Transportation

PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

June 7, 2016

Addendum No. 1
RE: Contract # C203567
WBS # 34915.3.FR1
F. A. # STP-55(20)
Durham County (U-3308)
NC-55 (ALSTON AVE) FROM NC-147 (BUCK DEAN FREEWAY) TO NORTH OF US-70BUS/NC-98 (HOLLOWAY ST)

June 21, 2016 Letting

To Whom It May Concern:

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

The following revisions has been made to the plans:

Sheet No.	Revisions
3D-1 thru 3D-11	Pipe Quantities revised as described below
4, 7, 11, 12, 13	References to DI Pipe removed

Please void Sheet Nos. 3D-1 thru 3D-11 and 4, 7, 11, 12, 13 in your plans and staple the revised Sheet Nos. 3D-1 thru 3D-11 and 4, 7, 11, 12, 13 thereto.

The following revisions have been made to the proposal:

Page No.	Revisions
R-4	The Project Special Provision "SPECIAL SEALED DRAINAGE SYSTEM" has been deleted. The subsequent pages have been renumbered accordingly

Please void the Proposal Cover and the affected pages in your proposal and replace with the revised pages.

On the item sheets the following pay item quantity changes have been made:

Item	Description	Old Quantity	New Quantity
0024-0448200000-E-310	15" RC Pipe Culverts, Class IV	5,472 LF	6,796 LF
0025-0448300000-E-310	18" RC Pipe Culverts, Class IV	592 LF	704 LF
0026-0448400000-E-310	24" RC Pipe Culverts, Class IV	1,836 LF	1,912 LF
0028-0448600000-E-310	36" RC Pipe Culverts, Class IV	164 LF	204 LF
0029-0448700000-E-310	42" RC Pipe Culverts, Class IV	820 LF	1,108 LF

On the item sheets the following pay items have been deleted:

Item	Description	Quantity
0032-0986000000-E-SP	15" Ductile Iron Pipe	1,324 LF
0034-0986000000-E-SP	18" Ductile Iron Pipe	112 LF
0035-0986000000-E-SP	24" Ductile Iron Pipe	76 LF
0037-0986000000-E-SP	36" Ductile Iron Pipe	40 LF
0038-0986000000-E-SP	42" Ductile Iron Pipe	288 LF

The Contractor's bid must include these pay item quantity changes. The contract will be prepared accordingly.

The Expedite File has been updated to reflect these revisions. Please download the Expedite Addendum File and follow the instructions for applying the addendum. Bid Express will not accept your bid unless the addendum has been applied.

Sincerely,

DocuSigned by:
Randy A Garris
A7079FC32A09478...

R. A. Garris, PE
Contract Officer

RAG/jjr

cc: Mr. Ron Hancock, PE
Mr. Joey Hopkins, PE
Mr. Rodger Rochelle, PE
Mr. R.E. Davenport, PE
Ms. Jaci Kincaid
Project File (2)
Mr. Ray Arnold, PE
Ms. Theresa Canales, PE
Ms. Marsha Sample
Mr. Mike Gwyn
Ms. Penny Higgins
Ms. Lori Strickland

(2) Trench Blasting

(a) Do not use trench blast holes more than 3" in diameter
(b) Do not use ANFO or other bulk loaded products
(c) Use cartridge explosives or other explosive types designed for trench blasting
(d) Use charges with a diameter of 1/2" to 3/4" less than the trench blast hole diameter

PIPE INSTALLATION:
(11-20-12) (Rev. 8-18-15) 300 SP3 R01

Revise the *2012 Standard Specifications* as follows:

Page 3-1, Article 300-2, Materials, line 15, in the materials table, replace "Flowable Fill" and "Geotextiles" with the following:

Item	Section
Flowable Fill, Excavatable	1000-6
Grout, Type 2	1003
Geotextiles, Type 4	1056

Page 3-1, Article 300-2, Materials, lines 23-24, replace sentence with the following:

Provide foundation conditioning geotextile and geotextile to wrap pipe joints in accordance with Section 1056 for Type 4 geotextile.

Page 3-3, Subarticle 300-6(A), Rigid Pipe, line 2, in the first paragraph, replace "an approved non-shrink grout." with "grout." and line 4, in the second paragraph, replace "filtration geotextile" with "geotextile".

Page 3-3, Article 300-7, Backfilling, lines 37-38, in the first and second sentences of the fifth paragraph, replace "Excavatable flowable fill" with "Flowable fill".

FLOWABLE FILL:
(9-17-02) (Rev 1-17-12) 300, 340, 450, 1000, 1530, 1540, 1550 SP3 R30

Description

This work consists of all work necessary to place flowable fill in accordance with these provisions, the plans, and as directed.

Materials

Refer to Division 10 of the *2012 Standard Specifications*.

Item	Section
Flowable Fill	1000-6

Construction Methods

Discharge flowable fill material directly from the truck into the space to be filled, or by other approved methods. The mix may be placed full depth or in lifts as site conditions dictate. The Contractor shall provide a method to plug the ends of the existing pipe in order to contain the flowable fill.

Measurement and Payment

At locations where flowable fill is called for on the plans and a pay item for flowable fill is included in the contract, *Flowable Fill* will be measured in cubic yards and paid as the actual number of cubic yards that have been satisfactorily placed and accepted. Such price and payment will be full compensation for all work covered by this provision including, but not limited to, the mix design, furnishing, hauling, placing and containing the flowable fill.

Payment will be made under:

Pay Item	Pay Unit
Flowable Fill	Cubic Yard

BRIDGE APPROACH FILLS:

(10-19-10) (Rev. 1-17-12) 422 SP4 R02

Description

Bridge approach fills include bridge approach fills for sub regional tier bridges and reinforced bridge approach fills. Construct bridge approach fills in accordance with the contract and Standard Drawing No. 422.10 or 422.11 of the *2012 Roadway Standard Drawings*. Define "geosynthetics" as geotextiles or geomembranes.

Materials

Refer to Division 10 of the *2012 Standard Specifications*.

Item	Section
Anchor Pins	1056-2
Geotextiles	1056
Portland Cement Concrete	1000
Select Material	1016
Subsurface Drainage Materials	1044
Wire Staples	1060-8(D)

For bridge approach fills for sub regional tier bridges, provide Type 1 geotextile for filtration geotextiles. For reinforced bridge approach fills, provide Type 5 geotextile for geotextile reinforcement and Type 1 geotextile and No. 78M stone for drains. Use Class B concrete for concrete pads.

Use Class III or V select material for reinforced bridge approach fills and only Class V select material (standard size No. 78M stone) for bridge approach fills for sub regional tier bridges. Provide PVC pipes, fittings and outlet pipes for subsurface drainage materials. For drains and PVC pipes behind end bents, use pipes with perforations that meet AASHTO M 278.

Use PVC, HDPE or linear low density polyethylene (LLDPE) geomembranes for reinforced bridge approach fills. For PVC geomembranes, provide grade PVC30 geomembranes that meet ASTM D7176. For HDPE and LLDPE geomembranes, use geomembranes with a nominal thickness of at least 30 mils that meet Geosynthetic Research Institute Standard Specifications GM13 or GM17, respectively. Handle and store geomembranes in accordance with Article 1056-2 of the *2012 Standard Specifications*. Provide material certifications for geomembranes in accordance with Article 1056-3 of the *2012 Standard Specifications*.

Construction Methods

Excavate as necessary for bridge approach fills in accordance with the contract. Notify the Engineer when foundation excavation is complete. Do not place geomembranes or filtration geotextiles until excavation dimensions and foundation material are approved. Attach geomembranes and filtration geotextiles to end bent cap back and wing walls with adhesives, tapes or other approved methods. Glue or weld geomembrane seams to prevent leakage.

For reinforced bridge approach fills, place geotextile reinforcement within 3" of locations shown in Standard Drawing No. 422.10 of the *2012 Roadway Standard Drawings* and in slight tension free of kinks, folds, wrinkles or creases. Install geotextile reinforcement with the orientation, dimensions and number of layers shown in Standard Drawing No. 422.10 of the *2012 Roadway Standard Drawings*. Place first layer of geotextile reinforcement directly on geomembranes with no void or material in between. Install geotextile reinforcement with the machine direction (MD) parallel to the roadway centerline. The MD is the direction of the length or long dimension of the geotextile roll. Do not splice or overlap geotextile reinforcement in the MD so seams are perpendicular to the roadway centerline. Wrap geotextile reinforcement at end bent cap back and wing walls as shown in Standard Drawing No. 422.10 of the *2012 Roadway Standard Drawings* and directed by the Engineer. Extend geotextile reinforcement at least 4 ft back behind end bent cap back and wing walls into select material.

Overlap adjacent geotextiles at least 18" with seams oriented parallel to the roadway centerline. Hold geotextiles in place with wire staples or anchor pins as needed. Contact the Engineer when existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with geosynthetics.

For reinforced bridge approach fills, construct one foot square drains consisting of 4" diameter continuous perforated PVC pipes surrounded by No. 78M stone wrapped in Type 1 geotextiles. Install drains in accordance with Standard Drawing No. 422.10 of the *2012 Roadway Standard Drawings*. For bridge approach fills for sub regional tier bridges, install 4" diameter continuous perforated PVC drain pipes in accordance with Standard Drawing No. 422.11 of the *2012 Roadway Standard Drawings*.

Use solvent cement to connect PVC pipes so joints do not leak. Connect perforated pipes to outlet pipes just behind wing walls. Provide drain pipes and drains with positive drainage towards outlets. Place pipe sleeves in or under wing walls for outlet pipes so positive drainage is maintained. Use sleeves that can withstand wing wall loads.

Place select material in 8" to 10" thick lifts. Use only hand operated compaction equipment to compact select material for bridge approach fills. Compact Class III select material in accordance with Subarticle 235-3(C) of the *2012 Standard Specifications*. Compact No. 78M stone with a vibratory compactor to the satisfaction of the Engineer. Do not displace or damage geosynthetics, drain pipes or drains when placing and compacting select material. End dumping directly on geosynthetics is not permitted. Do not operate heavy equipment on geosynthetics, drain pipes or drains until they are covered with at least 8" of select material. Replace any damaged geosynthetics, drain pipes or drains to the satisfaction of the Engineer.

Cover open ends of outlet pipes with rodent screens as shown in Standard Drawing No. 815.03 of the *2012 Roadway Standard Drawings*. Connect ends of outlet pipes to concrete pads or existing drainage structures as directed by the Engineer. Construct concrete pads with an Ordinary surface finish that meets Subarticle 825-6(B) of the *2012 Standard Specifications*.

Measurement and Payment

Reinforced Bridge Approach Fill, Station ____ will be paid at the contract lump sum price. The contract lump sum price for *Reinforced Bridge Approach Fill, Station* ____ will be full compensation for labor, tools, equipment and reinforced bridge approach fill materials, excavating, backfilling, hauling and removing excavated materials, compacting select material, connecting outlet pipes to existing drainage structures and supplying select materials, geosynthetics, drains, pipe sleeves and outlet components and any incidentals necessary to construct all reinforced bridge approach fills at each bridge.

Bridge Approach Fill - Sub Regional Tier, Station ____ will be paid at the contract lump sum price. The contract lump sum price for *Bridge Approach Fill - Sub Regional Tier, Station* ____ will be full compensation for labor, tools, equipment and bridge approach fill materials, excavating, backfilling, hauling and removing excavated materials, compacting No. 78M stone, connecting outlet pipes to existing drainage structures and supplying No. 78M stone, filtration geotextiles, drain pipes, pipe sleeves and outlet components and any incidentals necessary to construct all bridge approach fills at each sub regional tier bridge.

Payment will be made under:

Pay Item	**Pay Unit**
Reinforced Bridge Approach Fill, Station ____	Lump Sum
Bridge Approach Fill - Sub Regional Tier, Station ____	Lump Sum

CLASS IV SUBGRADE STABILIZATION IN LIEU OF CHEMICAL STABILIZATION:

(6-16-15) 501, 542 SP05 R017

Description

In lieu of chemical stabilization, provide Class IV Subgrade Stabilization by replacing 8" of subgrade soils with geotextile and Class IV select material. This substitution is allowed in full typical section width and cannot result in chemically stabilized sections less than 1,000 feet in length, unless otherwise approved by the Engineer. Notify the Engineer at least 30 days in advance of starting Class IV Subgrade Stabilization in lieu of Chemical Stabilization.

Materials

Refer to the *2012 Standard Specifications*.

Item	Section
Geotextile for Soil Stabilization, Type 4	1056
Select Material, Class IV	1016

Use Class IV Select Material for Class IV Subgrade Stabilization.

Construction Methods

Install geotextile for soil stabilization in accordance with Article 270-3 in the *2012 Standard Specifications*. Place Class IV subgrade stabilization (standard size no. ABC) by end dumping ABC on geotextiles. Do not operate heavy equipment on geotextiles until geotextiles are covered with Class IV subgrade stabilization. Compact ABC to 97% of AASHTO T 180 as modified by the Department.

Maintain Class IV subgrade stabilization in an acceptable condition and minimize the use of heavy equipment on ABC in order to avoid damaging aggregate subgrades. Provide and maintain drainage ditches and drains as required to prevent entrapping water in aggregate subgrades.

Measurement and Payment

Class IV Subgrade Stabilization in Lieu of Chemical Stabilization will be paid at the prices established in the contract that relate to the chemical stabilization type that is being replaced (Lime or Cement). No direct payment will be made for additional excavation required to accommodate this alternate.

The total amount paid for this subgrade stabilization alternative will be limited to the contract amounts per square yard for replacement for Portland cement or lime, theoretical tons of Portland cement or lime replaced, mixing of cement or lime, and theoretical gallons of asphalt curing seal replaced at the rate of 0.15 gallons per square yard.

A Supplement Agreement will be executed prior to starting the work to create a square yard price for the *Class IV Subgrade Stabilization in Lieu of Chemical Stabilization* and deleting the quantities associated with the work being replaced.

BRICK PAVERS ON CONCRETE BASE WITH BORDER:
(01-30-14) SPD08(REV)-

General

This provision covers 4" Concrete Base and Concrete Border with Brick Pavers. All applicable sections of the Standard Specifications Section 825, Incidental Concrete Construction - General and Section 848, Concrete Sidewalks, Driveways and Wheelchair Ramps shall apply.

Materials

See Standard Specifications Section 848 for concrete specifications. Submit sample (at least 3 paver units but enough to show color variations that will be provided in the full installation) for approval prior to beginning installation.

Pavers shall be first class representation of the type specified and meet all applicable standard specifications of the brick paver industry.

Construction

Remove all construction and vegetative debris and add and compact subgrade material in area to be paved. Construct expansion joints and place groove joints as directed in Section 825-10 of the Standard Specifications and as detailed in Section 848.01 of the Standard Drawings. Drill drainage holes in concrete base as detailed on the plans. Dimensions shall be as shown on plans unless field conditions necessitate changes. Any revisions will be at the direction of the Engineer in the field.

Form banding with stepped concrete pavement beneath to accommodate paver depth as shown on plans and details. Install pavers within the concrete pavement as detailed on the plans and details. Lay pavers on full sand bed. Joints will be tight. Install pavers so that surface level of pavers and concrete border create a smooth continuous surface with no raised edges and no changes in level other than the intended surface slope for drainage.

Measurement and Payment

Brick Pavers on Concrete Base with Border will be paid for as the actual square feet of pavers installed and accepted. Pavers will be measured along the surface of the completed and accepted work. Such price includes, but is not limited to preparing site and subgrade, and furnishing and placing concrete, sand bed, and brick pavers.

Payment will be made under:

Pay Item	**Pay Unit**
Brick Paver on Concrete Base with Border	Square Foot

ASPHALT PAVEMENTS - SUPERPAVE:
(6-19-12) (Rev. 1-19-16) 605, 609, 610, 650 SP6 R01

Revise the *2012 Standard Specifications* as follows:

Page 6-3, Article 605-7, APPLICATION RATES AND TEMPERATURES, replace this article, including Table 605-1, with the following:

Apply tack coat uniformly across the existing surface at target application rates shown in Table 605-1.

TABLE 605-1
APPLICATION RATES FOR TACK COAT

Existing Surface	Target Rate (gal/sy)
	Emulsified Asphalt
New Asphalt	0.04 ± 0.01
Oxidized or Milled Asphalt	0.06 ± 0.01
Concrete	0.08 ± 0.01

Apply tack coat at a temperature within the ranges shown in Table 605-2. Tack coat shall not be overheated during storage, transport or at application.

TABLE 605-2
APPLICATION TEMPERATURE FOR TACK COAT

Asphalt Material	Temperature Range
Asphalt Binder, Grade PG 64-22	350 - 400°F
Emulsified Asphalt, Grade RS-1H	130 - 160°F
Emulsified Asphalt, Grade CRS-1	130 - 160°F
Emulsified Asphalt, Grade CRS-1H	130 - 160°F
Emulsified Asphalt, Grade HFMS-1	130 - 160°F
Emulsified Asphalt, Grade CRS-2	130 - 160°F

Page 6-7, Article 609-3, FIELD VERIFICATION OF MIXTURE AND JOB MIX FORMULA ADJUSTMENTS, lines 35-37, delete the second sentence of the second paragraph.

Page 6-18, Article 610-1 DESCRIPTION, lines 40-41, delete the last sentence of the last paragraph.

Page 6-19, Subarticle 610-3(A), Mix Design-General, line 5, add the following as the first paragraph:

Warm mix asphalt (WMA) is allowed for use at the Contractor's option in accordance with the NCDOT Approved Products List for WMA Technologies available at:

https://connect.ncdot.gov/resources/Materials/MaterialsResources/Warm%20Mix%20Asphalt%20Approved%20List.pdf

Page 6-20, Subarticle 610-3(C), Job Mix Formula (JMF), lines 47-48, replace the last sentence of the third paragraph with the following:

The JMF mix temperature shall be within the ranges shown in Table 610-1 unless otherwise approved.

Page 6-21, Subarticle 610-3(C) Job Mix Formula (JMF), replace Table 610-1 with the following:

TABLE 610-1
MIXING TEMPERATURE AT THE ASPHALT PLANT

Binder Grade	JMF Mix Temperature
PG 58-28; PG 64-22	250 - 290°F
PG 70-22	275- 305°F
PG 76-22	300- 325°F

Page 6-21, Subarticle 610-3(C) Job Mix Formula (JMF), lines 1-2, in the first sentence of the first paragraph, delete "and compaction". Lines 4-7, delete the second paragraph and replace with the following:

When RAS is used, the JMF mix temperature shall be established at 275°F or higher.

Page 6-22, Article 610-4, WEATHER, TEMPERATURE AND SEASONAL LIMITATIONS FOR PRODUCING AND PLACING ASPHALT MIXTURES, lines 15-17, replace the second sentence of the first paragraph with the following:

Do not place asphalt material when the air or surface temperatures, measured at the location of the paving operation away from artificial heat, do not meet Table 610-5.

Page 6-23, Article 610-4, WEATHER, TEMPERATURE AND SEASONAL LIMITATIONS FOR PRODUCING AND PLACING ASPHALT MIXTURES, replace Table 610-5 with the following:

TABLE 610-5
PLACEMENT TEMPERATURES FOR ASPHALT

Asphalt Concrete Mix Type	Minimum Surface and Air Temperature
B25.0B, C	35°F
I19.0B, C, D	35°F
SF9.5A, S9.5B	40°F[A]
S9.5C, S12.5C	45°F[A]
S9.5D, S12.5D	50°F

A. For the final layer of surface mixes containing recycled asphalt shingles (RAS), the minimum surface and air temperature shall be 50°F.

Page 6-23, Subarticle 610-5(A), General, lines 33-34, replace the last sentence of the third paragraph with the following:

Produce the mixture at the asphalt plant within ±25 °F of the JMF mix temperature. The temperature of the mixture, when discharged from the mixer, shall not exceed 350°F.

Page 6-26, Article 610-7, HAULING OF ASPHALT MIXTURE, lines 22-23, in the fourth sentence of the first paragraph replace "so as to overlap the top of the truck bed and" with "to". Line 28, in the last paragraph, replace "+15 °F to -25 °F of the specified JMF temperature." with "±25 °F of the specified JMF mix temperature."

Page 6-26, Article 610-8, SPREADING AND FINISHING, line 34, add the following new paragraph:

As referenced in Section 9.6.3 of the *HMA/QMS Manual*, use the automatic screed controls on the paver to control the longitudinal profile. Where approved by the Engineer, the Contractor has the option to use either a fixed or mobile string line.

Page 6-29, Article 610-13, FINAL SURFACE TESTING AND ACCEPTANCE, line 39, add the following after the first sentence in the first paragraph:

Smoothness acceptance testing using the inertial profiler is not required on ramps, loops and turn lanes.

Page 6-30, Subarticle 610-13(A), Option 1 – Inertial Profiler, lines 15-16, replace the fourth sentence of the fourth paragraph with the following:

The interval at which relative profile elevations are reported shall be 2".

Page 6-30, Subarticle 610-13(A), Option 1 – Inertial Profiler, lines 25-28, replace the ninth paragraph with the following:

Operate the profiler at any speed as per the manufacturer's recommendations to collect valid data.

Page 6-30, Subarticle 610-13(A), Option 1 – Inertial Profiler, lines 30-31, delete the third sentence of the tenth paragraph.

Page 6-31, Subarticle 610-13(A), Option 1 – Inertial Profiler, lines 11-13, replace the first sentence of the third paragraph with the following:

After testing, transfer the profile data from the profiler portable computer's hard drive to a write once storage media (Flash drive, USB, DVD-R or CD-R) or electronic media approved by the Engineer.

Page 6-31, Subarticle 610-13(A), Option 1 – Inertial Profiler, lines 17-18, replace the first sentence of the fourth paragraph with the following:

Submit a report with the documentation and electronic data of the evaluation for each section to the Engineer within 10 days after completion of the smoothness testing. The report shall be in

the tabular format for each 0.10 segment or a portion thereof with a summary of the MRI values and the localized roughness areas including corresponding project station numbers or acceptable reference points. Calculate the pay adjustments for all segments in accordance with the formulas in Sections (1) and (2) shown below. The Engineer shall review and approval all pay adjustments unless corrective action is required.

Page 6-31, Subarticle 610-13(A)(1), Acceptance for New Construction, lines 36-37, replace the third paragraph with the following:

The price adjustment will apply to each 0.10-mile section or prorated for a portion thereof, based on the Mean Roughness Index (MRI), the average IRI values from both wheel paths.

Page 6-32, Subarticle 610-13(A)(2), Localized Roughness, lines 12-16, replace the first paragraph with the following:

Areas of localized roughness shall be identified through the "Smoothness Assurance Module (SAM)" provided in the ProVAL software. Use the SAM report to optimize repair strategies by analyzing the measurements from profiles collected using inertial profilers. The ride quality threshold for localized roughness shall be 165 in/mile for any sections that are 15 ft. to 100 ft. in length at the continuous short interval of 25 ft. Submit a continuous roughness report to identify each section with project station numbers or reference points outside the threshold and identify all localized roughness, with the signature of the Operator included with the submitted IRI trace and electronic files.

Page 6-32, Subarticle 610-13(A)(2), Localized Roughness, line 21, add the following new paragraph:

If the Engineer does not require corrective action, the pay adjustment for each area of localized roughness shall be based on the following formula:

$$PA = (165 - LR\#)\ 5$$

Where:

PA = Pay Adjustment (dollars)
LR# = The Localized Roughness number determined from SAM report for the ride quality threshold

Page 6-41, Subarticle 650-3(B), Mix Design Criteria, replace Table 650-1 with the following:

TABLE 650-1
OGAFC GRADATION CRITERIA

Sieve Size (mm)	*Type FC-1*	*Type FC-1 Modified*	*Type FC-2 Modified*
19.0	-	-	100
12.5	100	100	80 - 100
9.50	75 - 100	75 - 100	55 - 80
4.75	25 - 45	25 - 45	15 - 30
2.36	5 - 15	5 - 15	5 - 15
0.075	1.0 - 3.0	1.0 - 3.0	2.0 - 4.0

ASPHALT BINDER CONTENT OF ASPHALT PLANT MIXES:
(11-21-00) (Rev. 7-17-12) 609 SP6 R15

The approximate asphalt binder content of the asphalt concrete plant mixtures used on this project will be as follows:

Asphalt Concrete Base Course	Type B 25.0	4.4%
Asphalt Concrete Intermediate Course	Type I 19.0	4.8%
Asphalt Concrete Surface Course	Type S 4.75A	6.8%
Asphalt Concrete Surface Course	Type SA-1	6.8%
Asphalt Concrete Surface Course	Type SF 9.5A	6.7%
Asphalt Concrete Surface Course	Type S 9.5	6.0%
Asphalt Concrete Surface Course	Type S 12.5	5.6%

The actual asphalt binder content will be established during construction by the Engineer within the limits established in the *2012 Standard Specifications.*

ASPHALT PLANT MIXTURES:
(7-1-95) 609 SP6 R20

Place asphalt concrete base course material in trench sections with asphalt pavement spreaders made for the purpose or with other equipment approved by the Engineer.

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 *2012 Standard Specifications.*

The base price index for asphalt binder for plant mix is **$ 323.21** per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on **May 1, 2016.**

FRAME WITH GRATE (Driveway Drop Inlet):
(3-21-00) (Rev.7-18-06) SPI 8-35

Description

Provide grates for driveway drop inlets that are fabricated steel or cast iron. Provide grates that are of a design and weight that is recommended by the manufacturer as being adequate for HS-20 loadings. Furnish a manufacturer's certification stating that the grates and frame furnished on the project have been designed and manufactured to be adequate for an HS-20 loading. Provide grates with a minimum clear waterway opening of 50 in^2 per 1'-0" length of grate.

If the frame and grate is made from fabricated steel, the requirements of Article 1074-9 of the *2012 Standard Specifications* will be applicable. If the grate and frame is made from iron castings, the requirements of Article 1074-7 of the *2012 Standard Specifications* will be applicable.

