



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

January 07, 2022

**Addendum No. 1**

RE: Contract # C204542

WBS # 47133.3.1

STATE FUNDED

**Nash County (U-5996)**

SR-1603 (N CARRIAGE RD) FROM NORTH OF SR-1770 (EASTERN AVE/  
SUNSET AVE) TO SR-1601 (REGES STORE RD)

**January 18, 2022 Letting**

To Whom It May Concern:

Reference is made to the plans furnished to you on this project.

The following revisions have been made to the Utility Construction plans.

Sheet No.	Revision
UC-2	Revised to clarify type of acceptable joints under 4) PRODUCTS

Please void the above listed Sheet in your plans and staple the revised Sheet thereto.

The contract will be prepared accordingly.

Sincerely,

DocuSigned by:  
*Ronald E. Davenport, Jr.*  
F81B6038A47A442...  
Ronald E. Davenport, Jr., PE  
State Contract Officer

RED/jjr  
Attachments

cc: Mr. Lamar Sylvester, PE  
Mr. Kevin Bowen, PE  
Mr. Boyd Tharrington, PE  
Mr. Jon Weathersbee, PE  
Mr. Ken Kennedy, PE  
Project File (2)

Mr. Forrest Dungan, PE  
Ms. Jaci Kincaid  
Mr. Kyle Kempf  
Mr. Mike Gwyn  
Ms. Penny Higgins  
Ms. Lori Strickland



# PROJECT SPECIAL PROVISIONS:

A PORTION OF THE PROJECT SPECIAL PROVISIONS ARE PROVIDED BELOW FOR INFORMATION. REFER TO THE NCDOT SPECIFICATIONS AND PROJECT SPECIFIC SPECIAL PROVISIONS AND DETAIL SHEETS FOR ALL REQUIREMENTS.

## 15 10 00 WATER UTILITIES

15 11 13 PUBLIC WATER MAINS

### 1) DESCRIPTION

- A. THE WORK IN THIS SECTION COVERS THE REQUIREMENTS FOR FURNISHING AND INSTALLING ALL PIPE REQUIRED TO COMPLETE THE WATER DISTRIBUTION SYSTEM(S) AS SHOWN ON THE DRAWINGS, AS DESCRIBED IN THESE SPECIFICATIONS, AND AS DIRECTED BY THE DIRECTOR OF ENGINEERING.

### 2) QUALITY ASSURANCE

- A. THE CONTRACTOR SHALL USE SUFFICIENT WORKMEN AND COMPETENT SUPERVISORS IN THE EXECUTION OF THIS PORTION OF THE WORK TO ENSURE ADEQUATE AND PROPER INSTALLATION THROUGHOUT.
- B. THE PIPE CLASS NUMBERS OR PRESSURE RATINGS SHALL BE CLEARLY SHOWN ON THE PIPE.
- C. LOADING, UNLOADING, INSPECTION, STORAGE AND HANDLING SHALL BE IN ACCORDANCE WITH AWWA C600 AND AWWA C605 AND AS SPECIFIED HEREIN.
- D. STORAGE, STORE PIPE, FITTINGS, VALVES AND APPURTENANCES OFF THE GROUND USING SOUND WOOD BLOCKS, PLACED ON STABLE FOUNDATION OR USING OTHER APPROPRIATE MEANS. ALLOW SPACE BETWEEN ROWS, INDIVIDUAL PIECES AND BUNDLES WITH CLEARANCE BELOW AND ABOVE TO ALLOW FULL VIEW FOR INSPECTION PURPOSES.
  1. STORE IN WELL-DRAINED AREA AWAY FROM BRUSH AND ACCESSIBLE FOR INSPECTION.
  2. DO NOT STACK PIPE HIGHER THAN 54 INCHES
  3. KEEP SPIGOT ENDS OF PIPE CLEAN AND CLEAR FOR DIMENSIONING PURPOSES
  4. DO NOT PLACE EXCAVATED OR OTHER MATERIAL OVER OR AGAINST STORED MATERIAL.
  5. PVC PIPE SHALL BE STORED SO THAT IT DOES NOT DEFORM OR BEND. PIPE STORED OUTDOORS OR OTHERWISE EXPOSED TO DIRECT SUNLIGHT SHALL BE COVERED WITH CANVAS OR OTHER OPAQUE MATERIAL WITH PROVISION FOR ADEQUATE AIR CIRCULATION.
- E. HANDLING UNLOAD AND HANDLE MATERIALS WITH CRANE, BACKHOE, OR EQUIPMENT OF ADEQUATE CAPACITY, EQUIPPED WITH APPROPRIATE SLINGS OR PADDING TO PROTECT MATERIALS FROM DAMAGE.

