STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

December 07, 2021

Addendum No. 1
RE: Contract # C204633
WBS # 34839.3.GV5
FEDERAL-AID NO. NHPIM-0040(68)
Forsyth County (U-2579AB)
FUTURE I-74 (WINSTON-SALEM NORTHERN BELTWAY) FROM I-40 TO I-40 BUS/US 421

December 21, 2021 Letting

To Whom It May Concern:

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

The following revisions have been made to the Roadway plans.

Sheet No.	Revision
2B-22	Corrected thickness of PCC (11.5" to 12")
2C-8	Revised DDI Barrier detail
3B-1	Added note concerning use of Select Granular Material Class III

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

The following revisions have been made to the Traffic Management plans.

Sheet No.	Revision
TMP-1B and TMP-1C	Revised note at beginning of Sheet TMP-1B Sheets TMP-1B and TMP-1C have been revised to expand General Note B), so that I-40 (-Y15-/-Y15REV-) and Kernersville Road (-Y4-) have their own Holiday restrictions

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

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
CONTRACT STANDARDS AND DEVELOPMENT
1591 MAIL SERVICE CENTER
RALEIGH, NC 27699-1591

Telephone: (919) 707-6900
Fax: (919) 250-4127
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DR.
RALEIGH, NC 27610

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

Sheet No.	Revision
UC-3	Revised Note 4 and Note 5 under Project Specific Notes
UC-3G	Deleted detail for "Thrust Restraint for Tying Proposed D.I. Water Main to Existing Water Main". Added details "Thrust Collar for Existing Pipe" and "Thrust Harness for Existing Pipe".
UC-10	Pay item note added for "Abandon Utility MH"
UC-10A	Inset added at the upper right portion of the sheet to more clearly depict the water line tie-ins at Glenn Hi Road and Yeaton Glenn Drive
UC-10B	Pay item note added for "Abandon Utility MH"
UC-13	Proposed water meter relocation and water service line originally shown for the house on Parcel 355 revised to show for house on Parcel 385. Water service line quantity corrected

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

The following revisions have been made to the Structure plans (Bridges).

Sheet No.	Revision
Index	Revised to label structure S-5 correctly

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

The following revisions have been made to the proposal:

Page No.	Revisions
Proposal Cover	Note added that reads "Includes Addendum No. 1 Dated 12-07-2021"
R-12	The Project Special Provision entitled **AGGREGATE SUBGRADE** was revised (Type 2 changed to 10 inch)
R-14 thru R-16	The Project Special Provision entitled **DIAMOND GRINDING CONCRETE PAVEMENT** was revised
UC-1 thru UC-19 and New Pages UC-20 thru UC-24	The Unit Project Special Provision entitled Utility Construction has been revised and replaced in its entirety with New Pages UC-20 thru UC-21 added.

Please void the above listed Pages in your proposal and staple the revised Pages thereto. Staple New Pages UC-20 thru UC-24 after revise Page UC-19 in your proposal.

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. Pat Ivey, PE
Mr. Boyd Tharrington, PE
Mr. Jon Weathersbee, PE
Mr. Ken Kennedy, PE
Project File (2)
Mr. Forrest Dungan, PE
Ms. Jaci Kincaid
Ms. Lori Strickland
Ms. Penny Higgins
Mr. Mike Gwyn
Mr. Kyle Kempf

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH, N.C.

PROPOSAL

INCLUDES ADDENDUM No.1 DATED 12-07-2021

DATE AND TIME OF BID OPENING: **DECEMBER 21, 2021 AT 2:00 PM**

CONTRACT ID	C204633
WBS	34839.3.GV5

FEDERAL-AID NO.	NHPIM-0040(68)
COUNTY	FORSYTH
T.I.P. NO.	U-2579AB
MILES	2.727
ROUTE NO.	I 74
LOCATION	FUTURE I-74 (WINSTON-SALEM NORTHERN BELTWAY) FROM I-40 TO I-40 BUS/US 421.
TYPE OF WORK	GRADING, DRAINAGE, PAVING, AND STRUCTURE.

NOTICE:

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS $30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A <u>ROADWAY & STRUCTURE</u> PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

AUTOMATED FINE GRADING:

(1-16-96) 610 SP5 R05

On mainline portions and ramps of this project, prepare the subgrade and base beneath the pavement structure in accordance with the applicable sections of the *2018 Standard Specifications* except use an automatically controlled fine grading machine using string lines, laser controls or other approved methods to produce final subgrade and base surfaces meeting the lines, grades and cross sections required by the plans or established by the Engineer.

No direct payment will be made for the work required by this provision as it will be considered incidental to other work being paid for by the various items in the contract.

AGGREGATE SUBGRADE:

(5-15-18) 505 SP5 R8

Revise the *2018 Standard Specifications* as follows:

Page 5-8, Article 505-1 DESCRIPTION, lines 4-6, replace the paragraph with the following:

Construct aggregate subgrades in accordance with the contract. Install geotextile for soil stabilization and place Class IV subgrade stabilization at locations shown in the plans and as directed.

Undercut natural soil materials if necessary to construct aggregate subgrades. Define "subbase" as the portion of the roadbed below the Class IV subgrade stabilization. For Type 2 aggregate subgrades, undercut subbases as needed. The types of aggregate subgrade with thickness and compaction requirements for each are as shown below.

Type 1 – A 6 to 24 inch thick aggregate subgrade with Class IV subgrade stabilization compacted to 92% of AASHTO T 180 as modified by the Department or to the highest density that can be reasonably obtained.

Type 2 – A 10 inch thick aggregate subgrade on a proof rolled subbase with Class IV subgrade stabilization compacted to 97% of AASHTO T 180 as modified by the Department.

Page 5-8, Article 505-3 CONSTRUCTION METHODS, line 12, insert the following after the first sentence of the first paragraph:

For Type 2 aggregate subgrades, proof roll subbases in accordance with Section 260 before installing geotextile for soil stabilization.

Page 5-8, Article 505-3 CONSTRUCTION METHODS, lines 16-17, replace the last sentence of the first paragraph with the following:

Compact ABC as required for the type of aggregate subgrade constructed.

Page 5-8, Article 505-4 MEASUREMENT AND PAYMENT, line 26, insert the following after the last sentence of the first paragraph:

Undercut Excavation of natural soil materials from subbases for Type 2 aggregate subgrades will

PRICE ADJUSTMENT - ASPHALT BINDER FOR PLANT MIX:
(11-21-00) 620 SP6 R25

Price adjustments for asphalt binder for plant mix will be made in accordance with Section 620 of the *2018 Standard Specifications.*

The base price index for asphalt binder for plant mix is **$ 502.73** per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on **October 1, 2021**.

DIAMOND GRINDING CONCRETE PAVEMENT:
(4-15-08) (Rev 11-16-21) SPI 7-9A(Revised)

Description

Perform the work covered by this provision including but not limited to diamond grinding and regrinding concrete pavement to meet final surface acceptable smoothness requirements detailed in Article 710-7, selecting diamond tipped saw blades and configuration of cutting head; continual removal of residual slurry from pavement and disposal; furnishing all labor, materials, supplies, tools, equipment and incidentals as necessary. Perform this work on all new concrete pavement or as directed by the Engineer.

Prior to beginning any diamond grinding operations, schedule a pre-grind meeting with grinding subcontractor, Division Construction Engineer, Project Engineer, Area Roadway Engineer, State Pavement Construction Engineer, representatives from the Roadside Environmental Unit and the Materials and Tests Unit.

Equipment

Use equipment with diamond tipped saw blades gang mounted on a power driven self-propelled machine with a minimum wheel base length of 15 feet that is specifically designed to smooth and texture Portland Cement Concrete pavement. Utilize equipment that does not cause ravels; aggregate fracture; spalls or disturbance to the longitudinal or transverse joints; or damage and/or strain to the underlying surface of the pavement. Should any of the above problems occur immediately suspend operations.

Provide a minimum 3 feet wide grinding head with 50 to 60 evenly spaced grooves per foot. Prior to designing the grinding head, evaluate the aggregate hardness of the concrete pavement and select the appropriate diamond size, diamond concentration and bond hardness for the individual saw blades.

Provide vacuuming equipment to continuously remove slurry residue and excess water from the pavement as part of the grinding operation. Transport slurry material off-site and dispose of this material appropriately. Do not allow the slurry material to flow into a travel lane occupied by traffic or into any drainage facility.

Method of Construction

Grind the pavement surface to a uniform appearance with a high skid resistant longitudinal corduroy type texture. Provide grooves between 0.09 and 0.15 inches wide with the land area between the grooves between 0.06 and 0.13 inches wide. Ensure a ridge peak of approximately 0.0625 inches higher than the bottom of the grooves.

Begin and end diamond grinding at lines normal to the pavement centerline. Grind only in the longitudinal direction. All grooves and adjacent passes shall be parallel to each other with no variation. Completely lap adjacent passes with no unground surface remaining between passes and no overlap of more than 1½ inches. Adjacent passes shall be within 1/8 inch of the same height as measured with a 3 foot straightedge. Maintain positive cross-slope drainage for the duration of the grinding operation.

Grind all travel lanes to include auxiliary lanes, ramps and loops with not less than 98 percent of the specified surface being textured by grinding. Grinding of the bridge decks and concrete shoulders will not be required. Remove a minimum 0.0625 inches at all locations except dips. Extra grinding to eliminate minor depressions is not required. It is anticipated that extra grinding will be required on the high side of existing faults in the pavement. There shall be no ridge between lanes. In a separate operation, transition the grinding of any remaining ridges greater than 1/8 inch in height on the outside edge next to the shoulder or at a tie to an existing facility to the satisfaction of the Engineer.

Final surface testing is required on this project in accordance with Article 710-7 of the *2018 Standard Specifications.* All corrective actions must be approved by the Engineer.

Disposal of Residual Slurry

Diamond grinding slurry disposal shall be in accordance with the latest Permit No. WQ0035749. Submit a slurry disposal plan to the Engineer detailing method of handling and disposing of slurry from the diamond grinding operation a minimum of 60 days prior to beginning the diamond grinding operation. Engineer shall review the slurry disposal plan. Plan must be accepted prior to beginning the diamond grinding operation. DGS shall be transported beyond the project limits to an approved permitted site. No land application of residual slurry will be allowable in NCDOT Right of Way. No additional payment will be made for transporting this slurry material for disposal.

Disposal options are:

(A) Concrete grinding residues (CGR) that are not liquid and otherwise not hazardous may be disposed of in a municipal solid waste landfill or utilized as an alternate daily cover (ADC). The sanitary landfill operator that requests the use of this material as ADC shall contact the N.C. Department of Environmental Quality (DEQ) inspector for approval. The definition of a solid, for solid waste disposal purposes, is a material that passes a Paint Filter test. CGR's may be eligible for disposal or use as ADC in an unlined sanitary landfill or a construction and demolition debris landfill. If CGR is disposed in an unlined-landfill, the Contractor shall submit samples of the material to a certified laboratory to verify that the CGR does not exceed Resource Conservation and Recovery Act (RCRA) regulatory

limits for the following metals: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium and Silver.

(B) Upon the Engineer's approval, dewatered CGR's may be beneficially reused within the DOT project boundary or areas under DOT control at agronomic rates suitable for the establishment of vegetation. Dewatered CGR's that meet the solid waste definition for inert debris, North Carolina General Statute 130A-290(a)(14), may also be used within the roadbed at rates approved by the Engineer for soil modification purposes. If CGR is disposed as beneficial reuse within DOT project boundaries, the Contractor shall submit samples of the material to a certified laboratory to verify that the CGR does not exceed RCRA regulatory limits for the following metals: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium and Silver.

To prevent the migration of any direct discharge from the diamond grinding machine DGS from entering a drainage inlet or structure, the contractor shall install coir fiber wattles and silt fence at the direction of the Engineer. Silt Fence shall be installed in accordance with Section 1605 of the NCDOT *2018 Standard Specifications*

Measurement and Payment

The quantity of *Diamond Grinding PCC Pavement* to be paid for will be the actual number of square yards of pavement which has been satisfactorily diamond ground, measured along the final top surface of the pavement. No separate payment will be made for any overlapping, regrinding, or for extra grinding on the high side of existing faults.

Payment will be full compensation for the work, including but is not limited to grinding, disposal of slurry, final surface testing, furnishing all materials, equipment, labor and all incidentals necessary to satisfactorily complete the work.

Payment will be made under:

Pay Item	**Pay Unit**
Diamond Grinding PCC Pavement	Square Yard

ASPHALT CONCRETE PLANT MIX PAVEMENTS:

(2-20-18) (Rev.1-15-19) 610, 1012 SP6 R65

Revise the *2018 Standard Specifications* as follows:

Page 6-14, Table 609-3, LIMITS OF PRECISION FOR TEST RESULTS, replace with the following:

TABLE 609-3
LIMITS OF PRECISION FOR TEST RESULTS

Mix Property	Limits of Precision
25.0 mm sieve (Base Mix)	± 10.0%
19.0 mm sieve (Base Mix)	± 10.0%
12.5 mm sieve (Intermediate & Type P-57)	± 6.0%
9.5 mm sieve (Surface Mix)	± 5.0%

PROJECT SPECIAL PROVISIONS
Utility Construction

DAVIS • MARTIN • POWELL
ENGINEERS & SURVEYORS
T: 336-886-4821 | F: 336-886-4458 | License: F-0245
6415 Old Plank Road, High Point, NC 27265 | www.dmp-inc.com

NORTH CAROLINA PROFESSIONAL SEAL 26457 ENGINEER ANDREW P. LARRICK
DocuSigned by: Andrew P. Larrick D7[illegible]
10/16/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Revise the 2018 Standard Specifications as follows:

Page 2-1, Subarticle 200-3, Construction Methods (D)
Delete the following:
Cut off and plug at the right-of-way or construction limits any private water or sewer line intercepted during the construction of the project.

Replace with the following:
Locate and do not damage any private water or sewer line intercepted during the construction of the project. Immediately repair any water or sewer line damaged during construction of the project.

Page 2-8, Article 220-3, Construction Methods
Add the following:
All blasting operations will be conducted in strict conformance with the existing ordinances of the City of Winston-Salem (or any other governing authority) and accepted safe practices relative to the storage and use of explosives.

Page 3-2, Article 300-4 Preparation of Pipe Foundation
Delete the last 2 sentences of the second paragraph.

Page 3-3, Article 300-7 Backfilling
Add the following to line 39:
Flowable fill, if approved, must not come in contact with the pipe.

Page 8-37, Article 858-3 Construction Methods
Add the following paragraph after the first paragraph:
The use of cast iron or steel fittings in the adjustment of manholes will not be permitted on this project except where it is considered by the Engineer to be in the best interest of the Department to allow rings to be used. When rings are permitted for the adjustment of manholes, the rings shall have satisfactory bearing on the existing manhole frames and 50 percent of the circumference shall be tack welded at four equally spaced locations as directed by the Engineer. If the existing covers do not fit the rings, furnish and install new covers at no additional expense to the Department.

Page 10-61, Article 1034-2, Plastic Pipe
Delete in its entirety. City does not allow PVC pipe in its gravity sewer system and there is no force main replacement included in this project.

Page 10-61, Article 1034-3, Concrete Pipe
Delete in its entirety. City does not allow new concrete pipe in its sewer system.

Page 10-61, Subarticle 1034-4 (A), Gravity Flow Sewer Pipe
Add the following sentences after the third paragraph:

Rubber gasket joints shall conform to ANSI A21.11 (AWWA C111). Pipe design laying condition will be Type 2, flat-bottom trench with backfill lightly consolidated to centerline of pipe. Pipe for sanitary sewer shall be minimum thickness Class 50.

The interior of ductile iron pipe for sanitary sewer will be lined with 40 mils of ceramic epoxy. All bells and spigots for ductile iron sanitary sewer pipe must be lined with a minimum of 8 mils of joint compound. The exterior of all ductile iron pipe shall be coated with a bituminous coating.

For fittings, all glands shall be ductile iron, not gray iron. Fittings shall have a minimum pressure rating of 250 psi. Rubber gasket joints shall conform to ANSI A21.11 (AWWA C111). "DI" or "Ductile" shall be cast on each fitting.

The interior of ductile iron fittings for sanitary sewer will be lined with 40 mils of ceramic epoxy. All bells and spigots for sanitary sewer ductile iron fittings must be lined with a minimum of 8 mils of joint compound. The exterior of all ductile iron fittings shall be coated with a bituminous coating. Ductile iron fittings coated on the interior and exterior with 8 mils of fusion-bonded epoxy in accordance with ANSI/AWWA C116 and ANSI/AWWA C550 are acceptable.

Restrained joint ductile iron pipe and fittings with a gripping gasket as the only means of restraint will not be allowed.

Page 10-61, Subarticle 1034-4 (B), Force Main Sewer Pipe
Delete in its entirety. There is no force main replacement in this project.

Page 10-62, Section 1034 Sanitary Sewer Pipe and Fittings
Add the following Article:

1034-5 Cast Iron Soil Pipe
All cast iron soil pipe and fittings will conform to ASTM A74 and be classified as SV (service weight). Single or double hub is acceptable. No-hub pipe shall not be used. All pipe and fittings shall be uniformly coated with bituminous coating. Joints will be rubber gasket. Rubber gaskets shall conform to ASTM C564. 4" x 4" combination wye and eighth bends shall be short pattern -Fig. No. SV-32 by Charlotte Pipe and Foundry (or approved equal). 4" cleanouts shall consist of a 4" service weight cast iron ferrule (with 3" iron pipe size tap) and a 3" brass plug. The plug shall have a low raised square head (Southern Code). Cleanouts shall be Part Number 184 by Jumbo Manufacturing Company (or approved equal).