Measurement and Payment

Frame with Grate, Driveway Drop Inlet will be measured and paid for as the actual number of linear feet that have been incorporated into the completed and accepted work. Such price and payment will be full compensation for furnishing the grates and frame, and all labor and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	**Pay Unit**
Frame with Grate, Driveway Drop Inlet	Linear Foot

GUARDRAIL ANCHOR UNITS, TYPE 350 TL-2:
(10-21-08) (Rev. 7-21-15) 862 SP08 R064

Description

Furnish and install guardrail anchor units in accordance with the details in the plans, the applicable requirements of Section 862 of the *2012 Standard Specifications*, and at locations shown in the plans.

Materials

Furnish guardrail anchor units listed on the NCDOT Approved Products List at https://apps.dot.state.nc.us/vendor/approvedproducts/ or approved equal.

Prior to installation the Contractor shall submit to the Engineer:

(A) FHWA acceptance letter for each guardrail anchor unit certifying it meets the requirements of NCHRP Report 350, Test Level 2 in accordance with Article 106-2 of the *2012 Standard Specifications*.

(B) Certified working drawings and assembling instructions from the manufacturer for each guardrail anchor unit in accordance with Article 105-2 of the *2012 Standard Specifications*.

No modifications shall be made to the guardrail anchor unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans, and details and assembling instructions furnished by the manufacturer.

Construction Methods

Guardrail end delineation is required on all approach and trailing end sections for both temporary and permanent installations. Guardrail end delineation consists of yellow reflective sheeting applied to the entire end section of the guardrail in accordance with Article 1088-3 of the *2012 Standard Specifications* and is incidental to the cost of the guardrail anchor unit.

Measurement and Payment

Measurement and payment will be made in accordance with Article 862-6 of the *2012 Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Guardrail Anchor Units, Type 350 TL-2	Each

GUARDRAIL ANCHOR UNITS, TYPE 350 (TL-3):

(4-20-04) (Rev. 7-21-15) 862 SP08 R065

Description

Furnish and install guardrail anchor units in accordance with the details in the plans, the applicable requirements of Section 862 of the *2012 Standard Specifications*, and at locations shown in the plans.

Materials

Furnish guardrail anchor units listed on the NCDOT Approved Products List at https://apps.dot.state.nc.us/vendor/approvedproducts/ or approved equal.

Prior to installation the Contractor shall submit to the Engineer:

(A) FHWA acceptance letter for each guardrail anchor unit certifying it meets the requirements of NCHRP Report 350, Test Level 3, in accordance with Article 106-2 of the *2012 Standard Specifications*.

(B) Certified working drawings and assembling instructions from the manufacturer for each guardrail anchor unit in accordance with Article 105-2 of the *2012 Standard Specifications*.

No modifications shall be made to the guardrail anchor unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans, and details and assembling instructions furnished by the manufacturer.

Construction Methods

Guardrail end delineation is required on all approach and trailing end sections for both temporary and permanent installations. Guardrail end delineation consists of yellow reflective sheeting applied to the entire end section of the guardrail in accordance with Article 1088-3 of the *2012 Standard Specifications* and is incidental to the cost of the guardrail anchor unit.

Measurement and Payment

Measurement and payment will be made in accordance with Article 862-6 of the *2012 Standard Specifications*.

Payment will be made under:

Pay Item	**Pay Unit**
Guardrail Anchor Units, Type 350	Each

IMPACT ATTENUATOR UNITS, TYPE 350 TL-2:
(4-11-07) (Rev. 5-14-13) SPI(Rev)

Description

Furnish and install impact attenuator units and any components necessary to connect the impact attenuator units in accordance with the manufacturer's requirement, the details in the plans and at locations shown in the plans.

Materials

Furnish impact attenuator units listed on the Approved Products List at https://apps.dot.state.nc.us/vendor/approvedproducts/ or approved equal. Prior to installation the Contractor shall submit to the Engineer:

(A) FHWA acceptance letter for each impact attenuator unit certifying it meets the requirements of NCHRP Report 350, Test Level 2, in accordance with Article 106-2 of the *2012 Standard Specifications*.

(B) Certified working drawings and assembling instructions from the manufacturer for each impact attenuator unit in accordance with Article 105-2 of the *2012 Standard Specifications*.

No modifications shall be made to the impact attenuator unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans and details and assembling instructions furnished by the manufacturer.

Measurement and Payment

Impact attenuator units will be measured and paid for at the contract unit price per each for *Impact Attenuator Unit, Type 350 TL-2*. Such prices and payment will be full compensation for all work covered by this provision including but not limited to furnishing, installing and all incidentals necessary to complete the work.

Payment will be made under:

Pay Item	**Pay Unit**
Impact Attenuator Unit, Type 350 TL-2	Each

CONCRETE BOLLARDS:

Furnish and install concrete bollards in accordance with the detail in the plans, at locations shown in the plans and as directed by the Engineer.

Install bollards plum and true to line with all applicable portions of Section 825 and 1000 of the *Standard Specifications*.

The quantity of concrete bollards to be paid for will be the actual number installed and accepted. Such payment will be full compensation for all materials, labor, and equipment necessary to complete the work.

Payment will be made under:

Pay Item	**Pay Unit**
Concrete Bollards	Each

HANDRAIL ON RETAINING WALL:

Description

Furnish and install handrail on retaining walls at the locations shown in the plans, in accordance with the detail in the plans and as directed by the Engineer.

Measurement and Payment

Handrail On Retaining Wall will measured and paid for as the actual number of linear feet of handrail measured along the top of the handrail to the nearest 0.1 of a foot. Such price and payment shall be full compensation for fabricating, furnishing, installing, and all incidentals necessary to satisfactorily install the handrail.

Payment will be made under:

Pay Item	Pay Unit
Handrail On Retaining Wall	Linear Foot

TEMPORARY 72" CHAIN LINK FENCE WITH POSTS:

Description

Construct temporary 72" chain link fence in accordance with the plans, the *2012 Standard Specifications*, *Roadway Standard Drawing* No. 866.01, and as directed by the Engineer.

Materials

Refer to Article 866-2 of the *Standard Specifications*.

Construction Methods

Construct the temporary 72" chain link fence in accordance with the applicable requirements of Section 866 of the *2012 Standard Specifications*, *Roadway Standard Drawing* No. 866.01, and as directed by the Engineer. After the fence has served its purpose and is no longer needed, as determined by the Engineer, it will become the property of the Contractor and shall be removed.

Measurement and Payment

Temporary 72" Chain Link Fence With Posts will be measured and paid for as the actual number of linear feet of fence constructed and accepted, measured in place from center of end post to center of end post. All posts used for the chain link fence are included in the price of the fence and will not be paid for separately. Such price and payment will be full compensation for all materials, labor, fence maintenance, removal, and incidentals, necessary to satisfactorily complete the work.

Work includes, but is not limited to, clearing and grading; and furnishing and installing fence fabric, barbed wire, tie wires, tie rods, stretcher bars, top rails, tension wire, posts and post braces, concrete, fittings and any other materials, and removal of the fence.

Payment will be made under:

Pay Item	Pay Unit
Temporary 72" Chain Link Fence With Posts	Linear Foot

DETECTABLE WARNINGS FOR PROPOSED CURB RAMPS:

(6-15-10) (Rev. 8-16-11) 848 SP8 R126

Description

Construct detectable warnings consisting of integrated raised truncated domes on proposed concrete curb ramps in accordance with the *2012 Standard Specifications,* plan details, the requirements of the *28 CFR Part 36 ADA Standards for Accessible Design* and this provision.

Materials

Detectable warning for proposed curb ramps shall consist of integrated raised truncated domes. The description, size and spacing shall conform to Section 848 of the *2012 Standard Specifications.*

Use material for detectable warning systems as shown herein. Material and coating specifications must be stated in the Manufacturers Type 3 Certification and all Detectable Warning systems must be on the NCDOT Approved Products List.

Install detectable warnings created from one of the following materials: precast concrete blocks or bricks, clay paving brick, gray or ductile iron castings, mild steel, stainless steel, and engineered plastics, rubber or composite tile. Only one material type for detectable warning will be permitted per project, unless otherwise approved by the Engineer.

(A) Detectable Warnings shall consist of a base with integrated raised truncated domes, and when constructed of precast concrete they shall conform to the material requirements of Article 848-2 of the *2012 Standard Specifications.*

(B) Detectable Warnings shall consist of a base with integrated raised truncated domes, and may be comprised of other materials including, but not limited, to clay paving brick, gray iron or ductile iron castings, mild steel, stainless steel, and engineered plastics, rubber or composite tile, which are cast into the concrete of the curb ramps. The material shall have an integral color throughout the thickness of the material. The detectable warning shall include fasteners or anchors for attachment in the concrete and shall be furnished as a system from the manufacturer.

Prior to installation, the Contractor shall submit to the Engineer assembling instructions from the manufacturer for each type of system used in accordance with Article 105-2 of the *2012 Standard Specifications*. The system shall be furnished as a kit containing all consumable materials and consumable tools, required for the application. They shall be capable of being affixed to or anchored in the concrete curb ramp, including green concrete (concrete that has set but not appreciably hardened). The system shall be solvent free and contain no volatile organic compounds (VOC). The static coefficient of friction shall be 0.8 or greater when measured on top of the truncated domes and when measured between the domes in accordance with ASTM C1028 (dry and wet). The system shall be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to degradation by motor fuels, lubricants and antifreeze.

(C) When steel or gray iron or ductile iron casting products are provided, only products that meet the requirements of Subarticle 106-1(B) of the *2012 Standard Specifications* may be used. Submit to the Engineer a Type 6 Certification, catalog cuts and installation procedures at least 30 days prior to installation for all.

Construction Methods

(A) Prior to placing detectable warnings in proposed concrete curb ramps, adjust the existing subgrade to the proper grade and in accordance with Article 848-3 of the *2012 Standard Specifications*.

(B) Install all detectable warning in proposed concrete curb ramps in accordance with the manufacturer's recommendations.

Measurement and Payment

Detectable Warnings installed for construction of proposed curb ramps will not be paid for separately. Such payment will be included in the price bid for *Concrete Curb Ramps*.

COLORED CONCRETE CROSSWALK WITH CONCRETE HEADERS:

The Contractor shall construct the colored concrete crosswalk with concrete headers in accordance with the plans and as directed by the Engineer. Concrete for the crosswalk shall have a 28 day strength of 4,000 psi and have no fly ash in the mix. Concrete for the headers shall have a 28 day strength of 4,000 psi and have fly ash in the mix. The color of the concrete shall be mixed in the truck upon arrival to the site. The installation process for the imprinted concrete shall be as follows:

1. Prepare sub-grade (compact)
2. Place 4" Asphalt (compact)
3. Form headers of area to be poured
4. When concrete arrives, mix (1) bag of color per cubic yard of concrete in truck (see below)
5. Place concrete, float and use "jitter bug"
6. After floating, throw color hardener evenly covering top of concrete (see below)
7. Float again
8. Repeat Step 6
9. Float again
10. Throw release evenly across top (see below)
11. Stamp
12. Let cure two days
13. Pressure wash off release to desired color
14. Let dry
15. Spray or roll on matte finish (see below)
16. Cure additional five days
17. Open to traffic

All color materials shall be supplied by QC Products of California.
The stamps shall be provided by Brick Form and Scofield of California.

Measurement and Payment

Colored Concrete Crosswalk will be measured and paid in square yards, measured along the surface of the completed and accepted work. Such price includes, but is not limited to, excavating and backfilling, preparing subgrade, furnishing and placing concrete, coloring and imprinting the concrete, and constructing and sealing joints.
Concrete Crosswalk Headers will be measured and paid in square yards, measured along the surface of the completed and accepted work. Such price includes, but is not limited to, excavating and backfilling, furnishing and placing concrete, and constructing and sealing joints.

Payment will be made under:

Pay Item	Pay Unit
Colored Concrete Crosswalk	Square Yard
Concrete Crosswalk Headers	Square Yard

MEDIAN HAZARD PROTECTION:

Description

Construct Median Hazard Protection at the concrete barrier transition sections as shown in the detail in the plans, in accordance with the detail in the plans and as directed by the Engineer.

Measurement and Payment

Median Hazard Protection will be measured and paid for per each that are completed and accepted. Such price and payment will be full compensation for all labor, materials (including, but not limited to concrete barrier, earth material, #57 stone, concrete cover, galvanized bar and grout) and all incidentals necessary construct the Median Hazard Protection.

Concrete barrier transition sections will be measured and paid for as provided elsewhere in the contract. No separate measurement or payment will be made for concrete cover at barrier transition sections as the cost of such shall be included in the unit price bid per each for *Concrete Barrier Transition Section.*

Payment will be made under:

Pay Item	Pay Unit
Median Hazard Protection	Each

STREET SIGNS AND MARKERS AND ROUTE MARKERS:

(7-1-95) 900 SP9 R02

Move any existing street signs, markers, and route markers out of the construction limits of the project and install the street signs and markers and route markers so that they will be visible to the traveling public if there is sufficient right of way for these signs and markers outside of the construction limits.

Near the completion of the project and when so directed by the Engineer, move the signs and markers and install them in their proper location in regard to the finished pavement of the project.

Stockpile any signs or markers that cannot be relocated due to lack of right of way, or any signs and markers that will no longer be applicable after the construction of the project, at locations directed by the Engineer for removal by others.

The Contractor shall be responsible to the owners for any damage to any street signs and markers or route markers during the above described operations.

No direct payment will be made for relocating, reinstalling, and/or stockpiling the street signs and markers and route markers as such work shall be considered incidental to other work being paid for by the various items in the contract.

FOUNDATIONS AND ANCHOR ROD ASSEMBLIES FOR METAL POLES:

(1-17-12) (Rev. 5-19-15) 9, 14, 17 SP9 R05

Description

Foundations for metal poles include foundations for signals, cameras, overhead and dynamic message signs (DMS) and high mount and low level light standards supported by metal poles or upright trusses. Foundations consist of footings with pedestals and drilled piers with or without grade beams or wings. Anchor rod assemblies consist of anchor rods (also called anchor bolts) with nuts and washers on the exposed ends of rods and nuts and a plate or washers on the other ends of rods embedded in the foundation.

Construct concrete foundations with the required resistances and dimensions and install anchor rod assemblies in accordance with the contract and accepted submittals. Construct drilled piers consisting of cast-in-place reinforced concrete cylindrical sections in excavated holes. Provide temporary casings or polymer slurry as needed to stabilize drilled pier excavations. Use a prequalified Drilled Pier Contractor to construct drilled piers for metal poles. Define "excavation" and "hole" as a drilled pier excavation and "pier" as a drilled pier.

This provision does not apply to materials and anchor rod assemblies for standard foundations for low level light standards. See Section 1405 of the *2012 Standard Specifications* and Standard Drawing No. 1405.01 of the *2012 Roadway Standard Drawings* for materials and anchor rod assemblies for standard foundations. For construction of standard foundations for low level light standards, standard foundations are considered footings in this provision.

This provision does not apply to foundations for signal pedestals; see Section 1743 of the *2012 Standard Specifications* and Standard Drawing No. 1743.01 of the *2012 Roadway Standard Drawings*.

Materials

Refer to the *2012 Standard Specifications*.

Item	Section
Conduit	1091-3
Grout, Type 2	1003
Polymer Slurry	411-2(B)
Portland Cement Concrete	1000
Reinforcing Steel	1070
Rollers and Chairs	411-2(C)
Temporary Casings	411-2(A)

Provide Type 3 material certifications in accordance with Article 106-3 of the *2012 Standard Specifications* for conduit, rollers, chairs and anchor rod assemblies. Store steel materials on blocking at least 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Load, transport, unload and store foundation and anchor rod assembly materials so materials are kept clean and free of damage. Bent, damaged or defective materials will be rejected.

Use conduit type in accordance with the contract. Use Class A concrete for footings and pedestals, Class Drilled Pier concrete for drilled piers and Class AA concrete for grade beams and wings including portions of drilled piers above bottom of wings elevations. Corrugated temporary casings may be accepted at the discretion of the Engineer. A list of approved polymer slurry products is available from:
connect.ncdot.gov/resources/Geological/Pages/Products.aspx

Provide anchor rod assemblies in accordance with the contract consisting of the following:

(A) Straight anchor rods,

(B) Heavy hex top and leveling nuts and flat washers on exposed ends of rods, and

(C) Nuts and either flat plates or washers on the other ends of anchor rods embedded in foundations.

Do not use lock washers. Use steel anchor rods, nuts and washers that meet ASTM F1554 for Grade 55 rods and Grade A nuts. Use steel plates and washers embedded in concrete with a thickness of at least 1/4". Galvanize anchor rods and exposed nuts and washers in accordance with Article 1076-4 of the *2012 Standard Specifications*. It is not necessary to galvanize nuts, plates and washers embedded in concrete.

Construction Methods

Install the required size and number of conduits in foundations in accordance with the plans and accepted submittals. Construct top of piers, footings, pedestals, grade beams and wings flat, level and within 1" of elevations shown in the plans or approved by the Engineer. Provide an Ordinary Surface finish in accordance with Subarticle 825-6(B) of the *2012 Standard Specifications* for portions of foundations exposed above finished grade. Do not remove anchor bolt templates or pedestal or grade beam forms or erect metal poles or upright trusses onto foundations until concrete attains a compressive strength of at least 3,000 psi.

(A) Drilled Piers

Before starting drilled pier construction, hold a predrill meeting to discuss the installation, monitoring and inspection of the drilled piers. Schedule this meeting after the Drilled Pier Contractor has mobilized to the site. The Resident or Division Traffic Engineer, Contractor and Drilled Pier Contractor Superintendent will attend this predrill meeting.

Do not excavate holes, install piles or allow equipment wheel loads or vibrations within 20 ft of completed piers until 16 hours after Drilled Pier concrete reaches initial set.

Check for correct drilled pier alignment and location before beginning drilling. Check plumbness of holes frequently during drilling.

Construct drilled piers with the minimum required diameters shown in the plans. Install piers with tip elevations no higher than shown in the plans or approved by the Engineer.

Excavate holes with equipment of the sizes required to construct drilled piers. Depending on the subsurface conditions encountered, drilling through rock and boulders may be required. Do not use blasting for drilled pier excavations.

Contain and dispose of drilling spoils and waste concrete as directed and in accordance with Section 802 of the *2012 Standard Specifications*. Drilling spoils consist of all materials and fluids removed from excavations.

If unstable, caving or sloughing materials are anticipated or encountered, stabilize holes with temporary casings and/or polymer slurry. Do not use telescoping temporary casings. If it becomes necessary to replace a temporary casing during drilling, backfill the excavation, insert a larger casing around the casing to be replaced or stabilize the excavation with polymer slurry before removing the temporary casing.

If temporary casings become stuck or the Contractor proposes leaving casings in place, temporary casings should be installed against undisturbed material. Unless otherwise approved, do not leave temporary casings in place for mast arm poles and cantilever signs. The Engineer will determine if casings may remain in place. If the Contractor

proposes leaving temporary casings in place, do not begin drilling until a casing installation method is approved.

Use polymer slurry and additives to stabilize holes in accordance with the slurry manufacturer's recommendations. Provide mixing water and equipment suitable for polymer slurry. Maintain polymer slurry at all times so slurry meets Table 411-3 of the *2012 Standard Specifications* except for sand content.

Define a "sample set" as slurry samples collected from mid-height and within 2 ft of the bottom of holes. Take sample sets from excavations to test polymer slurry immediately after filling holes with slurry, at least every 4 hours thereafter and immediately before placing concrete. Do not place Drilled Pier concrete until both slurry samples from an excavation meet the required polymer slurry properties. If any slurry test results do not meet the requirements, the Engineer may suspend drilling until both samples from a sample set meet the required slurry properties.

Remove soft and loose material from bottom of holes using augers to the satisfaction of the Engineer. Assemble rebar cages and place cages and Drilled Pier concrete in accordance with Subarticle 411-4(E) of the *2012 Standard Specifications* except for the following:

(1) Inspections for tip resistance and bottom cleanliness are not required,
(2) Temporary casings may remain in place if approved, and
(3) Concrete placement may be paused near the top of pier elevations for anchor rod assembly installation and conduit placement or
(4) If applicable, concrete placement may be stopped at bottom of grade beam or wings elevations for grade beam or wing construction.

If wet placement of concrete is anticipated or encountered, do not place Drilled Pier concrete until a concrete placement procedure is approved. If applicable, temporary casings and fluids may be removed when concrete placement is paused or stopped in accordance with the exceptions above provided holes are stable. Remove contaminated concrete from exposed Drilled Pier concrete after removing casings and fluids. If holes are unstable, do not remove temporary casings until a procedure for placing anchor rod assemblies and conduit or constructing grade beams or wings is approved.

Use collars to extend drilled piers above finished grade. Remove collars after Drilled Pier concrete sets and round top edges of piers.

If drilled piers are questionable, pile integrity testing (PIT) and further investigation may be required in accordance with Article 411-5 of the *2012 Standard Specifications*. A drilled pier will be considered defective in accordance with Subarticle 411-5(D) of the *2012 Standard Specifications* and drilled pier acceptance is based in part on the criteria in Article 411-6 of the *2012 Standard Specifications* except for the top of pier tolerances in Subarticle 411-6(C) of the *2012 Standard Specifications*.

If a drilled pier is under further investigation, do not grout core holes, backfill around the pier or perform any work on the drilled pier until the Engineer accepts the pier. If the drilled pier is accepted, dewater and grout core holes and backfill around the pier with approved material to finished grade. If the Engineer determines a pier is unacceptable, remediation is required in accordance with Article 411-6 of the *2012 Standard Specifications*. No extension of completion date or time will be allowed for remediation of unacceptable drilled piers or post repair testing.

Permanently embed a plate in or mark top of piers with the pier diameter and depth, size and number of vertical reinforcing bars and the minimum compressive strength of the concrete mix at 28 days.

(B) Footings, Pedestals, Grade Beams and Wings

Excavate as necessary for footings, grade beams and wings in accordance with the plans, accepted submittals and Section 410 of the *2012 Standard Specifications*. If unstable, caving or sloughing materials are anticipated or encountered, shore foundation excavations as needed with an approved method. Notify the Engineer when foundation excavation is complete. Do not place concrete or reinforcing steel until excavation dimensions and foundation material are approved.

Construct cast-in-place reinforced concrete footings, pedestals, grade beams and wings with the dimensions shown in the plans and in accordance with Section 825 of the *2012 Standard Specifications*. Use forms to construct portions of pedestals and grade beams protruding above finished grade. Provide a chamfer with a 3/4" horizontal width for pedestal and grade beam edges exposed above finished grade. Backfill and fill in accordance with Article 410-8 of the *2012 Standard Specifications*. Proper compaction around footings and wings is critical for foundations to resist uplift and torsion forces. Place concrete against undisturbed soil and do not use forms for standard foundations for low level light standards.

(C) Anchor Rod Assemblies

Size anchor rods for design and the required projection above top of foundations. Determine required anchor rod projections from nut, washer and base plate thicknesses, the protrusion of 3 to 5 anchor rod threads above top nuts after tightening and the distance of one nut thickness between top of foundations and bottom of leveling nuts.

Protect anchor rod threads from damage during storage and installation of anchor rod assemblies. Before placing anchor rods in foundations, turn nuts onto and off rods past leveling nut locations. Turn nuts with the effort of one workman using an ordinary wrench without a cheater bar. Report any thread damage to the Engineer that requires extra effort to turn nuts.

Arrange anchor rods symmetrically about center of base plate locations as shown in the plans. Set anchor rod elevations based on required projections above top of foundations.

Securely brace and hold rods in the correct position, orientation and alignment with a steel template. Do not weld to reinforcing steel, temporary casings or anchor rods.

Install top and leveling (bottom) nuts, washers and the base plate for each anchor rod assembly in accordance with the following procedure:

(1) Turn leveling nuts onto anchor rods to a distance of one nut thickness between the top of foundation and bottom of leveling nuts. Place washers over anchor rods on top of leveling nuts.

(2) Determine if nuts are level using a flat rigid template on top of washers. If necessary, lower leveling nuts to level the template in all directions or if applicable, lower nuts to tilt the template so the metal pole or upright truss will lean as shown in the plans. If leveling nuts and washers are not in full contact with the template, replace washers with galvanized beveled washers.

(3) Verify the distance between the foundation and leveling nuts is no more than one nut thickness.

(4) Place base plate with metal pole or upright truss over anchor rods on top of washers. High mount luminaires may be attached before erecting metal poles but do not attach cables, mast arms or trusses to metal poles or upright trusses at this time.

(5) Place washers over anchor rods on top of base plate. Lubricate top nut bearing surfaces and exposed anchor rod threads above washers with beeswax, paraffin or other approved lubricant.

(6) Turn top nuts onto anchor rods. If nuts are not in full contact with washers or washers are not in full contact with the base plate, replace washers with galvanized beveled washers.

(7) Tighten top nuts to snug-tight with the full effort of one workman using a 12" wrench. Do not tighten any nut all at once. Turn top nuts in increments. Follow a star pattern cycling through each nut at least twice.

(8) Repeat (7) for leveling nuts.

(9) Replace washers above and below the base plate with galvanized beveled washers if the slope of any base plate face exceeds 1:20 (5%), any washer is not in firm contact with the base plate or any nut is not in firm contact with a washer. If any washers are replaced, repeat (7) and (8).

(10) With top and leveling nuts snug-tight, mark each top nut on a corner at the intersection of 2 flats and a corresponding reference mark on the base plate. Mark top nuts and base plate with ink or paint that is not water-soluble. Use the turn-of-nut method for pretensioning. Do not pretension any nut all at once. Turn top nuts in increments for a total turn that meets the following nut rotation requirements:

NUT ROTATION REQUIREMENTS (Turn-of-Nut Pretensioning Method)

Anchor Rod Diameter, inch	Requirement
≤ 1 1/2	1/3 turn (2 flats)
> 1 1/2	1/6 turn (1 flat)

Follow a star pattern cycling through each top nut at least twice.