### 3) SUBMITTAL

- A. PRIOR TO THE INSTALLATION OF ANY PIPE, THE CONTRACTOR SHALL SUBMIT AND RECEIVE THE DIRECTOR OF ENGINEERING'S APPROVAL OF SHOP DRAWINGS AND/OR MANUFACTURER'S MATERIAL CERTIFICATION OF COMPLIANCE WITH SPECIFICATIONS.
- B. SUBMITTALS SHALL BE IN FIVE (5) COPIES AND SHALL BE PROVIDED TO THE DIRECTOR OF ENGINEERING AT LEAST 15 DAYS PRIOR TO THE PLANNED INSTALLATION TIME.

### 4) PRODUCTS

- A. PRODUCT REQUIREMENTS FOR PIPE, SERVICE PIPE, VALVES, FITTINGS AND OTHER MATERIALS FOR THIS WORK ARE INCLUDED ELSEWHERE IN THESE SPECIFICATIONS.
- B. ALLOWABLE MATERIALS ON THIS PROJECT ARE AS FOLLOWS:
  1. DUCTILE IRON (DI) PIPE (RESTRAINED JOINTS)
    - a) PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C150 AND C151 AND SHALL BE A MINIMUM PRESSURE CLASS OF 350 AND THICKNESS CLASS 50, EXCEPT AS NOTED ON THE PLANS, SUITABLE FOR POTABLE WATER USE.
      - i. PIPE JOINTS: PIPE SHALL BE "RESTRAINED JOINT" IN ACCORDANCE WITH AWWA C110 UNLESS OTHERWISE SHOWN ON THE PLANS AND SPECIFIED HEREIN.
      - ii. COATINGS: DUCTILE IRON PIPE SHALL BE BITUMINOUS COATED OUTSIDE AND CEMENT MORTAR LINED IN ACCORDANCE WITH ANSI/AWWA STANDARD C104/A 21.4.
      - iii. PIPE LENGTHS: 18 TO 20 FEET
    - b. FITTINGS SHALL BE DUCTILE IRON, MECHANICAL JOINT COMPACT FITTINGS AND SHALL CONFORM WITH ANSI/AWWA C153/A21.53 UNLESS OTHERWISE NOTED.
      - i. MECHANICAL JOINT SOLID SLEEVES SHALL BE IN ACCORDANCE WITH AWWA C110.
      - ii. BOLTS: HIGH STRENGTH LOW ALLOY STEEL TEE HEAD BOLTS.
      - iii. UNLESS SHOWN OTHERWISE, FURNISH FITTINGS 3 INCH THROUGH 24 INCH DIAMETER HAVING MINIMUM PRESSURE RATING OF 350 PSI, AND FURNISH FITTINGS LARGER THAN 24 INCH DIAMETER HAVING A MINIMUM PRESSURE RATING OF 250 PSI.
      - iv. COATINGS: DUCTILE IRON FITTINGS SHALL BE BITUMINOUS COATED OUTSIDE AND CEMENT MORTAR LINED IN ACCORDANCE WITH ANSI/AWWA STANDARD C104/A 21.4.
      - v. ALL WATER MAIN FITTINGS SHALL BE INSTALLED WITH THRUST RESTRAINT. REACTION BLOCKING SHALL BE TRANSMITTED CONCRETE OF 2500 PSI 28-DAY COMPRESSIVE STRENGTH PLACED IN ADEQUATE QUANTITIES FOR THE SIZE AND SHAPE OF THE FITTING BEING INSTALLED. REACTION BLOCKING SHALL BE FORMED AND Poured SUCH THAT MECHANICAL JOINTS' BOLTS REMAIN ACCESSIBLE AND THE BLOCKING SHALL BE BACKED BY FIRM, SOLID EARTH.
  2. VALVES, HYDRANTS AND MISCELLANEOUS APPURTENANCES
    - a) VALVES, HYDRANTS AND MISCELLANEOUS APPURTENANCES SHALL BE IN ACCORDANCE WITH SECTION 15 12 16.
  3. WATER SERVICE CONNECTIONS
    - a) WATER SERVICE CONNECTIONS SHALL BE IN ACCORDANCE WITH SECTION 15 12 13.