Page 10-62, Article 1036-2, Copper Pipe
In Paragraph 2, delete: "Use flared or"

Page 10-62, Article 1036-3, Plastic Pipe
Delete in its entirety.

Replace with: POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS (2 INCH ONLY): Pipe and fittings shall be manufactured and tested in the U.S.A. All two (2) inch PVC pipe shall have a hydrostatic minimum working pressure of 250 psi (SDR 17 or SDR 13.5) and pipe shall conform to ASTM D-2241 or the latest revision. PVC pipe shall have the National Sanitation Foundation (NSF) seal of approval. Pipe jointing shall be push on integral bell type with elastomeric joints and shall conform to ASTM D-3139. PVC pipe shall be furnished in standard lay lengths of twenty feet with one or both ends tapered for use with the integral bell. Any lubrication used shall conform to AWWA and the pipe manufacturer. Fittings shall be push on joint PVC with elastomeric joints and shall conform to ASTM D-3139. Fittings shall have a hydrostatic minimum working pressure of 200 psi (SDR 21). If, for any reason, the Engineer finds any or all PVC pipe unacceptable, the Contractor shall be responsible for obtaining acceptable pipe. The Engineer's acceptance or rejection of all pipe will be final.

Page 10-62, Article 1036-4, Steel Pipe
Delete Subarticle **(A) Water Pipe** in its entirety. City does not allow new steel pipe in its water system.

(B) Encasement Pipe
Add the following paragraph after the first paragraph:

Steel encasement pipe shall be smooth wall pipe with welded joints. The encasement pipe must be capable of withstanding highway loadings and must have an inside diameter which will allow the carrier pipe to be removed subsequently without disturbing the encasement pipe. Minimum wall thicknesses for steel encasement pipe are as follows: ENCASEMENT PIPE SIZE (Outside Diameter) WALL THICKNESS (NCDOT) 16" 0.250", 18" 0.250", 20" 0.250", 24" 0.250", 30" 0.312", 36" 0.375", 48" 0.500". Pipe diameter shall be as shown on the Engineer's drawings.

Page 10-63, Article 1036-5, Ductile Iron Pipe and Fittings
Add the following after the second paragraph:

Rubber gasket joints for pipe shall conform to ANSI A21.11 (AWWA C111). Pipe design laying condition will be Type 2, flat-bottom trench with backfill lightly consolidated to centerline of pipe. Ductile iron pipe for water shall be Pressure Class 350 for 3" – 16" and Pressure Class 250 for 18" and above.

The exterior of all ductile iron pipe and fittings shall be coated with a bituminous coating.

For fittings, all glands shall be ductile iron, not gray iron. Fittings shall have a minimum pressure rating of 250 psi. Rubber gasket joints shall conform to ANSI A21.11 (AWWA C111). "DI" or "Ductile" shall be cast on each fitting.

Page 10-63, Article 1036-5, Ductile Iron Pipe and Fittings
Add the following sentences to the third paragraph:

All retainer glands shall be wedge-action glands with torque-limiting twist off nuts. Glands shall be Megalug Series 1100 by EBAA Iron, Inc., Uni-Flange Series 1400 by Ford Meter Box Company, Inc., RomaGrip by Romac Industries, Inc., One-Lok Series SLDE by Sigma Corp., Stargrip Series 3000 by Star Pipe Products, Cam-Lock Series 111 by Smith-Blair, Inc., EZ Grip by SIP Industries, Tufgrip by Tyler Union, or approved equal.

Page 10-63, Article 1036-6, Fire Hydrants
Delete the following:
"Outlets shall have national standard fire hose coupling threads. Use fire hydrants with a minimum bury length of 36 inches."

Add the following:
All fire hydrants shall be dry-barrel fire hydrants which comply with ANSI/AWWA C502. All hydrants will have a dry top with O-ring seals which permanently seal off the stem operating threads from water and keep the lubricant in. All hydrants shall be opened by turning the operating nut on top of the hydrant counterclockwise. The operating nut and cap nuts shall be pentagon-shaped, 1 ½" measured point to flat. The main valve shall be a compression type valve with a valve opening of 5 ¼". Each hydrant will have two hose nozzles and one steamer nozzle. The 2 ½" hose nozzles shall have national standard threads. The steamer nozzle shall have a 5" integral Storz connection. The nozzle shall be fastened into the hydrant barrel by mechanical means, but shall not be leaded into the barrel. Nozzle caps shall be chained to the barrel. All hydrants will be furnished with a breakable traffic feature that will break upon impact. The feature shall consist of a breakable safety flange on the barrel and a breakable safety coupling in the main valve stem. Hydrants must have a bronze main valve seat ring that threads into a bronze drain ring. Each hydrant shall have at least two bronze drain outlets. All hydrants will have 6" mechanical joint base connections or the Alpha connection by American Flow Control unless otherwise specified by the Engineer. Hydrants shall be designed for a minimum working pressure of 250 psi. Assembled hydrants shall be subjected to hydrostatic tests of twice the rated working pressure in accordance with ANSI/AWWA C502. All exterior iron surfaces below ground level shall be covered with two coats of asphaltic varnish or fusion bonded epoxy. All exterior iron surfaces above ground level shall be painted yellow to the satisfaction of the Engineer. Yellow paint shall be Rust-Oleum 7446, Rust-Oleum V2148, Kimball Midwest 80-942, or manufacturer's standard equivalent. All interior iron surfaces of the hydrant shoe which are in contact with water (including the lower valve plate and nut) shall be coated with a minimum of 8 mils of fusion bonded epoxy or liquid epoxy in accordance with ANSI/AWWA C550. All hydrants shall have a thrust or anti-friction washer in the operating area of the hydrant bonnet. A weather cap around the operating nut on top of the hydrant is required.

Hydrants accepted by the City of Winston- Salem are as follows:
(1) Super Centurion 250, manufactured by Mueller Company
(2) B-84-B-5, manufactured by American Flow Control
(3) K-81D Guardian, manufactured by Kennedy Valve Company
(4) Medallion, manufactured by Clow Valve Company

Page 10-63, Article 1036-7, Water Valves

(A) Gate Valves:
Delete in its entirety, and replace with the following:

All gate valves shall be resilient-seated gate valves which meet the specifications of ANSI/AWWA C509 or ANSI/AWWA C515. The valve body, bonnet and seal plate shall be coated on all exterior and interior surfaces with a minimum of 8-10 mils of fusion-bonded epoxy in accordance with ANSI/AWWA C550. The valve shall incorporate a guide system with guide lugs on the wedge or on the body. The wedge shall be gray or ductile iron, fully encapsulated with rubber (including guide lugs and stem nut holder). Non-rising stem valves shall have two O-ring seals above the stem thrust collar that can be replaced with the valve under pressure. Non-rising stem valves shall also have a thrust washer on the stem thrust collar. Valves used for buried service will have a non-rising stem, mechanical joint end connections, and a 2" square operating nut. The word "OPEN" and an arrow to indicate the direction of opening the valve shall be cast on the flanged base of the operating nut. Above ground valves, unless otherwise specified, will have an outside screw and yoke rising stem or a non-rising stem, flanged end connections, and a handwheel to operate the valve. The word "OPEN" and an arrow to indicate the direction of opening the valve shall be cast on the rim of the handwheel. All valves will open by turning the nut or handwheel counterclockwise. Valves installed in manholes will normally be considered to be buried service valves and valves installed in vaults will normally be considered to be above ground valves.

Resilient-seated gate valves shall be designed for a minimum working pressure of 250 psi. Each valve shall be seat tested at the rated working pressure and shell tested at twice the rated working pressure in accordance with ANSI/AWWA C509 - Section 5 or ANSI/AWWA C515 - Section 5. All valves shall be warranted for l0 years from date of purchase against defective materials and workmanship.

Gate valves furnished under these specifications must be manufactured by one of the following or approved equal:
(1) Clow Valve Company
(2) M & H Valve Company
(3) American Flow Control
(4) U.S. Pipe and Foundry Company
(5) Mueller Company
(6) Kennedy Valve Company

(B) Bronze Gate Valves:
Delete in its entirety, and replace with the following:

The use of bronze gate valves shall not be permitted.

(C) Tapping Valves:
Delete in its entirety and replace with the following:

Use tapping valves conforming to the special provision above for gate valves. The valve shall have an inlet flange (with centering ring) for connection to the flanged sleeve outlet.

Tapping valves furnished under these specifications must be manufactured by one of the following or approved equal:
(1) Clow Valve Company
(2) M & H Valve Company
(3) American Flow Control
(4) U.S. Pipe and Foundry Company
(5) Mueller Company
(6) Kennedy Valve Company

Page 10-63, Article 1036-8 Sleeves, Couplings and Miscellaneous
(A) Tapping Sleeves - Add the following after the first paragraph:

Tapping sleeves and valves shall be used for "wet" taps into existing water mains as indicated on the Engineer's drawings. The Contractor shall verify the type of material, size, etc., of the existing main prior to ordering the sleeve. The sleeve shall be a split sleeve with mechanical joint end connections and a flanged outlet.

All tapping sleeves and valves shall be water tested before the tap is made. Test pressure shall be 200 psi. All tapping sleeves and valves shall be installed level. The Engineer must be present during the entire tapping and testing process.

Tapping sleeves furnished under these specifications must be manufactured by one of the following or approved equal:
(1) Mueller Company
(2) American Flow Control
(3) Tyler Pipe Company
(4) U.S. Pipe and Foundry Company
(5) Kennedy Valve Company

Page 10-64, Article 1036-9, Service Line Valves and Fittings
Add the following to the first paragraph:

All corporation stops shall be made of brass. All brass fittings shall be manufactured in accordance with AWWA C800 and ASTM B-584. All brass components in contact with potable water must be made from CDA/UNS Brass Alloy C89833 with a maximum lead content of 0.25% by weight. Brass alloys not listed in ANSI/AWWA C800 Paragraph 4.1.2 are not approved. All fittings shall be UL classified to NSF/ANSI 61 and NSF/ANSI 372 standards and stamped or embossed with a mark or name indicating that the product is manufactured from the low-lead alloy as specified. All corporation stops shall be of the ball valve type with AWWA inlet threads.

Page 10-64, Article 1036-9 Service Line Valves and Fittings
Add the following to the second paragraph:

Service saddles shall be used as follows:

Pipe Size	Maximum Size Direct Tap without Saddle
4"	3/4"
6"	1"
8"	1"
12"	1-1/2"

The saddle body shall be ductile iron with corrosion-resistant paint. The body shall have a CC threaded outlet. Attached to the body shall be double U-bolt straps. Straps, washers and nuts shall be Type 305 or Type 316 stainless steel. Saddles shall be F202-SSB by Ford, or 202SSU by Romac Industries, Inc.

Page 10-64, Article 1036-9 Service Line Valves and Fittings
Add the following paragraph after the third paragraph:

Use brass fittings manufactured in accordance with AWWA C800 and ASTM B-584. All brass components in contact with potable water must be made from CDA/UNS Brass Alloy C89833 with a maximum lead content of 0.25% by weight. Brass alloys not listed in ANSI/AWWA C800 Paragraph 4.1.2 are not approved. All fittings shall be UL classified to NSF/ANSI 61 and NSF/ANSI 372 standards and stamped or embossed with a mark or name indicating that the product is manufactured from the low-lead alloy as specified.

Page 10-64, Section 1036 Water Pipe and Fittings
Add the following Articles:

1036-10 Retainer Glands
All retainer glands shall be wedge-action glands with torque-limiting twist off nuts. Glands shall be Megalug Series 1100 by EBAA Iron, Inc., Uni-Flange Series 1400 by Ford Meter Box Company, Inc., RomaGrip by Romac Industries, Inc., One-Lok Series SLDE by Sigma Corp., Stargrip Series 3000 by Star Pipe Products, Cam-Lock Series 111 by Smith-Blair, Inc., EZ Grip by SIP Industries, Tufgrip by Tyler Union, or approved equal.

1036-11 Casing Spacers
Casing spacers shall be made of Type 304 stainless steel (including risers and hardware). Each shell shall be PVC lined and shall have bolted flanges. Casing spacer runners shall be constructed of ultra-high molecular weight polymer (minimum 1-1/2" wide) with a friction coefficient of not more than 0.12. Risers shall be 10 gauge. Risers and runners for top and bottom shells shall be of equal height. With approval of the Engineer, unequal height risers and runners may be used to obtain proper grade for sanitary sewer mains. Casing spacers must be designed to ensure that only the runners of the spacer are in contact with the steel encasement pipe. The bell of the carrier pipe will not be allowed to be in contact with the encasement.

Casing spacers shall be manufactured by one of the following or approved equal:
(1) Cascade Waterworks Manufacturing Company
(2) Advance Products and Systems, Inc.
(3) BWM Company
(4) Black Widow by Spider Manufacturing, Inc.

Page 10-119, Article 1074-8 Steps
Replace with the following:

All manhole steps shall conform to current OSHA standards and ASTM C478. The approved step shall conform to the City of Winston-Salem detail drawing for "Polypropylene Manhole Step". All other steps must be approved by the Engineer prior to being installed.

Page 15-1, Article 1500-2 Cooperation with the Utility Owner
Add the following after the second paragraph:

The water and sewer utility owner is the City of Winston-Salem City/County Utilities Division (City). The contact person is Todd Lewis, PE, Senior Civil Engineer. He can be reached by phone at (336) 747-6842. All coordination with shutdowns and tie-ins to existing water and sewer facilities are to be coordinated through CCUC's main point of contact.

Page 15-2, Article 1500-7, Submittals and Records
Add the following after the third paragraph:

As a final measure required for acceptance, the Contractor shall clean and televise all sanitary sewer mains prior to requesting final inspection. The Contractor shall televise the entire sewer main and all service connections using standardized NASSCO (PACP, MACP, & LACP) practices, unless otherwise specified.

Two copies of the entire video inspection along with a properly formatted PACP standard exchange database shall be submitted to the Engineer on a data disc (DVD or flash drive).

Page 15-2, Article 1500-9 Placing Pipelines into Service
Add the following after the second paragraph:

Obtain approval from City prior to placing a new water line into service. Use backflow prevention assemblies for temporary connections to isolate new water lines from existing water line. A representative from City will witness all tests performed on their water facilities.

Obtain approval from City prior to placing a new sewer line into service. A representative from City will witness all tests performed on their sewer facilities.

Page 15-3, Article 1505-2 Materials:
Replace Line 12 with the following:

Use Class VI select material for foundation conditioning and bedding.

Page 15-4, Subarticle 1505-3 (C), Bedding:
Replace the first three (3) sentences with the following:

Stone bedding shall have a minimum thickness beneath the pipe of four inches (4") or one-eighth of the outside diameter of the pipe, whichever is greater. The required thickness shall be determined by the Engineer.

Page 15-4, Subarticle 1505-3 (E), Thrust Restraint:
Replace the fourth paragraph with the following:

Concrete thrust blocks shall be constructed as directed by the Engineer at all bends, tees, tapping sleeves, tapping saddles, reducers, plugs, etc. to provide restraint against thrust resulting from internal pressure. Any exceptions to this such as restrained joints or mechanical joints with retainer glands will be noted on the Engineer's drawings or otherwise specified. Thrust blocks will not be required for restrained joint pipe (exception - blocking will be required when connecting restrained pipe to existing pipe).

All thrust blocks will be constructed of a minimum of Class A concrete. Thrust blocks for bends, fire hydrants, tees and stub-outs shall be constructed in accordance with the City of Winston-Salem thrust block detail drawings.

Polyethylene shall be placed over all fittings before the concrete is poured. All nuts and bolts shall be clear of concrete so that the joint will be accessible. Plywood shall be used as forms for blocking. Concrete is to be poured only against stable undisturbed soil and should be allowed to set prior to any backfilling. Thrust blocks should be allowed to cure two days prior to pressure testing the water main. Higher strength concrete may be required when it is necessary to pressure test prior to the end of the two-day curing time.

Page 15-6, Subarticle 1510-3 (A), General
Replace the words "36" to 42" of cover" with "a minimum of 36" of cover".

Page 15-6, Subarticle 1510-3 (B), Testing and Sterilization
Add the following to second paragraph:

The backflow preventer must be approved by the City.

Page 15-6, Subarticle 1510-3 (B), Testing and Sterilization
Add the following to the fifth paragraph:

Prior to pressure testing and disinfection, the Contractor shall flush all water mains with a polyurethane foam pipe pig (minimum 5 pounds per cubic foot density) by Knapp Poly Pig, Inc. or approved equal. The pipe pig shall be propelled hydraulically through the mains at a rate sufficient to remove all foreign matter. Valves shall be operated in a manner which will direct the pipe pig toward the end of the main or a selected discharge point. The pig shall be removed through an open end of the main, a fitting, or through a fire hydrant which has the main valve seat ring removed. Flushing shall continue until the Engineer determines that the mains are free from all

foreign matter. The Engineer must be present during the entire flushing process. Any work done without the Engineer's supervision will not be accepted.

