

Union County, Georgia

ADDENDUM # 1
February 24, 2025
Union County New 911 Center Facility Construction
Project# UC-2025-01

This addendum is issued to change or clarify the proposal documents associated with the Union County RFP for Union County New 911 Center Facility Construction Issued January 29, 2025

List of Items Included in Addendum #1

1. Extension of due date for proposals: **March 12, 2025 by 2:00 p.m.**
2. Questions and Answers (attached)
3. Amended Spec 331415 (attached)
4. Spec 261020 – Cable Trays for Low Voltage Systems (attached)

Note: A signed acknowledgement of this addendum must be received by the Purchasing Agent attached to your response.

Vendor Name: _____

Address: _____

Email: _____

Authorized Signature: _____ Date: _____

Name (Printed): _____ Title: _____

Question 1:

Sheet FP0.00 – Fire Protection General Notes was not included in the download set. Please clarify if this sheet is to be a part of the Bid Documents.

Answer to Question 1:

A Fire Sprinkler System is not included in this project. Please disregard reference to Sheet FP0.00. It is not part of the Contract Documents.

Question 2:

The water meter specification states that a 2-inch meter shall be installed by the City of Gainesville and references the City of Gainesville multiple times in the specifications. Please clarify.

Answer to Question 2:

Please see revised Specification 331415 – Site Water Distribution Piping, attached to this addendum with notation as “ADDENDUM 1.”

Question 3:

Will the general contractor be responsible for Tap fees?

Answer to Question 3:

No.

Question 4:

Is all work to be performed during normal business hours? Are there any restrictions?

Answer to Question 4:

No restrictions.

Question 5:

Please confirm if general contractor is responsible for the construction permit fees?

Answer to Question 5:

No.

Question 6:

Please confirm project start and desired duration.

Answer to Question 6:

Anticipated start in April, 2025. Duration is in RFP Document - Appendix C – Contract, which specifies 360 days from Notice to Proceed for substantial completion.

Question 7:

Are there liquidated damages?

Answer to Question 7:

This is covered in the RFP Document – Appendix C – Contract.

Question 8:

A1.11 calls for a sliding gate and to refer to the civils for details. The civil drawings to not have any details regarding this gate. Please provide basis of design and additional information I.E. lengths, heights, details, etc.

Answer to Question 8:

The sliding gate, operators and accessories associated with the gate are furnished and installed by the Owner. The General Contractor is to furnish conduit, boxes, pullstrings, power, etc., as indicated on the drawings.

Question 9:

Please provide a basis of design for the chain link partitions on A1.11. Detail 2/S4.02 calls for max 3” post embedment into slab and attachment to joists. Second floor slab is 3” in depth total and A5.12 calls for the chain link to fasten to walls and ceilings. Please confirm chain link attachment.

Answer to Question 9:

The attachment for the posts of the chain link partitions at the slab is as follows:

Core drill concrete slab 1” larger than the diameter of the fence post, 3” deep. Install the post in the core and overfill with non-shrink grout.

The attachment of the posts at the walls is as follows:

Furnish standard chain link fence wall straps (min. four [4] per post) in size to fit the diameter of the post. Straps to be attached 1” above the floor, 3’-4” a.f.f., 6’-8” a.f.f. and 1” below the 10’-0” a.f.f. ceiling. General Contractor to furnish blocking behind the wall at each strap location as necessary to securely fasten the wall straps. Each dividing fence panel between spaces shall have end posts at each end per the specifications and one (1) line post per the

specifications centered on the dividing panel. Reference bracing in the specifications for fence panels taller than 72" (an intermediate brace is required).

The attachment of each post to the structural joist above the ceiling is as follows:

Utilize 1 ½" Unistrut at each fence post secured to a minimum of two (2) bar joists. Contractor is given the option to securely fasten the fence post to the Unistrut provided it is secure, and removable, such as a bolted, "U bolt" type fastener at each post secured to each Unistrut.

Question 10:

Has a construction budget/SCL been set for this project?

Answer to Question 10:

No

Question 11:

Will a mandatory pre-bid walk of the site be held? If a scheduled walk will not be held, what requirements are there (if any) to visit the site to review the existing conditions?

Answer to Question 11:

No mandatory pre-bid. Visit site any time.

Question 12:

Section 4.0.f of the RFP notes that the GC is to provide "copies of manufacturer installer certificates (if applicable to RFP). Contractors must be certified resellers of the products that they provide and install." Please confirm what products this refers to (if any), as we have not been able to locate any such requirements in the specifications. Also, if such certifications are required, please confirm that it is acceptable for the certifications to be held by the subcontractors providing the specified systems, and not by the general contractor.

Answer to Question 12:

It is acceptable for subs to hold certificates.

Question 13:

The fire alarm specification notes that an "intelligent" system should be provided, but does not list a basis of design or acceptable manufacturers. Is a particular system desired or required? Does the system need to tie into any existing systems within the county?

Answer to Question 13:

Specification section 271010 paragraph 1.3-C lists the following acceptable manufacturers: Notifier, Edwards EST, Simplex. The County has not indicated that a particular system is desired.

Question 14:

Sheet T1.01 indicates card readers, cameras and other security devices but no specifications for security systems were provided. Please confirm if the general contractor will be responsible for these systems, or if we are to provide rough-in only for system installation by others.

Answer to Question 14:

The contractor will be responsible for rough-in only for these systems.

Question 15:

Please provide details for the following concrete pads shown on drawing C-03:

15'x15' Communications Tower pad

5x5 Transformer pad

12/5 Generator pad

Need information on thickness and any reinforcement required.

Answer to Question 15:

The Communications Tower foundation is being procured and installed separately and is shown for reference only. The General Contractor will be responsible to coordinate with the Owner and his subcontractors for the tower foundation and tower installation. The Generator pad is noted on 3/E5.01 and direction for the Transformer pad is provided in Note 1 on the Power Riser Diagram, sheet E5.01.

Question 16:

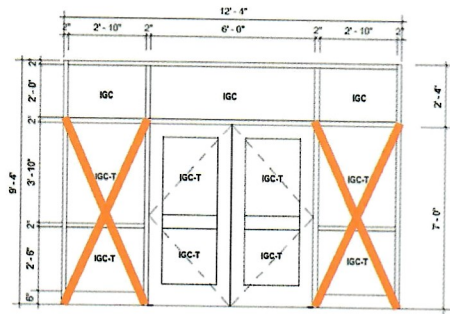
Drawing C-05 shows a proposed 8" DIP and 1" water line to be done by the city. Please clarify if GC is responsible for the 6"x6" tap and 1" water meter.

Answer to Question 16:

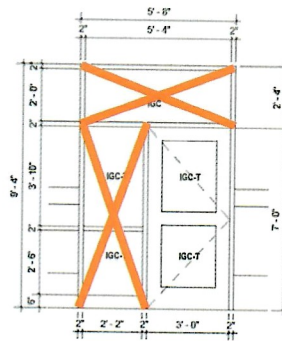
The construction of the 8" waterline will be the responsibility of the General Contractor but will be constructed and dedicated to the City of Blairsville. The General Contractor is also responsible for the Tap and the 1" meter and the 1" waterline to the building.

Question 17:

Please confirm location of window blinds at exterior windows. Should the transom also receive blinds? See illustration below showing two options. The X marks location of blinds.



SF4



SF5

Answer to Question 17:

Window blinds shall also be furnished at transoms above doors / windows.

Question 18:

On Drawing T0.02 – Detail 1 indicates “18”x4” CABLE TRAY, AS INDICATED ON PLANS” above the installed racks and it is also shown below the raised floor in that detail. On the same drawing, details 2 – 6 all are for Ladder rack style cable tray which does not come in an 18”x4” configuration (closest would be 18”x2”). Provided project manual refers to specification 261020 for cable tray, but that spec is not in the project manual. Please clarify responsible party for cable tray installation, and if the LV vendor, please provide specification 261020 and any other information on cable tray installation available.