### EXCAVATION

- A. PREPARATION
    1. CONTACT APPROPRIATE UTILITY LOCATING AGENCIES PRIOR TO ANY EARTHWORK
    2. DIG TEST PIT TO DETERMINE SIZE, TYPE, COMPOSITION AND EXACT LOCATION OF EXISTING PIPE TO WHICH THE PROPOSED PIPE WILL CONNECT
    3. EXCAVATE SUFFICIENT TRENCH IN ADVANCE AND TEST PIT ALL EXISTING UNDERGROUND UTILITIES OR STRUCTURES, WHETHER SHOWN ON THE DRAWINGS OR VISUALLY IDENTIFIED IN THE FIELD TO:
      - a) FIELD VERIFY ACTUAL LOCATIONS
      - b) MAKE REASONABLE ADJUSTMENTS TO LINE AND GRADE TO AVOID CONFLICT, WITH DIRECTOR OF ENGINEERING'S APPROVAL.
      - c) FURNISH DIRECTOR OF ENGINEERING WITH LOCATION AND ELEVATION INFORMATION WHEN PREVIOUSLY UNKNOWN OR DIFFERENT UNDERGROUND UTILITIES AND STRUCTURES ARE ENCOUNTERED.
      - d) ADDITIONAL WORK PERFORMED BECAUSE ABOVE MENTIONED PRECAUTIONS WERE NOT TAKEN WILL NOT BE COMPENSATED BY THE OWNER.
  - B. RELATION OF WATER MAINS TO SEWERS
    1. LATERAL SEPARATION OF SEWERS AND WATER MAINS - WATER MAINS SHALL BE LAID AT LEAST 10 FEET LATERALLY FROM EXISTING OR PROPOSED SEWERS, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 10-FOOT LATERAL SEPARATION, IN WHICH CASE:
      - a) THE WATER MAIN IS LAID IN A SEPARATE TRENCH, WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
      - b) THE WATER MAIN IS LAID IN THE SAME TRENCH AS THE SEWER WITH THE WATER MAIN LOCATED AT ONE SIDE ON A BENCH OF UNDISTURBED EARTH, AND WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
    2. CROSSING A WATER MAIN OVER A SEWER - WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS OVER A SEWER, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT AN 18 INCH VERTICAL SEPARATION, IN WHICH CASE BOTH THE WATER MAIN AND SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING.
    3. CROSSING A WATER MAIN UNDER A SEWER - WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER, BOTH THE WATER MAIN AND THE SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
    4. WHERE IT IS IMPOSSIBLE TO MAINTAIN A MINIMUM OF 10 FEET OF HORIZONTAL CLEARANCE BETWEEN THE WATER AND SEWER INSTALLATIONS, A VERTICAL SEPARATION OF 18 INCHES (WATER MAIN ABOVE SEWER) MUST BE MAINTAINED.
  - C. TRENCH EXCAVATION
    1. GENERAL
      - a) OPEN NO MORE TRENCH IN ADVANCE OF PIPE LAYING THAN IS NECESSARY TO EXPEDITE THE WORK.
      - b) EXCAVATE TRENCHES TO A WIDTH THAT WILL PROVIDE ADEQUATE WORKING SPACE, BUT NOT MORE THAN MAXIMUM DESIGN WIDTH SO AS NOT TO UNDERCUT TRENCH WALLS.
      - c) EXCAVATE BELL HOLES AT EACH JOINT TO PROVIDE FULL-LENGTH BARREL SUPPORT OF THE PIPE AND TO PREVENT POINT LOADING AT THE BELLS OR COUPLINGS.