(11) Ensure nuts, washers and base plate are in firm contact with each other for each anchor rod. Cables, mast arms and trusses may now be attached to metal poles and upright trusses.

(12) Between 4 and 14 days after pretensioning top nuts, use a torque wrench calibrated within the last 12 months to check nuts in the presence of the Engineer. Completely erect mast arm poles and cantilever signs and attach any hardware before checking top nuts for these structures. Check that top nuts meet the following torque requirements:

TORQUE REQUIREMENTS	
Anchor Rod Diameter, inch	**Requirement, ft-lb**
7/8	180
1	270
1 1/8	380
1 1/4	420
≥ 1 1/2	600

If necessary, retighten top nuts in the presence of the Engineer with a calibrated torque wrench to within ± 10 ft-lb of the required torque. Do not overtighten top nuts.

(13) Do not grout under base plate.

Measurement and Payment

Foundations and anchor rod assemblies for metal poles and upright trusses will be measured and paid for elsewhere in the contract.

No payment will be made for temporary casings that remain in drilled pier excavations. No payment will be made for PIT. No payment will be made for further investigation of defective piers. Further investigation of piers that are not defective will be paid as extra work in accordance with Article 104-7 of the *2012 Standard Specifications*. No payment will be made for remediation of unacceptable drilled piers or post repair testing.

MATERIALS:

(2-21-12) (Rev. 3-15-16) 1000, 1002, 1005, 1016, 1018, 1024, 1050, 1074, 1078, 1080, 1081, 1086, 1084, 1087, 1092 SP10 R01

Revise the *2012 Standard Specifications* as follows:

Page 10-1, Article 1000-1, DESCRIPTION, lines 9-10, replace the last sentence of the first paragraph with the following:

Type IL, IP, IS or IT blended cement may be used instead of Portland cement.

Page 10-1, Article 1000-1, DESCRIPTION, line 14, add the following:

If any change is made to the mix design, submit a new mix design (with the exception of an approved pozzolan source change).

If any major change is made to the mix design, also submit new test results showing the mix design conforms to the criteria. Define a major change to the mix design as:

(1) A source change in coarse aggregate, fine aggregate or cement.

(2) A pozzolan class or type change (e.g. Class F fly ash to Class C fly ash).

(3) A quantitative change in coarse aggregate (applies to an increase or decrease greater than 5%), fine aggregate (applies to an increase or decrease greater than 5%), water (applies to an increase only), cement (applies to a decrease only), or pozzolan (applies to an increase or decrease greater than 5%).

Use materials which do not produce a mottled appearance through rusting or other staining of the finished concrete surface.

Page 10-1, Article 1000-2, MATERIALS, line 16; Page 10-8, Subarticle 1000-7(A), Materials, line 8; and Page 10-18, Article 1002-2, MATERIALS, line 9, add the following to the table of item references:

Item	**Section**
Type IL Blended Cement	1024-1

Page 10-1, Subarticle 1000-3(A), Composition and Design, lines 25-27, replace the second paragraph with the following:

Fly ash may be substituted for cement in the mix design up to 30% at a rate of 1.0 lb of fly ash to each pound of cement replaced.

Page 10-2, Subarticle 1000-3(A), Composition and Design, lines 12-21, delete the third paragraph through the sixth paragraph beginning with "If any change is made to the mix design, submit..." through "...(applies to a decrease only)."

Page 10-5, Table 1000-1, REQUIREMENTS FOR CONCRETE, replace with the following:

TABLE 1000-1
REQUIREMENTS FOR CONCRETE

Class of Concrete	Min. Comp. Strength at 28 days	Maximum Water-Cement Ratio				Consistency Max. Slump		Cement Content			
		Air-Entrained Concrete		Non Air-Entrained Concrete		Vibrated	Non-Vibrated	Vibrated		Non- Vibrated	
		Rounded Aggregate	Angular Aggregate	Rounded Aggregate	Angular Aggregate			Min.	Max.	Min.	Max.
Units	*psi*					*inch*	*inch*	*lb/cy*	*lb/cy*	*lb/cy*	*lb/cy*
AA	4,500	0.381	0.426	-	-	3.5	-	639	715	-	-
AA Slip Form	4,500	0.381	0.426	-	-	1.5	-	639	715	-	-
Drilled Pier	4,500	-	-	0.450	0.450	-	5-7 dry 7-9 wet	-	-	640	800
A	3,000	0.488	0.532	0.550	0.594	3.5	4	564	-	602	-
B	2,500	0.488	0.567	0.559	0.630	1.5 machine-placed 2.5 hand-placed	4	508	-	545	-
Sand Light-weight	4,500	-	0.420	-	-	4	-	715	-	-	-
Latex Modified	3,000 7 day	0.400	0.400	-	-	6	-	658	-	-	-
Flowable Fill excavatable	150 max. at 56 days	as needed	as needed	as needed	as needed	-	Flow-able	-	-	40	100
Flowable Fill non-excavatable	125	as needed	as needed	as needed	as needed	-	Flow-able	-	-	100	as needed
Pavement	4,500 design, field 650 flexural, design only	0.559	0.559	-	-	1.5 slip form 3.0 hand place	-	526	-	-	-
Precast	See Table 1077-1	as needed	as needed	-	-	6	as needed	as needed	as needed	as needed	as needed
Prestress	per contract	See Table 1078-1	See Table 1078-1	-	-	8	-	564	as needed	-	-

Page 10-6, Subarticle 1000-4(I), Use of Fly Ash, lines 36-2, replace the first paragraph with the following:

Fly ash may be substituted for cement in the mix design up to 30% at a rate of 1.0 lb of fly ash to each pound of cement replaced. Use Table 1000-1 to determine the maximum allowable water-cementitious material (cement + fly ash) ratio for the classes of concrete listed.

Page 10-7, Table 1000-3, MAXIMUM WATER-CEMENTITIOUS MATERIAL RATIO, delete the table.

Page 10-7, Article 1000-5, HIGH EARLY STRENGTH PORTLAND CEMENT CONCRETE, lines 30-31, delete the second sentence of the third paragraph.

Page 10-19, Article 1002-3, SHOTCRETE FOR TEMPORARY SUPPORT OF EXCAVATIONS, line 30, add the following at the end of Section 1002:

(H) Handling and Storing Test Panels

Notify the Area Materials Engineer when preconstruction or production test panels are made within 24 hours of shooting the panels. Field cure and protect test panels from damage in accordance with ASTM C1140 until the Department transports panels to the Materials and Tests Regional Laboratory for coring.

Page 10-23, Table 1005-1, AGGREGATE GRADATION-COARSE AGGREGATE, replace with the following:

TABLE 1005-1
AGGREGATE GRADATION - COARSE AGGREGATE

Std. Size #	Percentage of Total by Weight Passing										Remarks
	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4	#8	#10	#16	#40	#200	
4	100	90-100	20-55	0-15	-	0-5	-	-	-	-	-	A	Asphalt Plant Mix
467M	100	95-100	-	35-70	-	0-30	0-5	-	-	-	-	A	Asphalt Plant Mix
5	-	100	90-100	20-55	0-10	0-5	-	-	-	-	-	A	AST, Sediment Control Stone
57	-	100	95-100	-	25-60	-	0-10	0-5	-	-	-	A	AST, Str. Concrete, Shoulder Drain, Sediment Control Stone
57M	-	100	95-100	-	25-45	-	0-10	0-5	-	-	-	A	AST, Concrete Pavement
6M	-	-	100	90-100	20-55	0-20	0-8	-	-	-	-	A	AST
67	-	-	100	90-100	-	20-55	0-10	0-5	-	-	-	A	AST, Str. Concrete, Asphalt Plant Mix
78M	-	-	-	100	98-100	75-100	20-45	0-15	-	-	-	A	Asphalt Plant Mix, AST, Str. Conc, Weep Hole Drains
14M	-	-	-	-	-	100	35-70	5-20	-	0-8	-	A	Asphalt Plant Mix, AST, Weep Hole Drains, Str. Concrete
9	-	-	-	-	-	100	85-100	10-40	-	0-10	-	A	AST
ABC	-	100	75-97	-	55-80	-	35-55	-	25-45	-	14-30	4-12[B]	Aggregate Base Course, Aggregate Stabilization
ABC (M)	-	100	75-100	-	45-79	-	20-40	-	0-25	-	-	0-12[B]	Maintenance Stabilization
Light-weight[C]	-	-	-	-	100	80-100	5-40	0-20	-	0-10	-	0-2.5	AST

A. See Subarticle 1005-4(A).
B. See Subarticle 1005-4(B).
C. For Lightweight Aggregate used in Structural Concrete, see Subarticle 1014-2(E)(6).

Page 10-39, Article 1016-3, CLASSIFICATIONS , lines 27-32, replace with the following:

Select material is clean, unweathered durable, blasted rock material obtained from an approved source. While no specific gradation is required, the below criteria will be used to evaluate the materials for visual acceptance by the Engineer:

(A) At least 50% of the rock has a diameter of from 1.5 ft to 3 ft,

(B) 30% of the rock ranges in size from 2" to 1.5 ft in diameter, and

(C) Not more than 20% of the rock is less than 2" in diameter. No rippable rock will be permitted.

Page 10-40, Tables 1018-1 and 1018-2, PIEDMONT, WESTERN AND COASTAL AREA CRITERIA FOR ACCEPTANCE OF BORROW MATERIAL, under second column in both tables, replace second row with the following:

Acceptable, but not to be used in the top 3 ft of embankment or backfill

Page 10-46, Article 1024-1, PORTLAND CEMENT, line 33, add the following as the ninth paragraph:

Use Type IL blended cement that meets AASHTO M 240, except that the limestone content is limited to between 5 and 12% by weight and the constituents shall be interground. Class F fly ash can replace a portion of Type IL blended cement and shall be replaced as outlined in Subarticle 1000-4(I) for Portland cement. For mixes that contain cement with alkali content between 0.6% and 1.0% and for mixes that contain a reactive aggregate documented by the Department, use a pozzolan in the amount shown in Table 1024-1.

Page 10-46, Table 1024-1, POZZOLANS FOR USE IN PORTLAND CEMENT CONCRETE, replace with the following:

TABLE 1024-1
POZZOLANS FOR USE IN PORTLAND CEMENT CONCRETE

Pozzolan	Rate
Class F Fly Ash	20% - 30% by weight of required cement content with 1.0 lb Class F fly ash per lb of cement replaced
Ground Granulated Blast Furnace Slag	35%-50% by weight of required cement content with 1.0 lb slag per lb of cement replaced
Microsilica	4%-8% by weight of required cement content with 1.0 lb microsilica per lb of cement replaced

Page 10-47, Subarticle 1024-3(B), Approved Sources, lines 16-18, replace the second sentence of the second paragraph with the following:

Tests shall be performed by AASHTO's designated National Transportation Product Evaluation Program (NTPEP) laboratory for concrete admixture testing.

Page 10-65, Article 1050-1, GENERAL, line 41, replace the first sentence with the following:

All fencing material and accessories shall meet Section 106.

Page 10-115, Subarticle 1074-7(B), Gray Iron Castings, lines 10-11, replace the first two sentences with the following:

Supply gray iron castings meeting all facets of AASHTO M 306 excluding proof load. Proof load testing will only be required for new casting designs during the design process, and conformance to M306 loading (40,000 lb.) will be required only when noted on the design documents.

Page 10-126, Table 1078-1, REQUIREMENTS FOR CONCRETE, replace with the following:

TABLE 1078-1
REQUIREMENTS FOR CONCRETE

Property	28 Day Design Compressive Strength 6,000 psi or less	28 Day Design Compressive Strength greater than 6,000 psi
Maximum Water/Cementitious Material Ratio	0.45	0.40
Maximum Slump without HRWR	3.5"	3.5"
Maximum Slump with HRWR	8"	8"
Air Content (upon discharge into forms)	5 + 2%	5 + 2%

Page 10-151, Article 1080-4, INSPECTION AND SAMPLING, lines 18-22, replace (B), (C) and (D) with the following:

(B) At least 3 panels prepared as specified in 5.5.10 of AASHTO M 300, Bullet Hole Immersion Test.

(C) At least 3 panels of 4"x6"x1/4" for the Elcometer Adhesion Pull Off Test, ASTM D4541.

(D) A certified test report from an approved independent testing laboratory for the Salt Fog Resistance Test, Cyclic Weathering Resistance Test, and Bullet Hole Immersion Test as specified in AASHTO M 300.

(E) A certified test report from an approved independent testing laboratory that the product has been tested for slip coefficient and meets AASHTO M253, Class B.

Page 10-161, Subarticle 1081-1(A), Classifications, lines 29-33, delete first 3 sentences of the description for Type 2 and replace with the following:

Type 2 - A low-modulus, general-purpose adhesive used in epoxy mortar repairs. It may be used to patch spalled, cracked or broken concrete where vibration, shock or expansion and contraction are expected.

Page 10-162, Subarticle 1081-1(A), Classifications, lines 4-7, delete the second and third sentences of the description for Type 3A. **Lines 16-22,** delete Types 6A, 6B and 6C.

Page 10-162, Subarticle 1081-1(B), Requirements, lines 26-30, replace the second paragraph with the following:

For epoxy resin systems used for embedding dowel bars, threaded rods, rebar, anchor bolts and other fixtures in hardened concrete, the manufacturer shall submit test results showing that the bonding system will obtain 125% of the specified required yield strength of the fixture. Furnish certification that, for the particular bolt grade, diameter and embedment depth required, the anchor system will not fail by adhesive failure and that there is no movement of the anchor bolt. For certification and anchorage, use 3,000 psi as the minimum Portland cement concrete compressive strength used in this test. Use adhesives that meet Section 1081.

List the properties of the adhesive on the container and include density, minimum and maximum temperature application, setting time, shelf life, pot life, shear strength and compressive strength.

Page 10-163, Table 1081-1, PROPERTIES OF MIXED EPOXY RESIN SYSTEMS, replace with the following:

TABLE 1081-1
PROPERTIES OF MIXED EPOXY RESIN SYSTEMS

Property	Type 1	Type 2	Type 3	Type 3A	Type 4A	Type 4B	Type 5
Viscosity-Poises at 77°F ± 2°F	Gel	10-30	25-75	Gel	40-150	40-150	1-6
Spindle No.	-	3	4	--	4	4	2
Speed (RPM)	-	20	20	--	10	10	50
Pot Life (Minutes)	20-50	30-60	20-50	5-50	40-80	40-80	20-60
Minimum Tensile Strength at 7 days (psi)	1,500	2,000	4,000	4,000	1,500	1,500	4,000
Tensile Elongation at 7 days (%)	30 min.	30 min.	2-5	2-5	5-15	5-15	2-5
Min. Compressive Strength of 2". mortar cubes at 24 hours	3,000 (Neat)	4,000-	6,000-	6,000 (Neat)	3,000	3,000	6,000
Min. Compressive Strength of 2" mortar cubes at 7 days	5,000 (Neat)	-	-	-	-	5,000	-
Maximum Water Absorption (%)	1.5	1.0	1.0	1.5	1.0	1.0	1.0
Min. Bond Strength Slant Shear Test at 14 days (psi)	1,500	1,500	2,000	2,000	1,500	1,500	1,500

Page 10-164, Subarticle 1081-1(E), Prequalification, lines 31-33, replace the second sentence of the first paragraph with the following:

Manufacturers choosing to supply material for Department jobs must submit an application through the Value Management Unit with the following information for each type and brand name:

Page 10-164, Subarticle 1081-1(E)(3), line 37, replace with the following:

(3) Type of the material in accordance with Articles 1081-1 and 1081-4,

Page 10-165, Subarticle 1081-1(E)(6), line 1, in the first sentence of the first paragraph replace "AASHTO M 237" with "the specifications".

Page 10-165, Subarticle 1081-1(E), Prequalification, line 9-10, delete the second sentence of the last paragraph.

Page 10-165, Subarticle 1081-1(F), Acceptance, line 14, in the first sentence of the first paragraph replace "Type 1" with "Type 3".

Page 10-169, Subarticle 1081-3(G), Anchor Bolt Adhesives, delete this subarticle.

Page 10-170, Article 1081-3, HOT BITUMEN, line 9, add the following at the end of Section 1081:

1081-4 EPOXY RESIN ADHESIVE FOR BONDING TRAFFIC MARKINGS

(A) General

This section covers epoxy resin adhesive for bonding traffic markers to pavement surfaces.

(B) Classification

The types of epoxies and their uses are as shown below:

Type I – Rapid Setting, High Viscosity, Epoxy Adhesive. This type of adhesive provides rapid adherence to traffic markers to the surface of pavement.

Type II – Standard Setting, High Viscosity, Epoxy Adhesive. This type of adhesive is recommended for adherence of traffic markers to pavement surfaces when rapid set is not required.

Type III – Rapid Setting, Low Viscosity, Water Resistant, Epoxy Adhesive. This type of rapid setting adhesive, due to its low viscosity, is appropriate only for use with embedded traffic markers.

Type IV – Standard Set Epoxy for Blade Deflecting-Type Plowable Markers.

(C) Requirements

Epoxies shall conform to the requirements set forth in AASHTO M 237.

(D) Prequalification

Refer to Subarticle 1081-1(E).

(E) Acceptance

Refer to Subarticle 1081-1(F).

Page 10-173, Article 1084-2, STEEL SHEET PILES, lines 37-38, replace first paragraph with the following:

Steel sheet piles detailed for permanent applications shall be hot rolled and meet ASTM A572 or ASTM A690 unless otherwise required by the plans. Steel sheet piles shall be coated as required

by the plans. Galvanized sheet piles shall be coated in accordance with Section 1076. Metallized sheet piles shall be metallized in accordance to the Project Special Provision "Thermal Sprayed Coatings (Metallization)" with an 8 mil, 99.9% aluminum alloy coating and a 0.5 mil seal coating. Any portion of the metallized sheet piling encased in concrete shall receive a barrier coat. The barrier coat shall be an approved waterborne coating with a low-viscosity which readily absorbs into the pores of the aluminum thermal sprayed coating. The waterborne coating shall be applied at a spreading rate that results in a theoretical 1.5 mil dry film thickness. The manufacturer shall issue a letter of certification that the resin chemistry of the waterborne coating is compatible with the 99.9% aluminum thermal sprayed alloy and suitable for tidal water applications.

Page 10-174, Subarticle 1086-1(B)(1), Epoxy, lines 18-24, replace with the following:

The epoxy shall meet Article 1081-4.

The 2 types of epoxy adhesive which may be used are Type I, Rapid Setting, and Type II, Standard Setting. Use Type II when the pavement temperature is above 60°F or per the manufacturer's recommendations whichever is more stringent. Use Type I when the pavement temperature is between 50°F and 60°F or per the manufacturer's recommendations whichever is more stringent. Epoxy adhesive Type I, Cold Set, may be used to attach temporary pavement markers to the pavement surface when the pavement temperature is between 32°F and 50°F or per the manufacturer's recommendations whichever is more stringent.

Page 10-175, Subarticle 1086-2(E), Epoxy Adhesives, line 27, replace "Section 1081" with "Article 1081-4".

Page 10-177, Subarticle 1086-3(E), Epoxy Adhesives, line 22, replace "Section 1081" with "Article 1081-4".

Page 10-179, Subarticle 1087-4(A), Composition, lines 39-41, replace the third paragraph with the following:

All intermixed and drop-on glass beads shall not contain more than 75 ppm arsenic or 200 ppm lead.

Page 10-180, Subarticle 1087-4(B), Physical Characteristics, line 8, replace the second paragraph with the following:

All intermixed and drop-on glass beads shall comply with NCGS § 136-30.2 and 23 USC § 109(r).

Page 10-181, Subarticle 1087-7(A), Intermixed and Drop-on Glass Beads, line 24, add the following after the first paragraph:

Use X-ray Fluorescence for the normal sampling procedure for intermixed and drop-on beads, without crushing, to check for any levels of arsenic and lead. If any arsenic or lead is detected, the sample shall be crushed and repeat the test using X-ray Fluorescence. If the X-ray Fluorescence test shows more than a LOD of 5 ppm, test the beads using United States Environmental Protection Agency Method 6010B, 6010C or 3052 for no more than 75 ppm arsenic or 200 ppm lead.

HIGH STRENGTH CONCRETE FOR DRIVEWAYS:
(11-21-00) (Rev. 1-17-12) 848 SP10 R02

Use high early strength concrete for all driveways shown in the plans and as directed by the Engineer. Provide high early strength concrete that meets the requirements of Article 1000-5 of the *2012 Standard Specifications*.

Measurement and payment will be in accordance with Section 848 of the *2012 Standard Specifications*.

SELECT MATERIAL, CLASS III, TYPE 3:
(1-17-12) 1016, 1044 SP10 R05

Revise the *2012 Standard Specifications* as follows:

Page 10-39, Article 1016-3, CLASS III, add the following after line 14:

Type 3 Select Material

Type 3 select material is a natural or manufactured fine aggregate material meeting the following gradation requirements and as described in Sections 1005 and 1006:

Percentage of Total by Weight Passing							
3/8"	#4	#8	#16	#30	#50	#100	#200
100	95-100	65-100	35-95	15-75	5-35	0-25	0-8

Page 10-39, Article 1016-3, CLASS III, line 15, replace "either type" with "Type 1, Type 2 or Type 3".

Page 10-62, Article 1044-1, line 36, delete the sentence and replace with the following:

Subdrain fine aggregate shall meet Class III select material, Type 1 or Type 3.

Page 10-63, Article 1044-2, line 2, delete the sentence and replace with the following:

Subdrain coarse aggregate shall meet Class V select material.

SHOULDER AND SLOPE BORROW:
(3-19-13) 1019 SP10 R10

Use soil in accordance with Section 1019 of the *2012 Standard Specifications*. Use soil consisting of loose, friable, sandy material with a PI greater than 6 and less than 25 and a pH ranging from 5.5 to 7.0.

Soil with a pH ranging from 4.0 to 5.5 will be accepted without further testing if additional limestone is provided in accordance with the application rates shown in Table 1019-1A. Soil type is identified during the soil analysis. Soils with a pH above 7.0 require acidic amendments

to be added. Submit proposed acidic amendments to the Engineer for review and approval. Soils with a pH below 4.0 or that do not meet the PI requirements shall not be used.

pH TEST RESULT	Sandy Soils Additional Rate (lbs. / Acre)	Silt Loam Soils Additional Rate (lbs. / Acre)	Clay Loam Soils Additional Rate (lbs. / Acre)
4.0 - 4.4	1,000	4,000	6,000
4.5 - 4.9	500	3,000	5,000
5.0 - 5.4	NA	2,000	4,000

Note: Limestone application rates shown in this table are in addition to the standard rate of 4000 lbs. / acre required for seeding and mulching.

No direct payment will be made for providing additional lime or acidic amendments for Ph adjustment.

GROUT PRODUCTION AND DELIVERY:

(3-17-15) 1003 SP10 R20

Revise the *2012 Standard Specifications* as follows:

Replace Section 1003 with the following:

SECTION 1003
GROUT PRODUCTION AND DELIVERY

1003-1 DESCRIPTION

This section addresses cement grout to be used for structures, foundations, retaining walls, concrete barriers, embankments, pavements and other applications in accordance with the contract. Produce non-metallic grout composed of Portland cement and water and at the Contractor's option or as required, aggregate and pozzolans. Include chemical admixtures as required or needed. Provide sand cement or neat cement grout as required. Define "sand cement grout" as grout with only fine aggregate and "neat cement grout" as grout without aggregate.

The types of grout with their typical uses are as shown below:

Type 1 – A cement grout with only a 3-day strength requirement and a fluid consistency that is typically used for filling subsurface voids.

Type 2 – A nonshrink grout with strength, height change and flow conforming to ASTM C1107 that is typically used for foundations, ground anchors and soil nails.

Type 3 – A nonshrink grout with high early strength and freeze-thaw durability requirements that is typically used in pile blockouts, grout pockets, shear keys, dowel holes and recesses for concrete barriers and structures.

Type 4 – A neat cement grout with low strength, a fluid consistency and high fly ash content that is typically used for slab jacking.

Type 5 – A low slump, low mobility sand cement grout with minimal strength that is typically used for compaction grouting.

1003-2 MATERIALS

Refer to Division 10.

Item	**Section**
Chemical Admixtures	1024-3
Fine Aggregate	1014-1
Fly Ash	1024-5
Ground Granulated Blast Furnace Slag	1024-6
Portland Cement	1024-1
Silica Fume	1024-7
Water	1024-4

Do not use grout that contains soluble chlorides or more than 1% soluble sulfate. At the Contractor's option, use an approved packaged grout instead of the materials above except for water. Use packaged grouts that are on the NCDOT Approved Products List.

Use admixtures for grout that are on the NCDOT Approved Products List or other admixtures in accordance with Subarticle 1024-3(E) except do not use concrete additives or unclassified or other admixtures in Type 4 or 5 grout. Use Class F fly ash for Type 4 grout and Type II Portland cement for Type 5 grout.

Use well graded rounded aggregate with a gradation, liquid limit (LL) and plasticity index (PI) that meet Table 1003-1 for Type 5 grout. Fly ash may be substituted for a portion of the fines in the aggregate. Do not use any other pozzolans in Type 5 grout.

TABLE 1003-1 AGGREGATE REQUIREMENTS FOR TYPE 5 GROUT			
Gradation		Maximum Liquid Limit	Maximum Plasticity Index
Sieve Designation per AASHTO M 92	Percentage Passing (% by weight)		
3/8"	100	N/A	N/A
No. 4	70 – 95		
No. 8	50 – 90		
No. 16	30 – 80		
No. 30	25 – 70		
No. 50	20 – 50		
No. 100	15 – 40		
No. 200	10 – 30	25	10

1003-3 COMPOSITION AND DESIGN

When using an approved packaged grout, a grout mix design submittal is not required. Otherwise, submit proposed grout mix designs for each grout mix to be used in the work. Mixes for all grout shall be designed by a Certified Concrete Mix Design Technician or an Engineer licensed by the State of North Carolina. Mix proportions shall be determined by a testing laboratory approved by the Department. Base grout mix designs on laboratory trial batches that meet Table 1003-2 and this section. With permission, the Contractor may use a quantity of chemical admixture within the range shown on the current list of approved admixtures maintained by the Materials and Tests Unit.