Answer to Question 18:

18”x2” ladder tray shall be provided overhead in the data room. Refer to details on T0.02.
 18”x4” wire basket cable tray shall be provided beneath the raised floors. Spec section 261020 is attached.

Question 19:

On drawing T1.01 – Server Room 106, there are 6 network/equipment cabinets indicated. The structured cabling for the data network can fit on 2 rack/cabinets as indicated on drawing T0.01. Is the LV contractor to provide and install the additional 4 cabinets, or will they be provided and installed by other system providers?

Answer to Question 19:

The LV contractor is to provide all 6 network equipment cabinets.

Question 20:

Locker section detail on 3/A7.21 shows the lockers to be made of plywood but spec section 105113 calls for metal lockers. Please confirm specs for Lockers.

Answer to Question 20:

Lockers and filler panels are to be plywood with plastic laminate finish per the detail.

Question 21:

Server Room on drawing 1/A1.11 shows an object in the middle of the room with no details. Please provide details for this object.

Answer to Question 21:

The floor plan indicates the location of the Owner's server racks.

Question 22:

The details for the countertop in the breakroom shows two different types of finish. Detail 1/A7.21 shows a Plam top and and splash but detail 2/A7.21 shows a synthetic surface top. Please provide a seam detail or confirm if we are to use synthetic throughout. Plam top is not recommended in sink locations.

Answer to Question 22:

All countertops at Breakroom 108 shall be solid surface as indicated on detail 2/A7.21. The plywood and laminate countertop indicated in detail 1/A7.21 shall also be solid surface.

Question 23:

The finish schedule on A9.11 shows a few rooms to receive sealed concrete as the floor finish but also included SC for base. Please provide further detail. Typically we see rubber base in these conditions.

Answer to Question 23:

All rooms to receive a sealed concrete floor finish are to also receive Rubber Base at the perimeter of the room. The Finish Schedule should reference "RB" where "SC" is shown in the "FIN" column under the "Floor" section. The label at the top of the "Floor" section that indicates "FIN" should be changed to "BASE."

Question 24:

Please provide specs for the sliding gate shown on C-03. We did not see any information in the project manual.

Answer to Question 24:

The sliding gate, operators and accessories associated with the gate are furnished and installed by the Owner. The General Contractor is to furnish conduit, boxes, pullstrings, power, etc. as indicated on the drawings.

Question 25:

Please confirm width for signage type E.

Answer to Question 25:

Sign is 6" wide.

Question 26:

The project specs include products for landscaping such as seeding and turf but the drawing does not identify their location. Is there a landscape plan you can share with us?

Answer to Question 26:

No landscape plan is included. Landscaping is via owner allowance.

Question 27:

The specifications ask for doors to be both heavy wall and to have thermal construction via cladding. The offerings are one or the other. Both of these door types are 2" thick as requested by the specs. The door schedule calls for a 1 3/4" door which is rated for high traffic and would be budget friendly. Please advise.

Answer to Question 27:

Storefront exterior doors are to be 1 3/4" thick, thermally insulated.

Question 28:

The storefront BOD is Kawneer Trifab 451T. This system has a max, tested infill of 1 1/8". The specified glazing thickness is 1 5/16" insulated glass commonly used in hurricane applications. Possible solutions:

- a. Reduce the specified spacer from 1/2" to 1/4"
- b. Change the BOD to Kawneer IR 501T
- c. Change from 9/16" laminated inboard lite to 1/4" laminated inboard lite
- d. Change from 1 5/16" IGU to 1" IGU

Answer to Question 28:

The insulated glazing in the storefront doors is to be 1" thick.

Question 29:

Will the low voltage be owner provided and installed?

Answer to Question 29:

Please coordinate with the construction documents and specifications for items that are part of the contract, and items that are owner furnished.

Question 30:

What warranty will be required for the communication and cabling 10, 25, or lifetime?

Answer to Question 30:

Cabling is by owner.

Question 31:

What, if any, certifications will be required for the cabling beyond the Nicet Certification?

Answer to Question 31:

Cabling is by owner.

Question 32:

Will there be a landscape plan issued for bid or are we to carry an owner provided allowance?

Answer to Question 32:

Landscaping is by owner allowance.

Question 33:

Please provide details for the communication tower pad. Concrete thickness, reinforcing, etc.

Answer to Question 33:

The communications tower pad is furnished and installed by the tower installer. GC is to coordinate with the tower installer.

Question 34:

Please provide detail for the sliding gate and operator.

Answer to Question 34:

Gate and operator is by the owner. GC to furnish conduits and power per the construction documents.

Question 35:

Specs say DDC controls are to be by Mallory and Evans Service. Please clarify if DDC controls are by GC or by other.

Answer to Question 35:

Union County intends to utilize Mallory and Evans for the DDC controls. The GC should be obtaining pricing from Mallory and Evans for their design and installation services.

Question 36:

General code summary sheet indicates this is to be II-B construction and sprinklered, however I do not see a fire line entering the building nor a fire riser room. Please clarify if this building is to be sprinklered or not.

Answer to Question 36:

Building is not sprinklered.

Question 37:

Will we be required to provide a list of the subcontractors at time of bid submission or post-award?

Answer to Question 37:

This will be part of the qualifications proposal review and evaluated as part of the scoring process of Company Background / Local Participation (see RFP).

Question 38:

Please confirm that the cost of the water meter, vault and installation of both are by owner. GC to take over connection of new meter to new water lines.

Answer to Question 38:

Costs for water meter, vault and installation are by the owner.

Question 39:

Please confirm that the costs associated with any relocation of utilities such as fiber optics, power, gas, communication should not be included in our bids.

Answer to Question 39:

Utility relocation costs are to be excluded from the bid.

Question 40:

Is the new proposed 8" water line by GC or City of Blairsville? If by GC, are we to tap the existing 6" line on the other side of Shoe Factory Rd? If so, please provide detail and notes. Same for the connection to the 6" line toward the back of the site.

Answer to Question 40:

The GC is to install the water line, which will be dedicated to the City. Wet tap 6" on the other side of Shoe Factory Road with a 6x8 tap. City details are referenced on the plans. See city detail W-9.

Question 41:

If the new water line is to be 8", shouldn't the tap for the 1" domestic line be 8"x8"x1"?

Answer to Question 41:

Plans were approved by the City as 8", so the label should read 1" tee in to new 8" line (not a tap).

Question 42:

Confirm the 1" water line is to be copper per the specs.

Answer to Question 42:

Yes, copper.

Question 43:

Please clarify the parameters of the "local participation". Will there be a list of local subcontractors provided to the bidders or a general radiused area provided that show the limits of the local participation?

Answer to Question 43:

The goal is to use as many Union County businesses as possible. No.

Question 44:

Vapor Barrier – please advise thickness & spec 10MIL or 15MIL – not found

a. Page 6 'Cast-In-Place Concrete' – 03 30 00 notes to "Cover vapor barrier with compactible granular fill (GAB) as indicated on drawings"

b. Typically, we cover the Granular fill (4" GAB) with Vapor Barrier – please clarify.

Answer to Question 44:

15 MIL Class A vapor barrier. Cover GAB with the vapor barrier is correct. Disregard errant spec note.

Question 45:

Foundation Plan S1.02 in the Notes:

- a. T/Exterior Footings shall be -1'-4" BFF U.N.O.
- b. T/Interior Footings shall be -0-8" BFF U.N.O.
- c. Detail 1/A5.16 shows the footing at -1'-0" BFF
- d. Confirm that T/Footing for the Exterior CIP Foundation walls should be at -1'-4" BFF – notable details show the footings at -1'-0"

Answer to Question 45:

All exterior CIP foundation walls shall have T/FTG = -1'-4" except where stepped to -2'-0". The 1'-0" Min. dimension is given in the details to accommodate the condition where the slab steps down. In general, the S1.02 notes apply unless noted otherwise.

Question 46:

Please advise the T/Footing for FTG4'-0" x 2 at CL's CB – C4 & C5

- a. Arch Detail 4/A5.11 shows the footing at 0'-0"
- b. TYP. T/FTG as noted above in item 2a. shows -1'-4" U.N.O.