Page 15-6, Subarticle 1510-3 (B), Testing and Sterilization
Add the following to the sixth paragraph:

The Engineer must be present during the entire sterilization process. Any work done without his supervision will not be accepted. Pounds of calcium hypochlorite for sterilization shall be as follows:

Pounds of Calcium Hypochlorite Required to Sterilize Water Mains with 100 Parts Per Million of Chlorine

Main Size	Pounds Per 1,000 Feet of Pipe
2"	0.2
4"	0.8
6"	1.8
8"	3.1
12"	7.0
16"	12.4
20"	19.4
24"	28.0
30"	43.9
36"	63.0

Page 15-6, Subarticle 1510-3 (B), Testing and Sterilization
Add the following to tenth paragraph:

The City must be notified prior to flushing. De-chlorination shall be accomplished using equipment by Pollard or approved equal. While the main is being flushed, all service connections shall be thoroughly flushed in order to disinfect each connection.

Page 15-6, Subarticle 1510-3 (B), Testing and Sterilization
Add the following before the last paragraph:

After final flushing and before the main is placed in service, a sample or samples shall be collected by City personnel from the line and tested for bacteriological quality. The City, upon 24 hours advance notice, will furnish the personnel and laboratory facilities to conduct the required bacteriological tests. No samples will be taken on Friday, the day before a holiday or on a holiday. The City will sample water from the pipes and test the water in their laboratory. Do not place the water lines into service until tests performed by the City are satisfactory.

Page 15-8, Subarticle 1515-3 (A), Valves
Add the following paragraph:

All existing valves larger than 12" that must be operated shall be operated by the City.

Page 15-8, Subarticle 1515-3 (B), Meters
Add the following paragraphs after the second paragraph:

For existing service connections being replaced:
Prior to connecting the dwelling or business to the new meter, the Contractor shall expose a portion of the water line from the dwelling or business to determine the material and have proper fittings for reconnection to the new meter box. After the new water line and connections have been pressure tested & disinfected & approved by the Engineer, the Contractor shall remove the existing meter and install it in the new yoke. The Contractor shall reconnect the dwelling or business side water line to the new meter box. This reconnection shall be directed by the Engineer and performed in a timely manner so that the dwelling or business is without water for a minimal time.

For relocated meters (with change to horizontal location):
The Contractor shall install a new meter box, angle valves, yoke, tee and ball valve as directed by the Engineer. The Contractor shall expose a portion of the water line from the dwelling or business to determine the material and have proper fittings for reconnection to the new meter box. At the approval of the Engineer, the Contractor shall remove the existing meter and install it in the new yoke. The Contractor shall reconnect the property side water line from the existing meter box to the new meter box. This reconnection shall be directed by the Engineer and performed in a timely manner so that the property is without water for a minimal amount of time. The Contractor shall remove and dispose of the existing meter box and yoke and backfill as shown on the plans or as directed by the Engineer.

For new and relocated 3/4" & 1" water connections, the Contractor shall install connection per the City of Winston-Salem detail drawing for "3/4" & 1" Water Connection (Without Curb & Gutter / Single Family)".

Page 15-8, Article 1515-3 Construction Methods
Add the following Subarticle:

(H) Tapping Sleeves
Tapping sleeves and valves shall be used for "wet" taps into existing water mains as indicated on the Engineer's drawings. The Contractor shall verify the type of material, size, etc., of the existing main prior to ordering the sleeve. For taps on larger mains (24" and above), a saddle may be used in lieu of a sleeve, but only if the tap is less than or equal to half the size of the line to be tapped. All tapping sleeves and valves shall be water tested before the tap is made. Test pressure shall be 200 psi for 15 minutes without any drop in pressure. All tapping sleeves and valves shall be installed level. The Engineer must be present during the entire tapping and testing process.

Page 15-9, Article 1515-4, Measurement and Payment
Add the following after the first paragraph:

36"x6" tapping sleeves and valves, installed in accordance with the plans and provisions herein and accepted, will be measured and paid for at the contract unit price per each for "36"x6" Tapping Sleeve and Valve". Such price and payments will be full compensation for all materials, labor, excavation, installation, sterilization, pressure testing, valve box installation with necessary extension pieces, backfilling, and incidentals necessary to complete the work as required.

Page 15-10, Article 1515-4, Measurement and Payment
Add the following pay item and pay unit to the Pay Item Table below Line 7:

Pay Item:	Pay Unit
36"x6" Tapping Sleeve and Valve	Each

Page 15-10, Article 1520-2, Materials
Delete the following sentence: "Use screw type plastic or brass cleanouts."

Replace with the following: "Cleanouts shall be constructed of cast iron soil pipe with brass plug."

Page 15-11, Article 1520-3, Construction Methods
Delete the third paragraph in its entirety. No PVC pipe is allowed on this project.

Add the following to the third sentence of the fifth paragraph: "or within fenced areas."

Page 15-11, Article 1520-3, Construction Methods
Delete the following: "10%"

Replace with the following "18%-22%"

Page 15-11, Article 1520-3, Construction Methods
Delete the seventh paragraph in its entirety.

Replace with the following: The standard fall through manhole is 1" (0.08') including 6" connections into a manhole.

Page 15-10, Article 1520-3 Construction Methods
Add the following:

Sewer connections shall be installed as shown on the appropriate City of Winston-Salem detail drawing. Wyes or taps will not be allowed within 5 feet of a manhole. Only one bend will be allowed for connecting the sewer connection to the sewer main. If more than one bend is needed (Ex: bored sewer connection), the road shall be open cut and the connection installed properly. Sewer connections shall be a maximum of 75 feet from the sewer main to the cleanout. Cleanouts shall be installed between property corners of the lot for which the connection is intended. Connections into manholes will require a flexible sleeve at the manhole. If approved by the Engineer, four-inch (4") connections will be allowed to spill into deep manholes. For connections which spill, the 4" pipe shall protrude a minimum of 4" and a maximum of 6" beyond the inside wall of the manhole. Connections into manholes must be at least 6" from the nearest manhole step. Six-inch (6") connections must connect into a manhole.

When installing new sewer connections intended to replace existing ones, the new sewer connection shall be of like size to the existing. Reconnection of the old connection to the new shall be performed by a qualified utility contractor or by a licensed plumbing contractor. The Contractor shall be responsible for all permits and inspections required for the reconnection.

Page 15-11, Subarticle 1520-3 (A), Gravity Sanitary Sewer
Add the following to the first paragraph:

"and City of Winston-Salem, North Carolina Department of Public Works Engineering Division."

Page 15-11, Subarticle 1520-3 (A), Gravity Sanitary Sewer
Under "(1) Pipe Installation", after the second paragraph, add the following:

Contractor shall provide labor, materials, and supervision to temporarily provide bypass pumping around the Contractor's work in accordance with the specific needs of the work. No interruption of sewage flow shall be permitted. Bypass operation shall be 24 hours per day during the period of Work. The bypassed flow shall be continuously monitored. The bypassing system shall not be shut down between shifts, on holidays or weekends, or during work stoppages.

Prior to the start of temporary bypass pumping, the Contractor will submit a Bypass Pumping Plan prepared, signed and sealed by a Professional Engineer licensed in the State of North Carolina that includes, at a minimum, the following:

- Staging areas for pumps.
- Sewer plugging method and types of plugs.
- Size and location of manholes or access points for suction and discharge hose or piping.
- Size of pipeline or conveyance system to be bypassed.
- Number, size, material, location and method of installation of suction and discharge piping.
- Bypass pump sizes, capacities, and number of each size to be provided on-site including all primary, secondary, and spare pumping units.
- Calculations of static lift, friction losses, and flow velocity (pump curves showing pump, operating range shall be submitted).
- System pressure for calculation of hydrostatic testing requirements.
- Downstream discharge plan.
- Method of protecting discharge manholes or structures from erosion and damage.
- Thrust and restraint block sizes and locations. Provide the details necessary to demonstrate the integrity of all suction and discharge piping including piping and fittings associated with all primary and secondary pumping units.
- Sections showing suction and discharge pipe depth, embedment, select fill and special backfill.
- Method of noise control for each pump and any additional equipment that is included in the Bypass Pumping Plan (pumps and generators shall keep the noise level below 70 dBA at 30 feet).
- Any temporary pipe supports and anchoring requirements.
- Access plans to all bypass pumping locations indicated on the drawings.
- Calculations for selection of bypass pumping pipe size.
- Schedule for installation of and maintenance of bypass pumping lines.
- Plan indicating location of bypass pumping pipe locations.
- Emergency plan for adverse weather and flooding for various phases of the Work.
- Contractor's plan for providing continuous monitoring of the bypass pumping operation as well as the monitoring persons' qualifications.
- Emergency Contact List: Provide list of three emergency contacts who are able to respond and be on site within two hours of contact. Provide name, cell phone, and email addresses. List shall be posted in a conspicuous location at the bypass pump location.

The Bypass Pumping Plan must be approved prior to the start of the work. The Contractor shall notify the City at least 48 hours prior to any bypassing or diverting of flow.

Contractor shall maintain on site, sufficient equipment and materials to ensure continuous and successful operation of the bypass systems. The Contractor shall maintain on site a sufficient number of valves, spare pumps, tees, elbows, connections, tools, sewer plugs, piping, fuel and/or back-up generator, and other parts or system hardware to ensure immediate repair or modification of any part of the system as necessary.

The Contractor shall be responsible for all bypass flows installed. The Contractor shall inspect the entire bypass pumping and piping system for leaks or spills on an hourly basis. No bypassing to the ground surface, receiving waters, storm drains, or bypassing which results in soil or groundwater contamination or any potential health hazards shall be permitted. In the event of any sewage spill, the Contractor shall notify Owner immediately and be responsible for the prompt cleanup and disinfecting of the spill per local and state requirements. The Contractor shall compensate the Owner for the cost of any fines levied as the result of a spill or unauthorized discharge.

Prior to operation, test each section of discharge piping with maximum pressure equal to 2.0 times the maximum operating pressure of system or 50 psi, whichever is greater. Notify Engineer at least 24 hours prior to testing. The line shall be sealed on the discharge end. The Contractor shall fill the line with water. The test shall run for a period of two hours. The line may be put in service if, after the two-hour period, the pressure has been maintained with no observable leaks.

The Contractor shall inspect the entire bypass pumping and piping system at a minimum of every hour. Keep written inspection log at each pumping location. The bypass system shall have a trained and qualified attendant on site 24 hours per day, 7 days per week to maintain the bypass pumping system from the start of bypass until the bypassing of the specific pipeline is no longer required. A float and dialer monitoring system is acceptable in place of a trained and qualified attendant. If used, the float and dialer system shall have a dual power source and a redundant system to send alarms. Bypass system shall be physically checked at least on a daily basis with float and dialer system. Contractor shall provide an on-site response from an alarm of less than two hours.

The bypass pumping system shall be cleaned and drained prior to being dismantled and moved to the next location. Upon completion of the bypass pumping operation, clean disturbed areas, restoring to original condition, including pavement restoration, at least equal to existing condition prior to start of work.

Page 15-11, Subarticle 1520-3 (A), Gravity Sanitary Sewer
Under "(2) Testing", delete in its entirety and replace with the following:

A low-pressure air test shall be performed by the Contractor after the pipeline is completely backfilled and before being placed into service. The Engineer must be present during the entire testing process. Any work done without their supervision will not be accepted.

(a) Low Pressure Air Testing Requirements:
The Contractor shall use an approved pressure gauge and perform the test in accordance with ASTM C-828. Each section of pipeline (including connections) between manholes will be tested by plugging the upstream manhole and the downstream manhole. By using mirrors, lights, etc., the Contractor must show the Engineer that the 2 plugs are at the proper location

and that the line is clear between the plugs. Air is added to the line until the pressure is between 3.0 psi and 4.0 psi. If the pressure drops more than 1.0 psi during the time shown on the chart below, the line is presumed to have failed the test. An obvious leak in any section will be corrected even if the section passes testing. The Contractor will be responsible for the complete removal of all plugs.

Air test time shall be as follows:

Minimum Air Test Time

Main Size	Time (minutes per 100 feet of pipe)
8"	1.5
10"	1.8
12"	2.1
15"	2.4
18"	2.7
21"	3.3
24"	3.9
27"	4.5
30"	5.1
36"	6.3
42"	7.6

No direct payment will be made for acceptance testing, as such work will be incidental to the installation of the pipe and/or service connections.

(b) Video Inspection:
As a final measure required for acceptance, the Contractor shall clean and televise all sanitary sewer mains prior to requesting final inspection. The Contractor shall televise the entire sewer main and all service connections using standardized NASSCO (PACP, MACP, & LACP) practices, unless otherwise specified below. The process shall begin at the upstream manhole for each segment, and proceed to the downstream manhole for that same segment. Connections shall be televised from the cleanout to the main. Video inspection may occur only after Record Drawings are accepted and approved by the City of Winston-Salem. Prior to beginning the process, a 24 hour notice must be given by the Contractor to the Engineer. Prior to video inspection in paved areas, structures must be raised to final grade and 2" of asphalt must be in place. The City will not accept video that is more than 180 days old unless approved by the Engineer.

The cameras used for inspection shall be ones specifically designed and constructed for sanitary sewer pipeline inspection. Lighting for the cameras shall be suitable to provide a clear color picture of the entire periphery of the pipe. The cameras used for mains must be able to pan, tilt and zoom in order to allow for 360-degree viewing. The television system shall be equipped to indicate the camera travel distance in feet by display on the video viewing screen. All television equipment (camera, monitor, etc.) must be capable of producing picture quality which is satisfactory to the Engineer.

Within 2 hours of the video inspection, the Contractor shall clean the sewer mains and service connections with a high velocity water jet. All debris shall be collected in the downstream manhole and removed by the Contractor. Debris shall not be released into the existing sewer system. During the entire video process, the distance counter must be set at zero at each upstream manhole for each segment (set the counter at zero at the ground for each service connection). The Contractor will be required to pan and tilt at each manhole and at each service connection. The interior of each manhole must be marked with the manhole station (or manhole number) with paint or some other legible identifier (6" - 12" high letters or numbers). Each cleanout stack must be marked with the house number or the lot number. For mains, the Contractor will also be required to pan, tilt and zoom at all couplings, at all dates for ceramic-epoxy lined ductile iron pipe, and when any potential problems or abnormalities are noticed or suspected. Travel speed for the camera will be 15 - 30 feet per minute. The following video screen data will be required:

- Project name and project number
- Date of inspection
- Travel distance and time
- Station of start and end manholes
- Depth of start and end manholes
- Size of main
- Type of pipe

All above data shall be shown at the start and end manholes of each segment. While the camera is moving through the main and service connections, distance shall be the only data shown on the screen (top left or top right of screen).

For mains, a stream of water approximately 1" in width must be flowing during the entire video process. For service connections, a minimum of 5 gallons of water must be introduced into each cleanout stack just prior to the video process. In all cases, the flow must be shown on the bottom of the video screen.

Two copies of the entire video inspection along with a properly formatted PACP standard exchange database shall be submitted to the Engineer on a data disc (DVD or flash drive). A "properly formatted PACP standard exchange database" includes properly PACP coded defects (NASSCO version 6.x), proper media paths to associated video files, and all asset IDs used in the inspection must match what the submitted record drawings indicate for each asset. The video file shall be formatted to MPEG-4 (MP4) with software compatible and readable by the City of Winston-Salem. The City of Winston-Salem shall not be responsible for purchasing additional software necessary to view the video file. Each inspection (manhole to manhole or cleanout to main) shall be separated into its own chapter or file. In the event of a main inspection, the chapter or file shall be named to indicate the upstream manhole station or number and then the downstream manhole station or number (e.g. MH1-MH2). In the event of a service connection inspection, the chapter or file shall be named to indicate the house number or lot number associated with the inspection. All file naming should match the identification numbers (manhole station or number, house number, or lot number) shown on the Record Drawings. The submitted video must have the ability to be viewed using fast forward and rewind.

Any video that does not clearly show the pipe and service connections will be rejected. In the event that repairs are made, the segment receiving the repairs shall be flushed and televised again. The Engineer must oversee the entire cleaning and televising process. Final approval of the video inspection will only be after the Engineer has reviewed the video in the office (videos will not be field approved).

No direct payment will be made for cleaning and video inspection, as such work will be incidental to the installation of the pipe and/or service connections.

Page 15-13, Article 1520-4, Measurement and Payment:
Add the following:

All materials, permits, and work performed to reconnect existing sewer services to new cleanouts will be considered incidental to the installation of Sanitary Sewer Clean-Out.

Page 15-14, Article 1525-2, Materials
In the first paragraph, add the following after the second sentence:

All manhole joints shall be sealed on the outside of the manhole with butyl adhesive tape (minimum 6" wide). When unstable subgrade is encountered, manholes shall be bedded on stabilization stone. Manholes on outfalls shall be built 24" above existing ground unless a Type "B" manhole is used or the manhole is in a yard. Precast reinforced concrete manholes used on right-of-way maintained by the North Carolina Department of Transportation must be approved the North Carolina Department of Transportation before being installed.

Page 15-14, Article 1525-2, Materials
First paragraph, delete the third sentence in its entirety.

Replace with the following: "Flexible manhole connectors shall conform to ASTM C923."

Page 15-14, Article 1525-2, Materials
On Line 10, add the following:

Connectors shall be manufactured by Press-Seal Gasket Corporation, Hamilton Kent, NPC Inc. or approved equal.