      - d) UNLESS TRENCH BANKS ABOVE THE TOP OF THE PIPE ARE CUT BACK ON A STABLE SLOPE, SHEET AND BRACE TRENCHES AS NECESSARY IN ORDER TO PREVENT CAVING AND SLIDING, TO PROVIDE PROTECTION FOR WORKMEN AND THE PIPE, AND TO PROTECT ADJACENT STRUCTURES AND FACILITIES. DO NOT REMOVE TRENCH SHEETING UNLESS THE PIPE STRENGTH IS SUFFICIENT TO SUPPORT THE EXTERNAL LOADS, THE WIDTH OF THE TRENCH AT ANY POINT BELOW THE TOP OF THE PIPE SHOULD NOT BE GREATER THAN THAT NECESSARY TO PROVIDE ADEQUATE ROOM FOR JOINING THE PIPE AND COMPACTING THE HAUNCHING AND INITIAL BACKFILL.
      - e) DURING THE COURSE OF CONSTRUCTION, SHOULD THE TRENCH BE OVER-EXCAVATED BELOW A POINT 6 INCHES BELOW THE BOTTOM OF THE PIPE, FILL THAT AREA OF OVER-EXCAVATION WITH AN ACCEPTABLE CLASS OF EMBANKMENT MATERIAL AND COMPACT TO A MINIMUM DENSITY OF 100%.
    2. WHERE TRENCH CONSTRUCTION CONDITIONS REQUIRE THE USE OF A TRENCH BOX, THE TRENCH BOX SHALL BE SUFFICIENT LENGTH TO EXTEND FOUR (4) FEET BEYOND BOTH ENDS OF ONE (1) JOINT OF PIPE IN ORDER TO ALLOW THE WORKMEN TO MAKE-UP THE PIPE JOINT INSIDE THE PROTECTION OF THE TRENCH BOX. THE WORKMEN REQUIRED TO WORK INSIDE THE TRENCH SHALL:
      - a) ENTER AND LEAVE THE TRENCH BOX FROM THE GROUND SURFACE ONLY
      - b) NOT TRAVEL ALONG THE TRENCH BOTTOM OUTSIDE THE PROTECTION OF THE TRENCH BOX
    3. THE TRENCH BOX SHALL CONFORM TO CURRENT OSHA REGULATIONS AND SHALL HAVE BEEN DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER. THE CONTRACTOR SHALL FURNISH PROOF OF SUCH DESIGN TO THE DIRECTOR OF ENGINEERING UPON REQUEST.
  - D. TRENCH WIDTH
    1. TRENCH WIDTH AT THE GROUND SURFACE MAY VARY AND WILL DEPEND UPON DEPTH, TYPE OF SOILS, POSITIONS OF SURFACE STRUCTURES, OR OTHER CONDITIONS AUTHORIZED BY THE DIRECTOR OF ENGINEERING.
    2. THE MAXIMUM CLEAR WIDTH OF THE TRENCH EXCLUDING SHEETING SHALL NOT EXCEED THE OUTSIDE DIAMETER OF THE PIPE PLUS ONE FOOT (1') ON EACH SIDE AT THE TOP OF THE AREA OF INITIAL BACKFILL AND ONE FOOT (1') ABOVE THE OUTSIDE TOP OF PIPE. THE MINIMUM WIDTH OF THE TRENCH AT THE TOP OF THE PIPE WHEN PLACED SHALL BE A WIDTH THAT WILL PERMIT THE PROPER CONSTRUCTION OF JOINTS AND COMPACTION OF BACKFILL AROUND THE PIPE, BUT SHALL BE AT LEAST EQUAL TO THE LARGEST OUTSIDE DIAMETER OF THE PIPE PLUS EIGHT INCHES (8") ON EACH SIDE OF THE PIPE.
- THE SIDES OF THE TRENCH SHALL BE VERTICAL UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF ENGINEERING. IN NO CASE SHALL THE VERTICAL WALLS PROJECT LESS THAN TWO INCHES (2") ABOVE THE TOP OF THE PIPE LINE LAID TO A GRADE UNLESS THE FINISHED GRADE IS DEPTH IS LESS THAN TWO FEET (2). THE MAXIMUM ALLOWABLE WIDTH OF TRENCH ON EACH SIDE OF THE PIPE SHALL NOT EXCEED TWELVE INCHES (12") FOR PIPE WHICH IS TWELVE INCHES (12") IN DIAMETER OR SMALLER, EIGHTEEN INCHES (18") FOR PIPE WHICH IS BETWEEN FOURTEEN INCHES (14") AND THIRTY-SIX INCHES (36") IN DIAMETER; AND TWENTY-FOUR INCHES (24") FOR PIPE DIAMETERS GREATER THAN THIRTY-SIX INCHES (36").

UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF ENGINEERING.

### E. PARALLEL ROADWAY TRENCHES

1. WHERE UTILITY INSTALLATION IS TO TAKE PLACE UPON THE SHOULDER OF ANY PAVED STREET OR HIGHWAY, EXCAVATE TRENCH TO A WIDTH THAT WILL PROVIDE ADEQUATE WORKING SPACE BUT IN NO CASE SHALL THE HARD-SURFACED, TRAVELED PORTION OF ROADWAY BE DAMAGED. WHERE THE STRUCTURAL INTEGRITY OF THE ROADWAY PAVEMENT SHEETING AND BRACING SHALL BE INSTALLED TO PROVIDE ADEQUATE PROTECTION TO ADJACENT ROADWAY AND STRUCTURES, AND TO AFFORD THE NECESSARY PROTECTION TO THE WORKMEN AND PIPE.
  2. EXCAVATED MATERIAL SHALL NOT BE STORED ON THE PAVEMENT IF IT CAN BE REASONABLY HANDLED OTHERWISE. IN CASES WHERE STORAGE OR EXCAVATED MATERIAL ON PAVEMENT IS ABSOLUTELY NECESSARY, SAME SHALL BE MOVED AS QUICKLY AS PRACTICAL AND THE PAVEMENT SHALL BE THOROUGHLY CLEANED.
  3. EXCAVATION IN THE IMMEDIATE VICINITY OF DRAINAGE STRUCTURES SHALL BE MADE WITH SPECIAL CARE SO AS NOT TO DAMAGE OR INTERFERE WITH THE USE OF THE EXISTING DRAINAGE FACILITIES.
  4. DRAINAGE FACILITIES THAT ARE INADVERTENTLY DAMAGED MUST BE REPAIRED OR REPLACED IMMEDIATELY.
  5. PARALLEL OPEN TRENCH INSTALLATIONS THAT INVOLVE POSSIBLE DAMAGE IN THE EVENT OF RAIN OR OTHER WEATHER EVENTS, OR WHICH MAY BE HAZARDOUS TO TRAFFIC DUE TO OPEN TRENCH, SHOULD BE CLOSED WITHOUT UNDUE DELAY. IN NO CASE SHOULD A TRENCH REMAIN OPEN LONGER THAN A 24-HOUR PERIOD, EXCEPT WITH APPROVAL OF THE DIRECTOR OF ENGINEERING.
- F. TRENCHING WITHIN PAVEMENT
    1. WHERE IT IS NECESSARY TO OPEN-CUT ASPHALT OR CONCRETE PAVEMENTS SURFACE CUTS SHALL BE MADE WITH A CONCRETE SAW WITH A MAXIMUM WIDTH OF FIVE (5) FEET.
    2. WHERE EXCESSIVE DEPTHS OF PIPE INSTALLATIONS ARE ENCOUNTERED AND THE STRUCTURAL INTEGRITY OF THE ROADWAY SURFACE AND/OR THE SAFETY OF THE WORKMEN IS IN DOUBT, PROPER SHEETING AND BRACING OF THE TRENCH SHALL BE REQUIRED.
    3. HANDLING AND PLACEMENT OF THE EXCAVATED MATERIAL WITHIN THIS AREA SHALL BE HANDLED AS IN PARAGRAPH E2 ABOVE.
    4. ALL EXCESS EXCAVATED MATERIAL SHALL BE REMOVED AND DISPOSED OF OUTSIDE THE LIMITS OF THE RIGHT-OF-WAY IN SUCH A MANNER AS NOT TO INTERFERE WITH THE DRAINAGE OF THE ROADWAY UNLESS OTHERWISE PERMITTED OR DIRECTED BY THE DIRECTOR OF ENGINEERING OR HIS REPRESENTATIVE.
    5. COMPACTION TEST(S) FOR OPEN-CUT CROSSINGS MAY BE REQUIRED AT THE DISCRETION OF THE DIRECTOR OF ENGINEERING IN ADDITION TO ANY SUPPLEMENTAL OR MORE STRINGENT TESTING REQUIREMENTS SPECIFIED IN THE APPROVED NORTH CAROLINA DEPARTMENT OF TRANSPORTATION ENCROACHMENT AGREEMENT. ALL GEOTECHNICAL TESTING REQUIRED AS SPECIFIED ABOVE TO MEET THE COMPACTION REQUIREMENTS WITHIN SECTION 15 05 00 SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE COST OF WHICH SHALL BE INCLUDED IN THE PRICE BID FOR ASPHALT ROADWAY (REMOVE & REPLACE).
  - H. PREPARATION OF PIPE FOUNDATION
    1. GENERAL
      - a) THE PIPE FOUNDATION SHALL BE TRUE TO LINE AND GRADE AND UNIFORMLY FIRM. WHERE BELL AND SPIGOT TYPE PIPE IS USED, RECESSES SHALL BE EXCAVATED TO RECEIVE THE PIPE BELLS.
    2. UNSUITABLE FOUNDATION MATERIAL
      - a) WHERE THE FOUNDATION MATERIAL IS FOUND TO BE OF POOR SUPPORTING VALUE OR OF ROCK, THE DIRECTOR OF ENGINEERING MAY MAKE MINOR ADJUSTMENT IN THE LOCATION OF THE PIPE TO PROVIDE A MORE SUITABLE FOUNDATION.
      - b) WHERE THIS IS NOT PRACTICAL, THE CONTRACTOR SHALL ACT UPON THE DIRECTIONS OF THE DIRECTOR OF ENGINEERING TO STABILIZE THE TRENCH BOTTOM BY UNDERCUTTING AND INSTALLING: (A) SOIL STABILIZATION WOVEN FABRIC; AND (B) (NCDOT CLASS V) STONE (CLEAN #57) OR (C) APPROVED SLEIC OR BORROW MATERIAL AND COMPACTING TO A MINIMUM DENSITY OF NINETY (90%) AS DIRECTED BY THE DIRECTOR OF ENGINEERING. COMPENSATION FOR THE UNDERCUT SHALL BE INCLUDED IN THE COST OF THE FOUNDATION MATERIAL FURNISHED, APPROVED BEDDING AND BACKFILL MATERIAL.