Answer to Question 46:

The footings should be below grade so they are not visible and so the brick joint would also not be visible.

Question 47:

Is there a specific access control system that is desired?
Does the access control system need to be FICAM & FIPS compliant?
Will the access control system be required to integrate with or connect back to any other ACS that is not in this building?

Answer to Question 47:

Not in general contractor's scope.

Question 48:

Is there a specific CCTV system that is desired?
Are there any exterior cameras to be installed that are not mounted to the building?
Will there be any exterior cameras installed on poles in parking areas or outside?
Will the CCTV system be required to integrate or connect back to any other CCTV system not local to this building?
What is the required time frame for the CCTV cameras?
What is the required retention time for CCTV video storage?

Answer to Question 48:

Not in general contractor's scope.

Question 49:

Is there a specific intrusion detection system that is desired?
Does the intrusion detection system need to dial out to an outside monitoring system? I would assume not as this is the 911 center.

Answer to Question 49:

Not in general contractor's scope.

Question 50:

What type of category cable does this facility require for telecom Division 27? Cat5e/Cat6/Cat6A?
Is the requirement for division 27 an end to end solution with a single manufacturer from end to end?

Answer to Question 50:

Not in general contractor's scope.

Question 51:

On the RFP, there is a section for "f. Copies of manufacturer installer certificates (if applicable to RFP). Contractors must be certified resellers of the products they provide and install." Will this be required at the time of bid submission or post-award?

Answer to Question 51:

Post-award.

331415-SITE WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Water-distribution piping and related components outside the building for combined domestic water service and fire-suppression water service and terminated 5 ft. from building. Terminate water-service piping with appropriate fitting for extension by Divisions 21 and 22.
2. The Union County Department of Water Resources requirements take precedence. Title:

1.2 DEFINITIONS

- A. CDA: Copper Development Association.
- B. EPDM: Ethylene-propylene-diene terpolymer rubber.
- C. PA: Polyamide (nylon) plastic.
- D. PE: Polyethylene plastic.
- E. PP: Polypropylene plastic.

1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: For piping and specialties including relation to other services in same area, drawn to scale. Show piping and specialty sizes and valves, meter and specialty locations, and elevations.
- B. Field Quality-Control Submittals:
 1. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each type of product indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare piping, valves, meters, backflow prevention devices, and fire hydrants according to the following:

1. Ensure that piping, valves, meters, backflow prevention devices, and fire hydrants are dry and internally protected against rust and corrosion.
 2. Protect threaded ends and flange faces against damage.
 3. Set piping, valves, meters, backflow prevention devices, and fire hydrants in best position for handling and to prevent rattling.
- B. During Storage: Use precautions for piping, valves, meters, backflow prevention devices, and fire hydrants according to the following:
1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
 2. Protect from weather. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Handling: Use sling to handle products if size requires handling by crane or lift. Rig products to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service in accordance with requirements indicated:
1. Notify Owner no fewer than two days in advance of proposed interruption of service.
 2. Do not proceed with interruption of water-distribution service without Owner's written permission.

1.7 COORDINATION

- A. Coordinate connection to water main with utility company.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of Union County Department of Water Resources. Include tapping of water mains and backflow prevention.
- B. Comply with Union County Department of Water Resources standards for domestic water-service piping, including materials, installation, testing, and disinfection.
- C. Comply with Union County Department of Water Resources standards for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- D. The Pressure Class or nominal thickness, net weight without lining, and casting period shall be clearly marked on each length of pipe. Additionally, the manufacturer's mark, country where cast, year in which the pipe was produced and let letters "DI" or "Ductile" shall be cast or stamped on each length of pipe.
- E. Piping materials to bear label, stamp, or other markings of specified testing agency.
- F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
- G. Comply with ASTM F645 for selection, design, and installation of thermoplastic water piping.
- H. Comply with FM Approvals' "Approval Guide" and/or UL's "Fire Protection Equipment Directory" for fire-suppression water-service products.
- I. Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-suppression water-service piping.
- J. All piping and appurtenances intended to convey or dispense water for human consumption are to comply with the U.S. Safe Drinking Water Act (SDWA), with requirements of the Authority Having Jurisdiction (AHJ), and with NSF 61/NSF 372 or are certified in compliance with NSF 61/NSF 372 by an ANSI-accredited third-party certification body, that the weighted average lead content at wetted surfaces is less than or equal to 0.25 percent.

2.2 PIPING MATERIALS

- A. Comply with requirements in "Piping Applications" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and service sizes.
- B. Potable-water piping and components comply with NSF 14, NSF 61, and NSF 372. Include marking "NSF-pw" on piping.

2.3 WATER MAINS

- A. Pipe for water mains shall be Pressure Class 350 Ductile Iron (D.I.P.) Each pipe shall be subjected to a hydrostatic test pressure of at least 500 psi at the time and place of manufacture. Pipe wall thickness shall be sufficient to meet the above conditions, and in accordance with the Pressure Class listed in the Proposal or shown on the contract drawings.
- B. The Pressure Class or nominal thickness, net weight without lining, and casting period shall be clearly marked on each length of pipe. Additionally, the manufacture’s mark, country where cast, year in which the pipe was produced and let letters “DI” or “Ductile” shall be cast or stamped on each length of pipe
- C. Ductile Iron Pipe shall have an inside cement lining and asphaltic seal coat in accordance with the latest revision of ANSI/AWWA C104/A21.4.
- D. The exterior of ductile iron pipe shall be coated with a layer of arc-sprayed zinc. The mass of the zinc applied shall be 200g/m² of pipe surface area. A finishing layer topcoat shall be applied to the zinc. The mean dry film thickness of the finishing layer shall not be less than 3 mils with a local minimum not less than 2 mils.
- E. All pipe shall be manufactured and coated in the United States at the pipe manufacturer’s facility.
- F. PVC pipe for water mains is not allowed.

2.4 JOINTS

- A. Joints for ductile iron pipe shall be mechanical joint or push-on joint in accordance with AWWA C111 (latest revision)
- B. Solvent-cemented joints are not allowed for buried pipes.
- C. Coating: Ductile iron pipe shall be lined with an approved cement lining sealed with an approved bituminous seal coat in accordance with AWWA C104 (latest revision). A standard pipe outside coating shall be used in accordance with AWWA C108 (latest revision).
- D. Casing Pipe: Jacked casing pipe shall be a smooth steel pipe with a minimum tensile strength of 35,000 psi, or as approved by Georgia DOT. The minimum wall thickness shall be as indicated in the Table below.

Nominal Diameter (Inches)	Nominal Thickness (Inches)
Under 14	0.188
14	0.219
16	0.219
18	0.250

20	0.281
22	0.312
24	0.344
26	0.375
28	0.406
30	0.406
32	0.438
34	0.469
36	0.469
42	0.500
48	0.625
54	0.750

2.5 SERVICE LINES

- A. Both ¾-inch and 1-inch water service lines shall be type “K” rolled copper tubing. Copper tubing shall be Type K, HDP soft or hard copper pipe conforming to ASTM B88.
- B. All 2-inch water service lines shall be Type K, DHP rolled or hard copper pipe, and shall conform to ASTM B88.
- C. Brass Fittings
 - 1. Curb Stops: Curb stops for copper service lines shall be Ford 90o c.t.s. pack-joint x meter swivel or equivalent as approved by the Union County Utility Inspector.
 - 2. Corporation Stops: Corporation stops for copper service outlets shall be Ford model F-1000-4 c.t.s. pack-joint or equivalent as approved by the Union County Utility Inspector.
 - 3. Copper female iron pipe adapters shall be Ford c.t.s. pack joint x f.i.p. or equivalent as approved by the Union County Utility Inspector.
 - 4. Copper by copper unions shall be Ford c.t.s. x c.t.s. pack joint or equivalent. All proposed equivalent brands must be approved by the Union County Utility Inspector.
 - 5. Copper by male iron pipe adapters shall be Ford c.t.s. pack joint x m.i.p. or equivalent. All proposed equivalent brands must be approved by the Union County Utility Inspector.