Page 15-14, Article 1525-2, Materials
Replace the second paragraph (Lines 12 – 16) with the following:

Type 1 manhole rings and covers will be made of cast iron and will conform to ASTM A48, Class 35B. In addition, all manhole rings and covers shall be designed to support an H-20 wheel load. All castings will conform to the shape and dimensions shown on the City of Winston- Salem detail drawing for "Manhole Ring and Cover (Type 1)" and will be free from holes, cracks or any other defects. Rings and covers will have machined seats so that the cover will not rattle. Rings will weigh a minimum of 190 pounds and covers a minimum of 120 pounds. The name of the manufacturer and the part number shall be cast permanently on the ring and the cover. Castings that do not meet specifications shall be rejected. Type 2 manhole rings and covers shall meet all

specifications for Type 1 rings and covers and shall conform to the City of Winston-Salem detail drawing for "Manhole Ring and Cover (Type 2)". Type 3 manhole rings and covers shall meet all specifications for Type 1 rings and covers, except that rings will weigh a minimum of 136 pounds and covers a minimum of 120 pounds. All rings and covers shall conform to the City of Winston-Salem detail drawing for "Manhole Ring and Cover (Type 3)".

Page 15-14, Article 1525-3, Construction Methods
In the second paragraph, first sentence, delete "resilient" and replace with "flexible".

Delete the second and third sentences in their entirety.

Page 15-14, Article 1525-3, Construction Methods
In the fifth paragraph, fourth sentence, delete "recommended but not required", and replace with "required, except for horseshoe (doghouse) manholes".

Page 15-15, Sub-Article 1525-3 (D), Testing
Replace with the following:

Each manhole constructed by the Contractor shall be vacuum tested by the Contractor after assembly of the manhole. Prior to testing, and as directed by the Engineer, the Contractor shall clean out each manhole without foreign material being discharged into the existing sanitary sewer system. The test shall be conducted in accordance with ASTM C-1244. The test shall be performed after all grade rings and rings and covers have been installed. After the testing equipment is in place, a vacuum of 10 inches of mercury shall be drawn on the manhole. The time for the vacuum to drop to 9 inches of mercury must be greater than the minimum time listed below:

Minimum Vacuum Test Time (Seconds)

Manhole Depth	Diameter of Manhole		
	4'	5'	6'
0' - 10'	60 sec.	75 sec.	90 sec.
10' - 15'	75 sec.	90 sec.	105 sec.
15' - 25'	90 sec.	105 sec.	120 sec.
25' - 30'	105 sec.	120 sec.	135 sec.

The Engineer shall be present during the entire testing process. Any subsequent repairs to manholes which fail the vacuum test must be made on the inside and outside of each manhole. The Contractor will be responsible for the complete removal of all plugs.

No direct payment will be made for vacuum testing of manholes, as such work will be incidental to the installation of the manhole.

Page 15-16, Subarticle 1530-3 (A), Abandoning Pipe
Add the following paragraph:

When abandoning water mains up to a main that is to remain in service, any valve or tee associated with the main to be abandoned shall be removed. A sleeve and any necessary piping shall be installed to reconnect the water main to remain in service. All other main line valves on abandoned

water mains that are plugged and left in place shall be abandoned by removing the valve box. Hydrants connected to abandoned mains that are plugged and left in place shall also be abandoned by removing the hydrant and valve box. The work covered in this paragraph shall be considered incidental to the abandonment.

Page 15-17, Subarticle 1530-3 (C), Remove Water Meter
Replace the first sentence with the following:

Remove water meter by closing the corporation cock at the main and removing the lateral including the angle valve, setter and meter box.

Page 15-17, Subarticle 1530-3 (D), Remove Fire Hydrant
Replace the first paragraph with the following: "The work performed to remove a hydrant from a main to be left in service shall include removing the hydrant, valve box and hydrant tee. A sleeve and any necessary piping shall be installed to reconnect the water main to be left in service."

Replace the second paragraph with the following: "Removed hydrants shall be provided to the City."

Page 15-17, Article 1530-3 Construction Methods
Add the following Subarticle:

(E) Abandoning Sewer Connections
Sewer connections shall be abandoned by removing the cleanout stack (if one exists) and plugging the lateral at the base of the stack. If no cleanout exists, the Contractor shall plug the lateral at the right-of-way line.

Page 15-17, Article 1530-4 Measurement and Payment
After the fourth paragraph, add the following paragraph: "*Abandon Sewer Connections* will not be measured and paid."

Page 15-18, Article 1540-2, Materials
Add the following:

Item	Section
Casing Spacers	1036-11

Page 15-18, Subarticle 1540-3 (D), Carrier Pipe Installation
Replace the first paragraph with the following:

Carrier pipe installed through encasement shall be ductile iron flexible restrained joint pipe. Casing spacers are required and shall be placed at 10-foot intervals within the encasement. One spacer shall be placed not more than 2 feet from each end of the encasement. Only the runners of the casing spacer shall be in contact with the encasement. The bell of the carrier pipe will not be allowed to be in contact with the encasement. The Engineer must be present to observe the entire installation of the carrier pipe.

Page 15-20, Subarticle 1550-4 (A), Bore and Jack
Add the following paragraphs after Line 44:

As the boring operation progresses, each new section of encasement pipe shall be butt-welded to the previously installed section. Voids are to be filled with a Portland cement grout consisting of one (1) part Portland cement grout to three (3) parts sand at sufficient pressure to insure there will be no settlement of the highway or railroad. In the event that an obstruction is encountered during the dry boring operation, the auger is to be withdrawn, the excess pipe cut off and capped, and the pipe abandoned by completely filling the void with Portland cement grout as described above.

Encasement pipe installed either trenchless or by open-cut shall be installed prior to laying the carrier pipe within 50 feet of either end of the encasement. The Contractor is responsible for using the methods and equipment needed to attain the alignment, grade and elevation shown on the Engineer's drawings. Any deviations shall be corrected at the Contractor's expense.

Additional attempts may be required at alternate locations as directed by the Engineer. The option to install the encasement by open-cutting shall not be permitted unless approved by the Engineer and, when applicable, the North Carolina Department of Transportation. If approved, open-cut encasement shall be installed per Section 1505 for excavation, trenching, pipe laying and backfill.

City of Winston-Salem Acceptable Product List:

Hydrants accepted by the City of Winston-Salem are as follows:
(1) Super Centurion 250, manufactured by Mueller Company
(2) B-84-B-5, manufactured by American Flow Control
(3) K -81D Guardian, manufactured by Kennedy Valve Company
(4) Medallion , Manufactured by Clow Valve Company

Gate valves furnished under these specifications must be manufactured by one of the following:
(1) Clow Valve Company
(2) M & H Valve Company
(3) American Flow Control
(4) U.S. Pipe and Foundry Company
(5) Mueller Company
(6) Kennedy Valve Company

Approved tapping saddles are as follows:
(1) American Flow Control
(2) U.S. Pipe and Foundry Company

Approved tapping sleeves are as follows:
(1) Mueller Company
(2) American Flow Control
(3) Tyler Pipe Company
(4) U.S. Pipe and Foundry Company
(5) Kennedy Valve Company

Approved tapping valves are as follows:
(1) Clow Valve Company
(2) M & H Valve Company
(3) American Flow Control
(4) U.S. Pipe and Foundry Company
(5) Mueller Company
(6) Kennedy Valve Company

All corporation cocks shall be: 3/4", 1", 1 1/2" and 2"- FB1000-G by Ford or 74701BT by McDonald.

Saddles shall be Model 202SSU by Romac Industries, Inc. or Model F202-SSB by Ford.

A. 3/4" Water Connection
1. Meter yoke- Y501 by Ford, H-5010 by Mueller or 14-1 by McDonald.
2. Angle ball valve with padlock wings- BA94-313W-G-NL by Ford (City side).
3. Angle ball valve without padlock wings- BA94-313-G-NL by Ford (property side).

B. 1" Water Connection
1. Meter Yoke - Y504 by Ford.
2. Angle ball valve with padlock wings- BA94-444W-G-NL by Ford- two required.

C. 1-1/2" Water Connection
Custom-setter with ball valve bypass and ball valves on inlet and outlet. (VBB76-12B-11-66-NL by Ford) as per City detail drawing.

D. 2" Water Connection
Custom-setter with ball valve bypass and ball valves on inlet and outlet (VBB77-12B-11-77-NL by Ford) as per City detail drawing.

METER BOXES (CAST IRON - 5/ 8" AND 1" METERS): Cast iron meter boxes furnished under these specifications shall be manufactured by one of the following:
(1) Sigma Corp.
(2) SIP Industries
(3) DSI International
(4) Star pipe Products
(5) Tri Cast Inc.

METER BOXES (POLYMER CONCRETE- 1 1/2" AND 2" METERS): Part numbers are as follows:
Box: PG2436B500
Cover: PG2436WAP1-50

Approved ductile iron flexible restrained joint pipe and fittings are as follows:
(1) Flex Ring by American
(2) TR-Flex by US Pipe
(3) TR-Flex by McWane

Approved flexible manhole connectors are as follows:
(1) Press-Seal Gasket Corporation
(2) Hamilton Kent

Approved manhole rings and covers are as follows:
(1) East Jordan Iron Works
(2) U.S. Foundry & Manufacturing Corp.

All interior linings for a sewer ductile iron pipe and fittings shall be Protecto 401™.

All butyl adhesive tape used for joint sealant on the exterior of manholes shall be EZ Wrap by Press-Seal Gasket Corporation.

All interior linings for ductile iron flexible restrained joint pipe and fittings shall be Protecto 401™.

Plan Sheet UC-3A, Steel Pile Pier Detail. The Contractor's attention is directed to this detail.

STEEL PILE PIERS:

For the proposed 8" sanitary gravity sewer line (PS500), install Steel Pile Piers per the details shown on Sheet UC-3D and to the depth shown on sheet UC-24 or to refusal, whichever is less. The locations of the proposed Steel Pile Piers are shown on Sheets UC-14, UC-15, and UC-24. All steel shall conform to the requirements of ASTM A992 Grade 50. All welds shall be by a certified welder. All steel members and straps will be power tool cleaned to a minimum of SSPC-SP3 and hot-dipped galvanized per ASTM A123. Bolts and washers shall be hot-dip galvanized per ASTM A153. All welds shall be grinded and coated with two (2) coats of a cold-applied galvanizing paint.

Measurement and Payment:
Payment for Steel Pile Piers, installed in accordance with the plans and provisions herein and accepted, will be measured and paid for at the contract unit price per each for "Steel Pile Pier". Such price and payment will be full compensation for furnishing all materials, installation, excavation, equipment including pile driving, backfilling, and incidentals necessary to complete the work as required.

Pay Item:	**Pay Unit**
Steel Pile Pier	Each

Plan Sheet UC-3H, 4" Combination Air Valve in Manhole. The Contractor's attention is directed to this detail.

The 4" Combination Air Valve in Manhole shall be installed in accordance with the applicable Special Provisions herein, as shown on the Utility Plans, and/or as directed by the Engineer.

4" Combination Air Valve

A. Description and Service

1. Valve shall have four functions of uninterrupted discharge of air/gas during filling, continuous discharge of dis-entrained pressurized air/gas, unrestricted vacuum break, and pipeline surge protection in a single chamber. Valves shall be anti-surge and antishock air release and vacuum break valves.
    a. The large orifice shall allow air to escape during pipeline filling and allow air intake during pipeline draining.
    b. The small orifice shall release air accumulations after the pipeline is filled, under pressure and in operation.
    c. The valve shall be equipped with an integral surge alleviation mechanism that automatically dampens surge pressures due to rapid air discharge or the subsequent rejoining of separated water columns.

B. Construction and Design

1. The intake/discharge orifice area is equal to the nominal size of the valve, i.e., a 4" valve shall have 4" full flow inlet and 4" outlet. Area around the floats must equal equivalent are of inlet/outet.
2. Valve shall utilize solid unbreakable HDPE floats with EPDM O-Ring seals. Floats must not deform, leak or experience damage of any kind at twice the design pressure, with floats providing continuous discharge of pressurized air release without levers, pins, springs that can break.
3. Materials of Construction:
    a. 316 Stainless Steel Barrel, Flanges, Tie Rods, Nozzle and Fasteners. ABS Polylac Top Cover.
    b. Floats: High Density Polyethylene
4. Valve shall be capable of operating between a pressure range 7.25 - 276 psi.
5. Valve shall have a 10 year in-service warranty for all internal components.
6. The valves furnished shall be standard products in regular production by the manufacturer and shall have been in satisfactory and successful operation for a period of at least five (5) years.

C. Manufacturers:

1. Vent-O-Mat – Series RBX
2. Vent-Tech – Model WTR
3. Approved equal.

Gate Valve

Gate valve inside the Combination Air Valve Manhole shall meet the requirements of Section 1036-7(A) of the NCDOT Standard Specifications, and shall be resilient-seated type gate valve with hand-wheel operator and flanged ends.

Precast Concrete Manhole

The pressure relief valve manhole shall be an approved precast concrete manhole conforming to ASTM C-478. The precast manhole top slab shall be H-20 rated. Steps shall be cast into the interior wall of the manhole as shown on the plans.

Access Hatch

The aluminum access hatch shall have a 1/4 inch thick, one-piece, mill finish, extruded aluminum frame, incorporating a continuous concrete anchor. The inside of the frame shall have a door-support ledge on two (2) sides. Both frame and ledge must be supported by a full bed of Class A concrete. The door panel shall be 1/4" aluminum diamond plate, reinforced to withstand a live H-20 uniform load. Door shall open to 90° and automatically lock with a T-316 stainless steel hold open arms with release handle. For ease of operation, door shall incorporate enclosed stainless steel compression spring assists. Door shall close flush with the frame. Hinges and all fastening hardware shall be T-316 stainless steel. Unit shall lock with a T-316 stainless steel slam lock with removable key and have a non-corrosive handle. Unit shall carry a lifetime guarantee against defects in material and/or workmanship.

Measurement and Payment:

Payment for 4" combination air valve in MH shall be per each valve, and paid for under the contract price for "4" Combination Air Valve in MH". Such price and payments will be full compensation for all labor, materials, excavation, backfilling, and any incidentals necessary to complete the work, as required.

Pay Item:	**Pay Unit**
4" Combination Air Valve in MH	Each

PROJECT REFERENCE NO.	SHEET NO.
U–2579AB	2B–22
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

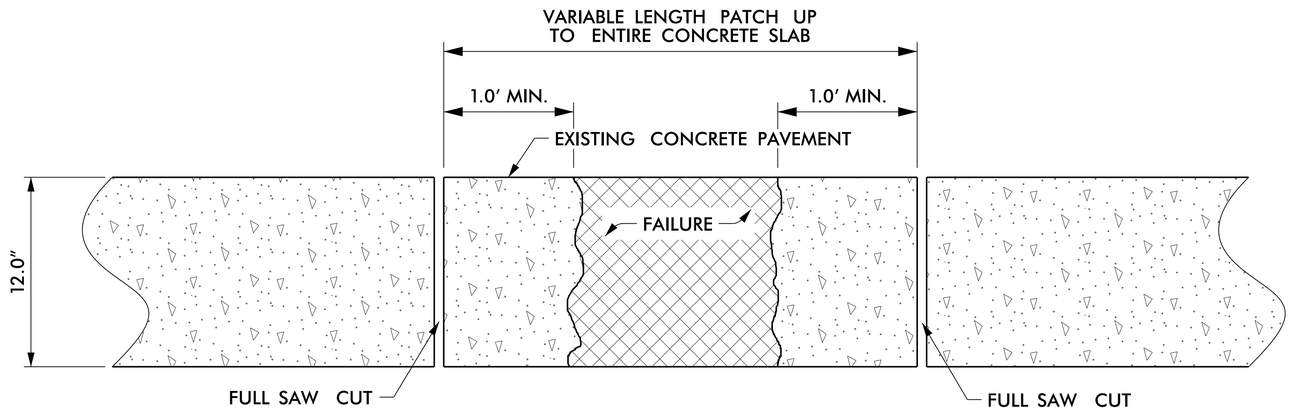
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS

11/23/2021

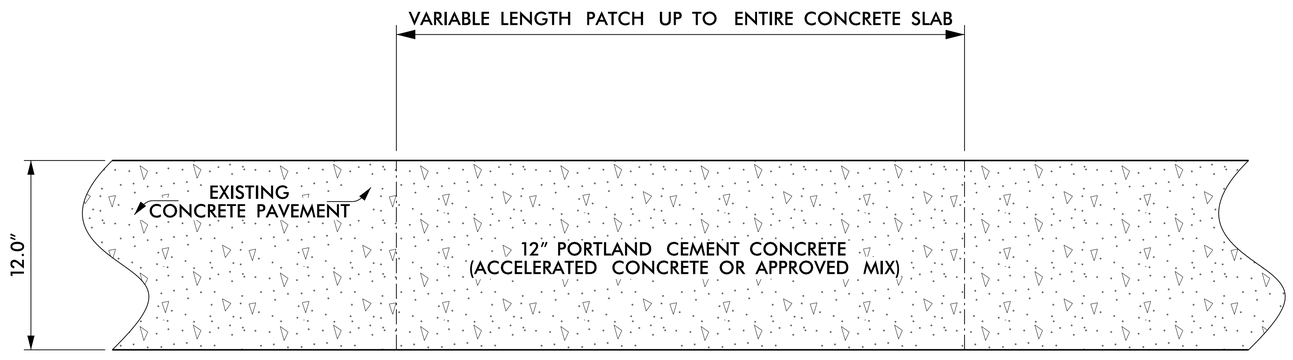
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