3. PLACEMENT OF BEDDING MATERIAL
  - a) IN SUCH CASE AS A STONE BEDDING AS SPECIFIED IS USED, A SUFFICIENT DEPTH (MINIMUM SIX (6) INCHES, MAXIMUM EIGHT (8) INCHES) OF THE MATERIAL SHALL BE PLACED IN THE TRENCH BOTTOM OF PIPE TO BE INSTALLED. FOR DEPTHS GREATER THAN SIXTEEN FEET (16') THE ENGINEER SHALL DIRECT THE DEPTH OF BEDDING.
  - b) IN ORDER TO ENSURE THAT ADEQUATE AND UNIFORM SUPPORT IS PROVIDED ALONG THE ENTIRE LENGTH OF PIPE, THE CONTRACTOR SHALL CAREFULLY BRING THE BEDDING MATERIAL TO GRADE ALONG THE ENTIRE LENGTH OF PIPE PRIOR TO INSTALLATION. MATERIAL USED FOR THE FORMATION OF THE PIPE BEDDING AND HAUNCH SHALL BE CAREFULLY PLACED BY HAND SHOVELING TO INSURE THAT SUFFICIENT MATERIAL HAS BEEN WORKED UNDER THE PIPE TO FORM THE HAUNCH AND TO ENSURE THAT THE PIPE DOES NOT BECOME DISLOADED DURING BACKFILLING. CONTRACTOR'S WORKMEN SHALL FILL EVENLY ON BOTH SIDES OF THE PIPE TO THE CENTERLINE AND SHALL COMPACT THE FILL USING HAND SHOVELING OR MECHANICAL TAMPS. EXTREME CARE SHALL BE TAKEN WHEN USING MECHANICAL TAMPS ADJACENT TO THE PIPE, WHEN REMOVING SHEETING, AND REMOVING TRENCH BOXES SO AS TO AVOID DISTURBING THE PIPE.
4. LAYING OF PIPE
  1. INSPECTION
    - a) AFTER DELIVERY ALONGSIDE THE TRENCH, ALL PIPELINE MATERIAL SHALL BE CAREFULLY EXAMINED FOR BOTH SOUNDNESS AND SPECIFICATIONS COMPLIANCE.
  2. INSTALLATION OF PIPE
    - a) WATER MAIN PIPING SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C600 AND AWWA C605. PIPE SHALL BE INSTALLED ON EVEN GRADES AND STRAIGHT ALIGNMENTS AND ALL JOINTS SHALL BE PROPERLY FITTED. ALL PIPE, FITTINGS AND APPURTENANCES SHALL BE PROPERLY LOWERED INTO THE TRENCH SO AS TO PREVENT DAMAGE TO MATERIAL.
    - b) CLEAN JOINT CONTACT SURFACES IMMEDIATELY PRIOR TO JOINTING. USE LUBRICANTS, PRIMERS, OR ADHESIVES AS RECOMMENDED BY THE PIPE OR JOINT MANUFACTURER. ALL PIPE SHALL BE LAID ON THE PREPARED FOUNDATION, BELL END UPGRADE WITH EACH JOINT BEING CHECKED FOR PROPER ALIGNMENT AND GRADE AS THE WORK PROCEEDS. EXCAVATE BELL HOLES FOR EACH PIPE JOINT. WHEN JOINED IN THE TRENCH, THE PIPE SHALL FORM A TRUE AND SMOOTH LINE. WHENEVER PRACTICABLE, START PIPE LAYING AT THE LOWEST POINT.
    - c) PIPE JOINTING SHALL BE ACCOMPLISHED ACCORDING TO MANUFACTURER RECOMMENDATIONS. JOINT DEFLECTION SHALL NOT EXCEED 90% OF THE MANUFACTURER'S MAXIMUM ALLOWABLE JOINT DEFLECTION.
    - d) FITTINGS SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE APPROVED PLANS. MECHANICAL JOINT AND RESTRAINED JOINT FITTINGS SHALL BE PROPERLY AND TIGHTLY INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS AND ADEQUATE THRUST RESTRAINT SHALL BE EMPLOYED AS SHOWN IN THE PLANS AND DESCRIBED IN THESE SPECIFICATIONS.
    - e) PIPE SECTION(S) THAT ARE STUBBED FOR FUTURE CONNECTION SHALL HAVE A MECHANICAL JOINT PLUG AT THE END WHICH SHALL BE RODDED BACK TO A THRUST COLLAR LOCATED MIDWAY ALONG THE SECTION. IN ADDITION, GATE VALVES FOR PIPE STUBS SHALL BE RODDED TO THE THRUST COLLAR AS WELL. RODS SHALL BE 5/8" OR 1/4" STEEL.

5. TRACING WIRE
  - a) TRACING WIRE SHALL BE INSTALLED IN THE TRENCH WITH THE POLYVINYL CHLORIDE AND DUCTILE IRON TRANSMISSION PIPING. THE WIRE SHALL BE INSTALLED ON TOP OF THE PIPE AND ATTACHED TO THE PIPE WITH A VINYL OR PLASTIC STRAP SPACED NO GREATER THAN 10 FEET ON CENTER TO PREVENT THE TRACING WIRE FROM MOVING DURING BACKFILLING OF THE TRENCH. THE WIRE SHALL RUN CONTINUOUSLY FROM VALVE BOX TO VALVE BOX WITH A MINIMUM OF 1/8" SPACING. THE TRACING WIRE SHALL TERMINATE AT THE TOP OF EACH VALVE BOX. THE TRACING WIRE SHALL BE AT LEAST 1/8" GAUGE SOLID COPPER WIRE WITH UL INSULATION FOR DIRECT BURIED RATED FOR 600 VOLTS. AT EACH MAIN LINE VALVE BOX LOCATION, THE TRACING WIRE SHALL BE TURNED UPWARD AND INSTALLED TO THE TOP OF THE VALVE BOX.
    - A. WATER PIPES SHALL BE RESTRAINED JOINT DUCTILE IRON PIPE (DIP).
    - B. SANITARY SEWER PIPES SHALL BE POLYVINYLCHLORIDE PIPE (PVC).
  - b) TRACING WIRE SHALL ALSO BE RUN CONTINUOUS ALONG ALL PLASTIC WATER SERVICES FROM THE CORPORATION STOP AND SHALL TERMINATE AT THE TOP OF EACH METER BOX. THE SERVICE TRACING WIRE SHALL BE INTEGRATED INTO THE MAIN PIPE WIRING SCHEME. FURTHER DETAILS FOR SERVICE LINES ARE FOUND WITHIN SECTION 15 12 13.
  - c) UPON COMPLETION OF A RUN OF PIPE AGREEABLE TO THE DIRECTOR OF ENGINEERING AND CONTRACTOR, AFTER BACKFILL AND PRIOR TO SUBSTANTIAL COMPLETION, THE CONTRACTOR SHALL DEMONSTRATE CONTINUITY IN THE WIRE ALONG THE MAIN AND SERVICES WITH AN ELECTRONIC LOCATOR. ANY REPAIR OF WIRE OR RESTORATION OF CONTINUITY ALONG THE PIPE AND SERVICES SHALL BE AT THE CONTRACTOR'S COST.
6. DEWATERING
  - a) KEEP TRENCHING DRY DURING PIPE LAYING. DIVERT SURFACE WATER FROM THE TRENCH AREA TO THE GREATEST EXTENT PRACTICABLE WITHOUT CAUSING DAMAGE TO THE ADJACENT PROPERTY. BEFORE PIPE LAYING IS STARTED REMOVE ALL WATER THAT MAY HAVE ENTERED THE TRENCH AND CONTINUE TO DEWATER TRENCH BY THE MOST EXPEDIENT METHOD.

