 Plan Submittal

11.1.1.1 All preliminary development plan submittals shall be prepared by a professional engineer licensed in the State of Georgia. Plans submitted for review need not bear the signature of the professional. A simple stamp marked "For Review" or "Preliminary" across the seal is adequate. The final plans submitted for construction requires a signature.

11.1.1.2 Plan submittals shall be no larger than a 24" x 36" sheet.

11.1.1.3 All plans submitted for development shall have a dedicated utility plan.

11.1.1.4 Utility plans shall contain the following information:

- Plan and profile for all sanitary sewer and storm sewer to be constructed. (Each plan and profile shall show new and existing sanitary and storm sewer lines in parallel and lateral reference.)
    - All sanitary and storm sewer lines shall be labeled with size, distance, slope, and material type in profile. Each reach shall be labeled to differentiate between one another.
    - Each manhole shall be labeled with frame and cover type (FC1, FC2, etc.)
- Plan shall show stationing along sanitary sewer line.
- Plan shall show existing and proposed contours of the site. The contours shall be light in background for reference.
- Plan and profile shall show all water lines.
- Plan and profile shall show all force mains where required including air release valves and isolation valves.
- All manholes in plan and profile shall be numbered. All drop manholes shall be labeled specifically.

- All private utility lines shall be labeled as “Private” in plan and profile.
- Plan shall show all existing and proposed easements required for the construction of the project. All easements shall be labeled accordingly.
- Existing easements shall list recorded references for ownership verification.
- Plan shall show all service taps for water and sewer lines.
- Plan shall show all existing and proposed water meters and delineate sizes for each.
- Plan shall be prepared in the Georgia East Zone, NAD 83 coordinate system and include a benchmark or temporary benchmark referencing a NAVD 88 elevation.
- North arrow (Grid North, GA East Zone)
- FEMA F.I.R.M. Map with 100 Year Flood Plain and elevation
- High Pool Elevation of Ponds, Lakes or Reservoirs

11.1.1.5 The professional engineer shall submit test borings if available or required by the CCWUED.

11.1.2 Sanitary Sewer Line Extension/Contribution Submittal Requirements

11.1.2.1 All residential and commercial developments are required to submit estimated sanitary sewer flow contributions to CCWUED. All calculations shall be prepared by a professional engineer.

- A single lot or site plan development shall require estimated sanitary sewer flow contribution calculations to be submitted.
- A sanitary sewer line extension shall require a sanitary sewer flow test to verify line capacity. The sanitary sewer flow test may be obtained from the CCWUED. The cost for the test shall be the most recent cost approved by the BOC (currently $350). To request a sewer flow test, please email the request to: Sewerflowtest@columbiacountyga.gov. See Appendix ‘E’ for more information.

11.1.2.2 All subdivision of property or sanitary sewer line extension, commercial or residential, shall be required to complete and submit an EPD sanitary sewer extension form with calculations and diagrams. The standard forms are attached as Appendix ‘A’. The calculations shall be done to encompass the entire project including all phases of the development.

- Allowable infiltration shall be quantified and summed as part of total flow in sewer line. Allowable infiltration shall be 25 gal/day per mile of sewer line.
- Each residential lot contribution shall be calculated at 75 gal / day / person. The peaking factor shall be a minimum of 1.5. Specific developments (residential or commercial) which may have a lower or higher contribution shall be reviewed and determined on

a case by case basis by the Columbia County Water Utility Engineering Office.

- Sanitary sewer lines 8" through 12" shall be considered at maximum capacity when ½ full under peak flow conditions. Sanitary sewer lines 15" and larger shall be considered at maximum capacity when ¾ full under peak conditions.
- Lot additions or deletions of more than 5 lots shall require a new submittal of forms, calculations and diagrams.

11.1.2.3 All sanitary sewer line extensions, residential or commercial, to be deeded to Columbia County for final acceptance by the BOC shall require the following information:

- As Built
- Easement Plat(s)
    - An easement plat will require a written deed of dedication to accompany the plat for acceptance.
- Construction Costs certified by contractor, engineer of record or land surveyor of record for infrastructure deeded to Columbia County. (See Appendix 'D' for standard form)
- Digital as built, final plat or easement plat files. (ACAD 2004-2008 format)

11.1.3 **Water Line Extension/Consumption Submittal Requirements**

11.1.3.1 All residential and commercial developments are required to submit estimated water consumption calculations to the CCWUED. All calculations shall be prepared by a professional engineer.

- A single lot or site plan development shall require estimated water consumption calculations to be submitted.
- A water flow test shall be performed for all subdivision of property that requires a water line extension. The water flow test shall be no older than 6 months from the submission date. The water flow test may be obtained from the CCWUED. The cost for the test shall be the most recent cost approved by the BOC (currently $300). To request a water flow test, please email the request to: Waterflowtest@columbiacountyga.gov. See Appendix 'F' for more information.