SLAB REPAIR DETAIL FOR 12″ PORTLAND CEMENT CONCRETE PAVEMENT



DETAIL OF SAW CUTS



DETAIL OF CONCRETE PAVEMENT REPAIR

NOTES:
1. DIMENSTIONS ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED
2. REHABILITATION OF CONCRETE SLAB SUBGRADE SHALL BE AS DIRECTED BY ENGINEER

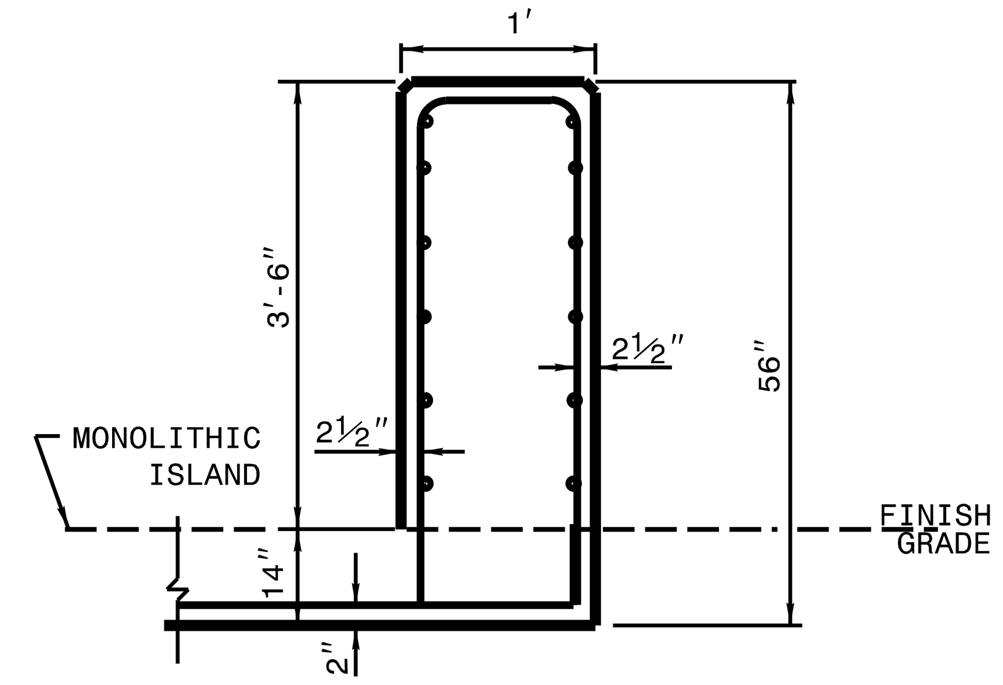
REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_pshpfl_conventional.tbl
USER: CHARRIS DATE: 11/23/2021 TIME: 1:01:19 PM
FILE: NCDOT\NCDOT-U2579AB\6.0_CAD_BIM\6.2_Work_In_Progress\U-2579AB\Roadway\Proj\U2579ab_rdy_psh_02B-22.dgn

5/14/99

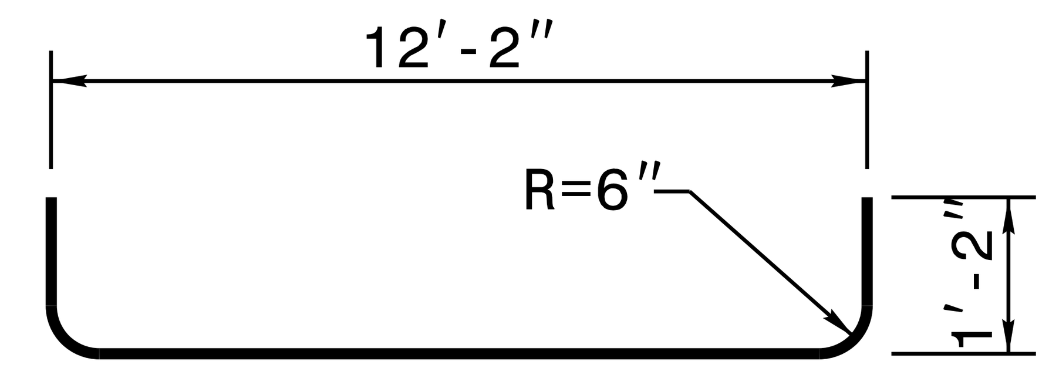
PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	2C-8

ALL REBAR TO MATCH THE VERTICAL
BARRIER OF STRUCTURE S2 AS SHOWN
ON SHEET S2-17 OF THE STRUCTURES PLANS



DETAIL X-X

CROSS SECTIONAL VIEW



J - BARS

#5 BAR

GENERAL NOTES:

-CLASS 'AA' CONCRETE TO BE USED THROUGHOUT.

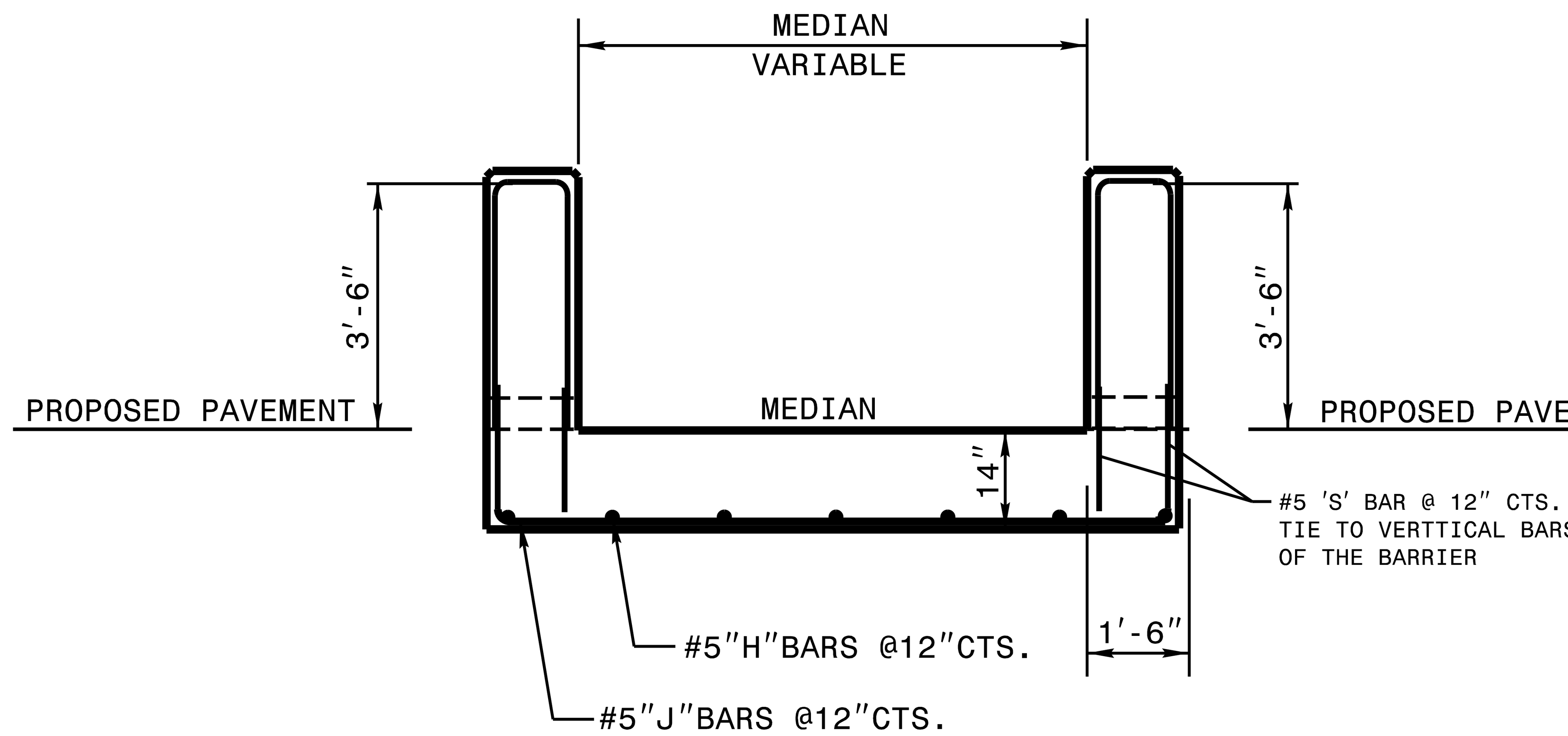
-REINFORCING STEEL TO BE CUT, BENT OR RELOCATED TO POSITION PIPE AS DIRECTED BY THE ENGINEER.

-ALL EXPOSED CORNERS TO BE CHAMFERED 1″.

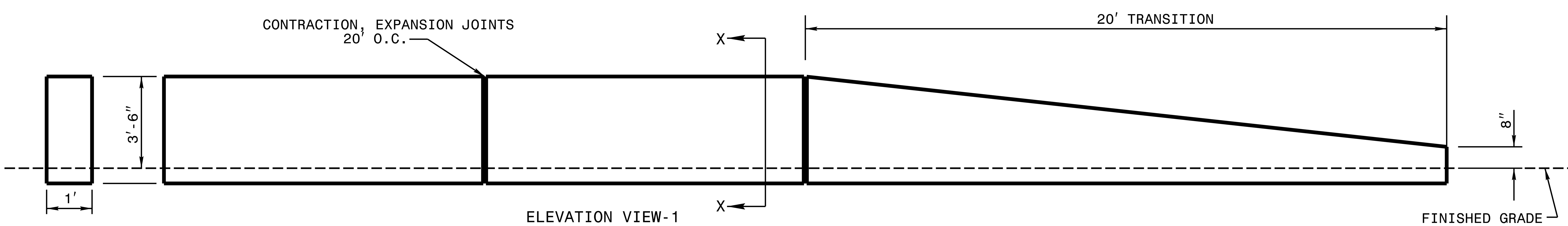
-MAINTAIN 2″ MINIMUM CONCRETE COVERAGE ON ALL STEEL.

BILL OF MATERIAL

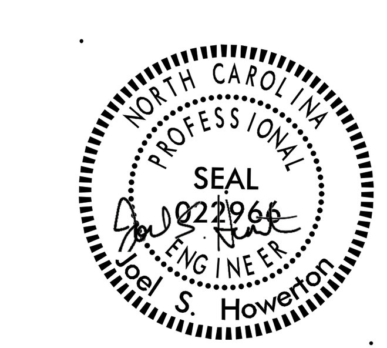
CODE	BAR#	LENGTH	LBS/FT.	QTY.	LBS
H	5	30′	1.043	48	1502
J	5	12′-2″	1.043	120	1528
S	5	1′-8″	1.043	480	836
	TOTAL WEIGHT STEEL				3866
TOTAL CLASS "AA" CONCRETE					220 CU.YDS.



CROSS SECTIONAL VIEW



ELEVATION VIEW-1



11/9/2021

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS
STANDARDS AND SPECIAL DESIGN
Office 919-707-6950 FAX 919-250-4119

DDI BARRIER

ORIGINAL BY: ________ DATE: ________
MODIFIED BY: nbritt DATE: 4-26-13
CHECKED BY: ________ DATE: ________
FILE SPEC.: details\nbritt\english\interstate\i5501 bridge barrier.dgn

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$

COMPUTED BY: __JG_____ DATE: _4/8/20____
CHECKED BY: __CEH_____ DATE: 9/16/20__

PROJECT NO.	SHEET NO.
U-2579AB	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Chain	Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
SEGMENT 1						
-L-	773+00.00	789+00.00	403,968	901	0	403,067
-Y5B-	14+50.00	23+00.00	857	6,453	5,596	0
-Y15- LT	17+63.82	56+00.00	3,532	13,107	9,575	0
-Y15REV- LT	81+50.00	96+28.30	11,064	28,457	17,393	0
-Y15- LT	145+00.00	175+50.00	16,745	2,791	0	13,954
-Y15FLYAC-	19+54.00	47+61.78	5,592	340,740	335,148	0
-Y15FLYBD-	23+00.00	39+40.31	0	366,905	366,905	0
-Y15FLYCA-	69+71.79	78+76.00	85,935	11,701	0	74,234
-Y15RPA-	14+52.00	32+11.00	115,804	40,937	0	74,867
-Y15LPA-	17+00.00	23+50.00	37,299	0	0	37,299
-Y15RPB-	17+00.00	28+81.00	100	70,815	70,715	0
-UXRPB-	16+00.00	22+70.00	1,369	980	0	389
-Y15XOVR1-	10+00.00	21+89.81	372	428	56	0
-Y15XOVR2-	10+00.00	21+89.81	347	535	188	0
-Y15- CROSSOVER DETOUR REMOVAL			837	827	0	10
	SUBTOTAL:		683,821	885,577	805,576	603,820
-Y15-	21+50.00	56+00.00	4,935	221	0	4,714
-Y15REV-	81+50.00	96+28.30	1,925	59	0	1,866
-Y15-	145+00.00	176+50.00	3,773	300	0	3,473
	SUBTOTAL:		10,633	580	0	10,053
-L-	789+00.00	818+00.00	347,454	138,393	0	209,061
-Y15- RT	21+50.00	56+00.00	14,566	6,918	0	7,648
-Y15REV-	8+00.00	27+00.00	139,464	13,909	0	125,555
-Y15REV-	27+00.00	46+12.61	80,715	266,550	185,835	0
-Y15REV-	48+57.61	65+00.00	157,578	704	0	156,874
-Y15REV-	65+00.00	81+50.00	88,445	17,620	0	70,825
-Y15REV- RT	81+50.00	96+28.30	39,541	4,403	0	35,138
-Y15FLYAC-	66+68.78	80+50.00	11,523	159,829	148,306	0
-Y15FLYBD-	51+59.31	70+50.00	1,643	294,865	293,222	0
-Y15FLYBD-	70+50.00	86+15.00	132,130	3,690	0	128,440
-Y15FLYCA-	19+50.00	52+30.79	198,716	147,619	0	51,097
-Y15RPC-	16+50.00	25+70.00	3,068	37,872	34,804	0
-Y15RPDREV-	29+68.00	42+55.00	3,692	55,466	51,774	0
-UXRPC-	19+50.00	21+00.00	242	522	280	0
	SUBTOTAL:		1,218,777	1,148,360	714,221	784,638
-L-	818+00.00	836+32.44	176,561	241,600	65,039	0
-Y16-	16+00.00	20+73.53	940	1,856	916	0
-Y16-	25+49.53	29+50.00	138	1,536	1,398	0
-Y16B-	12+00.00	14+00.00	173	12	0	162
-Y16DET-	13+00.00	33+76.97	595	12,215	11,620	0
-Y16B-	14+25.00	15+00.00	22	637	615	0
-Y16DET- & -Y16B- DETOUR REMOVAL			11,176	710	0	10,466
	SUBTOTAL:		189,605	258,566	79,588	10,628
	SEGMENT 1 SUBTOTAL		2,102,836	2,293,083	1,599,385	1,409,139
SEGMENT 2						
-L-	730+00.00	751+00.00	69,795	153,659	83,864	0
-L-	751+00.00	773+00.00	51,104	229,776	178,672	0
-Y6-	10+50.00	12+50.00	928	0	0	928
-Y8-	13+43.63	16+50.00	82	599	517	0
-Y15FLYBD-	19+95.00	23+00.00	0	42,553	42,553	0
-Y15FLYCA-	78+76.00	81+27.00	27,287	0	0	27,287
	SUBTOTAL:		149,196	426,587	305,606	28,215
	SEGMENT 2 SUBTOTAL		149,196	426,587	305,606	28,215

SUMMARY OF EARTHWORK CONT'D

IN CUBIC YARDS

Chain	Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
SEGMENT 3						
-L-	692+32.98	704+00.00	202,051	23,217	0	178,834
-Y1B-	12+50.00	20+50.39	412	2,297	1,885	0
-Y1B-	24+06.18	41+00.00	2,273	4,743	2,470	0
-Y1BDET-	13+00.00	31+00.00	378	7,304	6,926	0
-Y1BDET- DETOUR REMOVAL			6,351	435	0	5,916
	SUBTOTAL:		211,465	37,996	11,281	184,750
-L-	704+00.00	723+00.00	454,482	38	0	454,444
-Y1-	11+00.00	17+50.00	617	2,696	2,079	0
-Y1A-	10+75.00	12+00.00	16	515	499	0
-Y4-	11+50.00	20+50.00	2,937	569	0	2,368
-Y4-	20+50.00	29+85.66	6,677	14,709	8,032	0
-Y4-	31+49.65	45+50.00	11,737	14,864	3,127	0
-Y4-	45+50.00	60+00.00	2,859	1,831	0	1,028
-Y4RPA-	18+87.00	23+75.00	65,126	0	0	65,126
-Y4RPB-	18+63.00	22+70.00	1,778	21,855	20,077	0
-Y4SPB1-	23+33.78	24+69.77	1,055	8,758	7,703	0
-Y4DET-	10+36.67	32+89.22	12,497	17,233	4,736	0
-Y4DEET- DETOUR REMOVAL			14,985	14,372	0	613
-Y4A-	11+00.00	18+00.00	502	752	250	0
	SUBTOTAL:		575,268	98,192	46,503	523,579
-L-	723+00.00	730+00.00	142,143	131	0	142,012
-Y4RPC-	17+89.00	22+91.15	37,359	117	0	37,242
-Y4RPD-	17+81.00	22+31.00	29,933	0	0	29,933
-Y4SPD1-	22+75.88	24+00.00	655	1,586	931	0
	SUBTOTAL:		210,090	1,834	931	209,187
	SEGMENT 3 SUBTOTAL		996,823	138,022	58,715	917,516
	SUMMARY TOTALS		3,248,855	2,857,692	1,963,706	2,354,870
LOSS DUE TO CLEARING AND GRUBBING			-57,000	0	0	-57,000
ROCK WASTE TO REPLACE BORROW			0	0	-37,091	-37,091
ADJUST FOR ROCK WASTE				-5,564	-5,564	0
WASTE IN LIEU OF BORROW			0	0	-1,921,051	-1,921,051
PROJECT TOTALS			3,191,855	2,852,128	0	339,728
SAY			3,192,000			

PAVEMENT STRUCTURE VOLUME = 168,300 CY
EST. SHOULDER BORROW = 21,700 CY
EST. DDE = 162,460 CY
EST. UNDERCUT = 10,000 CY
EST. SHALLOW UNDERCUT = 8,000 CY
EST. SELECT GRANULAR MATERIAL CLASS III = 28,900 CY (FOR WORKING PLATFORMS IN SOFT AND WET SOILS)

Note: These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

MANAGEMENT STRATEGIES

SEE PROJECT CONTRACT FOR AREA (SEGMENT) AVAILABILITY DATES

SEGMENT 1

AREA 4

ALL EXISTING I-40 CONCRETE SLAB REPAIRS WILL BE CONDUCTED USING LANE CLOSURES DURING VARIOUS PHASES OF CONSTRUCTION.