- J. BACKFILLING
  1. AFTER THE BEDDING HAS BEEN PREPARED AND THE PIPE INSTALLED, SELECTED MATERIAL FROM EXCAVATION OR BORROW, AT A MOISTURE CONTENT WHICH WILL FACILITATE COMPACTION, SHALL BE PLACED ALONGSIDE THE PIPE LAYERS NOT EXCEEDING THREE (3) FEET IN DEPTH. CARE SHALL BE TAKEN TO ENSURE THOROUGH COMPACTION OF THE FILL UNDER THE HAUNCHES OF THE PIPE. EACH LAYER SHALL BE THOROUGHLY COMPACTED BY ROLLING, TAMPING AND MECHANICAL RAMMERS, OR BY HAND TAMPING WITH HEAVY IRON TAMPERS. THE TAMPING FACE AREA SHALL NOT EXCEED 25 SQUARE INCHES. THE METHOD OF FILLING AND COMPACTING SHALL BE CONTINUED UNTIL THE FILL HAS REACHED AN ELEVATION 12 INCHES ABOVE THE TOP OF THE PIPE. THE REMAINDER OF THE TRENCH SHALL BE BACKFILLED AND THOROUGHLY COMPACTED IN LAYERS NOT EXCEEDING 12 INCHES.
  2. CARE SHALL BE TAKEN DURING BACKFILL AND COMPACTION OPERATIONS TO MAINTAIN ALIGNMENT AND PREVENT DAMAGE TO THE JOINTS. THE BACKFILL SHALL BE KEPT FREE FROM STONE, FROZEN LUMPS, CHUMPS OF HIGHLY PLASTIC CLAY, OR OTHER OBJECTIONABLE MATERIAL.
  3. ALL LOCAL BACKFILL MATERIALS SHALL BE COMPACTED AT MOISTURE CONTENT SATISFACTORY TO THE DIRECTOR OF ENGINEERING, WHICH SHALL BE APPROXIMATELY THAT REQUIRED TO PRODUCE THE MAXIMUM DENSITY. THE CONTRACTOR SHALL DRY OR ADD MOISTURE TO THE LOCAL MATERIAL WHEN REQUIRED TO PROVIDE A UNIFORMLY COMPACTED AND STABLE EMBANKMENT.
  4. WHEN OTHER THAN LOCAL MATERIAL IS USED FOR BACKFILLING ABOVE THE FOUNDATION, SUCH MATERIAL WILL BE DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED. THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT AND CONTRACTOR'S FAILURE TO NOTIFY PRIOR TO PERFORMING ADDITIONAL WORK RELEASES OWNER FROM OBLIGATIONS FOR ADDITIONAL PAYMENTS WHICH OTHERWISE MAY BE WARRANTED TO RESOLVE THE CONFLICT.
- 3. UTILITY PIPE MATERIALS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLAN:
  - A. WATER PIPES SHALL BE RESTRAINED JOINT DUCTILE IRON PIPE (DIP).
  - B. SANITARY SEWER PIPES SHALL BE POLYVINYLCHLORIDE PIPE (PVC).
- 4. CONTRACTOR SHALL COORDINATE WITH PRIVATE UTILITY CONTRACTOR FOR EXCAVATION, INSTALLATION, AND BACKFILL OF PRIVATE UTILITY FURNISHED RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, DUCT BANKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL FURNISH CONCRETE ENGAGEMENT OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS.