2.6 PVC PIPE

- A. PVC Pipe: AWWA C900, Class 150, with bell end with gasket, and with spigot end.

1. Comply with UL 1285 for fire-suppression water service.
2. PVC Fabricated Fittings: AWWA C900, Class 150, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
3. PVC Molded Fittings: AWWA C907, Class 150, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
4. PVC Piping Gasketed Joints: Use joining materials in accordance with AWWA C900. Construct joints with elastomeric seals and lubricant in accordance with ASTM D2774 or ASTM D3139 and pipe manufacturer's written instructions.

2.7 FITTINGS

- A. Ductile iron fittings shall conform to ASA 21.10 and AWWA C110, or AWWA C153 (latest revision). Fittings shall have a minimum classifications of Class 350 type of joints, and fittings shall be mechanical joints only. All mechanical joint fittings shall include accessories. All fittings shall be cement lined with tar coated outside.
- B. Plastic, or galvanized, fittings on any size pipe will not be allowed.

2.8 VALVES

- A. Gate valves are required for all water mains.
 1. Gate valves shall be non-rising stem design, ductile iron body, bronze mounted with compression resilient seat manufactured in accordance with AWWA Standard C-515.
 2. Valves shall be designed for a minimum working pressure of 250 psi (except where plans call for a higher-pressure rating) and shall have 2" square operating nuts, except in meter vaults where handwheels shall be installed. The wedge shall be constructed of ductile iron fully encapsulated with EPDM rubber.
 3. Valves shall have non-rising stems, shall open when turned to the left and shall meet AWWA Specifications. The valves shall have a flange connection conforming to ANSI B 16.1 when flanges are shown on the plans.
 4. Restrained valve ends shall employ a boltless positive joint restraint equal to the Flex-Ring joint. Friction style restrainers, which point load in the adjoining pipe, will not be allowed.
 5. Gate valves shall be Series 2500 Flex-Ring RW Ductile Iron Resilient Wedge Gate Valve as manufactured by American Flow Control or approved equal.
- B. Gate Valves - AWWA, Cast Iron:
 1. Source Limitations: Obtain gate valves - AWWA, cast iron, from single manufacturer.
 2. Gate Valves - Nonrising Stem, Resilient Seated: Cast- or ductile-iron body and bonnet, with bronze or cast- or ductile-iron gate, resilient seats, bronze stem, and stem nut.
 - a. Standards: AWWA C509 or AWWA C515.
 - b. Minimum Pressure Rating: 200 psig.
 - c. End Connections: Mechanical joint, flanged, threaded, or push on.
 - d. Interior Coating: Complying with AWWA C550.
- C. Gate Valves - UL/FM Global, Cast Iron:

1. Source Limitations: Obtain gate valves - UL/FM Global, cast iron, from single manufacturer.
 2. Gate Valves - UL/FM Global, Nonrising Stem, Resilient Seated: Cast- or ductile-iron body and bonnet, with flange for indicator post, bronze seating material, and inside screw.
 - a. Standards: AWWA C509 or AWWA C515, UL listed and FM Global approved.
 - b. Minimum Pressure Rating: 175 psig.
 - c. End Connections: Mechanical joint or flanged.
 - d. Interior Coating: Complying with AWWA C550.
 - e. .
- D. Gate Valves - Bronze:
1. Source Limitations: Obtain gate valves - bronze, from single manufacturer.
 2. Gate Valves - Nonrising Stem: Class 125, bronze with solid wedge.
 - a. Standard: MSS SP-80.
 - b. End Connections: Threaded or solder.
 - c. Handwheel: Malleable iron.
- E. Butterfly Valves are not allowed in any water main installation unless authorized by Union County.
- F. Tapping Valves
1. Tapping sleeves shall be properly sized to fit the existing pipe and shall be of the fabricated stainless steel with wrap-around gasket type with ends suitable for connection into the pipeline onto which it will be installed.
 2. The valves furnished with the sleeves shall conform to the requirements for gate valves, except for modifications required to permit the use of full-size cutters through the valves.
 3. The outlet of the valves shall be mechanical joint for joining with the water mains. All 2-inch tapping valves shall be furnished with FIP ends. All proposed brands must be approved by the Union County Utility Inspector.
- G. Check Valves
1. Check Valves - AWWA: Swing-check type with resilient seat with ends to match piping.
 - a. Source Limitations: Obtain check valves, AWWA, from single manufacturer.
 - b. Standards:
 - 1) AWWA C508.
 - 2) Interior coating in accordance with AWWA C550.
 - c. Pressure Rating: 175 psig.
 2. Check Valves - UL/FM Global: Swing-check type with pressure rating, rubber-face checks unless otherwise indicated, and ends matching piping.
 - a. Source Limitations: Obtain check valves - UL/FM Global, from single manufacturer.
 - b. Standards: UL listed and FM Global approved.

- c. Pressure Rating: 175 psig.
- H. Detector Check Valves:
- 1. Source Limitations: Obtain detector check valves from single manufacturer.
 - 2. Description: Include threaded bypass taps in inlet and outlet for bypass meter connection. Set valve to allow minimal water flow through bypass meter when major water flow is required.
 - a. Standards: UL listed and FM Global approved.
 - b. Pressure Rating: 175 psig.
 - 3. Water Meter: AWWA C700, disc type, at least one-fourth size of detector check valve. Include meter, bypass piping, gate valves, check valve, and connections to detector check valve.
- I. Corporation Valves and Curb Valves and Meter Valves
- 1. Corporation Valves and Curb Valves and Meter Valves:
 - a. Source Limitations: Obtain corporation valves and curb valves and meter valves from single manufacturer.
 - b. Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.
 - 2. Corporation Valves: Comply with AWWA C800. Include saddle and valve compatible with tapping machine.
 - a. Service Saddle: Copper alloy with seal and AWWA C800, threaded outlet for corporation valve.
 - b. Corporation Valve: Bronze body, ground-key plug or ball, with AWWA C800, threaded inlet and outlet matching service piping material.
 - c. Manifold: Copper fitting with two to four inlets as required, with ends matching corporation valves and outlet matching service piping material.
 - 3. Curb Valves: Comply with AWWA C800. Include bronze body, ground-key plug or ball, and wide tee head, with inlet and outlet matching service piping material.
 - a. Service Boxes for Curb Valves: ASTM A48/A48M, Class 25 cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over curb valve and with a barrel approximately 3 inches in diameter.
 - 1) Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.
 - 4. Meter Valves: Comply with AWWA C800 for high-pressure, service-line valves. Include angle or straight-through-pattern bronze body, ground-key plug or ball, wide tee head, with inlet and outlet matching service piping material.
- J. Valve Markers
- 1. Valve markers shall be furnished and installed with each valve installed, with the exception of fire hydrant valves.
 - 2. The markers shall be of Class A concrete Georgia DOT (highway specifications) four (4) inches square by five (5) feet long, same construction as that of highway right-of-way marker, with the letter "V" firmly made into the marker six (6) inches below the top with a 1-1/4 inch brass plug one (1) inch below the letter "V", which shall be imprinted with the distance between the valve and marker.
 - 3. The markers shall be set opposite the valves in such a location as they would no be destroyed by traffic. The top of the marker should be set about eighteen (18) inches

above ground. The street curb shall also be marked with a saw-cut letter “V” and the “V” shall be painted blue.

K. Valve Boxes

1. Valve boxes and covers shall be provided for all valves. Valve boxes shall be of the adjustable slide type, of the length required by field conditions, and installed in accordance with the County’s latest water construction standard details.
2. The shaft shall be a minimum of 5-1/4-inch inner diameter, the base shall be a minimum 8-inch diameter, and the interior height according to field conditions.
3. The valve box covers shall be of the stay put or drop type, with the word “WATER” cast on top in raised letters. Base size and extension piece shall be as required for each individual size of valve and depth according to the specific manufacturer’s sizing requirements.
4. Valve Pads shall be furnished and installed with each valve installed. The pads shall be 2-foot squares of 3,000 psi concrete.