PHASE 1, STEP 1: I-40 (-Y15-) WILL REMAIN IN THE EXISTING PATTERN AND UTLIZE LANE CLOSURES/NARROWING TO CONSTRUCT TEMPORARY PAVEMENT TO THE INSIDE EB LANES. NEW LOCATION WORK IN THE INTERCHANGE, INCLUDING STAGE 1 CULVERT AND BRIDGES, WILL BEGIN IN PHASE 1, STEP 1, AWAY FROM TRAFFIC. DEMOLITION OF THE EXISTING OAK GROVE CHURCH ROAD BRIDGE WILL ALSO BEGIN. CONSTRUCTION OF MULTIPLE TURN-AROUNDS WILL NEED TO BE COMPLETED.

PHASE 1, STEP 2: SHIFT EB I-40 (-Y15-) TRAFFIC ONTO TEMPORARY PAVEMENT AND CONSTRUCT OUTSIDE WIDENING, INCLUDING ADDTIONAL TEMPORARY PAVEMENT ALONG PROPOSED. COMPLETE STAGE 1 CULVERT CONSTRUCTION AND STREAM RELOCATION AND CONSTRUCT -Y15XOVR3-. CONSTRUCT OUTSIDE TEMPORARY PAVEMENT ON EXISTING -UXRPB- ENTRANCE RAMP. DURING AN ICT IN PHASE 1, STEP 2A, EXIT RAMP (-UXRPC-) FOR EB I-40 (-Y15-) TO UNION CROSS RD WILL BE TEMPORARILY CLOSED FOR CONSTRUCTION USING AN OFF-SITE DETOUR, THEN RE-OPENED TO TRAFFIC.

PHASE 2: EB I-40 TRAFFIC WILL BE SHIFTED TOWARD THE OUTSIDE AND ONTO THE NEW -Y15REV- ALIGNMENT. WB I-40 WILL BE SHIFTED ONTO THE OUTSIDE SHOULDER. THE INSIDE LANE OF -Y15-/-Y15REV- AND TEMPORARY CROSSOVERS ON I-40 WILL BE CONSTRUCTED BEHIND BARRIER. THE PORTION OF OAK GROVE CHURCH RD SPANNING EXISTING EB I-40 (-Y15-) WILL BE REMOVED AWAY FROM TRAFFIC.

PHASE 3, STEP 1: WB I-40 TRAFFIC WILL BE SHIFTED ONTO THE EB SIDE OF THE NEW (-Y15REV-) ALIGNMENT UTILIZING TEMPORARY ALIGNMENT CROSSOVERS. CONTINUE CONSTRUCTION OF I-40 NEW ALIGNMENT (-Y15REV-), INCLUDING ADDITIONAL STRUCTURE CONSTRUCTION OVER -Y15REV-. AWAY FROM TRAFFIC, REMOVE EXISTING I-40 (-Y15-) PAVEMENT AND CONSTRUCT REMAINDER OF WINSTON-SALEM NORTHERN BELTWAY (-L-) IN THIS AREA. THE REMAINDER OF THE OAK GROVE CHURCH ROAD BRIDGE CAN NOW BE REMOVED AWAY FROM TRAFFIC.

PHASE 3, STEP 2: WB I-40 TRAFFIC IS SHIFTED FROM THE PROPOSED EB -Y15REV- ALIGNMENT TO THE PROPOSED WB LANES IN A TEMPORARY PATTERN AND THE MEDIAN LANES ARE CONSTRUCTED IN THE AREAS OF THE CROSSOVERS AS WELL AS COMPLETION OF THE MEDIAN BARRIER ALONG -Y15REV-.

PHASE 4: EB & WB I-40 (-Y15-/-Y15REV-) IS PLACED IN A TEMPORARY PATTERN WHILE THE REMAINDER OF THE OUTSIDE CONSTRUCTION ON WB I-40 IS COMPLETED, INCLUDING NOISE WALL. TEMPORARY PAVEMENT OFF OF PROPOSED WILL BE REMOVED AND REMAINING OF SHOULDER WORK IN THOSE AREAS WILL BE COMPLETED. DURING AN ICT IN PHASE 4, STEP 1A, ENTRANCE RAMP (-UXRPB-) FROM UNION CROSS RD TO WB I-40 (-Y15-) WILL BE TEMPORARILY CLOSED FOR CONSTRUCTION USING AN OFFSITE DETOUR, THEN RE-OPENED TO TRAFFIC.

AREA 5

GLENN HI RD (-Y16-) WILL REMAIN IN EXISTING PATTERNS DURING TEMPORARY PAVEMENT (-Y16DET-) CONSTRUCTION. MAINTAIN DRIVEWAY ACCESS TO FARMLAND AND RESIDENCE UNTIL -Y16- IS CONSTRUCTED.

ONCE TEMPORARY PAVEMENT (-Y16DET-) IS COMPLETE, TRAFFIC WILL BE SHIFTED ONTO TEMPORARY PAVEMENT TO CONSTRUCT GLENN HI RD (-Y16-). MAINTAIN ACCESS TO YEATON GLEN DRIVE (-Y16B-) DURING CONSTRUCTION.

SEGMENT 2

AREA 1

MAINLINE -L- FROM STA. 73+00 +/- TO STA. 733+00 +/- AND PORTION OF RAMPS WILL BE CONSTRUCTED AS MUCH AS POSSIBLE WITHOUT PROHIBITING RESIDENTIAL ACCESS. MAINLINE -L- CONSTRUCTION WILL BE COMPLETED ONCE TURN-AROUNDS / CUL-DE-SACS ARE CONSTRUCTED AND SERVICE ROADS ARE COMPLETED AND OPEN TO TRAFFIC TO MAINTAIN ACCESS TO ALL PRIVATE PROPERTIES.

SEGMENT 3

AREA 2

SEDGE GARDEN RD (-Y1B-) WILL REMAIN IN EXISTING PATTERNS DURING TEMPORARY PAVEMENT (-Y1BDET-) CONSTRUCTION. SCHOOL VIEW RD AND OLD WINSTON RD WILL BE PERMANENTLY CLOSED.

TRAFFIC WILL BE SHIFTED TO THE ON-SITE DETOUR (-Y1BDET-) TO CONSTRUCT PROPOSED SEDGE GARDEN RD (-Y1B-).

AREA 3

KERNERSVILLE RD (-Y4-) WILL REMAIN IN EXISTING PATTERNS DURING TEMPORARY PAVEMENT (-Y4DET-) CONSTRUCTION. PROPOSED OUTSIDE WIDENING WILL BE CONSTRUCTED ON THE RIGHT SIDE FOR TEMPORARY PAVEMENT CONNECTIONS ON KERNERSVILLE RD (-Y4-).

ONCE TEMPORARY PAVEMENT (-Y4DET-) IS COMPLETE, TRAFFIC WILL BE SHIFTED ONTO TEMPORARY ALIGNMENT TO CONSTRUCT REMAINDER OF KERNERSVILLE RD (-Y4-) INCLUDING BRIDGE OVER WINSTON-SALEM NORTHERN BELTWAY (-L-). COMPLETE CONSTRUCTION OF LINVILLE RD (-Y4A-) AND SEDGE GARDEN RD (-Y1B- AND -Y1-).

SHIFT TRAFFIC ONTO KERNERSVILLE RD (-Y4-) IN A TEMPORARY DDI PATTERN WITH ALL RAMPS CLOSED THEN REMOVE TEMPORARY PAVEMENT (-Y4DET-) AND CONSTRUCT REMAINING MONOLITHIC AND MEDIAN ISLANDS, CURB & GUTTER, AND SIDEWALK USING LANE CLOSURES/NARROWING. THIS WORK WILL BE COMPLETED DURING A 240 DAY ICT AND THEN ALL ROADS WILL OPEN TO THE FINAL PATTERN.

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS	
I-40 (-Y15-/-Y15REV-)	MONDAY - FRIDAY	5:00 A.M. - 9:00 P.M.
	SATURDAY	7:00 A.M. - 7:00 P.M.
	SUNDAY	9:00 A.M. - 8:00 P.M.
KERNERSVILLE RD (-Y4-)	MONDAY - FRIDAY	6:00 A.M. - 7:00 P.M.
SEDGE GARDEN RD (-Y1-/-Y1B-) LINVILLE RD (-Y4A-) GLENN HI RD (-Y16-)	MONDAY - FRIDAY	6:00 A.M. - 9:00 A.M. 3:00 P.M. - 6:00 P.M.

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME

I-40 (-Y15-/-Y15REV-)

HOLIDAY

1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 5:00 A.M. DECEMBER 31st TO 9:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 9:00 P.M. THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 5:00 A.M. THURSDAY AND 9:00 P.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 5:00 A.M. FRIDAY TO 9:00 P.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 5:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 9:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 5:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 9:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 5:00 A.M. FRIDAY AND 9:00 P.M. TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 5:00 A.M. TUESDAY TO 9:00 P.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 5:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 9:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.
9. FOR WAKE FOREST UNIVERSITY EVENTS OCCURING AT TRUIST FIELD AT WAKE FOREST, BETWEEN FOUR (4) HOURS BEFORE THE START AND FOUR (4) HOURS AFTER THE END OF EACH EVENT.
10. FOR THE CAROLINA CLASSIC FAIR IN WINSTON-SALEM BETWEEN THE HOURS OF 7:00 A.M. THE DAY BEFORE THE START OF THE FAIR AND 7:00 P.M. THE FOLLOWING DAY AFTER THE END OF THE FAIR.

ROAD NAME

KERNERSVILLE RD (-Y4-)

HOLIDAY

1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 6:00 A.M. DECEMBER 31st TO 7:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 7:00 P.M. THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 7:00 P.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 7:00 P.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 7:00 P.M. TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 7:00 P.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 7:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.
9. FOR WAKE FOREST UNIVERSITY EVENTS OCCURING AT TRUIST FIELD AT WAKE FOREST, BETWEEN FOUR (4) HOURS BEFORE THE START AND FOUR (4) HOURS AFTER THE END OF EACH EVENT.
10. FOR THE CAROLINA CLASSIC FAIR IN WINSTON-SALEM BETWEEN THE HOURS OF 7:00 A.M. THE DAY BEFORE THE START OF THE FAIR AND 7:00 P.M. THE FOLLOWING DAY AFTER THE END OF THE FAIR.

C) FOR RAMP CLOSURES ALLOWED IN AREA 4, PHASE 1, STEP 2A, AND AREA 4, PHASE 4, STEP 1A, DO NOT CLOSE ROADS AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
ON-RAMP & OFF-RAMP (-UXRPB- & -UXRPC-) AT THE I-40/UNION CROSS RD INTERCHANGE	ANYTIME ROBERT B. GLENN HIGH SCHOOL IS IN SESSION

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	TMP-1B

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

APPROVED: Michelle Ward

DATE: 11/22/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TRANSPORTATION OPERATIONS PLAN

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_tcp.tbl
USER: CHARNDEN DATE: 11/22/2021 TIME: 11:12:43 AM
FILE: p:\\pwhdruseas01\HDR_US_East_01\Documents\3322\100526291\6.0_CAD\BIM\6.2_Work_In_Progress\U-2579AB\Traffic\Traffic\TrafficControl\TCP\U2579AB_TC_TMP-01B.dgn

GENERAL NOTES

D) DO NOT STOP TRAFFIC AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS	DURATION AND OPERATION
KERNERSVILLE RD (-Y4-)	MONDAY - SUNDAY: 6:00 A.M. - 12:00 A.M. (MIDNIGHT)	30 MINUTES FOR OVERHEAD SIGN INSTALLION, SIGNAL MAST ARMS, AND OVERHEAD BRIDGE WORK (IF NEEDED & APPROVED BY THE ENGINEER
I-40 (-Y15-/-Y15REV-)	MONDAY - SUNDAY: 5:00 A.M. - 12:00 A.M. (MIDNIGHT)	

E) DO NOT CONDUCT MULTI-VEHICLE HAULING AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
I-40 (-Y15-/-Y15REV-)	SAME RESTRICTIONS AS NOTE "A"
ALL OTHER ROADS	MONDAY - FRIDAY: 6:00 A.M. - 8:00 P.M.

F) DO NOT CONDUCT ANY HAULING OPERATIONS AGAINST THE FLOW OF TRAFFIC OF AN OPEN TRAVELWAY UNLESS THE HAULING OPERATION IS PROTECTED BY BARRIER OR GUARDRAIL OR AS DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

G) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

H) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

I) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

J) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

K) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

L) DO NOT INSTALL MORE THAN 1 MILE OF LANE CLOSURE ON I-40 (-Y15-/-Y15REV-) MEASURED FROM THE BEGINNING OF THE MERGE TAPER TO THE END OF THE LANE CLOSURE.

M) DO NOT INSTALL MORE THAN TWO (2) SIMULTANEOUS LANE CLOSURES IN ANY ONE DIRECTION ON I-40 (-Y15-/-Y15REV-).

N) PROVIDE A MINIMUM OF 1 MILE BETWEEN LANE CLOSURES, MEASURED FROM THE END OF ONE CLOSURE TO THE FIRST SIGN OF THE NEXT LANE CLOSURE.

PAVEMENT EDGE DROP OFF REQUIREMENTS

O) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.
BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

P) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 500 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

Q) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

R) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

S) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

T) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

U) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

V) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 500 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

W) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE / RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

X) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

Y) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	TMP-1C

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

Z) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

AA) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES (DRUMS, SKINNY DRUMS OR CONES) PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

BB) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
I-40 (-Y15-/-Y15REV-)	PERFORMANCE PAVEMENT MARKING (6") (SEE SPECIAL PROVISION)	TEMPORARY RAISED
ALL OTHER ROADS	PAINT (4") (IF ROAD IS CURRENTLY STRIPED)	TEMPORARY RAISED (IF EXISTING MARKERS ARE PRESENT)

CC) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

DD) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

EE) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

FF) TRACE THE EXISTING AND PROPOSED MONOLITHIC ISLAND LOCATIONS WITH PROPER COLOR PAVEMENT MARKINGS PRIOR TO REMOVAL AND INSTALLATION. PLACE DRUMS TO DELINEATE ANY EXISTING AND PROPOSED MONOLITHIC ISLANDS AFTER REMOVAL AND BEFORE INSTALLATION.

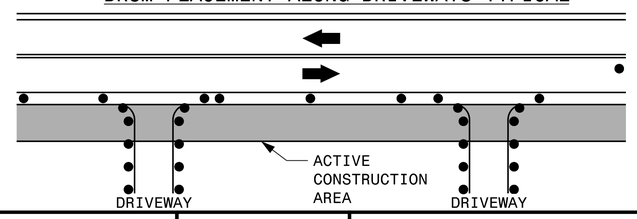
MISCELLANEOUS

GG) LAW ENFORCEMENT SHOULD BE USED ON I-40 (-Y15-/-Y15REV-) & MAY BE USED ON ALL OTHER ROADS TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS AS DIRECTED BY THE ENGINEER.

HH) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE PAVEMENT ENDS" SIGNS (W8-3) 500 FT AND 250 FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF THE ROADWAY ALONG UNPAVED AREAS. ALLOWABLE ROADS TO USE LOOSE GRAVEL WILL BE DETERMINED BY THE ENGINEER.

II) PLACE DRUMS ALONG ALL DRIVEWAYS TO PREVENT TRAFFIC FROM ENTERING ACTIVE CONSTRUCTION AREAS.