## Abbreviations

ABAN	ABANDON	LP	LIGHT POLE
ACR	ACCESSIBLE CURB RAMP	MAX	MAXIMUM
ADJ	ADJUST	MES	METAL END SECTION
APPROX	APPROXIMATE	MH	SANITARY SEWER MANHOLE
BV	BUTTERFLY VALVE	MIN	MINIMUM
BIT	BITUMINOUS	NIC	NOT IN CONTRACT
CB	CATCH BASIN	NTS	NOT TO SCALE
CIP	CAST IRON PIPE	PERF	PERFORATED
CMIP	CORRUGATED METAL PIPE	PIV	POST INDICATOR VALVE
CMO	CLEANOUT	PROP	PROPOSED
CON	CONNECT	PVC	POLYVINYLCHLORIDE PIPE
CONC	CONCRETE	RCP	REINFORCED CONCRETE PIPE
DCB	DOUBLE CATCH BASIN	REM	REMOVE
DMH	DRAIN MANHOLE	RET	RETAIN
DIP	DUCTILE IRON PIPE	RIM	RIM ELEVATION
EL / ELEV	ELEVATION	R/JDIP	RESTRAINED JOINT DIP
EX	EXISTING	R&D	REMOVE AND DISPOSE
FES	FLARED END SECTION	R&R	REMOVE AND RESET
FUT	FUTURE	SMH	STORM DRAIN MANHOLE
FM	FORCE MAIN	TSV	TAPPING SLEEVE, VALVE & BOX
F&G	FRAME AND GRATE	TYG	TYPICAL
F&C	FRAME AND COVER	UG	UNDERGROUND
GI	GUTTER INLET	UP	UTILITY POLE
GD	GRADE TO DRAIN		
GV	GATE VALVE		
HDPE	HIGH DENSITY POLYETHYLENE		
PIPE	PIPE		
HW	HEADWALL		
HYD	HYDRANT		
INV	INVERT ELEVATION		
LOD	LIMIT OF DISTURBANCE		

PROJECT REFERENCE NO.	SHEET NO.
U-5996	UC-2
REVISION NO.	UTILITIES ENGINEER
1 - 3/23/20 - ROWY & DRN REV.	
2 - 4/10/20 - SPEC. REV.	
3 - 10/21 - UTL REV.	

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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## Notes

### General

1. CONTRACTOR SHALL NOTIFY NORTH CAROLINA 811 (811 OR 1-800-632-4949) AT LEAST 72 HOURS BEFORE EXCAVATING.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
3. AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC) SHALL RECEIVE FOUR INCHES OF TOPSOIL, SEED AND MULCH.
4. WORK WITHIN THE LOCAL RIGHTS-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS. WORK WITHIN STATE RIGHTS-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
5. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
6. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
7. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL OLFACORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
8. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
9. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
10. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF-SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.

### Utilities

1. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR ITS REPRESENTATIVES HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO CROSSING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND, SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN RIGHTS OF WAY.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT AND CONTRACTOR'S FAILURE TO NOTIFY PRIOR TO PERFORMING ADDITIONAL WORK RELEASES OWNER FROM OBLIGATIONS FOR ADDITIONAL PAYMENTS WHICH OTHERWISE MAY BE WARRANTED TO RESOLVE THE CONFLICT.
3. UTILITY PIPE MATERIALS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLAN:
  - A. WATER PIPES SHALL BE RESTRAINED JOINT DUCTILE IRON PIPE (DIP).
  - B. SANITARY SEWER PIPES SHALL BE POLYVINYLCHLORIDE PIPE (PVC).
4. CONTRACTOR SHALL COORDINATE WITH PRIVATE UTILITY CONTRACTOR FOR EXCAVATION, INSTALLATION, AND BACKFILL OF PRIVATE UTILITY FURNISHED RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, DUCT BANKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL FURNISH CONCRETE ENGAGEMENT OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS.

Alignment	Length	Direction	Radius	Delta	Chord Length	Start Point		End Point	
						N	E	N	E
SS-1	74.00	7.8602				N 811711.5895	E 2326541.8207	N 811721.7107	E 2326615.1342
W-1	60.00	92.1661				N 811443.0563	E 2326597.0091	N 811503.0135	E 2326594.7413
	182.51		7746.99	1.35	182.5131	N 811503.0135	E 2326594.7413	N 811685.3023	E 2326585.6951
	57.90	81.9284				N 811685.3023	E 2326585.6951	N 811742.6292	E 2326593.8249
	219.46	81.9285				N 811742.6292	E 2326593.8249	N 811959.9201	E 2326624.6398
	119.29	104.4284				N 811959.9201	E 2326624.6398	N 812075.4523	E 2326594.9149
	481.73		6066.07	4.55	481.6046	N 812075.4523	E 2326594.9149	N 812314.9776	E 2326568.3652
W-2	279.99	91.7504				N 812314.9776	E 2326568.3652	N 812314.9776	E 2326568.3652
	21.99	91.7504				N 812314.9777	E 2326568.3652	N 812857.4131	E 2326551.6759
W-3	74.75	182.0561				N 811463.1004	E 2326596		