2.9 MARKER BALLS

A. Locator balls shall be 3M DYNA TEL Series EMS ID Ball Markers. The model number shall be 1423-XR/iD.

1. Marker balls shall be located every 200-LF along straight sections of pipe, every fitting and ends of casing.
2. Contractor shall coordinate with Owner’s Representative to program marker balls and provide data on Construction Record drawings.

2.10 FIRE HYDRANTS

A. Fire hydrants shall conform to the latest requirements of AWWA C502, be the traffic type, dry top, 5-1/4-inch valve opening with O-ring seals, three-way only. The three-way hydrants are to have two, 2-1/2-inch NST hose nozzles and one, 4-1/2-inch NST hose nozzle. The main valve shall be rubber faced, shall seat against a bronze seat, and shall open against pressure.

1. Hydrants shall range from 3-foot to 5-foot bury with 6-inch mechanical joint inlet connection.
2. Operating nuts shall be pentagon (1-1/2-inch point to flat) and shall open by turning counterclockwise.
3. All fire hydrant laterals shall have 6-inch gate valves and valve boxes.
4. All fire hydrants shall be painted in accordance with AWWA C502, Section 2.22 and Section 4.5. The color shall be silver.
5. All fire hydrants shall be connected to the water main with a 6-inch min. ductile iron lead. PVC pipe will not be allowed for fire hydrant leads.
6. Fire hydrants shall be as manufactured by M & H, Mueller, or approved equal.

2.11 FIRE DEPARTMENT CONNECTIONS

A. Fire Department Connections:

1. Source Limitations: Obtain fire department connections from single manufacturer.

2. Standard: UL 405.
3. Configuration: Freestanding, with cast-bronze body, thread inlets in accordance with NFPA 1963 and matching local fire department hose threads, and threaded bottom outlet. Include lugged caps, gaskets, and chains; lugged swivel connection and drop clapper for each hose-connection inlet; 18-inch-high, brass sleeve; and round escutcheon plate.
4. Connections:
 - a. Two NPS 3 inlets and one NPS 4 outlet.
5. Inlet Alignment: Inline, horizontal.
6. Finish Including Sleeve: Polished bronze.

2.12 ALARM DEVICES

- A. Alarm Devices: UL 753 and FM Global approved, of types and sizes to mate and match piping and equipment.
- B. Water-Flow Indicators: Vane-type water-flow detector, rated for 250 psig working pressure; designed for horizontal or vertical installation; with 2 SPDT circuit switches to provide isolated alarm and auxiliary contacts, 7 A, 125 V ac and 0.25 A, 24 V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal when cover is removed.
- C. Supervisory Switches: SPDT; designed to signal valve in other than fully open position.
- D. Pressure Switches: SPDT; designed to signal increase in pressure.

2.13 TAPPING SADDLES

- A. All service connections to the water main shall use 1-inch CC Tap Thread Saddles.
- B. 2-inch through 30-inch shall use double strap Smith Blair or approval equal.

2.14 COUPLINGS

Repair, transition, and bolted couplings to be used for water line installation shall be as shown below.

Water Line Size	Specification	Coupling
3/4 "	Type "K" Soft Copper	Ford brass "Pack-Joint" or A.Y. McDonald Brass "Mac-Pak"
1"	Type "K" Soft Copper	Ford brass "Pack-Joint" or A.Y. McDonald Brass "Mac-Pak"
2"	Type "K" Soft & Hard Copper	Ford brass "Pack-Joint" or A.Y. McDonald Brass "Mac-Pak"
6"	C900 Ductile	M.J. Ductile Iron

	Iron pipe	Solid Sleeve
8"	C900 Ductile Iron pipe	M.J. Ductile Iron Solid Sleeve
10"	C900 Ductile Iron pipe	M.J. Ductile Iron Solid Sleeve
12" And Larger	C900 Ductile Iron pipe	M.J. Ductile Iron Solid Sleeve

2.15 WATER METERS

- A. Service Line Meters: Water services requiring meters up to and including 2-inch size shall be installed by Union County.
- B. Master Meters (And Other Large Meters): Water meters 3-inches and larger, shall be compound type meters. These meters shall have a cast bronze main-case, measure in gallons per minute, and have a hermetically sealed register with a magnetic coupling drive, as manufactured by Neptune. The general arrangement of the meter pit shall include locking bypass lines, valves, double check valves, strainers, etc., as may be required by the County's Engineer for the specific application. There are two options available for water meters larger than 3-inches:
1. Option 1 – The owner or contractor may purchase and install a meter that meets the specifications of Union County.
 2. Option 2 – Union County will purchase and install the meter.
- C. Meter Boxes For 3/4 Inch Water Service
1. Typical residential water meter boxes shall be composed of cast iron and shall be approximately 14 1/2 inches long with an approximate 7 1/8-inch-wide oval top opening the meter box shall be approximately 11-inches deep. A cast iron locking lid shall be provided with all meter boxes. Each lid shall be supplied with a hole of the following diameter: 1 27/32 inches. Residential meter box details shall be in accordance with the standard construction details. Accepted brands include Ford cast iron long yoke-boxes and A.Y. McDonald cast iron long-boxes.
 2. Meter box inlets shall be configured as follows:
 - a. 3/4-inch cts angle locking-type ball valve with Ford Pack Joint or McDonald Mac-Pac compression fittings for dual meter services lines.
 - b. 3/4-inch angle locking-type ball valve with Ford Pack Joint or McDonald Mac-Pac compression fittings for single meter service lines.

NOTE: Dual meter service lines use a ball valve and "Y" fitting with 1-inch inlet X two 3/4-inch outlets. All single meters use a 1" x 3/4" adapter in place of the "Y" fitting.
 3. Meter box outlets shall be configured as follows:
 - a. All outlets will be 3/4-inch iron pipe threads
 - b. A 3/4-inch brass nipple and 3/4-inch brass ball valve are to be installed at the outlet of the meter box.
- D. Backflow Preventer

1. The County is responsible for protecting the public potable water distribution system from contamination or pollution due to the backflow of contaminants or pollutants through a water service connection.
2. A cross-connection is a connection or potential connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances would allow such substances to enter the potable water system. Other substances may be gases, liquids, or solids, such as chemicals, waste products, steam, water from other sources (potable or nonpotable), or any matter that may change the color or ad odor to the water.
3. In certain cases, the County will require a reduced pressure backflow prevention assembly. The County will dictate when these type of backflow preventers are to be installed.
4. Examples of businesses that will require an RPZ include but are not limited to mortuaries, industrial facilities, wastewater pumping systems, chemical plants, wastewater treatment facilities, commercial facilities, agricultural facilities, etc.
5. An approved RPZ and “hotbox” will be required so that the backflow preventer is elevated above the ground level and heated during freezing weather. Elevating an RPZ is required so that the appropriate “air-gap” is always provided.
6. An RPZ below grade could become submerged in water and thereby be rendered inoperable and ineffective. Reference the standard construction details for required configuration of the RPZ and hotbox. Please note that the hotbox must be supplied with electrical power and a heating element.
7. All residential services shall have backflow preventers installed in series with the water meter in the meter box.
8. For sizes ¾-inch through 1-inch, the backflow preventer shall be Watts No. 7 Residential Dual Check Backflow Preventer with bronze body or approved equal.
9. For sizes larger than 1-inch, or for services other than residential, backflow preventer shall be designed for the specific application and shall be approved by the Union County Utility Inspector.
10. Backflow Preventers - Reduced-Pressure Principle:
 - a. Source Limitations: Obtain backflow preventers - reduced-pressure principle, from single manufacturer.
 - b. Standard: AWWA C511.
 - c. Operation: Continuous-pressure applications.
 - d. Pressure Loss: 12 psig maximum, through middle one-third of flow range.
 - e. Size: 6 & 8.
 - f. Design Flow Rate: 200.
 - g. Selected Unit Flow Range Limits: 150-250.
 - h. Pressure Loss at Design Flow Rate: 10 psig for NPS 2 and smaller; 10 psig for NPS 2-1/2 and larger.
 - i. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved for NPS 2-1/2 and larger.
 - j. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
 - k. Configuration: Designed for horizontal, straight through flow.
 - l. Accessories:
 - 1) Valves: Ball type with threaded ends on inlet and outlet of NPS 2 and smaller; OS&Y gate type with flanged ends on inlet and outlet of NPS 2-1/2 and larger.