DRUM PLACEMENT ALONG DRIVEWAYS TYPICAL



APPROVED: Michelle Ward

DATE: 11/22/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TRANSPORTATION OPERATIONS PLAN

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_tcp.tbl
USER: CHARNDEN DATE: 11/22/2021 TIME: 11:13:44 AM
FILE: pw:\\pwhdrusea01:HDR_US_East_01\Documents\3322\10052629\6.0_CAD_BIM\6.2_Work_In_Progress\U-2579AB\Traffic\TrafficControl\TCP\U2579AB_TC_TMP-01B.dgn

5/14/99

REVISIONS

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

2. THE EXISTING WATER AND SEWER UTILITIES BELONG TO WINSTON-SALEM / FORSYTH COUNTY UTILITIES, UNLESS OTHERWISE NOTED.

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. UNLESS OTHERWISE NOTED:
PIPE FOR PROPOSED WATER MAINS 4" THRU 16" DIAMETER SHALL BE DUCTILE IRON, PC 350.
PIPE FOR PROPOSED WATER MAINS 18" THRU 36" DIAMETER SHALL BE DUCTILE IRON, PC 250.
PIPE FOR PROPOSED SANITARY SEWER SHALL BE DUCTILE IRON, MINIMUM THICKNESS CLASS 50.

2. WATER LINE VALVES SHALL BE RESILIENT-SEAT GATE VALVES CONFORMING TO ANSI/AWWA C509 OR ANSI/AWWA C515, AND SHALL BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI.

3. THE INTERIOR OF PROPOSED SANITARY SEWER LINES SHALL BE LINED WITH A MINIMUM OF 40 MILS OF CORROSION- RESISTANT CERAMIC EPOXY COATING AS DESCRIBED IN THE UC PROJECT SPECIAL PROVISIONS. ALL BELLS AND SPIGOTS FOR SANITARY SEWER PIPE MUST BE LINED WITH A MINIMUM OF 8 MILS OF JOINT COMPOUND.

4. TEMPORARY BYPASS PUMPING OF FLOW IN SOME EXISTING SEWER LINES WILL BE REQUIRED WHEN INSTALLING NEW SEWER LINES IN THE SAME HORIZONTAL ALIGNMENT AS THE EXISTING SEWER LINES, AND WHEN TYING PROPOSED MH'S INTO EXISTING SEWER LINES. SEE DIVISION 15, SECTION 1520-3-A-1 OF THE NCDOT STANDARD SPECIFICATIONS, AND CITY OF WINSTON-SALEM REQUIREMENTS OUTLINED IN THE UTILITY CONSTRUCTION PROJECT SPECIAL PROVISIONS. COSTS FOR TEMPORARY BYPASS PUMPING SHALL BE INCIDENTAL TO THE CONTRACT.

5. THE EXISTING 36" WATER MAIN ALONG -Y16- (GLENN HI ROAD, SR 2679), AS SHOWN ON SHEET UC-10, IS A CRITICAL WATER TRANSMISSION MAIN THAT CANNOT BE OUT OF SERVICE DURING PERIODS OF HIGHER WATER USAGE. NO SHUT-DOWNS OF THE 36" WATER MAIN WILL BE ALLOWED BETWEEN MAY 1ST AND SEPTEMBER 30TH, WHEN WATER USAGE RATES ARE TYPICALLY HIGHER THAN OTHER TIMES OF THE YEAR. ANY SHUT-DOWNS OF THE 36" WATER MAIN WILL BE ONLY AS ALLOWED BY THE WINSTON-SALEM / FORSYTH COUNTY UTILITIES (CITY). THE CONTRACTOR SHALL COORDINATE THE WORK WITH THE CITY AS NECESSARY, AND SHUT-DOWNS SHALL BE PERFORMED OVERNIGHT. SHUT-DOWNS OF THE 36" WATER MAIN WILL BE LIMITED TO EIGHT (8) HOURS, OR AS DIRECTED BY CITY STAFF. THE CONTRACTOR SHALL HAVE SUFFICIENT CREWS, EQUIPMENT, AND VARIETY OF MATERIALS ON HAND AND AVAILABLE TO HANDLE ANY POTENTIAL FIELD ADJUSTMENTS, AND FOR ALL WORK TO BE COMPLETED WITHIN THE ALLOTTED TIMEFRAME. THE CONTRACTOR SHALL CONTACT THE CITY AT LEAST TWO (2) WEEKS IN ADVANCE OF ANY WORK INVOLVING SHUT-DOWNS OF THE 36" WATER MAIN.

6. THE CONTRACTOR SHALL PROVIDE TEMPORARY WATER SERVICE TO CUSTOMERS WHEN EXISTING WATER MAINS HAVE TO BE SHUT DOWN FOR MORE THAN 8 HOURS, OR AS DIRECTED BY THE ENGINEER.

7. THE CONTRACTOR SHALL COORDINATE WITH WINSTON-SALEM / FORSYTH COUNTY UTILITIES STAFF CONCERNING THE TIMING AND SCHEDULE OF REQUIRED SHUT-DOWNS OF ANY EXISTING WATER OR SEWER MAINS.

8. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE TRENCHLESS INSTALLATIONS DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

9. THE CONTRACTOR SHALL REPLACE ANY DAMAGED SEWER LATERALS AND/OR CLEANOUTS AS DIRECTED BY THE ENGINEER. THE NECESSARY QUANTITIES HAVE BEEN ADDED TO THE CONTRACT TO FACILITATE THIS PROCEDURE.

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	UC-3
DESIGNED BY: APL	
DRAWN BY: RDL	
CHECKED BY: APL	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	

NORTH CAROLINA PROFESSIONAL SEAL 29457 ENGINEER ANDREW P. LARRICK
DocuSigned by: Andrew P. Larrick
10/16/2021

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

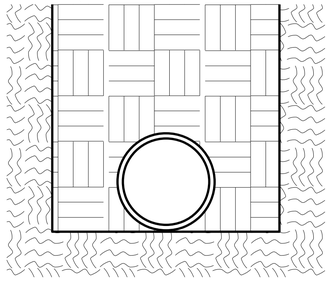
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL ENGINEERS & SURVEYORS dmp
6415 OLD PLANK RD, HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

5/14/99

REVISIONS

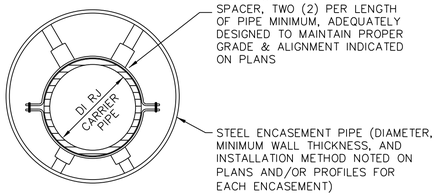
TYPE "2"
(BEDDING FOR D.I. PIPE)



PIPE BEDDED IN FLAT-BOTTOM TRENCH. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

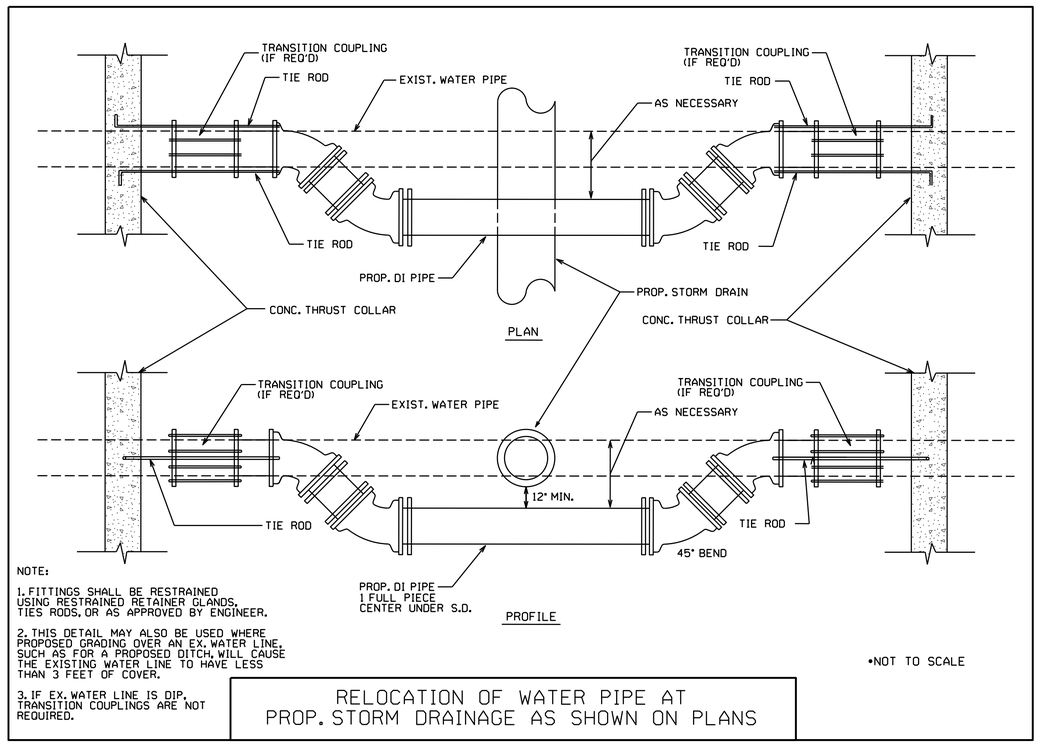
MAXIMUM TRENCH WIDTH
AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		



NOTES:
1. ENCLOSE ENDS WITH BRICK MASONRY.
2. PROVIDE 2" WEEP HOLE AT LOW END OF ENCASEMENT.
3. SEE 2018 NCDOT STANDARD SPECIFICATIONS, DIVISION 15, SECTIONS 1540 AND 1550, FOR OTHER REQUIREMENTS.

TYPICAL ENCASEMENT PIPE SECTION
N.T.S.



NOTE:

1. FITTINGS SHALL BE RESTRAINED USING RESTRAINED RETAINER GLANDS, TIES RODS, OR AS APPROVED BY ENGINEER.

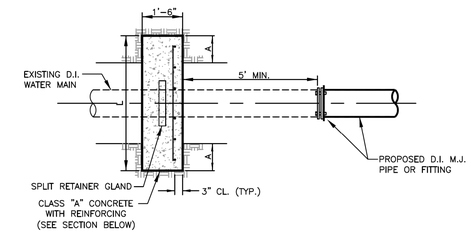
2. THIS DETAIL MAY ALSO BE USED WHERE PROPOSED GRADING OVER AN EX. WATER LINE, SUCH AS FOR A PROPOSED DITCH, WILL CAUSE THE EXISTING WATER LINE TO HAVE LESS THAN 3 FEET OF COVER.

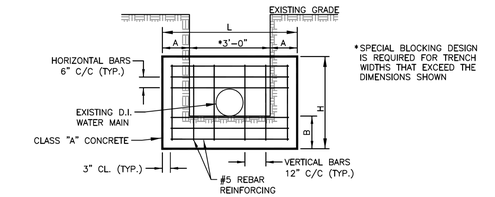
3. IF EX. WATER LINE IS DIP, TRANSITION COUPLINGS ARE NOT REQUIRED.

•NOT TO SCALE

RELOCATION OF WATER PIPE AT PROP. STORM DRAINAGE AS SHOWN ON PLANS

THRUST COLLAR FOR EXISTING PIPE





TRENCH CROSS SECTION

•SPECIAL BLOCKING DESIGN IS REQUIRED FOR TRENCH WIDTHS THAT EXCEED THE DIMENSIONS SHOWN

NOTES:
1. CONCRETE SHALL BE PLACED AND CURED THREE DAYS PRIOR TO REMOVING EXISTING PIPE OR FITTINGS.
2. INSTALL POLYETHYLENE WRAP AROUND EXISTING PIPE PRIOR TO POURING CONCRETE.
3. MAINTAIN 2" CLEAR BETWEEN ALL REBARS AND PIPE.
4. CONCRETE TO BE KEYED IN TO UNDISTURBED SOIL ADJACENT TO TRENCH WALL AND BOTTOM.
5. DESIGN BASED ON MIN. SOIL BEARING OF 2000 PSF. SOFT SOIL CONDITIONS MAY REQUIRE SPECIAL DESIGN.

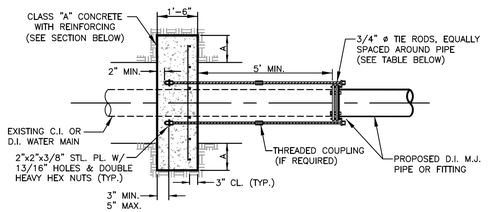
PIPE SIZE (INCHES)	CONCRETE DIMENSIONS (FT)			
	H	L	A	B
6	2.5	5	1	1
8	2.5	5	1	1
12	4	6	1.5	1
16	4	9	3	1
20	5	10	3.5	1
24	5.5	12	4.5	1

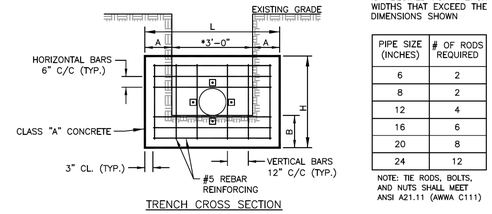
CITY OF WINSTON-SALEM
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

N.T.S. 5-21-18

R:\Data\Utility\Utility Spec Drawings/thrust_restraint.dwg

THRUST HARNESS FOR EXISTING PIPE





TRENCH CROSS SECTION

*SPECIAL BLOCKING DESIGN IS REQUIRED FOR TRENCH WIDTHS THAT EXCEED THE DIMENSIONS SHOWN

PIPE SIZE (INCHES)	# OF RODS REQUIRED
6	2
8	2
12	4
16	6
20	8
24	12

NOTE: TIE RODS, BOLTS, AND NUTS SHALL MEET ANSI A21.11 (AWWA C111)

NOTES:
1. CONCRETE SHALL BE PLACED AND CURED THREE DAYS PRIOR TO REMOVING EXISTING PIPE OR FITTINGS.
2. INSTALL POLYETHYLENE WRAP AROUND EXISTING PIPE PRIOR TO POURING CONCRETE.
3. MAINTAIN 2" CLEAR BETWEEN ALL REBARS AND PIPE.
4. CONCRETE TO BE KEYED IN TO UNDISTURBED SOIL ADJACENT TO TRENCH WALL AND BOTTOM.
5. DESIGN BASED ON MIN. SOIL BEARING OF 2000 PSF. SOFT SOIL CONDITIONS MAY REQUIRE SPECIAL DESIGN.

PIPE SIZE (INCHES)	CONCRETE DIMENSIONS (FT)			
	H	L	A	B
6	2.5	5	1	1
8	2.5	5	1	1
12	4	6	1.5	1
16	4	9	3	1
20	5	10	3.5	1
24	5.5	12	4.5	1

CITY OF WINSTON-SALEM
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

N.T.S. 5-21-18

R:\Data\Utility\Utility Spec Drawings/thrust_restraint.dwg

PROJECT REFERENCE NO.	SHEET NO.
U2579AB	UC-3G
DESIGNED BY: APL	
DRAWN BY: RDL	
CHECKED BY: APL	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	

NORTH CAROLINA PROFESSIONAL SEAL 26457 ENGINEER ANDREW P. LARRICK
DocuSigned by: Andrew P. Larrick
10/16/2021

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL
ENGINEERS & SURVEYORS
6415 OLD PLANK RD. HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	UC-10

DESIGNED BY: DMP
DRAWN BY: DMP
CHECKED BY: DMP
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026457 ANDREW P. LARRICK
DocuSigned by: Andrew P. Larrick
10/16/2021

UTILITY CONSTRUCTION PLANS ONLY

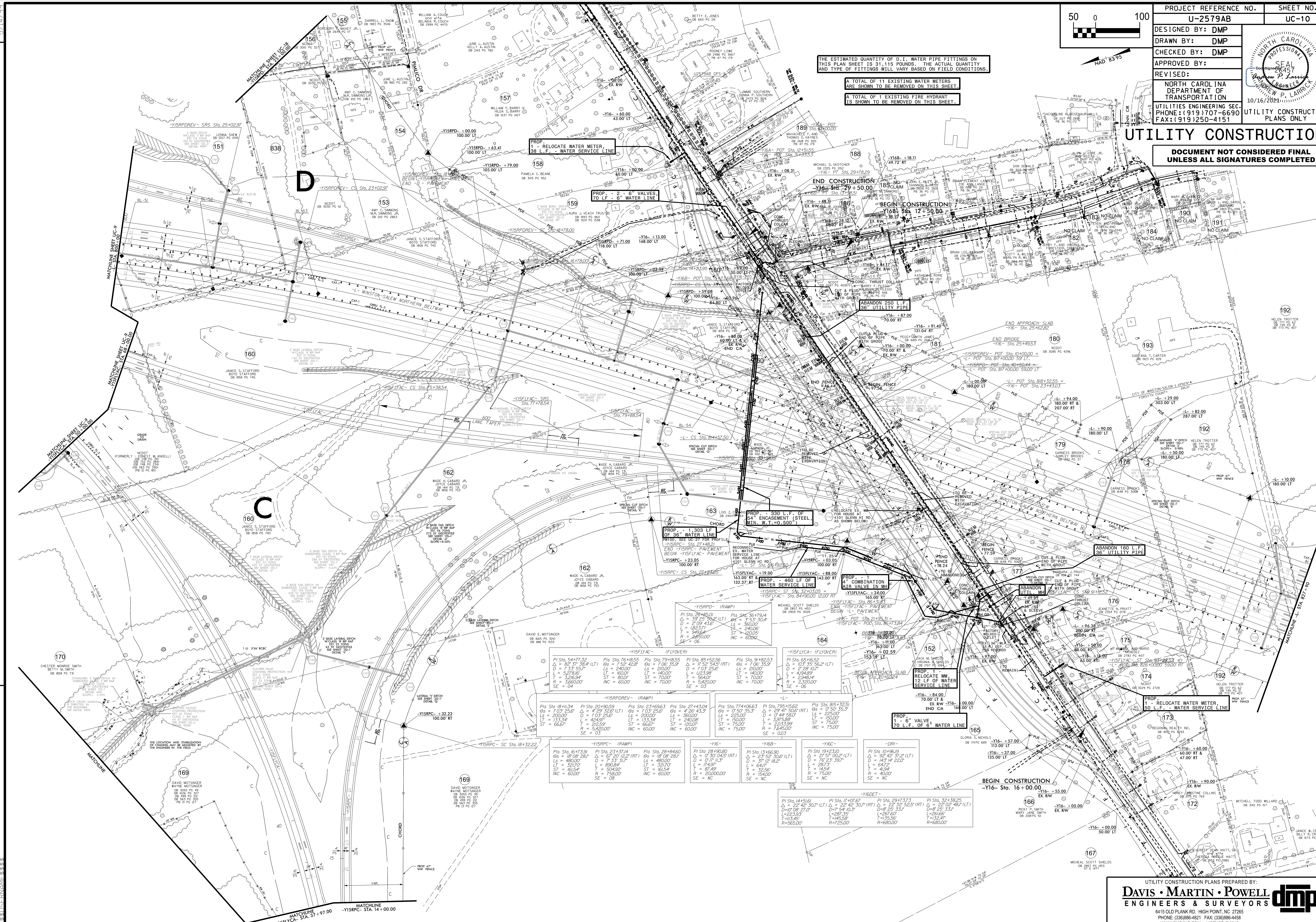
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THE ESTIMATED QUANTITY OF D.I. WATER PIPE FITTINGS ON THIS PLAN SHEET IS 31,115 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

A TOTAL OF 11 EXISTING WATER METERS ARE SHOWN TO BE REMOVED ON THIS SHEET.