Submit grout mix designs in terms of saturated surface dry weights on Materials and Tests Form 312U at least 35 days before proposed use. Adjust batch proportions to compensate for surface moisture contained in the aggregates at the time of batching. Changes in the saturated surface dry mix proportions will not be permitted unless revised grout mix designs have been submitted to the Engineer and approved.

Accompany Materials and Tests Form 312U with a listing of laboratory test results of compressive strength, density and flow or slump and if applicable, aggregate gradation, durability and height change. List the compressive strength of at least three 2" cubes at the age of 3 and 28 days.

The Engineer will review the grout mix design for compliance with the contract and notify the Contractor as to its acceptability. Do not use a grout mix until written notice has been received. Acceptance of the grout mix design or use of approved packaged grouts does not relieve the Contractor of his responsibility to furnish a product that meets the contract. Upon written request from the Contractor, a grout mix design accepted and used satisfactorily on any Department project may be accepted for use on other projects.

Perform laboratory tests in accordance with the following test procedures:

Property	**Test Method**
Aggregate Gradation[A]	AASHTO T 27
Compressive Strength	AASHTO T 106
Density (Unit Weight)	AASHTO T 121, AASHTO T 133[B], ANSI/API RP[C] 13B-1[B] (Section 4, Mud Balance)
Durability	AASHTO T 161[D]
Flow	ASTM C939 (Flow Cone)
Height Change	ASTM C1090[E]
Slump	AASHTO T 119

A. Applicable to grout with aggregate.
B. Applicable to Neat Cement Grout.
C. American National Standards Institute/American Petroleum Institute Recommended Practice.
D. Procedure A (Rapid Freezing and Thawing in Water) required.
E. Moist room storage required.

1003-4 GROUT REQUIREMENTS

Provide grout types in accordance with the contract. Use grouts with properties that meet Table 1003-2. The compressive strength of the grout will be considered the average compressive strength test results of three 2" cubes at each age. Make cubes that meet AASHTO T 106 from the grout delivered for the work or mixed on-site. Make cubes at such frequencies as the Engineer may determine and cure them in accordance with AASHTO T 106.

TABLE 1003-2 GROUT REQUIREMENTS					
Type of Grout	**Minimum Compressive Strength at**		**Height Change at 28 days**	**Flow[A]/Slump[B]**	**Minimum Durability Factor**
	3 days	**28 days**			
1	3,000 psi	–	–	10 – 30 sec	–
2	Table 1[C]			Fluid Consistency[C]	–
3	5,000 psi	–	0 – 0.2%	Per Accepted Grout Mix Design/ Approved Packaged Grout	80
4[D]	600 psi	1,500 psi	–	10 – 26 sec	–
5	–	500 psi	–	1 – 3"	–

A. Applicable to Type 1 through 4 grouts.
B. Applicable to Type 5 grout.
C. ASTM C1107.
D. Use Type 4 grout with proportions by volume of 1 part cement and 3 parts fly ash.

1003-5 TEMPERATURE REQUIREMENTS

When using an approved packaged grout, follow the manufacturer's instructions for grout and air temperature at the time of placement. Otherwise, the grout temperature at the time of placement shall be not less than 50°F nor more than 90°F. Do not place grout when the air temperature measured at the location of the grouting operation in the shade away from artificial heat is below 40°F.

1003-6 ELAPSED TIME FOR PLACING GROUT

Agitate grout continuously before placement. Regulate the delivery so the maximum interval between the placing of batches at the work site does not exceed 20 minutes. Place grout before exceeding the times in Table 1003-3. Measure the elapsed time as the time between adding the mixing water to the grout mix and placing the grout.

TABLE 1003-3 ELAPSED TIME FOR PLACING GROUT (with continuous agitation)		
Air or Grout Temperature, Whichever is Higher	**Maximum Elapsed Time**	
	No Retarding Admixture Used	**Retarding Admixture Used**
90°F or above	30 minutes	1 hr. 15 minutes
80°F through 89°F	45 minutes	1 hr. 30 minutes
79°F or below	60 minutes	1 hr. 45 minutes

1003-7 MIXING AND DELIVERY

Use grout free of any lumps and undispersed cement. When using an approved packaged grout, mix grout in accordance with the manufacturer's instructions. Otherwise, comply with Articles 1000-8 through 1000-12 to the extent applicable for grout instead of concrete.

GEOSYNTHETICS:

(2-16-16) 1056 SP10 R25

Revise the *2012 Standard Specifications* as follows:

Replace Section 1056 with the following:

SECTION 1056
GEOSYNTHETICS

1056-1 DESCRIPTION

Provide geosynthetics for subsurface drainage, separation, stabilization, reinforcement, erosion control, filtration and other applications in accordance with the contract. Use geotextiles, geocomposite drains and geocells that are on the NCDOT Approved Products List. Prefabricated geocomposite drains include sheet, strip and vertical drains (PVDs), i.e., "wick drains" consisting of a geotextile attached to and/or encapsulating a plastic drainage core. Geocells are comprised of ultrasonically welded polymer strips that when expanded form a 3D honeycomb grid that is typically filled with material to support vegetation.

If necessary or required, hold geotextiles and sheet drains in place with new wire staples, i.e., "sod staples" that meet Subarticle 1060-8(D) or new anchor pins. Use steel anchor pins with a diameter of at least 3/16" and a length of at least 18" and with a point at one end and a head at the other end that will retain a steel washer with an outside diameter of at least 1.5".

1056-2 HANDLING AND STORING

Load, transport, unload and store geosynthetics so geosynthetics are kept clean and free of damage. Label, ship and store geosynthetics in accordance with Section 7 of AASHTO M 288. Geosynthetics with defects, flaws, deterioration or damage will be rejected. Do not unwrap geosynthetics until just before installation. Do not leave geosynthetics exposed for more than 7 days before covering except for geosynthetics for temporary wall faces and erosion control.

1056-3 CERTIFICATIONS

Provide Type 1, Type 2 or Type 4 material certifications in accordance with Article 106-3 for geosynthetics. Define "minimum average roll value" (MARV) in accordance with ASTM D4439. Provide certifications with MARV for geosynthetic properties as required. Test geosynthetics using laboratories accredited by the Geosynthetic Accreditation Institute (GAI) to perform the required test methods. Sample geosynthetics in accordance with ASTM D4354.

1056-4 GEOTEXTILES

When required, sew geotextiles together in accordance with Article X1.1.4 of AASHTO M 288. Provide sewn seams with seam strengths meeting the required strengths for the geotextile type and class specified.

Provide geotextile types and classes in accordance with the contract. Geotextiles will be identified by the product name printed directly on the geotextile. When geotextiles are not marked with a product name or marked with only a manufacturing plant identification code, geotextiles will be identified by product labels attached to the geotextile wrapping. When identification is based on labels instead of markings, unwrap geotextiles just before use in the presence of the Engineer to confirm that the product labels on both ends of the outside of the geotextile outer wrapping match the labels affixed to both ends of the inside of the geotextile roll core. Partial geotextile rolls without the product name printed on the geotextile or product labels affixed to the geotextile roll core may not be used.

Use woven or nonwoven geotextiles with properties that meet Table 1056-1. Define "machine direction" (MD) and "cross-machine direction" (CD) in accordance with ASTM D4439.

TABLE 1056-1
GEOTEXTILE REQUIREMENTS

Property	Requirement					Test Method
	Type 1	**Type 2**	**Type 3[A]**	**Type 4**	**Type 5[B]**	
Typical Application	*Shoulder Drains*	*Under Rip Rap*	*Silt Fence Fabric*	*Soil Stabilization*	*Temporary Walls*	
Elongation (MD & CD)	≥ 50%	≥ 50%	≤ 25%	< 50%	< 50%	ASTM D4632
Grab Strength (MD & CD)	Table 1[D], Class 3	Table 1[D], Class 1	100 lb[C]	Table 1[D], Class 3	–	ASTM D4632
Tear Strength (MD & CD)			–			ASTM D4533
Puncture Strength			–			ASTM D6241
Ultimate Tensile Strength (MD & CD)	–	–	–	–	2,400 lb/ft[C] (unless required otherwise in the contract)	ASTM D4595
Permittivity	Table 2[D], 15% to 50% *in Situ* Soil Passing 0.075 mm	Table 6[D], 15% to 50% *in Situ* Soil Passing 0.075mm	Table 7[D]	Table 5[D]	0.20 sec^{-1}[C]	ASTM D4491
Apparent Opening Size					0.60 mm[E]	ASTM D4751
UV Stability (Retained Strength)					70%[C] (after 500 hr of exposure)	ASTM D4355

A. Minimum roll width of 36" required.
B. Minimum roll width of 13 ft required.
C. MARV per Article 1056-3.
D. AASHTO M 288.
E. Maximum average roll value.

1056-5 GEOCOMPOSITE DRAINS

Provide geocomposite drain types in accordance with the contract and with properties that meet Table 1056-2.

TABLE 1056-2
GEOCOMPOSITE DRAIN REQUIREMENTS

Property	Requirement			Test Method
	Sheet Drain	Strip Drain	Wick Drain	
Width	≥ 12" (unless required otherwise in the contract)	12" ±1/4"	4" ±1/4"	N/A
In-Plane Flow Rate[A] (with gradient of 1.0 and 24-hour seating period)	6 gpm/ft @ applied normal compressive stress of 10 psi	15 gpm/ft @ applied normal compressive stress of 7.26 psi	1.5 gpm[B] @ applied normal compressive stress of 40 psi	ASTM D4716

A. MARV per Article 1056-3.
B. Per 4" drain width.

For sheet and strip drains, use accessories (e.g., pipe outlets, connectors, fittings, etc.) recommended by the Drain Manufacturer. Provide sheet and strip drains with Type 1 geotextiles heat bonded or glued to HDPE, polypropylene or high impact polystyrene drainage cores that meet Table 1056-3.

TABLE 1056-3
DRAINAGE CORE REQUIREMENTS

Property	Requirement (MARV)		Test Method
	Sheet Drain	Strip Drain	
Thickness	1/4"	1"	ASTM D1777 or D5199
Compressive Strength	40 psi	30 psi	ASTM D6364

For wick drains with a geotextile wrapped around a corrugated drainage core and seamed to itself, use drainage cores with an ultimate tensile strength of at least 225 lb per 4" width in accordance with ASTM D4595 and geotextiles with properties that meet Table 1056-4.

TABLE 1056-4 WICK DRAIN GEOTEXTILE REQUIREMENTS		
Property	**Requirement**	**Test Method**
Elongation	≥ 50%	ASTM D4632
Grab Strength	Table 1[A], Class 3	ASTM D4632
Tear Strength		ASTM D4533
Puncture Strength		ASTM D6241
Permittivity	0.7 sec^{-1}[B]	ASTM D4491
Apparent Opening Size (AOS)	Table 2[A], > 50% *in Situ* Soil Passing 0.075 mm	ASTM D4751
UV Stability (Retained Strength)		ASTM D4355

A. AASHTO M 288.
B. MARV per Article 1056-3.

For wick drains with a geotextile fused to both faces of a corrugated drainage core along the peaks of the corrugations, use wick drains with an ultimate tensile strength of at least 1,650 lb/ft in accordance with ASTM D4595 and geotextiles with a permittivity, AOS and UV stability that meet Table 1056-4.

1056-6 GEOCELLS

Geocells will be identified by product labels attached to the geocell wrapping. Unwrap geocells just before use in the presence of the Engineer. Previously opened geocell products will be rejected.

Manufacture geocells from virgin polyethylene resin with no more than 10% rework, also called "regrind", materials. Use geocells made from textured and perforated HDPE strips with an open area of 10% to 20% and properties that meet Table 1056-5.

TABLE 1056-5 GEOCELL REQUIREMENTS		
Property	**Minimum Requirement**	**Test Method**
Cell Depth	4"	N/A
Sheet Thickness	50 mil -5%, +10%	ASTM D5199
Density	58.4 lb/cf	ASTM D1505
Carbon Black Content	1.5%	ASTM D1603 or D4218
ESCR[A]	5000 hr	ASTM D1693
Coefficient of Direct Sliding (with material that meets AASHTO M 145 for soil classification A-2)	0.85	ASTM D5321
Short-Term Seam (Peel) Strength (for 4" seam)	320 lb	USACE[C] Technical Report GL-86-19, Appendix A
Long-Term Seam (Hang) Strength[B] (for 4" seam)	160 lb	

A. Environmental Stress Crack Resistance.

B. Minimum test period of 168 hr with a temperature change from 74°F to 130°F in 1-hour cycles.

C. US Army Corps of Engineers.

Provide geocell accessories (e.g., stakes, pins, clips, staples, rings, tendons, anchors, deadmen, etc.) recommended by the Geocell Manufacturer.

TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS:

(8-21-12) 1101.02 SP11 R10

Revise the *2012 Roadway Standard Drawings* as follows:

Drawing No. 1101.02, Sheet 12, TEMPORARY LANE CLOSURES, replace General Note #11 with the following:

11- TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS (TMCMS) USED ON SHADOW VEHICLES FOR "IN LANE" ACTIVITIES SHALL BE A MINIMUM OF 43" X 73". THE DISPLAY PANEL SHALL HAVE FULL MATRIX CAPABILITY WITH THE CAPABILITY TO PROVIDE 2 MESSAGE LINES WITH 7 CHARACTERS PER LINE WITH A MINIMUM CHARACTER HEIGHT OF 18". FOR ADDITIONAL MESSAGING, CONTACT THE WORK ZONE TRAFFIC CONTROL SECTION.

12- TMCMS USED FOR ADVANCED WARNING ON VEHICLES LOCATED ON THE SHOULDER MAY BE SMALLER THAN 43" X 73". THE DISPLAY PANEL SHALL HAVE THE CAPABILITY TO PROVIDE 2 MESSAGE LINES WITH 7 CHARACTERS PER LINE WITH A MINIMUM CHARACTER HEIGHT OF 18". FOR ADDITIONAL MESSAGING, CONTACT THE WORK ZONE TRAFFIC CONTROL SECTION.

Drawing No. 1101.02, Sheet 13, TEMPORARY LANE CLOSURES, replace General Note #12 with the following:

12- TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS (TMCMS) USED ON SHADOW VEHICLES FOR "IN LANE" ACTIVITIES SHALL BE A MINIMUM OF 43" X 73". THE DISPLAY PANEL SHALL HAVE FULL MATRIX CAPABILITY WITH THE CAPABILITY TO PROVIDE 2 MESSAGE LINES WITH 7 CHARACTERS PER LINE WITH A MINIMUM CHARACTER HEIGHT OF 18". FOR ADDITIONAL MESSAGING, CONTACT THE WORK ZONE TRAFFIC CONTROL SECTION.

13- TMCMS USED FOR ADVANCED WARNING ON VEHICLES LOCATED ON THE SHOULDER MAY BE SMALLER THAN 43" X 73". THE DISPLAY PANEL SHALL HAVE THE CAPABILITY TO PROVIDE 2 MESSAGE LINES WITH 7 CHARACTERS PER LINE WITH A MINIMUM CHARACTER HEIGHT OF 18". FOR ADDITIONAL MESSAGING, CONTACT THE WORK ZONE TRAFFIC CONTROL SECTION.

GROUT REFERENCES FOR POSITIVE PROTECTION:

(5-19-15) 1170 SP11 R20

Revise the *2012 Standard Specifications* as follows:

Page 11-14, Article 1170-2, Materials, line 30, in the materials table, replace "Freeze-Thaw Durable Grout, Nonshrink" with "Grout, Type 3".

Page 11-14, Article 1170-2, Materials, lines 31-32, delete the first paragraph after the materials table.

GROUT REFERENCES FOR UTILITY MANHOLES:

(8-18-15) 1525 SP15 R40

Revise the *2012 Standard Specifications* as follows:

Page 15-13, Article 1525-2, Materials, line 9, in the materials table, add the following:

Item	**Section**
Grout, Type 2	1003

Page 15-13, Article 1525-2, Materials, lines 20-21, replace the third paragraph after the materials table with the following:

Use Type 2 grout with properties that meet Table 1003-2 in the *Grout Production and Delivery* provision except provide grout with a plastic consistency in accordance with ASTM C1107.

Page 15-14, Subarticle 1525-3(B), Installation of Precast Units, line 22, in the second sentence of the first paragraph, replace "non-shrink grout." with "grout."

PERMANENT SEEDING AND MULCHING:

(7-1-95) 1660 SP16 R02

The Department desires that permanent seeding and mulching be established on this project as soon as practical after slopes or portions of slopes have been graded. As an incentive to obtain an early stand of vegetation on this project, the Contractor's attention is called to the following:

For all permanent seeding and mulching that is satisfactorily completed in accordance with the requirements of Section 1660 in the *2012 Standard Specifications* and within the following percentages of elapsed contract times, an additional payment will be made to the Contractor as an incentive additive. The incentive additive will be determined by multiplying the number of acres of seeding and mulching satisfactorily completed times the contract unit bid price per acre for Seeding and Mulching times the appropriate percentage additive.

Percentage of Elapsed Contract Time	Percentage Additive
0% - 30%	30%
30.01% - 50%	15%

Percentage of elapsed contract time is defined as the number of calendar days from the date of availability of the contract to the date the permanent seeding and mulching is acceptably completed divided by the total original contract time.

CONCRETE STEPS (with handrail):

(Rev 11-7-08) SPI 8-04

Description

Construct reinforced concrete steps with handrails in accordance with the plans and contract documents.

Materials

Refer to Division 10.

Item	Section
Portland cement concrete, Class B	1000
Curing agents	1026
Steel bar reinforcement	1070-2
Galvanizing	1076
Steel Pipe Rail	ASTM A53 (schedule 40)Plain End Galvanized Pipe

Construction Methods

Construct concrete in accordance with Section 825, except as otherwise provided herein. Furnish and place reinforcement, as shown on the plans, in accordance with Section 425. Give formed surfaces of the concrete a rubbed finish. Give unformed surfaces a float finish. Compact backfill to a degree comparable to the adjacent undisturbed material.

Measurement and Payment

Concrete Steps will be measured and paid for in cubic yards computed from the dimensions shown on the plans or established by the Engineer that has been incorporated into the completed and accepted steps. Work includes but is not limited to excavation and backfilling, furnishing and placing concrete, reinforcing steel, steel pipe rail, grout and all labor, tools, materials, equipment and incidentals necessary to complete the work.

Handrail on Steps will be measured and paid in linear feet along the top of the rail to the nearest 0.1 foot. Such price shall include furnishing and installing handrails, grouting, painting, and all labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	**Pay Unit**
Concrete Steps	Cubic Yard
Handrail on Steps	Linear Foot

County : Durham

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
			ROADWAY ITEMS			
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0001000000-E	200	CLEARING & GRUBBING .. ACRE(S)	Lump Sum	L.S.	
0004	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUBBING	1 ACR		
0005	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ********** (16+42.70 -L ALT-)	Lump Sum	L.S.	
0006	0029000000-N	SP	REINFORCED BRIDGE APPROACH FILL, STATION ********** (17+05.05 -Y-)	Lump Sum	L.S.	
0007	0036000000-E	225	UNDERCUT EXCAVATION	1,950 CY		
0008	0156000000-E	250	REMOVAL OF EXISTING ASPHALT PAVEMENT	42,000 SY		
0009	0163000000-E	250	REMOVAL OF EXISTING CONCRETE PAVEMENT	520 SY		
0010	0192000000-N	260	PROOF ROLLING	10 HR		
0011	0195000000-E	265	SELECT GRANULAR MATERIAL	750 CY		
0012	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	5,100 SY		
0013	0199000000-E	SP	TEMPORARY SHORING	1,622 SF		
0014	0255000000-E	SP	GENERIC GRADING ITEM HAULING & DISPOSAL OF PETROLEUM CONTAMINATED SOIL	500 TON		
0015	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	2,630 TON		
0016	0320000000-E	300	FOUNDATION CONDITIONING GEOTEXTILE	4,470 SY		
0017	0335200000-E	305	15" DRAINAGE PIPE	68 LF		
0018	0335300000-E	305	18" DRAINAGE PIPE	68 LF		

County : Durham

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0019	0354000000-E	310	***" RC PIPE CULVERTS, CLASS ***** (15", V)	344 LF		
0020	0354000000-E	310	***" RC PIPE CULVERTS, CLASS ***** (18", V)	120 LF		
0021	0448000000-E	310	*****" RC PIPE CULVERTS, CLASS IV (48")	84 LF		
0022	0448000000-E	310	*****" RC PIPE CULVERTS, CLASS IV (54")	1,168 LF		
0023	0448000000-E	310	*****" RC PIPE CULVERTS, CLASS IV (72")	92 LF		
0024	0448200000-E	310	15" RC PIPE CULVERTS, CLASS IV	6,796 LF		
0025	0448300000-E	310	18" RC PIPE CULVERTS, CLASS IV	704 LF		
0026	0448400000-E	310	24" RC PIPE CULVERTS, CLASS IV	1,912 LF		
0027	0448500000-E	310	30" RC PIPE CULVERTS, CLASS IV	476 LF		
0028	0448600000-E	310	36" RC PIPE CULVERTS, CLASS IV	204 LF		
0029	0448700000-E	310	42" RC PIPE CULVERTS, CLASS IV	1,108 LF		
0030	0582000000-E	310	15" CS PIPE CULVERTS, 0.064" THICK	184 LF		
0031	0636000000-E	310	**" CS PIPE ELBOWS, ******" THICK (15", 0.064")	2 EA		
0033	0986000000-E	SP	GENERIC PIPE ITEM 18" CS PIPE	54 LF		
0036	0986000000-E	SP	GENERIC PIPE ITEM 36" BCCM PIPE	116 LF		
0039	0992000000-E	SP	GENERIC PIPE ITEM 36" BCCMP BAND	2 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0040	0995000000-E	340	PIPE REMOVAL	3,558 LF		
0041	1011000000-N	500	FINE GRADING	Lump Sum	L.S.	
0042	1044000000-E	501	LIME TREATED SOIL (SLURRY METHOD)	16,400 SY		
0043	1066000000-E	501	LIME FOR LIME TREATED SOIL	170 TON		
0044	1099500000-E	505	SHALLOW UNDERCUT	1,450 CY		
0045	1099700000-E	505	CLASS IV SUBGRADE STABILIZATION	2,800 TON		
0046	1110000000-E	510	STABILIZER AGGREGATE	500 TON		
0047	1115000000-E	SP	GEOTEXTILE FOR PAVEMENT STABILIZATION	5,000 SY		
0048	1176000000-E	542	SOIL CEMENT BASE	16,400 SY		
0049	1187000000-E	542	PORTLAND CEMENT FOR SOIL CEMENT BASE	451 TON		
0050	1209000000-E	543	ASPHALT CURING SEAL	4,920 GAL		
0051	1220000000-E	545	INCIDENTAL STONE BASE	4,980 TON		
0052	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***" DEPTH (0" TO 1-1/2")	690 SY		
0053	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***" DEPTH (1-1/2")	3,700 SY		
0054	1297000000-E	607	MILLING ASPHALT PAVEMENT, ***" DEPTH (3")	1,730 SY		
0055	1330000000-E	607	INCIDENTAL MILLING	1,050 SY		
0056	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	11,200 TON		
0057	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	12,250 TON		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0058	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	50 TON		
0059	2000000000-N	806	RIGHT OF WAY MARKERS	173 EA		
0060	2022000000-E	815	SUBDRAIN EXCAVATION	336 CY		
0061	2033000000-E	815	SUBDRAIN FINE AGGREGATE	168 CY		
0062	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	1,000 LF		
0063	2070000000-N	815	SUBDRAIN PIPE OUTLET	2 EA		
0064	2077000000-E	815	6" OUTLET PIPE	30 LF		
0065	2143000000-E	818	BLOTTING SAND	10 TON		
0066	2190000000-N	828	TEMPORARY STEEL PLATE COVERS FOR MASONRY DRAINAGE STRUCTURE	45 EA		
0067	2209000000-E	838	ENDWALLS	3.5 CY		
0068	2220000000-E	838	REINFORCED ENDWALLS	7.1 CY		
0069	2253000000-E	840	PIPE COLLARS	0.45 CY		
0070	2264000000-E	840	PIPE PLUGS	3.833 CY		
0071	2275000000-E	SP	FLOWABLE FILL	50 CY		
0072	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	216 EA		
0073	2297000000-E	840	MASONRY DRAINAGE STRUCTURES	33.77 CY		
0074	2308000000-E	840	MASONRY DRAINAGE STRUCTURES	59.7 LF		
0075	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	48 EA		
0076	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	25 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0077	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	71 EA		
0078	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	70 EA		
0079	2396000000-N	840	FRAME WITH COVER, STD 840.54	12 EA		
0080	2407000000-N	840	STEEL FRAME WITH TWO GRATES, STD 840.37	4 EA		
0081	2418000000-E	SP	FRAME WITH GRATES, DRIVEWAY DROP INLET	36 LF		
0082	2451000000-N	852	CONCRETE TRANSITIONAL SECTION FOR DROP INLET	14 EA		
0083	2542000000-E	846	1'-6" CONCRETE CURB & GUTTER	4,400 LF		
0084	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	23,625 LF		
0085	2591000000-E	848	4" CONCRETE SIDEWALK	9,400 SY		
0086	2605000000-N	848	CONCRETE CURB RAMP	125 EA		
0087	2612000000-E	848	6" CONCRETE DRIVEWAY	1,080 SY		
0088	2655000000-E	852	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)	1,070 SY		
0089	2710000000-N	854	CONCRETE BARRIER TRANSITION SECTION	2 EA		
0090	2738000000-E	SP	GENERIC PAVING ITEM COLORED CONCRETE CROSSWALK	600 SY		
0091	2738000000-E	SP	GENERIC PAVING ITEM CONCRETE CROSSWALK HEADERS	150 SY		
0092	2738100000-E	SP	GENERIC PAVING ITEM BRICK PAVER ON CONCRETE BASE WITH BORDER	3,780 SF		
0093	2759000000-N	SP	GENERIC PAVING ITEM MEDIAN HAZARD PROTECTION	1 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0094	2830000000-N	858	ADJUSTMENT OF MANHOLES	10 EA		
0095	2845000000-N	858	ADJUSTMENT OF METER BOXES OR VALVE BOXES	10 EA		
0096	2893000000-N	859	CONVERT EXISTING CATCH BASIN TO JUNCTION BOX WITH MANHOLE	1 EA		
0097	2938000000-N	859	CONVERT EXISTING DROP INLET TO JUNCTION BOX WITH MANHOLE	1 EA		
0098	3030000000-E	862	STEEL BM GUARDRAIL	2,737.5 LF		
0099	3045000000-E	862	STEEL BM GUARDRAIL, SHOP CURVED	50 LF		
0100	3135000000-N	862	W-TR STEEL BM GUARDRAIL TRANSITION SECTIONS	1 EA		
0101	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	10 EA		
0102	3165000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE ********** (350, TL-2)	8 EA		
0103	3180000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE ********** (III MODIFIED)	1 EA		
0104	3195000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE AT-1	1 EA		
0105	3210000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	5 EA		
0106	3215000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE III	6 EA		
0107	3360000000-E	863	REMOVE EXISTING GUARDRAIL	1,920 LF		
0108	3380000000-E	862	TEMPORARY STEEL BM GUARDRAIL	600 LF		
0109	3387000000-N	862	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE ********** (CAT -1)	4 EA		
0110	3389100000-N	SP	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE 350	4 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0111	3421000000-E	862	GENERIC GUARDRAIL ITEM STEEL BM GUARDRAIL SHOP CURVED THRIE BEAM	50 LF		
0112	3421000000-E	862	GENERIC GUARDRAIL ITEM STEEL BM GUARDRAIL STRAIGHT THRIE BEAM	37.5 LF		
0113	3435000000-N	SP	GENERIC GUARDRAIL ITEM CONCRETE BOLLARDS	12 EA		
0114	3435000000-N	SP	GENERIC GUARDRAIL ITEM IMPACT ATTENUATOR UNIT, TYPE 350 TL-2	2 EA		
0115	3533000000-E	866	CHAIN LINK FENCE, **" FABRIC (60")	145 LF		
0116	3533000000-E	866	CHAIN LINK FENCE, **" FABRIC (72")	110 LF		
0117	3539000000-E	866	METAL LINE POSTS FOR **" CHAIN LINK FENCE (60")	13 EA		
0118	3539000000-E	866	METAL LINE POSTS FOR **" CHAIN LINK FENCE (72")	9 EA		
0119	3545000000-E	866	METAL TERMINAL POSTS FOR **" CHAIN LINK FENCE (60")	4 EA		
0120	3545000000-E	866	METAL TERMINAL POSTS FOR **" CHAIN LINK FENCE (72")	2 EA		
0121	3566000000-E	867	WOVEN WIRE FENCE RESET	210 LF		
0122	3572000000-E	867	CHAIN LINK FENCE RESET	900 LF		
0123	3575000000-E	SP	GENERIC FENCING ITEM HANDRAIL ON RETAINING WALL	1,050 LF		
0124	3575000000-E	SP	GENERIC FENCING ITEM TEMPORARY 72" CHAIN LINK FENCE WITH POSTS	110 LF		
0125	3635000000-E	876	RIP RAP, CLASS II	80 TON		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0126	3649000000-E	876	RIP RAP, CLASS B	2,137 TON		
0127	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	4,565 SY		
0128	3832000000-E	SP	RAILROAD TRACK TO BE REMOVED	1,192 TF		
0129	3883000000-N	SP	GENERIC TRACKWORK ITEM JUNCTION BOX NO 1	Lump Sum	L.S.	
0130	3883000000-N	SP	GENERIC TRACKWORK ITEM JUNCTION BOX NO 2	Lump Sum	L.S.	
0131	3883000000-N	SP	GENERIC TRACKWORK ITEM JUNCTION BOX REMOVAL	Lump Sum	L.S.	
0132	3884000000-N	SP	GENERIC TRACKWORK ITEM 12" BALLAST SCREEN	1 EA		
0133	3885000000-E	SP	GENERIC TRACKWORK ITEM BALLAST	3,500 TON		
0134	3885000000-E	SP	GENERIC TRACKWORK ITEM SUB-BALLAST	4,522 TON		
0135	4072000000-E	903	SUPPORTS, 3-LB STEEL U-CHANNEL	2,322 LF		
0136	4096000000-N	904	SIGN ERECTION, TYPE D	2 EA		
0137	4102000000-N	904	SIGN ERECTION, TYPE E	141 EA		
0138	4108000000-N	904	SIGN ERECTION, TYPE F	26 EA		
0139	4155000000-N	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	86 EA		
0140	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	7,162 SF		
0141	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	1,261 SF		
0142	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	1,573 SF		
0143	4415000000-N	1115	FLASHING ARROW BOARD	5 EA		