11.1.3.2 All subdivision of property or water line extension, commercial or residential, shall be required to submit a completed water system extension form with calculations. The standard forms are attached as Appendix 'B'. The calculations shall be done to encompass the entire project including all phases of the development.

- Proposed water line extensions shall be verified by taking 50% lot consumption at peak factor and maintaining a minimum of 500 gpm and a 20 psi residual pressure at a hydrant at the highest point

in the development. All previously approved, but not yet constructed lot consumption shall be added to calculations and taken into account in order to verify pressure and flow for development.

- All current water meter flow and head loss information is attached as Appendix 'C'.
- A single line diagram along with the proposed demands shall be submitted with calculations.
- Each residential lot shall be a minimum of 0.25gpm usage with a peaking factor of 4.
- Each commercial lot shall be a minimum of 0.15gpm with a peaking factor of 2.
- Lot additions or deletions of more than 5 lots shall require a new submittal of forms, calculations and diagrams.

11.1.3.3 All water line extensions, residential or commercial, to be deeded to Columbia County for final acceptance by the BOC shall require the following information:

- As Built
- Easement Plat(s)
  - An easement plat will require a written deed of dedication to accompany the plat for acceptance
- Construction Costs certified by contractor, engineer of record or land surveyor of record for infrastructure deeded to Columbia County. (See Appendix 'D' for standard form)
- Digital as built, final plat or easement plat files. (ACAD 2004-2008 format)

11.1.4 **Standard Details**

All pertinent details that apply to the particular development must be shown on a separate detail sheet. Where a standard detail must be modified for the particular condition, the detail shall be shown and titled as a "Modified Standard Detail number….".All modified standard details must be approved by the CCWUED.

11.1.5 **Standard Notes**

- All water and sanitary sewer construction shall be in accordance with the current Columbia County Water Utility Construction Standards and Specifications.
- All contractors installing water and sanitary sewer utilities shall be responsible for obtaining a current copy of the Columbia County Water Utility Construction Standards and Specifications. Each superintendent or foreman shall have a set on site all at times.

- "Call before you dig" Note and Phone Number.
- The contractor is responsible for contacting the Columbia County Water Utility Maintenance Office to request locates for all underground sanitary sewer facilities. The contact number is 706-863-6928.
- The contractor is responsible for making all water/sewer service taps during construction or added for the development. The contractor is responsible for the removal of existing service taps not to be used for the development or upgrades required to the existing water or sewer services that will be used for the proposed development.

11.1.6 **As Built Submittal**

11.1.6.1 All as builts shall be prepared by a professional land surveyor licensed in the state of Georgia. Plans submitted for review need not bear the signature of the professional. A simple stamp marked "For Review" or "Preliminary" across the seal is adequate. The final plans shall require a signature.

11.1.6.2 All as builts (plans and digital files) shall be referenced to the State Plane Coordinate System of Georgia, East Zone, and NAD 83. All elevations shall be based on NAVD 88.

11.1.6.3 All as builts shall be submitted for review and approval prior to final acceptance by the BOC.

11.1.6.4 As built submittals shall be no larger than a 24 x 36 sheet and consist of two paper copies and contain the following information:

- Project name and section or phase delineation
- Prepared in the Georgia East Zone, NAD 83 Coordinate System
- Benchmark referencing NAVD 88 elevation
- North Arrow (Grid North, Georgia East Zone)
- At least two points of the project shall be labeled with State Plane Coordinates and list the combined scale factor.
- Bar Scale (no larger than 1"=100') *As builts may be large enough to fill out the entire sheet size chosen. A 24x36 size sheet is preferred in order to increase as much as built information on one page as possible and to utilize as large of a scale as possible.*
- Contractor's Certification Block:

  "All water line material is constructed of C900 PVC CL 200 (unless otherwise noted) and all sanitary sewer lines are constructed of SDR-35 PVC pipe (unless otherwise noted)"

  _____

  Contractor Date
- Surveyor's Certification Block:

  "It is hereby certified that all as built measurements are correct and actual field measurements, verified by me or under my supervision"

  _____

Professional Land Surveyor Date

- Property boundary and specific labeling (in background)
- Correct addresses for each lot or parcel, including green spaces and lift station sites.
- Easements and right of ways with specific labeling describing the metes and bounds along with public or private delineations. All existing easements shall be labeled as such and references shall be listed.
- 100 year flood plain (where applicable)
- Lift station site and access road (where applicable)
    - The lift station site shall be a separate parcel with an address. Where an agreement is required for access, all information for the agreements shall be listed.
- All water lines, sanitary sewer lines, force mains, and storm sewer lines, including the appurtenances. (These features should stand out on the as built. All other information shall be light and in background.)
    - Water lines shall be labeled with size and material type.
    - Sanitary and storm sewer lines shall be labeled with distance, size, slope and material type.
    - All sanitary and storm sewer structures shall be numbered to clearly delineate each structure and must show all rim/top elevations and all invert elevations**.**
    - All water meters and sanitary sewer taps shall show two tie distances to property corners or shall be listed in a table and labeled with state plane northing and easting coordinates.
    - All water valves and force main valves shall show two tie distances to permanent structures (ie manholes, storm traps, etc.). Valve locations may be listed in a table format and labeled with state plane northing and easting coordinates. Valves for hydrant leads do not need to have tie distances unless the lead is a termination of a water line, (ie at a cul-de-sac).
    - All water meters sizes shall be labeled when larger than a standard ¾" residential meter size. *(For example, commercial or professional development that require 1 ½" or 2" meters.)*