A TOTAL OF 1 EXISTING FIRE HYDRANT IS SHOWN TO BE REMOVED ON THIS SHEET.



-Y15RPD- (RAMP)

PI Sta. 26+85.01	PIs Sta. 36+79.14
Δ = 39° 25' 50.2" (LT)	θs = 3° 53' 30.4"
D = 2° 09' 43.6"	Ls = 360.00'
L = 1,823.71'	LT = 240.06'
T = 949.64'	ST = 120.05'
R = 2,650.00'	INC = 60.00'
SE = 06	

-Y15FLYAC- (FLYOVER)

PI Sta. 54+77.32	PIs Sta. 76+18.55	PIs Sta. 79+18.55	PI Sta. 85+52.56	PIs Sta. 91+82.53
Δ = 82° 37' 38.4" (LT)	θs = 1° 52' 42.8"	θs = 1° 06' 35.9"	Δ = 11° 52' 54.5" (RT)	θs = 1° 06' 35.9"
D = 1° 33' 55.7"	Ls = 240.00'	Ls = 210.00'	D = 1° 03' 25.6"	Ls = 210.00'
L = 5,278.16'	LT = 160.01'	LT = 140.00'	L = 1,123.98'	LT = 140.00'
T = 3,216.94'	ST = 80.01'	ST = 70.00'	T = 564.01'	ST = 70.00'
R = 3,660.00'	INC = 60.00'	INC = 70.00'	R = 5,420.00'	INC = 70.00'
SE = 04			SE = 03	

-Y15FLYCA- (FLYOVER)

PI Sta. 65+16.52
Δ = 103° 35' 56.2" (LT)
D = 2° 28' 10.7"
L = 4,194.89'
T = 2,948.14'
R = 2,320.00'
SE = 06

-Y15RPDREV- (RAMP)

PIs Sta 18+11.34	PI Sta 20+90.59	PIs Sta 23+69.63	PIs Sta 27+43.04
θs = 1° 03' 25.6"	Δ = 4° 29' 32.6" (LT)	θs = 1° 03' 25.6"	θs = 4° 26' 43.3"
Ls = 200.00'	D = 1° 03' 25.6"	Ls = 200.00'	Ls = 360.00'
LT = 133.34'	L = 424.97'	LT = 133.34'	LT = 240.08'
ST = 66.67'	T = 212.59'	ST = 66.67'	ST = 120.07'
	R = 5,420.00'	INC = 60.00'	INC = 60.00'
	SE = 03		

-L-

PIs Sta. 774+06.63	PI Sta. 795+15.62	PIs Sta. 815+32.51
θs = 0° 50' 35.3"	Δ = 29° 47' 50.6" (RT)	θs = 0° 50' 35.3"
Ls = 225.00'	D = 0° 44' 58.0"	Ls = 225.00'
LT = 150.00'	L = 3,975.88'	LT = 150.00'
ST = 75.00'	T = 2,033.99'	ST = 75.00'
INC = 75.00'	R = 7,645.00'	INC = 75.00'
	SE = 0.03	

-Y15RPC- (RAMP)

PIs Sta. 16+73.91	PI Sta. 23+37.14	PIs Sta. 28+84.60
θs = 18° 08' 28.1"	Δ = 67° 20' 12.2" (RT)	θs = 18° 08' 28.1"
Ls = 480.00'	D = 7° 33' 31.7"	Ls = 480.00'
LT = 321.70'	L = 890.84'	LT = 321.70'
ST = 161.54'	T = 504.92'	ST = 161.54'
INC = 60.00'	R = 758.00'	INC = 60.00'
	SE = 08	

-Y16-	-Y16B-	-Y16C-	-DRI-
PI Sta 28+90.80	PI Sta 13+66.90	PI Sta 19+23.10	PI Sta 10+96.19
Δ = 0° 30' 04.5" (RT)	Δ = 23° 52' 30.6" (LT)	Δ = 21° 57' 00.2" (LT)	Δ = 92° 42' 37.2" (LT)
D = 0° 17' 11.3"	D = 37° 12' 18.2"	D = 76° 23' 39.7"	D = 143° 14' 22.0"
L = 174.97'	L = 64.17'	L = 28.73'	L = 64.72'
T = 87.49'	T = 32.56'	T = 14.54'	T = 41.94'
R = 20,000.00'	R = 154.00'	R = 75.00'	R = 40.00'
SE = NC	SE = NC	SE = NC	SE = NC

-Y16DET-

PI Sta. 14+51.61	PI Sta. 17+07.67	PI Sta. 29+73.73	PI Sta. 32+38.25
Δ = 22° 42' 30.7" (LT)	Δ = 22° 42' 30.7" (RT)	Δ = 22° 32' 52.5" (RT)	Δ = 22° 02' 48.1" (LT)
D=10° 08' 27.0"	D=7° 54' 10.3"	D=8° 25' 33.1"	D=8° 25' 33.1"
L=223.93'	L=287.35'	L=267.60'	L=261.66'
T=113.45'	T=145.58'	T=135.56'	T=132.47'
R=565.00'	R=725.00'	R=680.00'	R=680.00'

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS · MARTIN · POWELL
ENGINEERS & SURVEYORS
6415 OLD PLANK RD, HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

$$$$$$SYSTIME$$$$$
$$$$$$$$DGN$$$$$$$$$$$$$$
$$$$USERNAME$$$$

5/14/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	UC-10A
DESIGNED BY: DMP	
DRAWN BY: DMP	
CHECKED BY: DMP	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	

NORTH CAROLINA PROFESSIONAL SEAL 26457 ENGINEER ANDREW P. LARRICK
10/16/2021

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE:
THIS SHEET IS A 1"=50' SCALE INSET OF THE UPPER RIGHT PORTION OF SHEET UC-10, FOR CLARITY.

25 0 50

INSET FOR WATER LINE TIE-INS AT GLENN HI ROAD AND YEATON GLENN DRIVE
SCALE: 1"=20'

NAD 83/95

PROP. 1 - RELOCATE WATER METER, 38 L.F. - WATER SERVICE LINE

PROP. - 2 - 6" VALVES, 70 LF - 6" WATER LINE

ABANDON 250 L.F. 36" UTILITY PIPE

END CONSTRUCTION -Y16- Sta. 29+50.00

BEGIN CONSTRUCTION -Y16B- Sta. 12+50.00

END APPROACH SLAB -Y16- Sta. 25+62.82

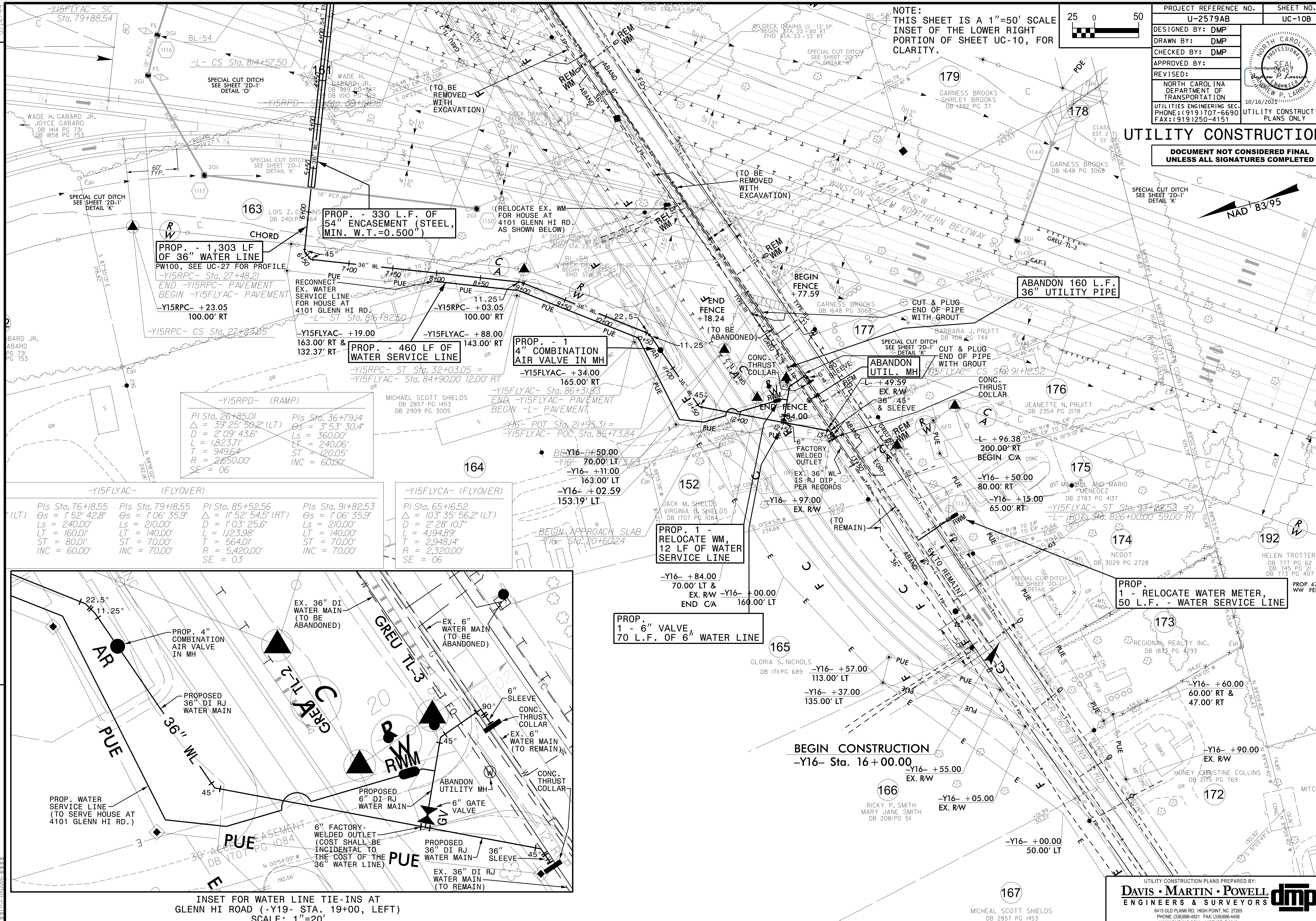
END BRIDGE -Y16- Sta. 25+49.53

-Y15RPDREV- POT Sta. 10+00.00 = -L- POT Sta. 817+00.00 59' LT.

-Y15RPD- POT Sta. 40+50.44 = -L- POT Sta. 817+00.00 59.00' LT

-L- POT Sta. 818+32.55 -Y16- POT Sta. 23+4

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL ENGINEERS & SURVEYORS dmp
6415 OLD PLANK RD, HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245



PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	UC-13
DESIGNED BY: DMP	
DRAWN BY: DMP	
CHECKED BY: DMP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 036457 ENGINEER ANDREW P. LARRICK
10/16/2021

UTILITY CONSTRUCTION PLANS ONLY

25 0 50

NAD 83/95

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THE ESTIMATED QUANTITY OF D.I. WATER PIPE FITTINGS ON THIS PLAN SHEET IS 750 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

END CONSTRUCTION
–Y4D– Sta. 11+00.00

PROP.
1 - RELOCATE WATER METER,
71 LF - WATER SERVICE LINE

PROP.
1 - RELOCATE WATER METER,
16 LF - WATER SERVICE LINE

PROP. - 35 LF
6" WATER LINE

PROP.
1 - RELOCATE WATER METER,
72 LF - WATER SERVICE LINE

PROP. - 10 LF
6" WATER LINE

PROP.
2 - RELOCATE WATER METERS,
123 LF - WATER SERVICE LINE

PROP.
1- REMOVE F.H.,
1 - FIRE HYDRANT,
37 LF F.H. LEG

END CONSTRUCTION
–Y4– Sta. 60+00.00

WILLA PLACE DR

ON THIS PLAN SHEET, THE ESTIMATED QUANTITY OF SANITARY SEWER CLEANOUTS IS 2 EACH, AND THE ESTIMATED QUANTITY OF SEWER SERVICE LINE IS 180 L.F. THE ACTUAL QUANTITIES WILL VARY BASED ON FIELD CONDITIONS.

PARCELS WHERE SEWER SERVICES MAY NEED RELOCATION:
PARCEL 358 – 4426 KERNERSVILLE ROAD (LONG SIDE)
PARCEL 359 – 4430 KERNERSVILLE ROAD (LONG SIDE)

MATCHLINE SHEET UC-12 –Y4– STA. 53+50.00

REVISIONS

5/14/99

UTILITY CONSTRUCTION PLANS PREPARED BY:
DAVIS • MARTIN • POWELL
ENGINEERS & SURVEYORS
6415 OLD PLANK RD. HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

BEGIN TIP PROJECT U-2579AB
-L- STA. 692+32.98

END TIP PROJECT U-2579AB
-L- STA. 836+32.44

INDEX

STR. NO.	STATION	DESCRIPTION	SHEETS
S1	STA. 22+26.35 -Y1B STA. 703+89.11 -L-	BRIDGE ON SR 2632 OVER WINSTON-SALEM NORTHERN BELTWAY	S1-1 THRU S1-47
S2	STA. 30+67.66 -Y4- STA. 722+96.09 -L-	BRIDGE ON SR 4315 OVER WINSTON-SALEM NORTHERN BELTWAY	S2-1 THRU S2-37
S3	STA. 47+28.33 -Y15REV- STA. 788+92.10 -L-	BRIDGE ON I-40 BYPASS OVER WINSTON-SALEM NORTHERN BELTWAY	S3-1 THRU S3-61
S4	STA. 60+66.06 -Y15FLYAC- STA. 793+45.42 -L-	BRIDGE ON -Y15FLYAC- IN INTERCHANGE CONNECTING WINSTON-SALEM NORTHERN BELTWAY & I-40 BYPASS	S4-1 THRU S4-144
S5	STA. 47+63.62 -Y15FLYBD- STA. 795+32.16 -L-	BRIDGE ON -Y15FLYBD- IN INTERCHANGE CONNECTING WINSTON-SALEM NORTHERN BELTWAY & I-40 BYPASS	S5-1 THRU S5-116
S6	STA. 58+33.94 -Y15FLYCA- STA. 792.28.12 -L-	BRIDGE ON -Y15FLYCA- IN INTERCHANGE CONNECTING WINSTON-SALEM NORTHERN BELTWAY & I-40 BYPASS	S6-1 THRU S6-129
S7	STA. 23+43.03 -Y16- STA. 818+32.55 -L-	BRIDGE ON SR 2679 OVER WINSTON-SALEM NORTHERN BELTWAY	S7-1 THRU S7-48
C1	STA. 768+62.23 -L-	DOUBLE 12' X 10' RCBC	C1-1 THRU C1-11
C2	STA. 792+88.12 -L-	SINGLE 6' X 7' RCBC	C2-1 THRU C2-6
C3	STA. 43+66.60 -Y15FLYCA-	SINGLE 5' X 6' RCBC	C3-1 THRU C3-5

STR. NO.	STATION	DESCRIPTION	SHEETS
C4	STA. 30+13.47 -Y15REV-	SINGLE 8' X 6' RCBC	C4-1 THRU C4-6
C5	STA. 18+22.67 -Y5B-	TRIPLE 12' X 7' RCBC	C5-1 THRU C5-9
C6	STA. 19+75.11 -Y5B-	SINGLE 7' X 8' RCBC	C6-1 THRU C6-5
C7	STA. 35+53.70 -Y15RPDREV-	SINGLE 6' X 7' RCBC	C7-1 THRU C7-7
W1	STA. 29+93.81 -Y4-	MSE RETAINING WALL @ STR. 2 END BENT 1	W-1 THRU W-5
W2	STA. 31+41.50 -Y4-	MSE RETAINING WALL @ STR. 2 END BENT 2	
SBW1	STA. 21+60.00 -Y4RPC-	-NW11/13-	1 THRU 6
SBW2	STA. 19+40.00 -Y15RPA-	-NW15/16-	
SBW3	STA. 17+63.79 -Y15-	-NW17/18/19-	
SBW4	STA. 70+01.05 -Y15FLYBD-	-NW24/25-	

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$