County : Durham

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0144	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	10 EA		
0145	4430000000-N	1130	DRUMS	475 EA		
0146	4435000000-N	1135	CONES	100 EA		
0147	4445000000-E	1145	BARRICADES (TYPE III)	1,616 LF		
0148	4450000000-N	1150	FLAGGER	3,168 HR		
0149	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	16 EA		
0150	4470000000-N	1160	RESET TEMPORARY CRASH CUSHION	7 EA		
0151	4480000000-N	1165	TMA	4 EA		
0152	4485000000-E	1170	PORTABLE CONCRETE BARRIER	2,384 LF		
0153	4490000000-E	1170	PORTABLE CONCRETE BARRIER (ANCHORED)	690 LF		
0154	4500000000-E	1170	RESET PORTABLE CONCRETE BARRIER	605 LF		
0155	4507000000-E	1170	WATER FILLED BARRIER	161 LF		
0156	4510000000-N	SP	LAW ENFORCEMENT	808 HR		
0157	4516000000-N	1180	SKINNY DRUM	200 EA		
0158	4590000000-E	SP	GENERIC TRAFFIC CONTROL ITEM TEMPORARY 6' FENCE	85 LF		
0159	4650000000-N	1251	TEMPORARY RAISED PAVEMENT MARKERS	1,892 EA		
0160	4685000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	3,885 LF		
0161	4686000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	16,228 LF		
0162	4690000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (6", 120 MILS)	5,167 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0163	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	716 LF		
0164	4697000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)	2,251 LF		
0165	4710000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)	5,858 LF		
0166	4721000000-E	1205	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)	36 EA		
0167	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	201 EA		
0168	4770000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)	434 LF		
0169	4770000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	912 LF		
0170	4780000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (8") (II)	199 LF		
0171	4795000000-E	1205	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (24") (IV)	32 LF		
0172	4800000000-N	1205	COLD APPLIED PLASTIC PAVEMENT MARKING CHARACTER, TYPE ** (II)	4 EA		
0173	4805000000-N	1205	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (II)	5 EA		
0174	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	133,925 LF		
0175	4820000000-E	1205	PAINT PAVEMENT MARKING LINES (8")	13,808 LF		
0176	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	10,646 LF		
0177	4840000000-N	1205	PAINT PAVEMENT MARKING CHARAC-TER	158 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0178	4845000000-N	1205	PAINT PAVEMENT MARKING SYMBOL	335 EA		
0179	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	35,915 LF		
0180	4860000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (8")	1,765 LF		
0181	4870000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	1,348 LF		
0182	4875000000-N	1205	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS	53 EA		
0183	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	635 EA		
0184	5000000000-E	1401	***' HIGH MOUNT STANDARD (60')	1 EA		
0185	5015000000-E	1401	120' HIGH MOUNT STANDARD	1 EA		
0186	5020000000-N	1401	PORTABLE DRIVE UNIT	1 EA		
0187	5025000000-E	SP	HIGH MOUNT FOUNDATIONS	14 CY		
0188	5050000000-N	1404	LIGHT STANDARD, TYPE MTLT ********** (45' TA 15' ARM)	8 EA		
0189	5070000000-N	1405	STANDARD FOUNDATION ********* (TYPE R1)	11 EA		
0190	5070000000-N	1405	STANDARD FOUNDATION ********* (TYPE R2)	2 EA		
0191	5120000000-N	1407	ELECTRIC SERVICE POLE **** ******** (30' CLASS 4)	1 EA		
0192	5125000000-E	1407	ELECTRIC SERVICE LATERAL ********** (3 #1/0 USE)	25 LF		
0193	5145000000-N	1408	LIGHT CONTROL EQUIPMENT, TYPE RW ********** (240/480 V)	1 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0194	5155000000-E	1409	ELECTRICAL DUCT, TYPE BD, SIZE ***** (2")	305 LF		
0195	5160000000-E	1409	ELECTRICAL DUCT, TYPE JA, SIZE ***** (3")	150 LF		
0196	5160000000-E	1409	ELECTRICAL DUCT, TYPE JA, SIZE ***** (4")	225 LF		
0197	5170000000-E	1410	** #8 W/G FEEDER CIRCUIT (2)	820 LF		
0198	5205000000-E	1410	** #8 W/G FEEDER CIRCUIT IN ****** CONDUIT (2, 1.5")	6,050 LF		
0199	5270000000-N	SP	GENERIC LIGHTING ITEM 120' HIGH MOUNT LUMINAIRE - LED	8 EA		
0200	5270000000-N	SP	GENERIC LIGHTING ITEM 60' HIGH MOUNT LUMINAIRE - LED	4 EA		
0201	5270000000-N	SP	GENERIC LIGHTING ITEM ELECTRICAL JUNCTION BOXES PC18	10 EA		
0202	5270000000-N	SP	GENERIC LIGHTING ITEM ELECTRICAL JUNCTION BOXES PC36	1 EA		
0203	5270000000-N	SP	GENERIC LIGHTING ITEM LIGHT STANDARD, TYPE MTLT, 45' SA, 15' ARM, BEHIND GR	4 EA		
0204	5270000000-N	SP	GENERIC LIGHTING ITEM LIGHT STANDARD, TYPE MTLT, 45' SA, 15' ARM, EXPOSED	1 EA		
0205	5270000000-N	SP	GENERIC LIGHTING ITEM ROADWAY LIGHT STANDARD LUMI-NAIRE - LED	21 EA		
0206	5325000000-E	1510	**" WATER LINE (36")	1,314 LF		
0207	5325200000-E	1510	2" WATER LINE	74 LF		
0208	5325600000-E	1510	6" WATER LINE	4,341 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0209	5325800000-E	1510	8" WATER LINE	1,386 LF		
0210	5326200000-E	1510	12" WATER LINE	2,528 LF		
0211	5326600000-E	1510	16" WATER LINE	2,669 LF		
0212	5327400000-E	1510	24" WATER LINE	106 LF		
0213	5534000000-E	1515	**" VALVE (36")	7 EA		
0214	5536000000-E	1515	2" VALVE	1 EA		
0215	5540000000-E	1515	6" VALVE	40 EA		
0216	5546000000-E	1515	8" VALVE	9 EA		
0217	5558000000-E	1515	12" VALVE	15 EA		
0218	5558600000-E	1515	16" VALVE	19 EA		
0219	5559400000-E	1515	24" VALVE	2 EA		
0220	5643100000-E	1515	3/4" WATER METER	1 EA		
0221	5648000000-N	1515	RELOCATE WATER METER	106 EA		
0222	5649000000-N	1515	RECONNECT WATER METER	3 EA		
0223	5666000000-E	1515	FIRE HYDRANT	1 EA		
0224	5672000000-N	1515	RELOCATE FIRE HYDRANT	16 EA		
0225	5691300000-E	1520	8" SANITARY GRAVITY SEWER	8,750 LF		
0226	5691500000-E	1520	12" SANITARY GRAVITY SEWER	266 LF		
0227	5768000000-N	1520	SANITARY SEWER CLEAN-OUT	148 EA		
0228	5775000000-E	1525	4' DIA UTILITY MANHOLE	83 EA		
0229	5781000000-E	1525	UTILITY MANHOLE WALL, 4' DIA	172 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0230	5801000000-E	1530	ABANDON 8" UTILITY PIPE	4,992 LF		
0231	5804000000-E	1530	ABANDON 12" UTILITY PIPE	2,469 LF		
0232	5810000000-E	1530	ABANDON 16" UTILITY PIPE	2,816 LF		
0233	5813000000-E	1530	ABANDON 24" UTILITY PIPE	1,315 LF		
0234	5815000000-N	1530	REMOVE WATER METER	8 EA		
0235	5816000000-N	1530	ABANDON UTILITY MANHOLE	15 EA		
0236	5828000000-N	1530	REMOVE UTILITY MANHOLE	31 EA		
0237	5882000000-N	SP	GENERIC UTILITY ITEM 24" FLUSHING CONNECTION ASSEMBLY	1 EA		
0238	5882000000-N	SP	GENERIC UTILITY ITEM 6" AIR RELEASE ASSEMBLY	1 EA		
0239	5888000000-E	SP	GENERIC UTILITY ITEM 30" ENCASEMENT PIPE	190 LF		
0240	6000000000-E	1605	TEMPORARY SILT FENCE	20,000 LF		
0241	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	1,200 TON		
0242	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	435 TON		
0243	6012000000-E	1610	SEDIMENT CONTROL STONE	2,055 TON		
0244	6015000000-E	1615	TEMPORARY MULCHING	13.5 ACR		
0245	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	900 LB		
0246	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEEDING	4.5 TON		
0247	6024000000-E	1622	TEMPORARY SLOPE DRAINS	400 LF		
0248	6029000000-E	SP	SAFETY FENCE	1,000 LF		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0249	6030000000-E	1630	SILT EXCAVATION	1,210 CY		
0250	6036000000-E	1631	MATTING FOR EROSION CONTROL	15,000 SY		
0251	6037000000-E	SP	COIR FIBER MAT	100 SY		
0252	6042000000-E	1632	1/4" HARDWARE CLOTH	1,700 LF		
0253	6070000000-N	1639	SPECIAL STILLING BASINS	40 EA		
0254	6071010000-E	SP	WATTLE	800 LF		
0255	6071020000-E	SP	POLYACRYLAMIDE (PAM)	225 LB		
0256	6071030000-E	1640	COIR FIBER BAFFLE	200 LF		
0257	6084000000-E	1660	SEEDING & MULCHING	10 ACR		
0258	6087000000-E	1660	MOWING	9 ACR		
0259	6090000000-E	1661	SEED FOR REPAIR SEEDING	150 LB		
0260	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	0.5 TON		
0261	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	350 LB		
0262	6102000000-E	1664	SODDING	260 SY		
0263	6105000000-E	1664	WATER	2.5 M/G		
0264	6108000000-E	1665	FERTILIZER TOPDRESSING	10.25 TON		
0265	6111000000-E	SP	IMPERVIOUS DIKE	2,500 LF		
0266	6114500000-N	1667	SPECIALIZED HAND MOWING	40 MHR		
0267	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	25 EA		
0268	6123000000-E	1670	REFORESTATION	0.25 ACR		
0269	6132000000-N	SP	GENERIC EROSION CONTROL ITEM CONCRETE WASHOUT STRUCTURE	15 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0270	6132000000-N	SP	GENERIC EROSION CONTROL ITEM FABRIC INSERT INLET PROTECTION DEVICE CLEANOUT	20 EA		
0271	6132000000-N	SP	GENERIC EROSION CONTROL ITEM FABRIC INSERT INLET PROTECTION DEVICE	10 EA		
0272	6890000000-E	SP	CONCRETE STEPS	18 CY		
0273	6895000000-E	SP	HANDRAIL ON STEPS	209 LF		
0274	7048500000-E	1705	PEDESTRIAN SIGNAL HEAD (16", 1 SECTION W/COUNTDOWN)	105 EA		
0275	7060000000-E	1705	SIGNAL CABLE	35,020 LF		
0276	7120000000-E	1705	VEHICLE SIGNAL HEAD (12", 3 SECTION)	153 EA		
0277	7132000000-E	1705	VEHICLE SIGNAL HEAD (12", 4 SECTION)	15 EA		
0278	7144000000-E	1705	VEHICLE SIGNAL HEAD (12", 5 SECTION)	2 EA		
0279	7264000000-E	1710	MESSENGER CABLE (3/8")	3,010 LF		
0280	7279000000-E	1715	TRACER WIRE	450 LF		
0281	7288000000-E	1715	PAVED TRENCHING (**********) (1, 2")	170 LF		
0282	7300000000-E	1715	UNPAVED TRENCHING (**********) (1, 2")	3,560 LF		
0283	7300000000-E	1715	UNPAVED TRENCHING (**********) (2, 2")	250 LF		
0284	7301000000-E	1715	DIRECTIONAL DRILL (**********) (2, 2")	1,790 LF		
0285	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	41 EA		
0286	7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)	21 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0287	7360000000-N	1720	WOOD POLE	25 EA		
0288	7372000000-N	1721	GUY ASSEMBLY	57 EA		
0289	7396000000-E	1722	1/2" RISER WITH WEATHERHEAD	29 EA		
0290	7408000000-E	1722	1" RISER WITH WEATHERHEAD	26 EA		
0291	7420000000-E	1722	2" RISER WITH WEATHERHEAD	39 EA		
0292	7430000000-N	1722	HEAT SHRINK TUBING RETROFIT KIT	1 EA		
0293	7432000000-E	1722	2" RISER WITH HEAT SHRINK TUBING	5 EA		
0294	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	6,990 LF		
0295	7456000000-E	1726	LEAD-IN CABLE (**********) (14-2)	9,530 LF		
0296	7481000000-N	SP	SITE SURVEY	7 EA		
0297	7481220000-N	SP	CAMERA WITH INTERNAL LOOP EMU-LATOR PROCESSING UNIT	27 EA		
0298	7528000000-E	1730	DROP CABLE	1,400 LF		
0299	7540000000-N	1731	SPLICE ENCLOSURE	5 EA		
0300	7541000000-N	1731	MODIFY SPLICE ENCLOSURE	1 EA		
0301	7552000000-N	1731	INTERCONNECT CENTER	8 EA		
0302	7564000000-N	1732	FIBER-OPTIC TRANSCEIVER, DROP & REPEAT	7 EA		
0303	7588000000-N	SP	METAL POLE WITH SINGLE MAST ARM	1 EA		
0304	7590000000-N	SP	METAL POLE WITH DUAL MAST ARM	13 EA		
0305	7613000000-N	SP	SOIL TEST	14 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0306	7614100000-E	SP	DRILLED PIER FOUNDATION	126 CY		
0307	7631000000-N	SP	MAST ARM WITH METAL POLE DESIGN	14 EA		
0308	7636000000-N	1745	SIGN FOR SIGNALS	105 EA		
0309	7642100000-N	1743	TYPE I POST WITH FOUNDATION	50 EA		
0310	7642200000-N	1743	TYPE II PEDESTAL WITH FOUNDATION	25 EA		
0311	7684000000-N	1750	SIGNAL CABINET FOUNDATION	7 EA		
0312	7744000000-N	1751	DETECTOR CARD (TYPE 170)	140 EA		
0313	7756000000-N	1751	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)	7 EA		
0314	7901000000-N	1753	CABINET BASE EXTENDER	7 EA		
0315	7960000000-N	SP	METAL POLE FOUNDATION REMOVAL	2 EA		
0316	7972000000-N	SP	METAL POLE REMOVAL	2 EA		
0317	7980000000-N	SP	GENERIC SIGNAL ITEM 5/8" X 10' GROUNDING ELECTRODE	4 EA		
0318	7980000000-N	SP	GENERIC SIGNAL ITEM CCTV CAMERA ASSEMBLY	1 EA		
0319	7980000000-N	SP	GENERIC SIGNAL ITEM CCTV EQUIPMENT CABINET DISCONNECT	1 EA		
0320	7980000000-N	SP	GENERIC SIGNAL ITEM CCTV METAL POLE DESIGN	1 EA		
0321	7980000000-N	SP	GENERIC SIGNAL ITEM CCTV SOIL TEST	1 EA		
0322	7980000000-N	SP	GENERIC SIGNAL ITEM INSTALL CCTV FIELD EQUIPMENT CABINET	1 EA		
0323	7980000000-N	SP	GENERIC SIGNAL ITEM INSTALL CCTV METAL POLE	1 EA		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0324	7980000000-N	SP	GENERIC SIGNAL ITEM INSTALL DIVISION FURNISHED MVD UNIT	1 EA		
0325	7980000000-N	SP	GENERIC SIGNAL ITEM OPTICALLY ACTIVATED TRAFFIC SIGNAL PRIORITY CONTROL SYS-TEMS	12 EA		
0326	7980000000-N	SP	GENERIC SIGNAL ITEM RECTANGULAR RAPID FLASHING BEACON ASSEMBLY	2 EA		
0327	7980000000-N	SP	GENERIC SIGNAL ITEM REMOVE EXISTING CCTV ELECTRICAL SERVICE EQUIPMENT	1 EA		
0328	7980000000-N	SP	GENERIC SIGNAL ITEM REMOVE EXISTING CCTV CAMERA ASSEMBLY	1 EA		
0329	7980000000-N	SP	GENERIC SIGNAL ITEM SCHOOL FLASHER	2 EA		
0330	7980000000-N	SP	GENERIC SIGNAL ITEM VIDEO OPTICAL TRANSCEIVER	1 EA		
0331	7990000000-E	SP	GENERIC SIGNAL ITEM #4 SOLID BARE GROUNDING CONDUCTOR	65 LF		
0332	7990000000-E	SP	GENERIC SIGNAL ITEM BACK PULL FIBER OPTIC CABLE	80 LF		
0333	7992000000-E	SP	GENERIC SIGNAL ITEM CCTV DRILLED PIER FOUNDATION	5 CY		
			******* BEGIN SCHEDULE AA ******* ******* (2 ALTERNATES) *******			
0334 AA1	0022000000-E	225	UNCLASSIFIED EXCAVATION	60,000 CY		
0335 AA1	1121000000-E	520	AGGREGATE BASE COURSE	18,000 TON		
0336 AA1	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	7,090 TON		
0337 AA1	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	1,743 TON		
			*** OR ***			

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0338 AA2	0022000000-E	225	UNCLASSIFIED EXCAVATION	55,000 CY		
0339 AA2	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	13,850 TON		
0340 AA2	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	2,070 TON		
			***** END SCHEDULE AA *****			
			WALL ITEMS			
0341	8801000000-E	SP	MSE RETAINING WALL NO **** (1)	1,090 SF		
0342	8801000000-E	SP	MSE RETAINING WALL NO **** (4)	1,360 SF		
0343	8801000000-E	SP	MSE RETAINING WALL NO **** (5)	935 SF		
0344	8802040000-E	SP	CIP GRAVITY RETAINING WALLS	1,740 SF		
			STRUCTURE ITEMS			
0345	8021000000-N	SP	REMOVAL OF EXISTING STRUCTURE AT STATION ********** (16+42.70 -LALT-)	Lump Sum	L.S.	
0346	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ********** (13+22.18 -CSXN-)	Lump Sum	L.S.	
0347	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ********** (23+00.86 -LALT-)	Lump Sum	L.S.	
0348	8042000000-N	402	REMOVAL OF EXISTING STRUCTURES AT STATION ********** (24+09.63 -LALT-)	Lump Sum	L.S.	
0349	8096000000-E	450	PILE EXCAVATION IN SOIL	80 LF		
0350	8097000000-E	450	PILE EXCAVATION NOT IN SOIL	16 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0351	8105540000-E	411	3'-6" DIA DRILLED PIERS IN SOIL	106.15 LF		
0352	8105640000-E	411	3'-6" DIA DRILLED PIERS NOT IN SOIL	65 LF		
0353	8113000000-N	411	SID INSPECTIONS	2 EA		
0354	8115000000-N	411	CSL TESTING	2 EA		
0355	8121000000-N	412	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION ******** (13+22.18 -CSXN-)	Lump Sum	L.S.	
0356	8121000000-N	412	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION ******** (24+09.63 -LALT-)	Lump Sum	L.S.	
0357	8147000000-E	420	REINFORCED CONCRETE DECK SLAB	37,064 SF		
0358	8161000000-E	420	GROOVING BRIDGE FLOORS	25,977 SF		
0359	8182000000-E	420	CLASS A CONCRETE (BRIDGE)	374.8 CY		
0360	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (16+42.70 -LALT-)	Lump Sum	L.S.	
0361	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ********** (23+00.86 -LALT-)	Lump Sum	L.S.	
0362	8217000000-E	425	REINFORCING STEEL (BRIDGE)	244,562 LB		
0363	8224000000-E	425	EPOXY COATED REINFORCING STEEL (BRIDGE)	55,372 LB		
0364	8226000000-E	425	EPOXY COATED SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	14,584 LB		
0365	8238000000-E	425	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	37,867 LB		
0366	8265000000-E	430	54" PRESTRESSED CONCRETE GIRDERS	771.88 LF		
0367	8280000000-E	440	APPROX ..... LBS STRUCTURAL STEEL	1,827,994 LS		

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0368	8364000000-E	450	HP12X53 STEEL PILES	1,456 LF		
0369	8391000000-N	450	STEEL PILE POINTS	8 EA		
0370	8440000000-E	454	METHOD A WATERPROOFING	53.3 SY		
0371	8475000000-E	460	TWO BAR METAL RAIL	295.78 LF		
0372	8517000000-E	460	1'-**"X *****" CONCRETE PARA-PET (1'-0" X 2'-0")	656.6 LF		
0373	8517000000-E	460	1'-**"X *****" CONCRETE PARA-PET (1'-2 3/4" X 3'-0")	667.95 LF		
0374	8531000000-E	462	4" SLOPE PROTECTION	1,829 SY		
0375	8654000000-N	SP	DISC BEARINGS	Lump Sum	L.S.	
0376	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum	L.S.	
0377	8692000000-N	SP	FOAM JOINT SEALS	Lump Sum	L.S.	
0378	8741000000-N	SP	STRUCTURE DRAINAGE SYSTEM AT STA********** (13+22.18 -CSXN-)	Lump Sum	L.S.	
0379	8741000000-N	SP	STRUCTURE DRAINAGE SYSTEM AT STA********** (24+09.63 -LALT-)	Lump Sum	L.S.	
0380	8860000000-N	SP	GENERIC STRUCTURE ITEM ASBESTOS ASSESSMENT	Lump Sum	L.S.	
0381	8860000000-N	SP	GENERIC STRUCTURE ITEM CONDUIT IN PARAPET	Lump Sum	L.S.	
0382	8860000000-N	SP	GENERIC STRUCTURE ITEM CONSTR,MAINT AND REMOVAL OF TEMPORARY SPAN	Lump Sum	L.S.	
0383	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING OF STRUCTURAL STEEL (CSX)	Lump Sum	L.S.	