11.1.7 **Final Plat Submittal**

11.1.7.1 Final plat submittals shall be no larger than a 17" x 22" sheet. Easement plats for utilities only do not require the "Plat Approval Block". Easement plats and final plats shall consist of two paper copies and contain the following information:

- Project name and section or phase delineation
- North Arrow (Grid North)

- Surveyor's Certification Block:

  "It is hereby certified that this plat is true and correct and was prepared from an actual survey of the property by me or under my supervision, that all monuments shown hereon actually exist and their location, size, type and material are correctly shown"

  _____

  Professional Land Surveyor Date

- Professional Engineer's Certification Block:

  "It is hereby certified that all engineering requirements of the subdivision regulations of Columbia County, Georgia have been fully complied with"

  _____

  Professional Engineer Date

- County Certification Block:

  "This is to certify that the Water Distribution System, Sanitary Sewer System, Storm Water System, including the street installation or Bond in lieu thereof, Right of Way, associated easements as shown, and other improvements have been dedicated to and accepted by The Board of Commissioners of Columbia County, Georgia"

  _____

  Development Services Division Director Date

  _____

  Clerk, Board of Commissioners Date

  This block may require modification when a specific utility system(s) is to be private or a roadway may be private.

- Owners Certification Block:

  "We hereby certify that we are the owners of the property as shown on this plat, that this plat was prepared from an actual survey, that all State and County taxes or other assessments now due on this land have been paid, and that we adopt this plan of subdivision with our free consent and dedicate the Sanitary Sewer System, Storm Sewer System and Water Distribution System and their associated easements as shown to The Board of Commissioners of Columbia County, Georgia" _____

  _____ Authorized Agent

  Date This block may require modification when a specific utility system(s) is to be private or a roadway may be private.

- Final Plat Approval Block:

  "Pursuant to the land subdivision regulations of Columbia County, Georgia, all the requirements for approval having been fulfilled, this plat was given final approval by the Columbia County Planning Commission

  This approval constitutes approval of a final plat. This Day of_____,year_____

  _____
  Secretary, Columbia County Planning Commission

- Property boundary and specific labeling
- Easements and specific labeling
  - Easements to be dedicated to Columbia County shall be indicated as such.
- 100 year flood plain (where applicable)
- Lift station site and access road (where applicable)

11.1.8 Note to be added to final plat "The builder is responsible for verifying all service lateral invert elevations before establishing finish floor elevations for the structure. All finish floor elevations must be a minimum of 5'-0" above the service lateral invert.

11.1.9 **Final Pacakge**

11.1.9.1 The final package shall consist of:

- As Built
- Final plat or easement plat as required
  - An easement plat will require a written deed of dedication to accompany the plat for acceptance
- Construction Cost of infrastructure dedicated to Columbia County. (See Appendix 'D' for standard form)
- Digital as built and final plat files on CD

11.2 GDOT Utility Encroachment Permits

11.2.1.1 All permits must be approved before any work is to be conducted within the GDOT right of way. The contractor must have the approved permit posted on site before commencing work.

11.2.1.2 All utility encroachment permits shall be submitted for approval and processing through the CCWUED. Upon GDOT approval, the CCWUED shall send approval letter to engineer of record. The engineer of record is responsible for forwarding approval letter to contractor. The contractor is responsible for picking up the permit from the local GDOT office and posting the permit in accordance with GDOT instruction.

11.2.1.3 All utilities to be constructed within the GDOT right of way shall be installed 5' to 7' inside the right way unless otherwise approved.

11.2.1.4 All utility crossings of GDOT right of way shall be by bore and jack installation unless otherwise approved.

11.2.1.5 All water lines within the GDOT right of way shall be ductile iron pipe.

11.2.1.6 All bore and jack installations of Interstates shall have a valve on each side of the right of way.

11.2.1.7 All sewer lines within the GDOT right of way shall be a minimum of 6'-0" deep.

11.2.1.8 Utility Encroachment permits shall be submitted as "PDF" files and consist of the following:

11.2.1.8.1 Plan and Profile (8 ½ x 11 size)

- Width of right of way
- Pavement width
- Road name and State Route number.
- Utility to be tied to nearest intersection.
- Utility to be tied to existing asphalt pavement.
- North Arrow

11.2.1.8.2 Copy of State Hwy Map (8 ½ x 11 size)

- Map to show proposed work area.
- North Arrow.