- 2) Air-Gap Fitting: ASME A112.1.2, matching backflow preventer connection.
11. Backflow Preventers - Double-Check Assembly:
 - a. Source Limitations: Obtain backflow preventers - double-check assembly, from single manufacturer.
 - b. Standard: AWWA C510.
 - c. Operation: Continuous-pressure applications unless otherwise indicated.
 - d. Pressure Loss: 5 psig maximum, through middle one-third of flow range.
 - e. Size: 6 & 8.
 - f. Design Flow Rate: 200.
 - g. Selected Unit Flow Range Limits: 150-250.
 - h. Pressure Loss at Design Flow Rate: 10 psig for NPS 2 and smaller; 10 psig for NPS 2-1/2 and larger.
 - i. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved for NPS 2-1/2 and larger.
 - j. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
 - k. Configuration: Designed for horizontal, straight through flow.
 - l. Accessories: Ball valves with threaded ends on inlet and outlet of NPS 2 and smaller; OS&Y gate valves with flanged ends on inlet and outlet of NPS 2-1/2 and larger.
 12. Backflow Preventer Test Kits: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.
 - a. Source Limitations: Obtain backflow preventer test kits from single manufacturer.

2.16 ENCASUREMENT FOR PIPING

- A. Standards: ASTM A674 or AWWA C105/A21.5.
- B. Form: tube.
- C. Material: high-density, cross-laminated PE film of 0.004-inch minimum thickness.
- D. Color: natural.

2.17 CONCRETE VAULTS

- A. Concrete Vault - Precast, Reinforced Concrete: Designed for A-16 load designation in accordance with ASTM C857 and made in accordance with ASTM C858.
 1. Ladder: ASTM A36/A36M, steel or PE-encased steel steps.
 2. Manhole:
 - a. ASTM A48/A48M Class No. 35A minimum tensile strength, gray-iron traffic frame and cover; 24-inch minimum diameter unless otherwise indicated.
 - b. ASTM A536, Grade 60-40-18, ductile-iron traffic frame and cover: 24-inch minimum diameter unless otherwise indicated.

3. Drain: ASME A112.6.3, cast-iron floor drain with outlet of size indicated. Include body anchor flange, light-duty cast-iron grate, bottom outlet, and integral or field-installed bronze ball or clapper-type backwater valve.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Comply with excavating, trenching, and backfilling requirements in Section 312000 "Earth Moving."

3.2 PIPING APPLICATIONS

- A. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used unless otherwise indicated.
- B. Do not use flanges or unions for underground piping.
- C. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
- D. Underground water-service piping NPS 3/4 to NPS 3 to be any of the following:
 1. Soft copper tube, ASTM B88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
 2. PVC, Schedule 40 pipe; PVC, Schedule 40 socket fittings; and solvent-cemented joints.
 3. AWWA C900, Class 150, with bell end with gasket, and with spigot end.
- E. Underground water-service piping NPS 4 to NPS 8 to be any of the following:
 1. Soft copper tube, ASTM B88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
 2. Ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints.
 3. PVC, Schedule 40 pipe; PVC, Schedule 40 socket fittings; and solvent-cemented joints.
 4. NPS 4 and NPS 6: NPS 6 PVC, AWWA Class 150 pipe; PVC, AWWA Class 150 molded fittings; and gasketed joints.
 5. NPS 8: PVC, AWWA Class 200 pipe; PVC, AWWA Class 200 fabricated fittings; and gasketed joints.
- F. Underground fire-service-main piping 6 & 8 & 10 to be any of the following:
 1. Ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints.
 2. PVC, AWWA Class 150 pipe listed for fire-protection service; PVC Class 150 fabricated or molded fittings; and gasketed joints.

3. PVC, AWWA Class 200 pipe listed for fire-protection service; PVC Class 200 fabricated fittings; and gasketed joints.

3.3 VALVE APPLICATIONS

- A. General Application: Use mechanical-joint-end valves for NPS 3 and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use UL/FM Global, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 and smaller installation.
- B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, resilient-seated gate valves with valve box.
 2. Underground Valves, NPS 4 and Larger, for Indicator Posts: UL/FM Global, cast-iron, nonrising-stem gate valves with indicator post.
 3. Use the following for valves in vaults and aboveground:
 - a. Gate Valves, NPS 3 and Larger: AWWA, cast iron, OS&Y rising stem, metal seated.
 - b. Check Valves: AWWA C508, swing type.
 4. Pressure-Reducing Valves: Use for water-service piping in vaults and aboveground to control water pressure.
 5. Relief Valves: Use for water-service piping in vaults and aboveground.
 - a. Air-Release Valves: To release accumulated air.
 - b. Air/Vacuum Valves: To release or admit large volume of air during filling of piping.
 - c. Combination Air Valves: To release or admit air.
 6. Detector Check Valves: Use for water-service piping in vaults and aboveground to detect unauthorized use of water.

3.4 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Comply with Section 330500 "Common Work Results for Water Resources" for piping-system common requirements.
- B. Provide a continuous bare copper or aluminum tracer wire not less than 0.10 inch in diameter in sufficient length over each separate run of nonmetallic pipe.

3.5 INSTALLATION OF PIPING

- A. Water-Main Connection:

1. Arrange with Union County Department of Water Resources for tap of size and in location indicated in water main.
 2. Tap water main in accordance with requirements of Union County Department of Water Resources and of size and in location indicated.
- B. Make connections larger than NPS 2 with tapping machine according to the following:
1. Install tapping sleeve and tapping valve in accordance with MSS SP-60.
 2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
 3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
 4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.
- C. Make connections NPS 2 and smaller with drilling machine according to the following:
1. Install service-saddle assemblies and corporation valves in size, quantity, and arrangement required by utility company standards.
 2. Install service-saddle assemblies on water-service pipe to be tapped. Position outlets for corporation valves.
 3. Use drilling machine compatible with service-saddle assemblies and corporation valves. Drill hole in main. Remove drilling machine and connect water-service piping.
 4. Install corporation valves into service-saddle assemblies.
 5. Install manifold for multiple taps in water main.
 6. Install curb valve in water-service piping with head pointing up and with service box.
- D. Comply with NFPA 24 for fire-service-main piping materials and installation.
1. Install PE corrosion-protection encasement in accordance with ASTM A674 or AWWA C105/A21.5.
 2. Install copper tube and fittings in accordance with CDA's "Copper Tube Handbook."
- E. Install ductile-iron, water-service piping in accordance with AWWA C600 and AWWA M41.
1. Install PE corrosion-protection encasement in accordance with ASTM A674 or AWWA C105/A21.5.
- F. Install PVC, AWWA pipe in accordance with ASTM F645 and AWWA M23.
- G. Bury piping with depth of cover over top at least 48 inches, with top at least 12 inches below level of maximum frost penetration, and according to the following:
1. Under Driveways: With at least 48 inches of cover over top.
 2. Under Railroad Tracks: With at least 48 inches of cover over top.
 3. In Loose Gravelly Soil and Rock: With at least 12 inches of additional cover.
- H. Install piping by tunneling or jacking, or combination of both, under streets and other obstructions that cannot be disturbed.

- I. Extend water-service and fire-suppression water-service piping and connect to water-supply source and building water-piping and fire-suppression piping systems at outside face of building wall in locations and pipe sizes indicated.
 - 1. Terminate water-service and fire-suppression water-service piping at building wall until building water-piping and fire-suppression piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building water-piping and fire-suppression piping systems when those systems are installed.
- J. Sleeves are specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping"
- K. Mechanical sleeve seals are specified in Section 220517 "Sleeves and Sleeve Seals for Fire-Suppression Piping"
- L. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Fire-Suppression Piping"
- M. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.
- N. Comply with Section 211200 "Fire-Suppression Standpipes," Section 211313 "Wet-Pipe Sprinkler Systems," and Section 211316 "Dry-Pipe Sprinkler Systems" for fire-suppression-water piping inside the building.
- O. Comply with Section 221116 "Domestic Water Piping" for potable-water piping inside the building.