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0384	8860000000-N	SP	GENERIC STRUCTURE ITEM PAINTING OF STRUCTURAL STEEL (NS)	Lump Sum	L.S.	
0385	8860000000-N	SP	GENERIC STRUCTURE ITEM SELF-LUBRICATING EXP BEARING ASSEMBLIES	Lump Sum	L.S.	
0386	8860000000-N	SP	GENERIC STRUCTURE ITEM TEMPORARY RAILROAD SHORING @ STATION 24+09.63 -LALT-	Lump Sum	L.S.	
0387	8867000000-E	SP	GENERIC STRUCTURE ITEM (4'-0")(LFD) DRILLED PIERS IN SOIL	146 LF		
0388	8867000000-E	SP	GENERIC STRUCTURE ITEM (4'-0")(LFD) DRILLED PIERS NOT IN SOIL	65 LF		
0389	8867000000-E	SP	GENERIC STRUCTURE ITEM (4'-6")(LFD) DRILLED PIERS IN SOIL	146.5 LF		
0390	8867000000-E	SP	GENERIC STRUCTURE ITEM (4'-6")(LFD) DRILLED PIERS NOT IN SOIL	133 LF		
0391	8867000000-E	SP	GENERIC STRUCTURE ITEM (5'-6")(LFD) DRILLED PIERS IN SOIL	76 LF		
0392	8867000000-E	SP	GENERIC STRUCTURE ITEM (5'-6")(LFD) DRILLED PIERS NOT IN SOIL	97 LF		
0393	8867000000-E	SP	GENERIC STRUCTURE ITEM ANODIZED 2 BAR METAL RAIL	340.46 LF		
0394	8867000000-E	SP	GENERIC STRUCTURE ITEM BRIDGE MOUNTED CHAIN LINK FENCE, 84" FABRIC	335.62 LF		
0395	8867000000-E	SP	GENERIC STRUCTURE ITEM HANDRAIL AND FENCE	370.2 LF		
0396	8867000000-E	SP	GENERIC STRUCTURE ITEM HP12X53 STEEL PILES (LFD)	1,380 LF		
0397	8867000000-E	SP	GENERIC STRUCTURE ITEM METAL HANDRAIL	369.8 LF		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0398	8881000000-E	SP	GENERIC STRUCTURE ITEM CLASS AA CONCRETE AS MODIFIED BY RAILROAD	266.1 CY		
0399	8881000000-E	SP	GENERIC STRUCTURE ITEM CONCRETE	397.7 CY		
0400	8893000000-E	SP	GENERIC STRUCTURE ITEM (1" ASPHALT PLANKING PROTECTIVE COURSE FOR DECK)	913 SY		
0401	8893000000-E	SP	GENERIC STRUCTURE ITEM DAMPPROOFING (RR STRUCTURES)	342.4 SY		
0402	8893000000-E	SP	GENERIC STRUCTURE ITEM MEMBRANE LAYER WATER PROOFING SYSTEM FOR DECK	913 SY		
0403	8893000000-E	SP	GENERIC STRUCTURE ITEM TWO PART MEMBRANE WATERPROOFING SYSTEM	37.6 SY		
0404	8893000000-E	SP	GENERIC STRUCTURE ITEM WATERPROOFING (RR STRS)	478 SY		
0405	8897000000-N	SP	GENERIC STRUCTURE ITEM CSL TESTING (LFD)	33 EA		
0406	8897000000-N	SP	GENERIC STRUCTURE ITEM SID INSPECTIONS (LFD)	33 EA		
0407	8897000000-N	SP	GENERIC STRUCTURE ITEM SPT TESTING (LFD)	17 EA		

RD266193

COMPUTED BY:	L. JAH	DATE:	01/12/2015
CHECKED BY:	A.K. WHITE	DATE:	11/16/2015

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3308	3D-1

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	Drainage Pipe 18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	C. S. PIPE 15 .064	C. S. PIPE 18 .064	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	R. C. PIPE CLASS IV 36	R. C. PIPE CLASS IV 42	R. C. PIPE CLASS IV 48	R. C. PIPE CLASS V 12	R. C. PIPE CLASS V 15	R. C. PIPE CLASS V 18	R. C. PIPE CLASS V 24	R. C. PIPE CLASS V 30	R. C. PIPE CLASS V 48	BIT COAT CORRUGATED METAL PIPE 36	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	GRATE TYPE F	GRATE TYPE G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 61+62	372 LT	0128		344.5																																																								EXISTING CB TO BE RETAINED
R1 11+00	4 LT	0401		394.8																															1																1	1								
		0401	0403		393.2	392.5												140																																										
R1 12+40	0 CL	0402		399.0																															1	1.6															1	1								
R1 12+40	19 LT	0403		400.2																															1	2.7		1		1																				
		0403	0402		392.5	392.4												20																																										
LALT 14+70	33 LT	0404		407.3																															1			1		1																				
		0404	0405		404.1	403.6												16																																										
LALT 14+64	19 LT	0405		406.7																															1																1	1								
LALT 14+81	44 RT	0406		407.6																															1			1			1																			
		0406	0407		404.5	403.7												12																																										
LALT 14+78	31 RT	0407		406.9																															1																1	1								
LALT 19+89	34 RT	0409		402.9																															1			1		1																				
		0409	0416		399.8	399.3												76																																										
Y3 10+60	20 RT	0411		404.2																															1			1		1																				
		0411	0413															44																																										
Y3 10+79	36 LT	0412		404.3																															1									1	1															
		0412	0413		402.0	400.3												16																																										
Y3 10+80	20 LT	0413		403.5																															1			1			1																			
		0413	0414		400.3	396.6												88																																										
Y3 11+68	20 LT	0414		399.7																															1			1	1																					
		0414	0415		396.6	396.4												40																																										
Y3 11+68	20 RT	0415		401.2																															1			1	1																					
		0415	0416		396.4	396.3												48																																										
LALT 19+95	45 LT	0416		402.5																															1	1.4		1			1																			
		0416	0418		396.0	395.7													112																																									
LALT 18+13	33 LT	0417		409.9																															1			1			1																			
		0417	0418		406.7	403.9												68																																										
LALT 18+80	50 LT	0418		407.1																															1	5.0	1.3	1			1																			
LALT 18+72	77 LT	0419		406.2																																																1	1							
LALT 19+00	91 LT	0420		397.0																															1								1																	
		0420	0421		393.8	392.3												12																																										
LALT 19+00	79 LT	0421		395.4																																																1		1						
R3 11+05	12 RT	0422		407.8																															1			1	1																					
		0422	0423		404.7	398.0									56																																											
R1 13+90	19 RT	0425		403.5																															1			1			1																			
		0425	0426		400.5	400.4												40																																										
R1 13+75	18 LT	0426		403.6																															1			1		1																				
		0426	0403		400.4	397.1												132																																										
LALT 25+03	52 RT	0501		395.8																															1									1	1															
		0501	0509		393.5	389.1												16																																										
LALT 22+85	35 LT	0502		394.5																															1			1			1																			
		0502	0503		391.3	389.9												100																																										
LALT 23+85	35 LT	0503		393.0																															1			1			1																			
		0503	0517		389.9	389.2	0.5											88																																										
LALT 22+75	35 RT	0504		394.7																															1			1		1																				
		0504	0506		391.5	390.3												76																																										
LALT 23+40	80 RT	0505		399.8																															1								1																	
		0505	0506		396.8	390.3									48																																											
LALT 23+50	35 RT	0506		393.5																															1			1		1																				
					SHEET TOTALS											104		1032	112																26	10.7	1.3	18	3	7	8		2	2	2						4	6	1	1						

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RD286193

COMPUTED BY:	L. JAH	DATE:	01/12/2015
CHECKED BY:	A.K. WHITE	DATE:	11/16/2015

PROJECT NO.	SHEET NO.
U-3308	3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	C. S. PIPE 15 .064	C. S. PIPE 18 .064	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	R. C. PIPE CLASS IV 36	R. C. PIPE CLASS IV 42	R. C. PIPE CLASS IV 48	R. C. PIPE CLASS V 12	R. C. PIPE CLASS V 15	R. C. PIPE CLASS V 18	R. C. PIPE CLASS V 24	R. C. PIPE CLASS V 30	R. C. PIPE CLASS V 48	BIT COAT CORRUGATED METAL PIPE 36	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
			0506	0516		390.3	389.2	0.4											116																																										
LALT 25+15	35	LT	0507		392.2																															1			1			1																					
			0507	0513		388.8	388.7													28																																									
LALT 26+35	35	LT	0508		392.4																															1	0.4		1		1																						
			0508	0608		387.0	379.1	0.5													468																																								
LALT 25+03	35	RT	0509		392.2																															1			1		1																						
			0509	0510		388.3	388.2														40																																								
LALT 25+44	35	RT	0510		392.2																															1			1	1																							
			0510	0512		388.2	388.0														76																																								
LALT 26+27	44	RT	0511		390.2																															1													1	36												
			0511	0512		388.0	387.9												12																																										
LALT 26+20	35	RT	0512		392.3																															1	0.1		1			1																					
			0512	0508		387.2	387.0														68																																								
LALT 25+44	35	LT	0513		392.2																															1			1	1																							
			0513	0508		388.7	388.4													92																																									
Y 15+94	22	RT	0514		416.5																															1			1		1																						
			0514	0515		413.4	413.2												44																																										
Y 15+82	22	LT	0515		416.4																															1			1			1																					
			0515	1505		413.2	412.3												128																																										
LALT 24+65	35	RT	0516		392.4																															1			1		1																						
			0516	0509		389.0	388.8												36																																										
LALT 24+75	35	LT	0517		392.3																															1			1			1																					
			0517	0507		388.9	388.8												40																																										
LALT 29+50	49	RT	0601		390.2																															1									1	1																	
			0601	0602		387.9	385.1												16																																										
LALT 29+56	36	RT	0602		388.2																															1			1		1																						
			0602	0604		385.1	379.6												148																																										
LALT 31+04	46	RT	0603		382.8																															1									1	1																	
			0603	0604		380.6	379.6												12																																										
LALT 31+03	35	RT	0604		382.7																															1			1		1																						
			0604	0620		379.6	376.3												92																																										
Y2 11+00	18	RT	0605		382.1																															1			1			1																					
			0605	0606		378.9	378.1												44																																										
Y2 10+77	20	LT	0606		381.3																															1			1		1																						
			0606	0620		378.1	376.3												40																																										
LALT 32+47	47	RT	0607		378.5																															1									1	1																	
			0607	0621		376.2	374.7												12																																										
LALT 31+05	35	LT	0608		382.9																															1			1			1																					
			0608	0609		378.8	375.5	0.6													92																																								
LALT 31+99	35	LT	0609		379.4																															1			1			1																					
			0609	0616		374.5	373.0	0.4															48																																						
Y1 11+12	19	RT	0610		382.7																															1			1		1																						
			0610	0611		378.7	378.5														36																																								
Y1 11+11	18	LT	0611		382.4																															1			1			1																					
			0611	0622		378.5	376.7	0.4													64																																								
Y1 12+06	18	LT	0612		380.2																															1			1	1																							
			0612	0609		375.8	375.0	0.5														44																																							
Y1 11+97	53	RT	0613		379.6																															1									1	1																	
			0613	0614		377.3	377.2		24																																																					
Y1 11+92	28	RT	0614		381.0																															1															1		1								
SHEET TOTALS									24										740	120	844	44	48													25	0.5		19	3	8	8			4	4			1	36	1		1								

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RD266193

COMPUTED BY:	L. JAH	DATE:	01/12/2015
CHECKED BY:	A.K. WHITE	DATE:	11/16/2015

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3308	3D-3

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	Drainage Pipe 18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	C. S. PIPE 15 .064	C. S. PIPE 18 .064	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	R. C. PIPE CLASS IV 36	R. C. PIPE CLASS IV 42	R. C. PIPE CLASS IV 48	R. C. PIPE CLASS V 12	R. C. PIPE CLASS V 15	R. C. PIPE CLASS V 18	R. C. PIPE CLASS V 24	R. C. PIPE CLASS V 30	R. C. PIPE CLASS V 48	BIT COAT CORRUGATED METAL PIPE 36	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
			0614	0612		376.0	375.8															48																																							
Y1 12+18	92	LT	0615		375.0																															1									1	1															
			0615	0616		372.7	372.7		20																																																				
LALT 32+48	35	LT	0616		377.9																															1	2.0		1			1																			
			0616	0702		370.9	370.4	0.4															116																																						
LALT 31+05	5	LT	0617		382.8																															1							1		1	1															
			0617	0608		379.6	379.5												28																																										
LALT 31+98	35	RT	0620		379.4																															1			1		1																				
			0620	0621		376.3	374.7	0.6											48																																										
LALT 32+48	35	RT	0621		377.9																															1			1		1																				
			0621	0724		374.7	372.5	1.0											112																																										
Y1 11+75	19	LT	0622		380.6																															1			1			1																			
			0622	0612		376.7	376.3	0.4													32																																								
LALT 33+65	60	LT	0701		372.6																															1									1	1															
			0701	0702		370.3	370.2		24																																																				
LALT 33+65	35	LT	0702		375.7																															1	2.7		1			1																			
			0702	0722		368.0	367.8																	48																																					
LALT 34+60	75	LT	0703		371.0																															1									1	1															
			0703	0704		368.7	367.5												40																																										
LALT 35+00	75	LT	0704		369.7																															1									1	1															
			0704	0705		367.5	367.4												40																																										
LALT 35+04	35	LT	0705		376.1																															1	5.0	0.9	1			1																			
			0705	0714		365.1	364.7																	116																																					
LALT 34+60	50	RT	0706		375.0																															1									1	1															
			0706	0707		372.8	372.6												36																																										
LALT 35+00	50	RT	0707		374.9																															1									1	1															
			0707	0708		372.6	371.5												16																																										
LALT 35+00	35	RT	0708		374.7																															1			1		1																				
			0708	0712		370.7	369.7	0.3													96																																								
Y5 10+66	17	LT	0709		372.0																															1			1	1																					
			0709	0727		368.9	368.6												20																																										
Y5 10+85	20	RT	0710		372.4																															1			1			1																			
			0710	0709		369.3	368.9												40																																										
LALT 35+96	49	RT	0711		374.4																															1									1	1															
			0711	0712		372.2	370.5												12																																										
LALT 35+97	35	RT	0712		373.7																															1			1		1																				
			0712	0727		369.7	367.9	0.5													76																																								
LALT 36+21	52	LT	0713		373.9																															1									1	1															
			0713	0714		371.7	370.1												20																																										
LALT 36+18	35	LT	0714		373.3																															1	3.6		1			1																			
			0714	0726		364.7	364.1																	112																																					
Y4 12+37	20	LT	0715		380.4																															1			1		1																				
			0715	0716		377.2	375.1	0.4											44																																										
Y4 11+90	20	LT	0716		378.3																															1			1		1																				
			0716	0718		375.1	373.0	0.5											44																																										
Y4 11+00	20	LT	0717		375.1																															1			1		1																				
			0717	0719		371.9	371.3	0.7											36																																										
Y4 11+45	20	LT	0718		376.2																															1			1		1																				
			0718	0717		373.0	371.9	0.7											44																																										
Y4 11+00	20	RT	0719		374.5																															1			1			1																			
SHEET TOTALS									44										580		204	48	116	276												25	13.3	0.9	16	1	8	7	1		9	9															

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY:	L. JAH	DATE:	01/12/2015
CHECKED BY:	A.K. WHITE	DATE:	11/16/2015

PROJECT NO.	SHEET NO.
U-3308	3D-4

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 15	18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 (.064)	C. S. PIPE 15 (.064)	C. S. PIPE 18 (.064)	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	48	BIT COAT CORRUGATED METAL PIPE 36
		0719	0721		371.3	370.5	0.9											40													
LALT 36+10	5 LT	0720		374.0																											
		0720	0714		371.0	370.1												32													
Y4 10+59	20 RT	0721		373.7																											
		0721	0726		370.5	368.6	1.0											44													
LALT 34+12	35 LT	0722		375.6																											
		0722	0705		367.8	367.4																	92								
LALT 33+61	4 RT	0723		376.4																											
		0723	0702		373.3	372.5												40													
LALT 33+63	35 RT	0724		375.7																											
		0724	0708		371.8	370.7														136											
LALT 33+63	50 RT	0725		376.3																											
		0725	0724		373.1	372.5	0.4											16													
LALT 37+30	35 LT	0726		371.8																											
		0726	0835		364.1	361.9	0.3																136								
Y5 10+46	18 LT	0727		371.8																											
		0727	0728		367.9	365.8	0.8													76											
LALT 37+50	35 RT	0728		369.8																											
		0728	0801		365.8	361.8	0.9													120											
LALT 38+74	35 RT	0801		365.7																											
		0801	0813		360.3	359.8	0.5																24								
LALT 38+65	4 RT	0803		366.6																											
		0803	0801		361.2	360.3	0.3																32								
LALT 40+20	52 LT	0804		360.6																											
		0804	0807		358.4	357.5												16													
LALT 40+00	46 RT	0805		366.5																											
		0805	0838		362.6	359.8										12															
LALT 40+40	7 RT	0806		361.2																											
		0806	0821		358.0	356.1												60													
LALT 40+21	35 LT	0807		360.7																											
		0807	0812		357.5	355.3	0.3											68													
Y6 11+60	16 LT	0808		365.6																											
		0808	0809		362.4	362.1	0.6											28													
Y6 11+60	14 RT	0809		365.3																											
		0809	0811		362.1	355.9	0.7											92													
Y6 10+74	16 LT	0810		360.3																											
Y6 10+66	16 RT	0811		359.0																											
Y6 09+93	16 RT	0812		358.5																											
		0812	0827		355.3	350.8	0.4											156													
LALT 39+00	35 RT	0813		365.2																											
		0813	0838		359.8	357.5	0.5																100								
Y7 11+77	33 RT	0815		366.3																											
		0815	0816		360.3	360.2														16											
Y7 11+78	16 RT	0816		365.4																											
		0816	0817		360.2	360.1														32											
Y7 11+78	16 LT	0817		365.2																											
		0817	0819		360.1	357.7														72											
LALT 39+58	46 RT	0818		365.0																											
		0818	0805		362.7	362.6												40													
Y7 11+05	16 LT	0819		360.7																											
SHEET TOTALS																12		632		452			384								

FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0719	0721																													
0720					1							1		1	1															
0720	0714																													
0721					1			1			1																			
0721	0726																													
0722					1	2.8		1			1																			
0722	0705																													
0723					1							1		1	1															
0723	0702																													
0724					1			1		1																				
0724	0708																													
0725					1									1	1															
0725	0724																													
0726					1	2.7		1			1																			
0726	0835																													
0727					1			1		1																				
0727	0728																													
0728					1			1		1																				
0728	0801																													
0801					1	0.4		1		1																				
0801	0813																													
0803					1	0.4						1		1	1															
0803	0801																													
0804					1									1	1															
0804	0807																													
0805					1									1	1															
0805	0838																								2					2 @ 15°
0806					1							1		1	1															
0806	0821																													
0807					1			1			1																			
0807	0812																													
0808					1			1		1																				
0808	0809																													
0809					1			1			1																			
0809	0811																													
0810					1	2.4		1		1																				
0811					1	3.3		1			1																			
0812					1			1			1																			
0812	0827																													
0813					1	0.4		1		1																				
0813	0838																													
0815					1	1.0		1			1																			
0815	0816																													
0816					1	0.2															1	1								
0816	0817																													
0817					1	0.2		1		1																				
0817	0819																													
0818					1									1	1															
0818	0805																													
0819					1			1		1																				
SHEET TOTALS					26	13.8		17		9	8	4		8	8						1	1			2					

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RD266193

RD2666193

COMPUTED BY:	L. JAH	DATE:	01/12/2015
CHECKED BY:	A.K. WHITE	DATE:	11/16/2015

PROJECT NO.	SHEET NO.
U-3308	3D-5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	Drainage Pipe 18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	C. S. PIPE 15 .064	C. S. PIPE 18 .064	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	48	BIT COAT CORRUGATED METAL PIPE 36	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
		0819	0820		357.7	355.9														24																																								
Y7 10+82	17 LT	0820		359.8																															1	1.1		1	1																					
		0820	0842		353.7	349.8	0.7																156																																					
LALT 41+01	7 RT	0821		359.2																															1							1		1	1															
		0821	0820		356.1	356.0												28																																										
LALT 43+13	7 RT	0822		354.4																															1							1		1	1															
		0822	0839		349.8	349.7												28																																										
Y8 11+25	10 LT	0823		361.5																															1			1		1																				
		0823	0824		358.3	356.7												24																																										
Y8 11+09	10 RT	0824		359.8																															1			1			1																			
		0824	0826		356.7	349.7												96																																										
Y8 10+14	10 RT	0826		352.8																															1			1	1																					
		0826	0828		349.7	349.4												28																																										
LALT 42+50	35 LT	0827		353.9																															1	3.1		1			1																			
		0827	0842		345.8	345.6																		68																																				
LALT 43+16	35 LT	0828		352.5																															1			1			1																			
		0828	0905		349.4	347.7	0.4											120																																										
Y9 10+92	14 LT	0829		355.2																															1			1		1																				
		0829	0839		351.8	350.5	0.3												28																																									
Y9 10+93	14 RT	0830		355.4																															1			1			1																			
		0830	0829		352.0	351.8													28																																									
LALT 43+35	7 RT	0831		353.0																															1							1		1	1															
		0831	0822		349.9	349.8												20																																										
Y9 11+35	14 RT	0832		358.7																															1			1			1																			
		0832	0830		355.5	352.2	0.6											40																																										
LALT 42+53	51 RT	0833		357.4																															1									1	1															
		0833	0830		355.2	352.2												20																																										
LALT 42+48	52 LT	0834		352.8																															1	1.9								1	1															
		0834	0827		345.9	345.8																		16																																				
LALT 38+65	35 LT	0835		367.3																															1	0.4		1			1																			
		0835	0803		361.9	361.2	0.3																40																																					
LALT 40+00	35 RT	0838		362.9																															1	0.4		1		1																				
		0838	0820		357.5	354.4	0.5																100																																					
Y7 11+63	16 RT	0843		364.4																															1			1			1																			
		0843	0816		362.1	362.1																				16																																		
Y11 10+78	27 RT	0902		350.4																															1									1	1															
		0902	0903		348.2	347.1												16																																										
Y11 10+76	14 RT	0903		350.3																															1			1	1																					
		0903	0904		347.1	347.0												28																																										
Y11 10+67	16 LT	0904		350.2																															1			1	1																					
LALT 44+37	35 LT	0905		350.8																															1			1			1																			
		0905	0909		346.5	346.4														40																																								
Y10 10+85	10 LT	0906		355.3																															1			1		1																				
		0906	0907		352.1	349.1												28																																										
Y10 10+55	10 LT	0907		352.2																															1			1		1																				
		0907	0908		349.1	348.5												20																																										
Y10 10+50	10 RT	0908		351.6																															1			1			1																			
SHEET TOTALS																		496	56	64			296	84		16									24	6.9		18	4	5	9	3		6	6															