11.2.1.8.3 Plan of Traffic signage / Detours necessary (where required). MUTCD Part 6

11.2.1.8.4 See Appendix 'G' for a complete checklist of permit application requirements.

11.2.1.8.5 All existing utilities that will be under new pavement (accel/decel lanes) for driveway access must be relocated at the developer's expense unless otherwise approved by GDOT. The existing utilities shall be relocated to the back of the right of way or within a new easement to be dedicated to Columbia County.

11.2.1.8.6 All existing utilities within the GDOT right of way that are in conflict with proposed development shall be relocated by the developer's contractor.

No water or sewer facilities may be constructed on a solid waste landfill or a former solid waste landfill site. See page 7 of Appendix A.

11.3 Sanitary Sewer Design

11.3.1 **All sanitary sewer lines listed as ductile iron shall be epoxy lined ductile iron pipe.** Standard cement lined and asphaltic coated pipe shall not be used in the sanitary sewer system.

11.3.2 All gravity sanitary sewer lines that will be deeded to Columbia County shall be a minimum of 8" diameter. All 8" lines shall be designed to

have a minimum slope as specified herein to achieve at least 2 fps and no more than 15 fps. All sanitary sewer services shall be a minimum of 6" diameter.

11.3.3 All sanitary sewer lines and services not installed in public right of ways shall be installed in a permanent easement a minimum of 20' wide and dedicated to Columbia County.

11.3.4 All finish floor building elevations (residential or commercial) shall be a minimum of 5' above the service tap invert.

11.3.5 Each piece of property that will be served with sanitary sewer shall have an individual sewer tap. Branch taps for sewer service lines are not permitted for commercial or residential development.

11.3.6 All sewer service taps necessary for the development shall be installed by the developer's contractor.

11.3.7 All existing and newly installed sewer services not to be used for the development shall be removed by the developer's contractor.

11.3.8 All sanitary sewer lines shall have a minimum of a 10' separation between parallel water lines. There shall be a minimum separation of 18" vertically for crossings.

11.3.9 Sanitary sewer lines or services shall not be installed under any pond or lake or within a dam. The sewer line shall be a minimum of 15' away from the toe of slope of a pond berm or dam.

11.3.10 Sanitary sewer lines shall be designed to have the appropriate horizontal and vertical separations between storm lines to permit the installation of the lateral services. Sanitary sewer crossings of storm pipe with less than a 1'-0" of separation shall require the use of ductile iron pipe.

11.3.11 Minimum angle between influent and effluent lines (including service lines) at manholes shall be 90 degrees or greater. Where this is not practical, a vertical drop of 1'-0" or more is required within the manhole.

11.3.12 Maximum distance between manholes shall be 400'.

11.3.13 Sanitary sewer lines shall not run parallel inside a drainage ditch.

11.3.14 All sanitary sewer lines that are within the right of way must be located in the center of the paved roadway and cannot extend outside of the edge of asphalt pavement. Where roadway right of way is 100' or wider, the sanitary sewer may be installed within the back 17' of the right of way line.

11.3.15 Sanitary sewer lines constructed along dirt roads shall be installed within the right of way or within an easement completely out of the maintenance path of the Roads and Bridges Department.

11.3.16 Minimum slope for 8" diameter sanitary sewer lines is 0.50%.

11.3.17 Minimum slope for 10" diameter sanitary sewer lines is 0.28%.

11.3.18 Minimum slope for 12" diameter sanitary sewer lines is 0.22%.

11.3.19 Minimum slope for 15” diameter sanitary sewer lines is 0.15%.

11.3.20 Minimum slope for 18” diameter sanitary sewer lines is 0.12%.

11.3.21 Minimum slope for 24” diameter sanitary sewer lines is 0.08%.

11.3.22 Minimum slope for 6” diameter sanitary sewer service line is 1.0% and shall be no longer than 40’.

11.3.23 Sanitary sewer design shall utilize a larger pipe (lower slope) in order to gain vertical differential as necessary to avoid a lift station or private lift station.

11.3.24 Sanitary sewer services shall be designed to be installed 4’ to 6’ inside the property corner of the lower side of the lot to avoid construction entrance access and the final driveway installation. Where roadway grade is relatively flat, sanitary sewer taps may be installed in units of two but must maintain 4’ to 6’ inside the property corners for each lot. *A single sewer service shall constitute a single water tap.*

11.3.25 All offsite sanitary sewer line easements must have a minimum of one permanent access point which shall accommodate all maintenance equipment necessary.

11.3.26 Where sanitary sewer is extended to serve the particular development, an easement must exist in order to prevent a land locking of the sanitary sewer service area.

11.3.27 All sanitary sewer lines and service lines shall be a minimum of ASTM 3034 SDR35 PVC pipe. All sanitary sewer lines shall be green in color.