3.6 JOINT CONSTRUCTION

- A. Comply with Section 330500 "Common Work Results for Water Resources" for basic piping joint construction.
- B. Make pipe joints according to the following:
 - 1. Copper-Tubing, Pressure-Sealed Joints: Join copper tube and pressure-seal fittings with tools and procedures recommended by pressure-seal-fitting manufacturer. Leave insertion marks on pipe after assembly.
 - 2. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
 - 3. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
 - 4. Ductile-Iron Piping, Grooved Joints: Cut-groove pipe. Assemble joints with grooved-end, ductile-iron-piping couplings, gaskets, lubricant, and bolts in accordance with coupling manufacturer's written instructions.
 - 5. PVC Piping Gasketed Joints: Use joining materials in accordance with AWWA C900. Construct joints with elastomeric seals and lubricant in accordance with ASTM D2774 or ASTM D3139 and pipe manufacturer's written instructions.
 - 6. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

- a. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.7 INSTALLATION OF ANCHORAGE

- A. Anchorage: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:
 - 1. Concrete thrust blocks.
 - 2. Locking mechanical joints.
 - 3. Set-screw mechanical retainer glands.
 - 4. Bolted flanged joints.
 - 5. Heat-fused joints.
 - 6. Pipe clamps and tie rods.
- B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
 - 1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: In accordance with AWWA C600.
 - 2. Gasketed-Joint, PVC Water-Service Piping: In accordance with AWWA M23.
 - 3. Bonded-Joint Fiberglass, Water-Service Piping: In accordance with AWWA M45.
 - 4. Fire-Service-Main Piping: In accordance with NFPA 24.
- C. Concrete for reaction blocking shall have a minimum compressive strength of 3,000 psi at 28 days. The blocking, unless otherwise shown, shall be so placed that the pipe and fitting joints will be accessible for repair.
- D. Refer to the standard construction details for typical installations.
- E. Concrete collars and thrust rods may be required by the County where concrete blocking is inadequate or where the interruption of service is not permissible.
- F. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.8 INSTALLATION OF VALVES

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.
- B. AWWA Valves Other Than Gate Valves: Comply with AWWA C600 and AWWA M44.
- C. UL-Listed or FM Global-Approved Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.
- D. UL-Listed or FM Global-Approved Valves Other Than Gate Valves: Comply with NFPA 24.
- E. MSS Valves: Install as component of connected piping system.

- F. Corporation Valves: Install each underground curb valve with head pointed up and with service box.
- G. Relief Valves: Comply with AWWA C512. Install aboveground with shutoff valve on inlet.
- H. Valve boxes and covers shall be provided with all valves, shall be of the adjustable slide type, of the length required, and installed according to the County standard construction details, if any. The valve boxes shall be centered over the operating nut of the valve.
- I. Valve Pads shall be furnished and installed with each valved installed. The pads shall be 2-foot squares of 3,000 psi concrete.
- J. The markers shall be set opposite the valves in such a location as they would not be destroyed by traffic. The top of the marker should be set about 18 inches above ground.
- K. Valve locations shall be marked on the street curb with a saw-cut letter "V". The saw-cut letter "V" shall be painted blue.
- L. Comply with requirements for concrete piers in Section 033000 "Cast-in-Place Concrete" for support of valves and piping not direct buried.

3.9 INSTALLATION OF DETECTOR-CHECK VALVES

- A. Install in vault or aboveground.
- B. Install for proper direction of flow. Install bypass with water meter, gate valves on each side of meter, and check valve downstream from meter.
- C. Support detector check valves, meters, shutoff valves, and piping on brick or concrete piers. Comply with requirements of concrete piers in Section 033000 "Cast-in-Place Concrete."

3.10 INSTALLATION OF WATER METERS

- A. Install water meters, piping, and specialties in accordance with utility company's written instructions.
- B. Water Meters:
 - 1. Install displacement-type water meters, NPS 2 and smaller, in meter boxes with shutoff valves on water meter inlets. Include valves on water meter outlets and valved bypass around meters unless prohibited by authorities having jurisdiction.
 - 2. Install compound-type water meters, NPS 3 and larger, in meter vaults. Include shutoff valves on water meter inlets and outlets and valved bypass around meters. Support meters, valves, and piping on brick or concrete piers.
 - 3. Install detector-type water meters in meter vault in accordance with AWWA M6. Include shutoff valves on water meter inlets and outlets and full-size valved bypass around meters. Support meters, valves, and piping on brick or concrete piers.

- C. Support water meters and piping NPS 3 and larger on concrete piers. Comply with requirements for concrete piers in Section 033000 "Cast-in-Place Concrete."

3.11 ROUGHING-IN FOR WATER METERS

- A. Rough-in piping and specialties for water meter installation in accordance with utility company's written instructions.

3.12 INSTALLATION OF BACKFLOW PREVENTERS

- A. Install backflow preventers of type, size, and capacity indicated. Include valves and test cocks. Install in accordance with requirements of plumbing and health department and authorities having jurisdiction.
- B. Do not install backflow preventers that have relief drain in vault or in other spaces subject to flooding.
- C. Do not install bypass piping around backflow preventers.
- D. Support NPS 2-1/2 and larger backflow preventers, valves, and piping near floor and on brick or concrete piers.

3.13 INSTALLATION OF WATER METER BOXES

- A. Install water meter boxes in paved areas flush with surface.
- B. Install water meter boxes in grass or earth areas with top 2 inches above surface.

3.14 INSTALLATION OF CONCRETE VAULTS

- A. Install precast concrete vaults in accordance with ASTM C891.

3.15 INSTALLATION OF PROTECTIVE ENCLOSURES

- A. Install concrete base level and with top approximately 2 inches above grade.
- B. Install protective enclosure over valves and equipment.
- C. Anchor protective enclosure to concrete base.

3.16 INSTALLATION OF FIRE HYDRANTS

- A. Install each fire hydrant with separate gate valve in supply pipe, anchor with restrained joints or thrust blocks, and support in upright position.

- B. Hydrants shall be set plumb, and the hydrant latera shall have at least 36 inches cover over the pipe.
- C. The bottom flange of the hydrant shall be set 1-1/2 inches above the finished ground.
- D. Backfill shall be carefully placed in six (6) inch layers and carefully tamped.
- E. Concrete thrust blocks shall be poured at each hydrant tee.
- F. The hydrant shall be properly anchored to the hydrant tee using anchoring pipe.
- G. Not less than seven (7) cubic feet of crushed or broken stone shall be placed around the base of the hydrant it ensure drainage.
- H. The interior of the hydrant shall be thoroughly cleaned of all foreign matter prior to installation.
- I. See the typical standard construction details for installation.
- J. After installation, each hydrant and valve shall be inspected in both opened and closed positions to assure that all parts are in satisfactory working conditions.
- K. All hydrants shall be marked on the top layer of asphalt of each street by a blue reflective marker. (Astro Optics Corporation TPM-2B or equivalent).
- L. The marker shall be set in the middle of the lane nearest to the fire hydrant and shall be made to adhere to the asphalt with the appropriate epoxy-type glue or cement.
- M. AWWA Fire Hydrants: Comply with AWWA M17.
- N. UL/FM Global Fire Hydrants: Comply with NFPA 24

3.17 INSTALLATION OF FIRE DEPARTMENT CONNECTIONS

- A. Install ball drip valves at each check valve for fire department connection to mains.
- B. Install protective pipe bollards on three sides of each fire department connection.