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RD266193

COMPUTED BY: L. JAH DATE: 01/12/2015
CHECKED BY: A.K. WHITE DATE: 11/16/2015

PROJECT NO.	SHEET NO.
U-3308	3D-6

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".**

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	Drainage Pipe 18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	C. S. PIPE 15 .064	C. S. PIPE 18 .064	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	R. C. PIPE CLASS IV 36	R. C. PIPE CLASS IV 42	R. C. PIPE CLASS IV 48	R. C. PIPE CLASS V 12	R. C. PIPE CLASS V 15	R. C. PIPE CLASS V 18	R. C. PIPE CLASS V 24	R. C. PIPE CLASS V 30	R. C. PIPE CLASS V 48	BIT COAT CORRUGATED METAL PIPE 36	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
		0908	0909		348.5	347.3												36																																										
LALT 44+78	35 LT	0909		350.5																															1			1			1																			
		0909	0911		346.4	346.2														80																																								
LALT 45+58	35 LT	0911		350.3																															1			1	1																							
		0911	0916		346.2	345.8														84																																								
Y12 11+10	10 RT	0913		357.9																															1			1			1																			
		0913	0914		354.7	354.6												20																																										
Y12 11+10	10 LT	0914		357.8																															1			1		1																				
		0914	0915		354.6	350.5												32																																										
Y12 10+75	10 LT	0915		353.7																															1			1		1																				
		0915	0916		350.5	347.4												44																																										
LALT 46+41	35 LT	0916		350.5																															1			1		1																				
		0916	0917		345.8	345.7	0.3													112																																								
LALT 47+00	35 LT	0917		351.1																															1	0.9		1		1																				
		0917	1003		345.2	344.5															160																																							
LALT 47+50	5 LT	0918		352.4																															1							1		1	1															
		0918	0910		349.2	349.1												40																																										
LALT 44+35	50 LT	0919		350.5																															1									1	1															
		0919	0905		347.3	347.3												16																																										
LALT 47+00	47 LT	0920		350.9																															1									1	1															
		0920	0917		348.7	347.9												12																																										
LALT 45+57	48 LT	0921		350.3																															1									1	1															
		0921	0911		348.1	347.1												12																																										
Y14 10+72	20 RT	1001		352.2																															1			1	1																							
		1001	1002		349.0	348.8												40																																										
Y14 10+59	19 LT	1002		352.0																															1			1	1																							
		1002	1003		348.8	348.7												28																																										
LALT 48+62	30 LT	1003		352.4																															1	2.9		1		1																				
		1003	1018		344.5	344.3															68																																							
Y15 12+11	26 RT	1006		341.9																															1									1	1															
Y15 12+14	19 RT	1007		341.5																															1			1	1																							
LALT 50+50	7 RT	1010		349.7																															1							1		1	1															
		1010	1014		346.5	343.1												180																																										
LALT 51+80	35 LT	1011		345.8																															1			1			1																			
		1011	1015		342.7	342.4												48																																										
LALT 52+28	35 RT	1012		346.0																															1			1	1																							
		1012	1013		341.0	340.9															24																																							
LALT 52+28	7 RT	1014		346.3																															1	0.2						1		1	1															
		1014	1012		341.1	341.0															28																																							
LALT 52+28	35 LT	1015		345.6																															1			1	1																							
		1015	1014		341.2	341.1															40																																							
SHEET TOTALS																		508		276	320														21	4.0		14	6	5	3	3		7	7															

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

R2208193

COMPUTED BY: L. JAH DATE: 01/12/2015

CHECKED BY: A.K. WHITE DATE: 11/16/2015

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3308	3D-7

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 15	18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE SIZE 12	15	18	THICKNESS OR GAUGE .064	.064	.064	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	48	BIT COAT CORRUGATED METAL PIPE 36	ENDWALLS STD. 838.11, 838.13, 838.14 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.06	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. STD. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.39	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
LALT 53+00	35 LT	1016		346.1																														1			1																			
		1016	1015		342.2	341.7	0.4																72																																	
Y16 11+83	15 RT	1101		355.2																														1			1																			
		1101	1102		352.0	351.9															28																																	
Y16 11+82	15 LT	1102		355.0																														1			1																			
		1102	1123		351.9	349.1															56																																	
Y16 10+52	15 LT	1103		348.4																														1			1																			
		1103	1104		345.2	344.9	0.4														20																																	
LALT 53+68	35 LT	1104		348.1																														1			1																			
		1104	1016		344.7	342.7	1.6														88																																	
LALT 54+57	55 LT	1105		349.8																														1																						
		1105	1106		346.4	346.3															20																																	
LALT 54+63	35 LT	1106		350.0																														1			1																			
		1106	1104		346.3	344.7	0.7														72																																	
LALT 55+25	35 LT	1107		351.6																														1			1																			
		1107	1106		348.4	346.8	0.5														60																																	
LALT 55+97	35 LT	1108		353.4																														1			1																			
		1108	1107		350.2	348.4	0.4														72																																	
LALT 54+63	35 RT	1109		350.0																														1			1																			
		1109	1125		346.8	344.7															80																																	
LALT 54+52	47 RT	1110		350.0																														1																						
		1110	1109		346.8	346.8															16																																	
LALT 55+70	35 RT	1111		352.7																														1			1																			
		1111	1109		349.4	346.8															108																																	
LALT 55+70	50 RT	1112		352.7																														1																						
		1112	1111		349.5	349.4															16																																	
LALT 57+00	35 LT	1113		355.9																														1			1																			
		1113	1108		352.2	350.2															104																																	
Y18 13+30	19 RT	1114		355.6																														1			1																			
		1114	1113		352.4	352.2															16																																	
Y18 12+42	19 RT	1115		361.5																														1			1																			
		1115	1114		358.3	352.4															88																																	
Y18 12+40	20 LT	1116		361.8																														1			1																			
		1116	1115		358.6	358.3															36																																	
LALT 59+00	35 RT	1117		355.5																														1			1																			
LALT 59+00	4 RT	1118		356.2																														1					1					1	1									
		1118	1117		352.2	352.1															28																																	
LALT 59+00	35 LT	1119		355.5																														1			1																			
		1119	1118		352.3	352.2															36																																	
LALT 55+24	4 LT	1120		352.3																														1					1					1	1									
		1120	1107		349.2	348.4															28																																	
Y16 11+25	15 LT	1123		352.3																														1			1																			
		1123	1103		349.1	345.2	0.3														72																																	
LALT 56+00	55 LT	1124		353.7																														1					1					1	1									
		1124	1108		350.5	350.2															20																																	
LALT 53+80	35 RT	1125		347.9																														1			1																			
		1125	1013		344.5	344.1															124																																	
LALT 60+10	35 LT	1202		351.8																														1			1																			
		1202	1217		348.6	340.7															208																																	
SHEET TOTALS																					1092	304	72												25			19		10	9		2			6	6								

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

R2226193

COMPUTED BY: L. JAH DATE: 01/12/2015

CHECKED BY: A.K. WHITE DATE: 11/16/2015

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3308	3D-8

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE: 15	18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE SIZE: 12	15	18	R. C. PIPE CLASS IV: 15	18	24	30	36	42	48	R. C. PIPE CLASS V: 12	15	18	24	30	48	BIT COAT CORRUGATED METAL PIPE: 36	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A: 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE: E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.06 OR STD. 852.04	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
LALT 59+83	35 RT	1203		352.8																												1			1																	
		1203	1211		349.7	337.6												316																																	
Y20 10+87	10 RT	1204		357.9																												1			1																	
		1204	1202		354.5	348.6										32																																	
Y20 10+67	39 LT	1205		357.9																												1			1																	
		1205	1204		354.7	354.5												56																																	
Y22 12+60	26 RT	1206		337.4																												1																				
		1206	1207		335.2	334.1												16																																	
Y22 12+65	15 RT	1207		337.3																												1			1	1																
		1207	1208		334.1	334.1												28																																	
Y22 12+65	16 LT	1208		337.3																												1			1	1																
		1208	1215		334.1	333.7												84																																	
LALT 63+25	35 LT	1209		339.8																												1			1																	
		1209	1210		336.7	332.0	0.3											100																																	
LALT 64+25	35 LT	1210		336.2																												1			1																	
		1210	1301		332.0	331.3	1.0											72																																	
LALT 63+01	35 RT	1211		340.8																												1			1																	
		1211	1212		337.6	335.7												72																																	
Y22 14+94	24 RT	1212		338.9																												1			1																	
		1212	1213		335.7	334.2												104																																	
Y22 16+00	20 RT	1213		337.4																												1			1	1																	
		1213	2401		334.1	333.1	0.5											188																																	
Y22 13+50	17 LT	1215		337.7																												1			1																	
		1215	1210		333.7	332.0												44																																	
LALT 63+04	4 LT	1216		341.3																												1					1		1	1												
		1216	1211		338.2	337.6												40																																	
LALT 62+20	35 LT	1217		343.8																												1			1																	
		1217	1209		340.7	336.7												104																																	
LALT 64+99	35 LT	1301		334.4																												1			1																	
		1301	1309		329.5	329.2	0.4																	40																									
LALT 65+79	49 LT	1302		335.5																												1					1		1												
		1302	1303		332.0	329.6																24																											
LALT 65+79	28 LT	1303		334.0																												1			1																	
		1303	1309		329.6	329.5																40																											
LALT 65+81	20 RT	1304		334.1																												1			1																	
		1304	1306		331.0	330.9												40																																	
LALT 65+25	20 RT	1305		334.4																												1			1																	
		1305	1306		331.2	331.2												12																																	
LALT 65+39	20 RT	1306		334.3																												1	1.0		1			1												
		1306	1307		328.3	327.9	0.4																		12																								
LALT 65+39	30 RT	1307		334.3																												1	2.3								1			1					
LALT 65+39	31 LT	1309		334.1																												1	0.6		1																	
		1309	1306		328.5	328.3	0.4																		48																								
Y 13+89	21 LT	1501		415.7																												1			1																	
		1501	1502		412.2	407.6	0.5									36																																	TIES TO TRACK WORK
Y 14+50	22 LT	1505		415.5																												1			1																	
		1505	1501		412.3	412.2												60																																	
Y 24+11	18 RT	1602		407.6																												1			1																	
		1602	1603		404.4	402.7	0.4											32																																	
Y 24+17	17 LT	1603		408.5																												1	0.8		1																	
				SHEET TOTALS												68		1388			64	40	60										26	4.7		22	5	9	8		1		3	3			1		1			

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

R0206193

COMPUTED BY:	L. JAH	DATE:	01/12/2015
CHECKED BY:	A.K. WHITE	DATE:	11/16/2015

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3308	3D-9

**Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".**

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	15 .064	18 .064	R. C. PIPE CLASS IV 15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	48	BIT COAT CORRUGATED METAL PIPE 36	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.	CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
Y 23+62	18 RT	1604		409.0																															1			1		1																				
		1604	1602		405.8	404.4	0.4											48																																										
Y 21+85	18 RT	1605		413.9																															1			1		1																				
		1605	1604		411.4	405.8																				176																																		
Y 20+20	18 LT	1606		416.4																															1			1			1																			
		1606	1607		413.3	413.1												36																																										
Y 20+30	17 RT	1607		416.8																															1			1		1																				
		1607	1605		413.1	411.4																				152																																		
Y7 12+51	16 RT	1801		368.9																															1			1			1																			
		1801	0816		365.7	362.2												72																																										
Y15 15+75	15 LT	2001		340.0																															1	1.5		1			1																			
		2001	2002		333.5	333.0	1.6																72																																					
Y15 12+97	26 RT	2003		342.2																															1									1	1															
		2003	2004		339.9	338.9												8																																										
Y15 12+96	19 RT	2004		342.0																															1			1			1																			
		2004	1007		338.9	338.7												80																																										
Y15 13+51	26 RT	2005		342.4																															1									1	1															
		2005	2006		340.2	339.2												8																																										
Y15 13+51	19 RT	2006		342.4																															1			1			1																			
		2006	2004		339.2	338.9												56																																										
Y15 15+95	17 RT	2007		339.8																															1	1.4		1		1																				
		2007	2008		333.4	333.3																	20																																					
Y22 17+90	16 RT	2401		336.2																															1			1		1																				
		2401	2402		332.8	332.6													32																																									
		2402	2403		332.6	332.5													48																																									
Y22 17+89	16 LT	2402		336.5																															1			1			1																			
		2403	2404		331.7	328.1	0.3												32																																									
Y22 18+36	15 LT	2403		336.0																															1			1	1																					
Y22 16+00	20 LT	2406		337.4																															1			1			1																			
		2406	1213		334.2	334.1												40																																										
LALT 65+59	2 LT	0000																																																									40	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 65+16	2 LT	0000																																																								64	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 19+36	46 LT	0000																																																								35	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 20+14	39 LT	0000																																																								61	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 20+46	60 LT	0000																																																								68	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 19+95	8 RT	0000																																																								88	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 25+07	30 RT	0000																																																								76	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 31+51	55 LT	0000																																																								107	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 31+82	54 LT	0000																																																								42	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 31+42	42 LT	0000																																																								65	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 31+17	27 LT	0000																																																								60	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 31+39	39 RT	0000																																																								28	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 36+65	32 LT	0000																																																								26	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 36+77	29 LT	0000																																																								52	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 36+29	14 RT	0000																																																								75	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 36+74	86 LT	0000																																																								38	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 40+49	32 LT	0000																																																								30	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 43+01	32 LT	0000																																																								24	REMOVE PIPE OR FILL W/FLOWABLE FILL
SHEET TOTALS																		348	112				92			328									15	2.9		13	1	5	7			2	2														979	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY:	L. JAH	DATE:	01/12/2015
CHECKED BY:	A.K. WHITE	DATE:	11/16/2015

PROJECT NO.	SHEET NO.
U-3308	3D-10

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	TO	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
LALT 42+55	29	LT	0000			54	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 44+39	9	LT	0000			27	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 44+88	1	LT	0000			26	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 46+80	7	LT	0000			51	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 59+11	0	CL	0000			46	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 65+38	51	RT	0000			128	REMOVE PIPE OR FILL W/FLOWABLE FILL
LALT 44+29	45	LT	0000		0.029		
LALT 18+77	74	LT	0000		0.065		
LALT 19+92	18	LT	0000		0.065		
LALT 65+09	20	LT	0000		0.182		
LALT 65+26	22	RT	0000		0.182		
LALT 65+24	16	RT	0000		0.182		
LALT 65+67	20	LT	0000		0.182		
LALT 19+94	30	RT	0000		0.045		
LALT 19+96	15	LT	0000		0.045		
LALT 19+97	20	LT	0000		0.045		
LALT 20+30	59	LT	0000		0.045		
LALT 20+34	60	LT	0000		0.045		
LALT 20+58	60	LT	0000		0.045		
LALT 25+08	17	RT	0000		0.045		
LALT 25+07	43	RT	0000		0.045		
LALT 31+27	52	LT	0000		0.065		
LALT 31+08	2	LT	0000		0.065		
LALT 31+37	55	LT	0000		0.116		
LALT 31+65	54	LT	0000		0.116		
LALT 31+95	53	LT	0000		0.182		
LALT 31+69	54	LT	0000		0.182		
LALT 31+36	52	LT	0000		0.065		
LALT 31+25	52	RT	0000		0.065		
LALT 33+78	69	LT	0000		0.116		
LALT 36+54	25	LT	0000		0.045		
LALT 33+78	70	LT	0000		0.116		
LALT 36+54	25	LT	0000		0.045		
LALT 36+49	18	LT	0000		0.045		
LALT 36+10	45	RT	0000		0.045		
LALT 36+53	21	LT	0000		0.045		
LALT 37+02	36	LT	0000		0.045		
LALT 36+74	101	LT	0000		0.045		
LALT 40+56	61	LT	0000		0.065		
LALT 40+42	3	LT	0000		0.065		
LALT 42+48	49	LT	0000		0.045		
LALT 42+51	51	LT	0000		0.182		
LALT 42+63	10	LT	0000		0.045		
LALT 43+50	12	LT	0000		0.182		
LALT 44+49	27	RT	0000		0.029		
LALT 45+01	42	LT	0000		0.029		
LALT 44+75	41	RT	0000		0.029		
LALT 46+92	35	LT	0000		0.045		
LALT 46+67	21	RT	0000		0.045		
LALT 59+10	18	LT	0000		0.029		
SHEET TOTALS					3.440	332	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RD286193

COMPUTED BY: L. JAH DATE: 01/12/2015
CHECKED BY: A.K. WHITE DATE: 11/16/2015

PROJECT NO.	SHEET NO.
U-3308	3D-11

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

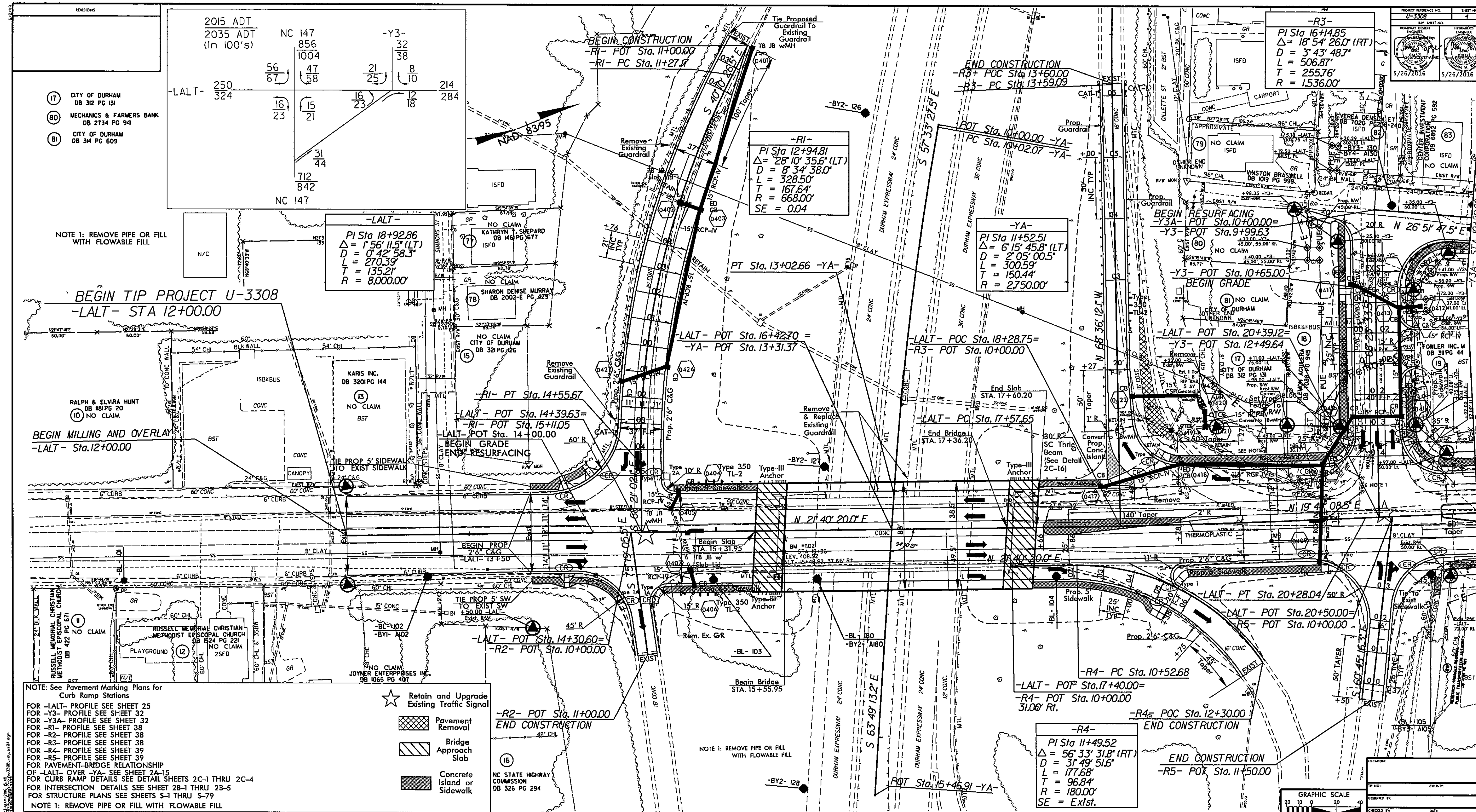
Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET		STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)									C. S. PIPE													R. C. PIPE CLASS IV									R. C. PIPE CLASS V							BIT COAT CORRUGATED METAL PIPE							ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	T.B.D.I. 840.36	T.B.D.I. FRAME AND GRATE 840.37	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34		M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING D.I. TO J.B.		CS PIPE ELBOWS NO. & SIZE	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE										15	18							12	15	18												15	18	24	30	36	42	48		12	15	18	24	30	48		36											A	B																											
THICKNESS OR GAUGE			FROM	TO	FT.	FT.	FT.	%					DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	.064	.064	.064																																			CY	CY	MASONRY CY	0' THRU 5' EACH	5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G		D.I. STD. 852.04 OR STD. 852.06																		CY	CY	CY	LIN. FT.	
LALT 59+11	16	RT	0000																																																																																		0.029		
LALT 65+51	80	RT	0000																																																																																		0.182		
LALT 65+51	16	RT	0000																																																																																	0.182		
LALT 40+66	33	RT	0000																																																																																		29	
LALT 40+71	78	RT	0000																																																																																			62	
LALT 29+73	14	RT	0000																																																																																		252	
LALT 40+54	90	LT	0000																																																																																		49	
LALT 59+06	26	RT	0000																																																																																	16	
LALT 65+73	34	LT	0000																																																																																		26	
LALT 15+05	331	LT	0000																																																																																		135	
LALT 18+81	37	LT	0000																																																																																		22	
LALT 26+77	15	RT	0000																																																																																	335	
LALT 31+04	6	RT	0000																																																																																	14	
LALT 30+91	58	LT	0000																																																																																		72	
LALT 31+31	54	LT	0000																																																																																		6	
LALT 31+30	68	LT	0000																																																																																		24	
LALT 31+35	108	LT	0000																																																																																		103	
LALT 33+30	62	LT	0000																																																																																		87	
LALT 37+51	53	LT	0000																																																																																		104	
LALT 36+52	23	LT	0000																																																																																		1	
LALT 40+52	8	RT	0000																																																																																		28	
LALT 42+85	17	RT	0000																																																																																		25	
LALT 42+69	3	RT	0000																																																																																		20	
LALT 44+38	24	RT	0000																																																																																		20	
LALT 46+56	38	LT	0000																																																																																		70	
LALT 46+64	75	RT	0000																																																																																		101	
LALT 44+60	38	RT	0000																																																																																		24	
LALT 44+02	10	RT	0000																																																																																		105	
LALT 53+16	19	LT	0000																																																																																		124	
LALT 54+08	22	LT	0000																																																																																		55	
LALT 65+04	28	LT	0000																																																																																		13	
Y 25+05	0	CL	0000																																																																																		54	
LALT 22+26	707	RT	0000																																																																																		4	
-LALT-																																																																																					50				CONTINGENCY FLOWABLE FILL
NSR/CSX																																																																																							207	SEE TRACK PLANS
NSR/CSX DETOUR											68			X	X	X	X			54																						120					116							3.500			3													3	4			2			2						0.4500		60	SEE TRACK PLANS
SHEET TOTALS											68									54																						120					116							3.500			3													3	4			2			2					50	0.4500	0.393	2247	
PROJECT TOTALS										68	68								184	54												6796	704	1912	476	204	1108	84			344	120					116							3.500			216	59.7		156	23	66	67		14		2	47	47	3	4	1	36	4	5		11	1	1		2	50	0.4500	3.833	3558	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