11.3.28 Minimum cover for sanitary sewer lines that are under pavement (travel way) or within the right of way shall be 6’-0” deep. Where this cannot be achieved, the sanitary sewer line shall be ductile iron pipe.

11.3.29 Minimum cover for sanitary sewer lines for offsite installation shall be 4’-0” deep. Where this cannot be achieved, the sanitary sewer line shall be ductile iron pipe. Maximum depth of sanitary sewer lines to be dedicated to Columbia County shall be 23’ deep.

11.3.30 All sanitary sewer lines 20’ deep or greater shall be ductile iron pipe. Where approved by the CCWUED, ASTM 3034 SDR26 PVC pipe may be installed with modified bedding in lieu of ductile iron pipe.

11.3.31 Ductile iron pipe to PVC gravity sewer pipe transitioning shall be permitted using specific fabricated adapter fittings. Fernco type couplings are no longer permitted.

11.3.32 Sanitary sewer lines for bore and jack crossings shall be epoxy lined ductile iron pipe with restrained joints inside the casing. Each bore and jack crossing shall have a manhole on each side of the crossing to terminate the ductile iron pipe.

11.3.33 All sanitary sewer lines dedicated to Columbia County not located within a public right of way shall have a minimum of a 20’ wide permanent easement centered over the sewer line. Sanitary sewers with a depth of 16’ up to a maximum of 23’ deep shall require a 30’ wide permanent easement centered over the sewer line.

11.3.34 A permanent structure is not permitted within the permanent easement.

11.3.35 Trees are not permitted to be planted within any permanent easement.

11.3.36 All sanitary sewers lines that have a 15% slope or greater shall have concrete anchors installed at a minimum of every 75’ between manholes.

11.3.37 All sanitary sewer manholes shall be precast concrete and have a minimum of 4’-0” inside diameter at depths of 0-15’-11”. All sanitary sewer manholes 16’ deep up to a maximum of 23’ deep shall have a minimum of a 5’-0” inside diameter. Sanitary sewer lines 24” and larger shall have a minimum of 5’-0” inside diameter. Brick manholes or brick adjustments to manholes are not permitted. All adjustments shall utilize concrete grade rings or steel ring risers.

11.3.38 Specific sanitary sewer tie in connections or turns may require a larger diameter manhole or a square manhole installed in the offset position in order to maintain the existing sanitary sewer service while a new tie in connection is being made.

11.3.39 Where specifically required, a development may need to install a monitoring manhole for sanitary sewer service in order to track and trend greater sanitary sewer flows into the existing system.

11.3.40 Manholes are required at all changes of grade, change in pipe size, and change in flow direction. Manholes are also required at the end of the sewer line and where a service lateral must be installed into an existing trunk line (where approved). Trunk lines are sanitary sewer lines 15” and greater in diameter.

11.3.41 All manholes shall be cored and have a flexible rubber boot connection. Manholes shall have a minimum of 0.2’ vertical change between influent and effluent inverts.

11.3.42 Manholes to be built over existing sanitary sewers shall consist of a minimum of a 6” thick compacted stone bedding, an 8” thick concrete slab, and a dog-house base section.

11.3.43 Manholes cannot have more than three (3) penetrations in the same horizontal and vertical plane.

11.3.44 Design of manholes to be built over existing sanitary sewers that require bypass pumping shall be specifically noted by the design engineer and outlined on the contract drawings for approval. All information shall be provided to guide the contractor in his performance of the construction.

11.3.45 Manholes that have a difference of elevation between influent and effluent of greater than 2'-0" shall be drop manholes. All other inverts shall have a standard sloping invert or slide to facilitate a smooth and consistent flow through the manhole.

11.3.46 Bore and jack crossings shall be required for all GDOT roadway crossings and CSX Railroad crossings. Bore and jack crossings are required for all Columbia County roadways unless otherwise approved. Where county roads are permitted to be open cut, a complete approved traffic control plan shall be required and approved by the Columbia County Traffic Engineering Department.

11.3.47 Bore and jack crossings shall be a minimum length of the distance from ditch line to ditch line of the roadway or railway cross section.

11.3.48 Aerial crossings must be pre-approved by the CCWUED. The aerial crossing must be designed such that the normal flow of water shall not be impeded. Submittal of said design does not constitute approval. Design shall include steel casing pipe, a complete cross section of existing conditions (field survey data), pipe stress design, pier design and anchor design by a professional engineer. The aerial crossing shall have a manhole on each side of the waterway no more than 50' from the top of each bank.

11.3.49 Creek crossings must be installed in a steel casing pipe with casing spacers, end seals and concrete anchors. The casing shall extend a minimum of 5' beyond the top of the slope. A casing pipe shall not be required where the sewer line has a minimum of 3' of cover over the pipe within the bottom of the creek bed.

11.3.50 Sanitary sewer lines that tie to existing manholes must be at least "Diameter/2" above the existing invert of the manhole. Coring of the existing invert shelf is not permitted.