3.18 CONNECTIONS

- A. See Section 330500 "Common Work Results for Water Resources" for piping connections to valves and equipment.
- B. Connect water-distribution piping to existing water main. Use tapping sleeve and tapping valve.
- C. Connect water-distribution piping to interior domestic water and fire-suppression piping.
- D. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."

- E. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.19 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Section 312000 "Earth Moving."
- B. Permanently attach equipment nameplate or marker indicating plastic water-service piping, on main electrical meter panel. See Section 330500 "Common Work Results for Water Resources" for identifying devices.

3.20 TESTING AND ACCEPTANCE

A. Pressure and Leakage Tests:

1. After pipe has been laid and backfilled, it shall be subjected to a hydrostatic pressure of 150% of the working pressure at point of test, but not less than 125% of normal working pressure at highest elevation for two (2) hours.
2. Before applying the specified test pressure, all air must be expelled from the line.
3. The County Utility Inspector must be allowed to witness all tests.
4. Any cracked or defective pipe, fittings, valves, or hydrants discovered during this pressure test, shall be removed, and replaced with sound material.
5. The test shall be repeated until satisfactory.
6. Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section thereof, after the air has been expelled and the pipe has been filled with water to the 200-psi test pressure. No pipe installation will be accepted until the leakage is less than the number of gallons per hour, as determined by the formula below and by following the table shown in item 7:

$$L = \frac{ND\sqrt{P}}{7400}$$

L=Allowable leakage in gallons per hour.

N=Number of joints in the section of pipe tested.

D=Nominal diameter of pipe in inches.

P=Average test pressure during the leakage test in pounds per square inch gauge.

7. The following table is based on the above leakage formula. Allowable leakage is shown in gallons per 1,000 feet of pipeline for a two (2) hour pressure test at 200 psi.

Pipe Size	Allowable Leakage Per 1000 feet During Test
8	1.5 Gallon
10	1.8 Gallon
12	2.2 Gallon

B. Flushing and Disinfection

1. All piping, complete with fittings and appurtenances, shall be flushed until clean and sterilized as specified in AWWA C601 (latest revision) "Disinfecting Water Mains", except that the tablet method, Section 7.3, shall not be allowed. The requirements of this paragraph apply equally to new pipe and fittings and to existing pipelines into which connections have been made, or which may have been otherwise disturbed to the extent that contamination may have occurred.
2. Chlorine shall be added, and a residual of 50 mg/l shall be maintained in the portion of line to be disinfected for a 24-hour period. After 24 hours, a sample shall be taken by the County Utility Inspector and tested at the County's Water Treatment Facility Labs (770) 781-2026. The test shall show a residual chlorine level of at least 25 mg/l.
3. When it has been determined that a residual chlorine concentration of 25 mg/l exists after a 24-hour period, the heavy chlorinated water shall be flushed from the water line. After flushing, the chlorine residual shall be less than or equal to 1.0 mg/l.
4. After the water line has been flushed, the County Utility Inspector shall take two (2) samples from the water line. One (1) sample shall be tested and show a chlorine residual less than or equal to 1.0 mg/l. The other sample shall be tested for bacteriologic quality and show the absence of coliform organisms. If chlorine residual tests exceed 1.0 mg/l, the water line must be flushed until chloring residual is equal to or less than 1.0 mg/l. The chlorine residual must be t.0 mg/l or less before samples can be taken and tested for bacteriologic quality.
5. The "tablet method" of disinfection, which consist of placing calcium hypochlorite granules or tables in the ware main as it is being installed and then filling the main with potable water when installation is complete is not allowed.
6. Before the main is chlorinated, it shall be filled to eliminate air pockets and shall be flushed to removed particulates. A flushing velocity of not less than 2.5 feet/second is usually maintained in pipe sizes less than 24 inches in diameter. For larger diameter mains, an alternative to flushing, such as broom sweeping of the main, is acceptable prior to chlorinating the main.
7. The chlorine solution used for disinfection of water mains shall have a free chloring residual concentration not less than t15 mg/L. This heavily chlorinated water shall be retained in the main for at least 24 hours, during which time all valves and hydrants shall be operated to ensure disinfection of the appurtenances.
8. After the applicable retention period, the heavily chlorinated water must not be disposed in a manner that will harm the environment. Neutralizing chemicals, such as Sulfur Dioxide, Sodium Bisulfite, Sodium Sulfite, or Sodium Thiosulfate can be used to neutralize the chlorine residual remaining in the water to be tested.
9. Flush all lines until residual is equal to existing system. After final flushing and before the water main is placed into service, water samples shall be collected from the main and tested for microbiological quality in accordance with the Georgia Rules for Safe Drinking Water, Chapter 391-3-5.

NOTE: The highly chlorinated water that is generated during the disinfection of any water line shall not be allowed in any way to enter the County's distribution system. If the County discovers that any person has allowed highly chlorinated water to enter the County's distribution system, the County shall hold that person in violation of the County's Utility Ordinance. In addition, chlorinated water shall not be allowed to enter the County's Municipal Separate Storm Sewer System (MS4). A fine may be levied against those individuals and/or companies who violate these requirements.

- C. Final Acceptance, As-Built Drawings, Spare Parts, O&M
 - 1. As-built drawings shall be submitted to Union County for every project governed by this book of specifications. The County will not permit the issuance of any certificate of occupancy or the approval of any final plat until appropriate as-built drawings are received. This includes both hard copies and electronic copies in AutoCAD format on CD ROM.

END OF SECTION 331415

SECTION 261020 - CABLE TRAYS FOR LOW VOLTAGE SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SCOPE OF WORK:

- A. Provide cable tray system in areas indicated, complete with all supports, fittings, and accessories.
- B. Only low voltage power-limited cables provided under Divisions 27 and 23 shall be installed in the cable trays. Installation of cables shall be as specified in Section 279010.

1.3 QUALITY ASSURANCE:

A. Acceptable Manufacturers:

1. *B-line*
2. *GS Metals*
3. *Panduit*
4. *Cablofil*
5. *Cope*
6. *Mega Snake*

- B. Submittals: Refer to Section 260120 for requirements.

PART 2 - PRODUCTS

2.1 CABLE TRAYS:

- A. Tray shall be welded wire-mesh type, nominal 4" deep. The mesh shall be nominal 2"x4", using 0.2" diameter electro-galvanized steel wires. Tray width shall be 18".
- B. Tray shall be suitable for mounting beneath raised floors.
- C. All fittings, inserts, covers, couplings, connectors, and other accessories required to effect a complete rigid mechanical installation shall be provided and shall be listed as suitable for use with cable tray.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Layout of cable tray is the responsibility of the Contractor. Coordinate location with building structure and other trades to ensure that the tray is readily accessible and that cables installed therein do not pass within 6" of sources of electrical interference, such as fluorescent ballasts, motors, and similar items. Tray shall not be installed more than 18" above ceilings, without written permission by the Design Professional.
- B. Subject to the Design Professional's approval, tray runs may be discontinuous, to avoid obstacles such as ducts or structural elements, for a maximum of 6'. In such cases, each section shall be grounded.
- C. Sections of tray shall be joined using a manufacturer's bolted connection. Bends shall be made using bolt cutters as recommended by the manufacturer. All edges shall be free from burrs.
- D. The tray shall be supported on 6' centers, maximum, by one of the following means:
 - 1. Wall mounted: wall bracket, attached to a 1-5/8"x1-5/8" steel channel. Channel shall be fastened to the wall in a minimum of two places, one above and one below the wall bracket.
- E. Provide additional supports at the points of tendency of all bends and at all take-offs such as tee fittings.
- F. Bracing and Leveling: Brace trays on intervals required to prevent lateral movement. After installation of cables by other trades, adjust supports and braces so that tray is level.
- G. Conduits containing low voltage cables, that terminate at tray, shall be supported within 6" of tray, independent of tray supports.
- H. Ground cable trays to the nearest 120/208V panel using a No. 6 THWN conductor installed in 1/2" conduit. Where tray sections are discontinuous, provide bonding jumper between adjacent sections. Bonding jumper shall be No. 6 THWN, installed to prevent physical damage).

END OF SECTION 261020