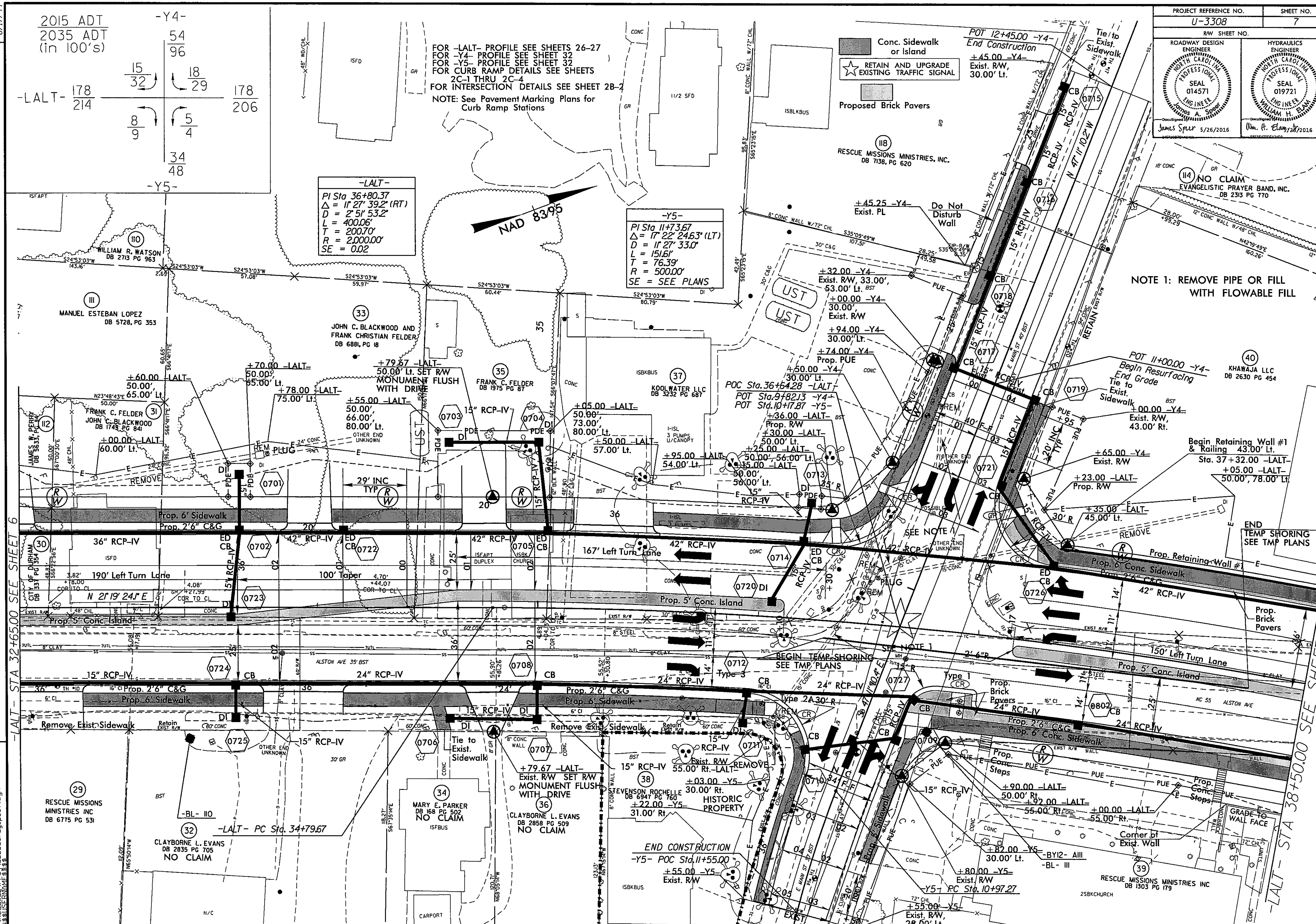


2015 ADT
2035 ADT
(in 100's)
NC 147
-Y3-
-LALT-
CITY OF DURHAM DB 312 PG 131
MECHANICS & FARMERS BANK DB 2734 PG 941
CITY OF DURHAM DB 314 PG 609
NOTE 1: REMOVE PIPE OR FILL WITH FLOWABLE FILL
BEGIN TIP PROJECT U-3308
-LALT- STA 12+00.00
BEGIN MILLING AND OVERLAY
-LALT- Sta.12+00.00
BEGIN CONSTRUCTION
-R1- POT Sta. 11+00.00
-R1- PC Sta. 11+27.17
-LALT-
PI Sta 18+92.86
Δ = 1° 56' 11.5" (LT)
D = 0° 42' 58.3"
L = 270.39'
T = 135.21'
R = 8,000.00'
-R1-
PI Sta 12+94.81
Δ = 28° 10' 35.6" (LT)
D = 8° 34' 38.0"
L = 328.50'
T = 167.64'
R = 668.00'
SE = 0.04
-YA-
PI Sta 11+52.51
Δ = 6° 15' 45.8" (LT)
D = 2° 05' 00.5"
L = 300.59'
T = 150.44'
R = 2,750.00'
-R3-
PI Sta 16+14.85
Δ = 18° 54' 26.0" (RT)
D = 3° 43' 48.7"
L = 506.87'
T = 255.76'
R = 1,536.00'
-R4-
PI Sta 11+49.52
Δ = 56° 33' 31.8" (RT)
D = 31° 49' 51.6"
L = 177.68'
T = 96.84'
R = 180.00'
SE = Exist.
END CONSTRUCTION
-R3- POC Sta. 13+60.00
-R3- PC Sta. 13+59.09
POT Sta. 10+00.00 -YA-
PC Sta. 10+02.07 -YA-
PT Sta. 13+02.66 -YA-
-LALT- POT Sta. 16+42.70 =
-YA- POT Sta. 13+31.37
-LALT- POC Sta. 18+28.75=
-R3- POT Sta. 10+00.00
-LALT- PC Sta. 17+57.65
-R1- PT Sta. 14+55.67
-LALT- POT Sta. 14+39.63=
-R1- POT Sta. 15+11.05
-LALT- POT Sta. 14+00.00
BEGIN GRADE
END RESURFACING
BEGIN RESURFACING
-Y3A- POT Sta. 10+00.00=
-Y3- POT Sta. 9+99.63
-Y3- POT Sta. 10+65.00
BEGIN GRADE
-LALT- POT Sta. 20+39.12=
-Y3- POT Sta. 12+49.64
-LALT- PT Sta. 20+28.04
-LALT- POT Sta. 20+50.00=
-R5- POT Sta. 10+00.00
-LALT- POT Sta. 14+30.60=
-R2- POT Sta. 10+00.00
-R2- POT Sta. 11+00.00
END CONSTRUCTION
-R4- PC Sta. 10+52.68
-LALT- POT Sta. 17+40.00=
-R4- POT Sta. 10+00.00
31.06' Rt.
-R4- POC Sta. 12+30.00
END CONSTRUCTION
END CONSTRUCTION
-R5- POT Sta. 11+50.00
POT Sta. 15+46.91 -YA-
N 21° 40' 20.0" E
N 26° 51' 47.5" E
N 19° 42' 08.5" E
S 57° 33' 27.5" E
S 63° 49' 13.2" E
DURHAM EXPRESSWAY
NAD 83/95
Begin Slab STA. 15+31.95
Begin Bridge STA. 15+55.95
End Slab STA. 17+60.20
End Bridge STA. 17+36.20
KARIS INC. DB 3201 PG 144
SHARON DENISE MURRAY DB 2002-E PG 429
KATHRYN T. SHEPARD DB 146 PG 677
RALPH & ELVIRA HUNT DB 181 PG 20 NO CLAIM
RUSSELL MEMORIAL CHRISTIAN METHODIST EPISCOPAL CHURCH DB 1524 PG 221
JOYNER ENTERPRISES INC. DB 1065 PG 407
NC STATE HIGHWAY COMMISSION DB 326 PG 294
WINSTON BRASWELL DB 1019 PG 999
FOWLER INC. DB 3 PG 44
NOTE: See Pavement Marking Plans for Curb Ramp Stations
FOR -LALT- PROFILE SEE SHEET 25
FOR -Y3- PROFILE SEE SHEET 32
FOR -Y3A- PROFILE SEE SHEET 32
FOR -R1- PROFILE SEE SHEET 38
FOR -R2- PROFILE SEE SHEET 38
FOR -R3- PROFILE SEE SHEET 38
FOR -R4- PROFILE SEE SHEET 39
FOR -R5- PROFILE SEE SHEET 39
FOR PAVEMENT-BRIDGE RELATIONSHIP OF -LALT- OVER -YA- SEE SHEET 2A-15
FOR CURB RAMP DETAILS SEE DETAIL SHEETS 2C-1 THRU 2C-4
FOR INTERSECTION DETAILS SEE SHEET 2B-1 THRU 2B-5
FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-79
NOTE 1: REMOVE PIPE OR FILL WITH FLOWABLE FILL
Retain and Upgrade Existing Traffic Signal
Pavement Removal
Bridge Approach Slab
Concrete Island or Sidewalk
GRAPHIC SCALE
PLANS
-LALT- STA 21+20.00 SEE SHEET 5
-Y3A- STA 10+80.00 SEE SHEET 15
U-3308
5/26/2016

PROJECT REFERENCE NO.	SHEET NO.
U-3308	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 014571 — James A. Speer — 5/26/2016

HYDRAULICS ENGINEER — SEAL 019721 — William H. Elam — 5/26/2016



2015 ADT
2035 ADT
(in 100's)
-Y4-
-LALT-
-Y5-
FOR -LALT- PROFILE SEE SHEETS 26-27
FOR -Y4- PROFILE SEE SHEET 32
FOR -Y5- PROFILE SEE SHEET 32
FOR CURB RAMP DETAILS SEE SHEETS 2C-1 THRU 2C-4
FOR INTERSECTION DETAILS SEE SHEET 2B-2
NOTE: See Pavement Marking Plans for Curb Ramp Stations
Conc. Sidewalk or Island
RETAIN AND UPGRADE EXISTING TRAFFIC SIGNAL
Proposed Brick Pavers
NOTE 1: REMOVE PIPE OR FILL WITH FLOWABLE FILL
NAD 83/95
-LALT-
PI Sta 36+80.37
Δ = 11° 27' 39.2" (RT)
D = 2° 51' 53.2"
L = 400.06'
T = 200.70'
R = 2,000.00'
SE = 0.02
-Y5-
PI Sta 11+73.67
Δ= 17° 22' 24.63" (LT)
D = 11° 27' 33.0"
L = 151.61'
T = 76.39'
R = 500.00'
SE = SEE PLANS
POT 12+45.00 -Y4-
End Construction
POT 11+00.00 -Y4-
Begin Resurfacing
End Grade
POC Sta. 36+64.28 -LALT-
POT Sta. 9+82.13 -Y4-
POT Sta. 10+17.87 -Y5-
RESCUE MISSIONS MINISTRIES, INC. DB 7138, PG 620
EVANGELISTIC PRAYER BAND, INC. DB 2313 PG 770
KHAWAJA LLC DB 2630 PG 454
KOOLWATER LLC DB 3232 PG 687
FRANK C. FELDER DB 1975 PG 87
JOHN C. BLACKWOOD AND FRANK CHRISTIAN FELDER DB 6881, PG 18
MANUEL ESTEBAN LOPEZ DB 5728, PG 353
WILLIAM R. WATSON DB 2713 PG 963
CITY OF DURHAM
RESCUE MISSIONS MINISTRIES INC DB 6775 PG 531
CLAYBORNE L. EVANS DB 2835 PG 705 NO CLAIM
MARY E. PARKER DB 168 PG 502 NO CLAIM
CLAYBORNE L. EVANS DB 2858 PG 509 NO CLAIM
STEVENSON ROCHELLE DB 6947 PG 760
HISTORIC PROPERTY
RESCUE MISSIONS MINISTRIES INC DB 1303 PG 179
Begin Retaining Wall #1 & Railing
END TEMP SHORING SEE TMP PLANS
BEGIN TEMP SHORING SEE TMP PLANS
190' Left Turn Lane
100' Taper
167' Left Turn Lane
150' Left Turn Lane
Prop. 6' Sidewalk
Prop. 2'6" C&G
Prop. 5' Conc. Island
Prop. Retaining Wall #1
Prop. Brick Pavers
-LALT- PC Sta. 34+79.67
-Y5- POC Sta. 11+55.00
END CONSTRUCTION
-Y5- PC Sta. 10+97.27
-LALT- STA 32+65.00 SEE SHEET 6
-LALT- STA 38+50.00 SEE SHEET 8

8/17/99

Revisions

25-MAY-2016 12:27

PROJECT REFERENCE NO.	SHEET NO.
U-3308	11
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 014571 ENGINEER James A. Speer — DocuSigned by: James Speer 5/26/2016

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 019721 ENGINEER WILLIAM H. BLANK — DocuSigned by: Wm. H. Blank 5/26/2016

8/17/99

Revisions

NOTE 1: REMOVE PIPE OR FILL WITH FLOWABLE FILL

FOR –LALT– PROFILE SEE SHEET 29
FOR –Y16– PROFILE SEE SHEET 36
FOR –Y17– PROFILE SEE SHEET 36
FOR –Y18– PROFILE SEE SHEET 36
FOR CURB RAMP DETAILS SEE SHEETS 2C-1 THRU 2C-4
FOR INTERSECTION DETAILS SEE SHEET 2B-4
NOTE: See Pavement Marking Plans for Curb Ramp Stations

Conc. Sidewalk or Island

RETAIN AND UPGRADE EXISTING TRAFFIC SIGNAL

2015 ADT / 2035 ADT (in 100's)	-Y18-	
-LALT-	52 / 102	
188 / 210	15 / 22	6 / 18
	32 / 26	3 / 4
	150 / 184	
-Y18-	66 / 92	

-Y18-

PI Sta 11+27.16	PI Sta 14+09.52
Δ = 4° 03' 09.6" (RT)	Δ = 7° 10' 05.7" (LT)
D = 6° 21' 58.3"	D = 1° 25' 56.6"
L = 63.66'	L = 500.44'
T = 31.84'	T = 250.55'
R = 900.00'	R = 4,000.00'
SE = SEE PLANS	SE = NC
RO = SEE PLANS	

-LALT- STA 53+30.00 SEE SHEET 10

-Y18- STA 11+30.00 SEE SHEET 22

-LALT- STA 59+00.00 SEE SHEET 12

-Y18- STA 15+25.00 SEE SHEET 23

END CONSTRUCTION -Y16- POT Sta. 11+85.00

END GRADE BEGIN RESURFACING -Y16- POT Sta. 11+40.00

END CONSTRUCTION -Y17- POT Sta. 11+45.00

PRC Sta. 11+58.98

NAD 83/95

NO CLAIM

Tie to Exist. Sidewalk

Do Not Disturb Vault

Paint Striping

Raised Grass Median

Prop. 5' Conc. Island

150' Left Turn Lane

100' Right Turn Lane

100' Taper

Prop. 6' Sidewalk

Prop. 2'6" C&G

Prop. 1'6" C&G

Prop. 5' Sidewalk

Prop. PUE

Prop. R/W

Exist. R/W

Remove Exist. Sidewalk

60 SOUTHERN REPAIR SERVICE INC. DB 1039 PG 826

61 M.M. FOWLER INC. DB 1029 PG 808

62 ECCLESIA COMMUNITY DEVELOPMENT DB 6435 PG 483

63 LEO'S SEAFOOD OF DURHAM L.D.R. INC. DB 1039 PG 581

64 ALI A. ISSA DB 5498, PG 96

65 THE SALVATION army DB 1239 PG 782

65A CITY OF DURHAM DB 2217 PG 828

66 CAROLYN A. BROWNING DB 305 PG 327

654 CITY OF DURHAM DB 2217 PG 828

57 DURHAM PUBLIC SCHOOLS BOARD OF EDUCATION DB 1838 PG 314 PB 129 PG 208

187 SOUTHERN PINE PROPERTY DB 6060, PG 258

188 DOCK TERRELL DB 3021 PG 13

188Z

189 JEAN C. TRAWICK DB 1425 PG 681

192 / 192Z

1101 1102 1103 1104 1105 1106 1107 1108 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1123 1124 1125

23-MAY-2016 15:41
R:\Roadway Proj\u3308_rdy_psll.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3308	12
R/W SHEET NO.	

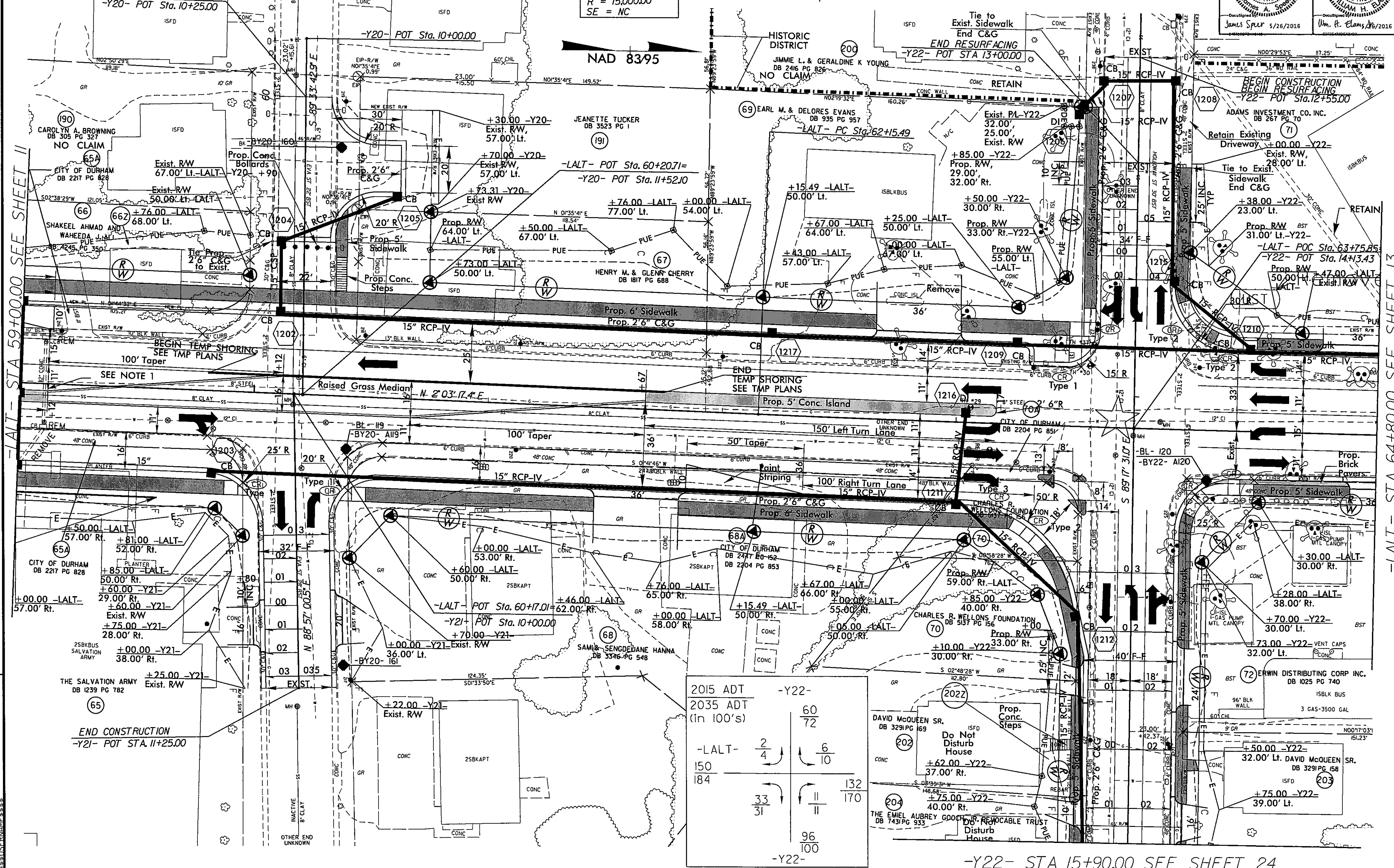
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 014571 James A. Speer — DocuSigned by: James Speer 5/26/2016

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 019721 WILLIAM H. ELAM — DocuSigned by: Wm. H. Elam Jr. 5/26/2016

NOTE 1: REMOVE PIPE OR FILL WITH FLOWABLE FILL

FOR -LALT- PROFILE SEE SHEETS 29-30
FOR -Y20- PROFILE SEE SHEET 37
FOR -Y21- PROFILE SEE SHEET 37
FOR -Y22- PROFILE SEE SHEET 37
FOR CURB RAMP DETAILS SEE SHEETS 2C-1 THRU 2C-4
FOR INTERSECTION DETAILS SEE SHEET 2B-5
NOTE: See Pavement Marking Plans for Curb Ramp Stations

Conc. Sidewalk or Island
Proposed Brick Pavers
RETAIN AND UPGRADE EXISTING TRAFFIC SIGNAL



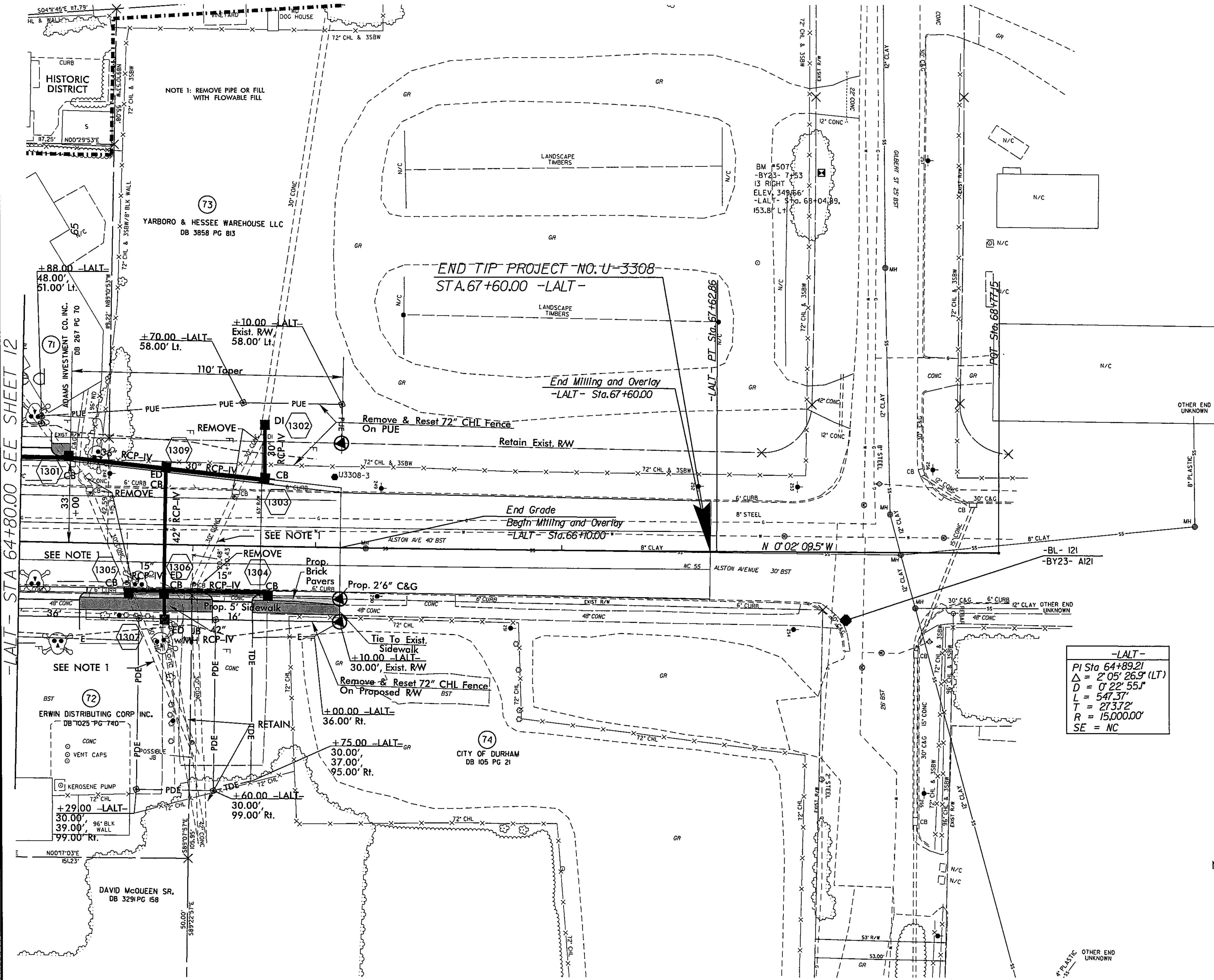
-LALT-
PI Sta 64+89.21
Δ = 2° 05' 26.9" (LT)
D = 0° 22' 55.1"
L = 547.37'
T = 273.72'
R = 15,000.00'
SE = NC
NAD 83/95
BEGIN CONSTRUCTION -Y20- POT Sta. 10+25.00
-Y20- POT Sta. 10+00.00
HISTORIC DISTRICT
END RESURFACING -Y22- POT STA 13+00.00
BEGIN CONSTRUCTION BEGIN RESURFACING -Y22- POT Sta. 12+55.00
-LALT- POT Sta. 60+20.71= -Y20- POT Sta. 11+52.10
-LALT- PC Sta. 62+15.49
-LALT- POC Sta. 63+75.85= -Y22- POT Sta. 14+13.43
-LALT- POT Sta. 60+17.01= -Y21- POT Sta. 10+00.00
BEGIN TEMP SHORING SEE TMP PLANS
END TEMP SHORING SEE TMP PLANS
SEE NOTE 1
Raised Grass Median
Prop. 6' Sidewalk
Prop. 2'6" C&G
Prop. 5' Conc. Island
150' Left Turn Lane
100' Right Turn Lane
100' Taper
50' Taper
15" RCP-IV
END CONSTRUCTION -Y21- POT STA. 11+25.00
-LALT- STA 59+00.00 SEE SHEET 11
-LALT- STA 64+80.00 SEE SHEET 13
-Y22- STA 15+90.00 SEE SHEET 24
CAROLYN A. BROWNING DB 305 PG 327 NO CLAIM
JEANETTE TUCKER DB 3523 PG 1
JIMMIE L. & GERALDINE K YOUNG DB 2416 PG 826 NO CLAIM
EARL M. & DELORES EVANS DB 935 PG 957
ADAMS INVESTMENT CO. INC. DB 267 PG 70
CITY OF DURHAM DB 2217 PG 828
SHAKEEL AHMAD AND WAHEEDA J. ALI DB 4245 PG 350
HENRY M. & GLENN CHERRY DB 1817 PG 688
CITY OF DURHAM DB 2204 PG 851
CHARLES R. WELLONS FOUNDATION DB 5137 PG 156
THE SALVATION ARMY DB 1239 PG 782
SAMI & SENGDEUANE HANNA DB 3346 PG 548
DAVID McQUEEN SR. DB 3291 PG 169
Do Not Disturb House
THE EMIEL AUBREY GOOCH JR. REVOCABLE TRUST DB 7431 PG 933
ERWIN DISTRIBUTING CORP INC. DB 1025 PG 740
32.00' Lt. DAVID McQUEEN SR. DB 3291 PG 158
2015 ADT
2035 ADT
(in 100's)
-Y22-
60/72
-LALT-
2/4
6/10
150/184
132/170
33/31
11/11
96/100

PROJECT REFERENCE NO.	SHEET NO.
U-3308	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 014571 ENGINEER James A. Speer	NORTH CAROLINA PROFESSIONAL SEAL 019721 ENGINEER WILLIAM H. ELAM
James Speer 5/26/2016	Wm. H. Elam 5/26/2016

8/17/99

REVISIONS

NAD 83/95



NOTE 1: REMOVE PIPE OR FILL WITH FLOWABLE FILL
HISTORIC DISTRICT
YARBORO & HESSEE WAREHOUSE LLC DB 3858 PG 813
ADAMS INVESTMENT CO. INC. DB 267 PG 70
ERWIN DISTRIBUTING CORP INC. DB 1025 PG 740
CITY OF DURHAM DB 105 PG 21
DAVID McQUEEN SR. DB 3291 PG 158
END TIP PROJECT NO. U-3308
STA. 67+60.00 -LALT-
End Milling and Overlay -LALT- Sta. 67+60.00
End Grade
Begin Milling and Overlay
-LALT- Sta. 66+10.00
-LALT- STA 64+80.00 SEE SHEET 12
-LALT- PT Sta. 67+62.86
POT Sta. 68+77.15
BM #507 -BY23- 7+53 13 RIGHT ELEV. 349.66' -LALT- Sta. 68+04.89, 153.8' Lt.
N 0°02' 09.5" W
-BL- 121
-BY23- A121
ALSTON AVENUE
GILBERT ST 25' BST
Remove & Reset 72" CHL Fence On PUE
Retain Exist. R/W
Remove & Reset 72" CHL Fence On Proposed R/W
Tie To Exist. Sidewalk
Prop. 5' Sidewalk
Prop. Brick Pavers
Prop. 2'6" C&G
110' Taper
SEE NOTE 1
LANDSCAPE TIMBERS
OTHER END UNKNOWN

-LALT-
PI Sta 64+89.21
Δ = 2°05' 26.9" (LT)
D = 0°22' 55.1"
L = 547.37'
T = 273.72'
R = 15,000.00'
SE = NC

NOTE 1: REMOVE PIPE OR FILL WITH FLOWABLE FILL

Proposed Brick Pavers

Conc. Sidewalk or Island

FOR -LALT- PROFILE SEE SHEET 30

23-MAY-2016 15:42
R:\Roadway\Proj\u3308_rdy_psh13.dgn
$$$$USERNAME$$$$