11.3.51 Where lot lines are shifted or added during final platting, the developer/contractor shall be responsible for terminating unused services or adding additional services. Where 2 or more lots are combined, the developer/contractor shall terminate the unused services.

11.3.52 Private communities shall incorporate a system boundary for the sanitary sewer system. All sanitary sewers inside the community shall be private and maintained by the owner/developer. Public sanitary sewer systems shall begin within an accessible easement or public right of way.

11.3.53 Commercial developments that will have multiple structures to be served with sanitary sewer, but shall remain one large tract of property, shall have a single sanitary sewer tap.

11.3.54 Gated communities that require Columbia County maintained water and sewer shall provide the current security code to the Water Utility Office for 24 hour access.

11.3.55 All private force mains shall connect to the existing County system through a standard service lateral. See Standard Detail 12.16-4

11.3.56 All sanitary sewer design shall be in accordance with the "Recommended Standards for Wastewater Facilities prepared for the Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (aka Ten State Standards)" unless otherwise noted within these specifications.

11.3.57 All Sanitary sewer extensions shall begin pipe laying from the tie-in / lowest point of the project.

11.4 Lift Station Design

11.4.1 All developments that request a lift station must be pre-approved by CCWUED and meet the following requirements:

11.4.1.1 Lift stations will only be considered when the area cannot be served by gravity sewer regardless of the cost of construction or easement acquisition necessary for the installation. A minimum of 100 lots must be planned for the completed phased development.

11.4.1.2 **All proposed lift station sites shall conduct a pre-SCADA survey to determine signal access capability.** The survey shall determine the height of the tower and footing size for the site design.

11.4.1.3 The engineer shall contact the Georgia Power Company (GPC) concerning power availability and submit said letter to CCWUED before approval of lift station design.

11.4.1.4 All lift stations to be deeded to the County shall be installed underground with duplex submersible pumps. No above ground or package plants shall be accepted.

11.4.1.5 Private lift stations are not permitted to serve more than one individual lot and shall remain a private lift station.

11.4.1.6 Pumps in lift stations deeded to Columbia County must be manufactured and supported by FLYGT or Hydromatic. The pump shall have a maximum speed of 1800 rpm. The horse power of the motors shall match the pump requirements throughout the entire range. Pump design shall not be based around using the last available impeller to meet the flow requirements.

11.4.1.7 The wet well and valve vault must have a minimum dimension of 6'-0" square inside and shall be precast concrete watertight structures. All penetrations shall be booted. The valve vault shall have a sloping floor and drain into the wet well. The drain to the wet well shall have a flap-valve to prevent back-up into the valve vault. The valve vault shall also be designed with steps to permit access.

11.4.1.8 All force mains shall be a minimum of 4" in diameter and be designed for a velocity of no less than 2 fps to prevent settling of solids. The maximum design velocity shall be no more than 15 fps. All force mains shall be positively restrained ductile iron pipe from the point of pump discharge through the bypass pump hook-up.

11.4.1.9 Force mains shall include a swing check valve, plug valve, restrained flange adapter (RFA), and pressure gauges immediately downstream of the check valve.

11.4.1.10 Air release valves shall be installed at all highpoints along the force main. All ARV shall be installed in precast concrete manholes.

11.4.1.11 Isolation valves shall be added in-line for force mains with lengths greater than 2000' or as required by the CCWUED. All waterway crossings shall be required to have an isolation valve on each side of the waterway.

11.4.1.12 The lift station site shall be a separate parcel deeded to the County as fee simple property. The minimum site size for lift stations shall be 40'x40' and must shed all runoff away from lift station wet well and valve vault. The site shall be completely fenced. The fenced area shall consist of a minimum of 6" of crusher run atop filter fabric.

11.4.1.13 The lift station site shall be designed to permit access for a minimum of a 22' long dual axle truck and 10' long trailer. The fenced area shall be large enough to house a portable generator and/or portable pump sized for the application in the secured position.

11.4.1.14 The lift station shall have one influent line. A manhole shall be installed prior to the wet well outside of the fenced area as the collector manhole. The top of the manhole shall be a minimum of 1'-0" below the top of the wet well. No other connections shall be made into the wet well.

11.4.1.15 The design elevation of the wet well and vault shall be a minimum of 4'-0" above the established 100 year flood plain elevation.

11.4.1.16 Lift station site must have a minimum of a 12' wide access road and turnout. The access road shall be a minimum of a 6" compacted crusher run road. Access roads with a steeper slope (5%-10%) shall be a minimum of 2" compacted asphalt over a 6" compacted crusher run base. All access roads with a grade greater than 10% shall be either special designed asphalt roads or concrete. Concrete access roads shall be 6" thick over a compacted subgrade. Concrete shall be 3000 psi minimum. The turnout length and radius shall accommodate a 40' long dual axle truck.

11.4.1.17 A 2" diameter water line with meter, RPZ and freeze proof yard hydrant shall be extended to serve the site.

11.4.1.18 A minimum of a 16' wide entrance gate shall be installed to permit access to the wet well and bypass pumping hook-up. The gate shall have a "No Trespassing" sign firmly affixed to one of the gates.

11.4.1.19 **A pre-SCADA survey must be completed before submittal to determine how tall and if a booster tower is required for an individual site)**

11.4.1.20 All lift station developments shall require an additional preconstruction meeting to be initiated by the contractor through the CCWU Inspector before any work is started on the station. The developer's design

engineer, contractor, supplier, CCWUMD, and CCWU Inspector shall be present for the meeting.

11.4.2 Lift Station Site Submittals shall contain the following information:

- Lift Station site plan (1"=10'), access road.
- Plan and section of wet well and valve vault
- Total flow (# of lots)
- Total static & dynamic head calculations
- Size & Length of force main & complete profile
- Total wet well storage volume
- Size and horse power of pumps required
- Cycle time calculations (< 6 / hour)
- Details/dimensions of piping, valves & equipment
- Certified pump curve from pump manufacture.
- Buoyancy calculations of wet well and valve vault
- Power Verification Letter (GPC)

11.5 Water Distribution System Design

11.5.1 All water lines shall be designed and installed not less than 20' from any permanent structure, house, or commercial building.

11.5.2 Trees are not permitted to be planted within a permanent easement.

11.5.3 Where a water line is extended to serve the particular development, an easement must exist in order to prevent a land locking of water service and facilitate the future expansion of the water distribution service area.

11.5.4 All water lines and service lines not installed in public right of ways shall be installed in a permanent easement a minimum of 20' wide and dedicated to Columbia County.

11.5.5 All water lines installed parallel with a sanitary sewer line shall have a minimum separation of 10'.

11.5.6 All water lines installed underground shall be push on or restrained joint. All water lines installed within a vault or pit shall be flanged pipe and fittings.

11.5.7 All water lines installed within a GDOT right of way shall be ductile iron pipe. All water service lines (2" and smaller) to be installed crossing the GDOT right of way, shall require a casing (steel, PVC or polyethylene)

11.5.8 All water lines installed parallel with a storm line or drainage culvert shall have a minimum separation of 4'-0" from outside of pipe to outside of pipe.

11.5.9 Where water and sewer lines are run parallel (minimum of 10' apart) within an easement, the minimum easement width shall be 30'.

11.5.10 Private utilities shall not be installed within easements to be dedicated to Columbia County.

11.5.11 All water lines shall be installed with a minimum depth of cover of 4'-0". The maximum depth of cover shall be 6'-0".

11.5.12 All water lines with less than 4'-0" of cover shall be constructed of ductile iron. All water line vertical offsets with less than 30" of cover shall be restrained joint ductile iron.

11.5.13 All water lines shall be installed on the North and East side of the roadway.

11.5.14 Water lines installed on collector/arterial roadways shall be installed within the outer most 5' to 7' of right of way unless otherwise approved. Where this cannot be achieved as a result of existing utilities, the water line shall not be installed within the ditch. See Standard Detail 11.5-1.

11.5.15 All water lines installed on land service streets shall be a minimum of 5'-0" off the curb. See standard details 11.5-2 through 11.5-3. All water lines installed on rural land service streets shall be a minimum of 5'-0" off the EOP. See Standard Detail 11.5-3.

11.5.16 All water lines to be deeded to the County shall be a minimum of 6" in diameter. Water lines serving more than one hydrant shall be a minimum of 8" in diameter in order to meet Fire Code (current edition and as amended) requirements. Where a water line is capable of being loop fed from two different existing water lines, a 6" line shall be adequate.

11.5.17 All water lines less than 12" shall be constructed of either Polyvinyl Chloride Pipe (PVC) or Ductile Iron Pipe as set forth within Section 14.0 of these specifications. All water lines 12" and larger shall be constructed of ductile iron pipe only. All fire lines shall be constructed of restrained joint ductile iron pipe.

11.5.18 Specific Commercial Developments: All water lines installed longitudinally under roadway or pavement shall be constructed of ductile iron pipe and be restrained joint.

11.5.19 All water lines shall terminate with a hydrant or temporary hydrant assembly. All phased development must account for hydrant distance requirements per fire code and dead end line requirements.

11.5.20 Hydrant locations shall be in accordance with Fire Code (current edition and as amended) and shall be strategically placed to be installed at property corners for subdivision development. Hydrant markers shall be placed in the roadway asphalt 12" right of the center line. See Standard Details 11-5.1, 11-5.2 & 11-5.3. Hydrants shall not be installed in the middle of a lot or parcel.

11.5.21 Additional valves and hydrants may be required for flushing at low points, purging air at high points or isolation for future connections or looping of the system.

11.5.22 Air Release Valves (ARV) shall not be installed in water lines. Hydrants shall be installed in lieu of air release valves to purge air.

11.5.23 Hydrant leads shall be ductile iron pipe with restrained joint pipe and fittings. Concrete blocking or rodding is not permitted for hydrant assemblies.

11.5.24 Hydrant assemblies shall not be tapped for water service lines.

11.5.25 Water lines that are installed and will be extended in future phases, shall have a permanent valve placed in the line to isolate existing from future phases. All valves shall be restrained to facilitate testing, disinfection and connection without interruption of service to existing system.

11.5.26 Each individual lot or parcel shall have a single domestic water tap and meter served directly from a water line owned and operated by Columbia County. *A single domestic water meter shall constitute a single sewer tap.*

11.5.27 A large single lot may be master metered with one service tap to supply multiple buildings. However; if the large tract is subdivided into smaller lots, a water service must serve each and every individual property.

11.5.28 Water lines 20" and larger shall not be tapped for a water service. However; a water line extension of 6" or greater may be installed and tapped for water service. The water line extension shall end with a hydrant assembly.

11.5.29 All water meters shall be installed within a public right of way or where approved, within a dedicated easement. The water meter shall be installed within 4' to 6' inside the property corner. The water meter shall be flush against the back of the curb inside a grassed area. Water meter shall not be installed within driveways or sidewalks. Where property lines are shifted for any reason, the developer shall be responsible for the re-alignment or re-tapping of the water service and meter as required.

11.5.30 The developer/contractor is responsible for installing all domestic or irrigation services on the plans, added to the plans, removed or relocated as a result of a change in the number of lots or repositioning of the lot lines for the development. This also applies to the relocation of the hydrant where necessary. Existing services that will not be used shall be removed by the developer/contractor. Existing services that will be used shall be upgraded to current standards if necessary.

11.5.31 All residential domestic service lines shall be a minimum of ¾" in diameter. All commercial domestic and irrigation service lines shall be a minimum of 1" in diameter. See Standard Detail 14.10-1 and 14.10-1A.

11.5.32 Water service taps for 1 ½" and 2" require a 2" tap and gate valve. See Standard Detail 14.10-2 and 14.10-2A.

11.5.33 All 3" and 4" service lines shall be 4" in diameter and constructed of ductile iron pipe. See Standard Details 14.10-3 and 14.10-4.

11.5.34 Water meters for 3" and larger service lines shall be installed in a precast concrete vault and consist of a valve bypass within the vault. The

bypass may be reduced to a single standard pipe size smaller than the meter for 6" and larger meters. See Standard Details 14.10-3, 14.10-4, 14.10-6, 14.10-7.

11.5.35 Fire and domestic services combined will require a minimum bypass size in accordance with Fire Code (current edition and as amended) and must be approved by the Fire Marshall.

11.5.36 All irrigation meters 3" and larger shall be installed within a precast concrete vault but do not require a bypass. See Standard Detail 14.10-8.

11.5.37 Fire service lines only shall consist of restrained joint ductile iron pipe, limited in length with a Post Indicator Valve (PIV) and backflow device. All underground installation isolation valves on a fire service line shall have a standard valve box and locking cover stamped with "FIRE". See Standard Detail 14.10-5 for general arrangement information. All fire service lines shall be in accordance with Fire Code (current edition and as amended). Fire service use only lines do not require a domestic water meter, but will require a detector meter at the backflow device. See Section 11.6 and Section 15 for specific backflow requirements.

11.5.38 Where any service line requires a booster pump installation, a pressure sustaining valve must be installed just prior to the pump suction intake. The minimum pressure before the pump (County side) must be 20 psi.

11.5.39 All water lines crossing an existing County road, GDOT right of way, or CSX Railroad shall be a bore and jack crossing. Where specifically approved, a County road may be open-cut. The developer/contractor shall be responsible for all traffic control, detouring, and pavement replacement as required.

11.5.40 All bore and jack crossings shall be designed to take into account a 35' long bore pit on one side of the right of way. Where the bore pit cannot fit inside the existing right of way, a temporary construction easement must be established to complete the bore and jack installation. All easements must be obtained before construction begins and are the responsibility of the developer.

11.5.41 Back tapping of water lines is not permitted.

11.5.42 All water line installations shall have a minimum cover of 4'-0" beneath the lowest point of the roadway cross section (including the ditch).

11.5.43 All bore and jack installations of GDOT Interstates shall have a valve on each side of the right of way.

11.5.44 All water lines that do not have a minimum vertical separation of 18" when crossing laterally to a sanitary sewer, storm sewer, or gas line shall be ductile iron pipe.

11.5.45 Private communities shall incorporate a system boundary for the water distribution system. The development shall be mastered metered and all water lines inside the community shall be private and maintained by the owner/developer. The public water systems shall begin within an accessible easement or public right of way.

11.5.46 Commercial developments that will have multiple structures to be served with water service, but shall remain one large tract of property, shall be master metered and have a private water system. The public water system shall begin within an accessible easement or public right of way.