



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

July 6, 2023

**Addendum No. 1**

RE: Contract # C204833

WBS # 47988.3.1

FEDERAL AID NO. 4798831

**New Hanover and Pender Counties (I-6039)**

I-40 FROM MM-420 TO MM-408 AT NC 210.

**July 18, 2023 Letting**

To Whom It May Concern:

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

The following revisions have been made to the Roadway Plans.

Sheet No.	Revision
11-12	Revised to reflect updated quantities.
13-14	Column for "Remove and Reset Existing Guardrail" item added. Revised to reflect updated quantities.
15-16	Column for "Flowable Fill" item added.
19-20	Erosion Control items moved from Map 18 to Map 2.
27-28	Guardrail Summary Sheets revised to reflect updated quantities.

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

The following revisions have been made to the proposal.

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

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

*Location:*  
1020 BIRCH RIDGE DR.  
RALEIGH, NC 27610

*Website:* [www.ncdot.gov](http://www.ncdot.gov)

<b>Page No.</b>	<b>Revision</b>
Proposal Cover	Note added that reads “Includes Addendum No. 1 Dated 07-06-2023”.
R-3	The project special provision entitled <b>DROP INLET REPAIR</b> has been revised.
R-3 thru R-4	The project special provision entitled <b>REMOVE &amp; REPLACE CONCRETE APRON FOR DROP INLET</b> has been revised.
R-12 thru R-13	The project special provision entitled <b>GUARDRAIL PRE-FAB POSTS</b> has been removed.
R-12 thru R-38	The project special provision entitled <b>REMOVE AND REPLACE EXISTING GUARDRAIL</b> has been revised.

Please void the above listed existing Pages in your proposal and staple the revised Pages thereto.

Please delete existing Pages R-39 thru R-41 in your proposal.

On the item sheets the following pay item revisions have been made:

<b><u>Item</u></b>	<b><u>Description</u></b>	<b><u>Old Quantity</u></b>	<b><u>New Quantity</u></b>
0004-1297000000-E 607	MILLING ASPHALT PAVEMENT, 1-1/2” DEPTH	61,867 SY	42,615 SY
0005-1297000000-E 607	MILLING ASPHALT PAVEMENT, 1-1/4” DEPTH	778,046 SY	797,298 SY
0009-1577000000-E 620	POLYMER MODIFIED ASPHALT BINDER FOR PLANT MIX	4,778 TON	5,532 TON
0010-1662000000-E 650	OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED	17,422 TON	28,453 TON
0016-3030000000-E 862	STEEL BEAM GUARDRAIL	1,922.5 LF	1,560 LF
0017-3210000000-N 862	GUARDRAIL END UNITS, TYPE CAT-1	9 EA	DELETED
0018-3287000000-N SP	GUARDRAIL END UNITS, TYPE TL-3	8 EA	5 EA

<u>Item</u>	<u>Description</u>	<u>Old Quantity</u>	<u>New Quantity</u>
0019-3345000000-E 864	REMOVE & RESET EXISTING GUARDRAIL	11,746 LF	11,990 LF
0023-3420000000-E SP	REMOVE AND REPLACE EXISTING GUARDRAIL	3,372 LF	3,250 LF
0024-3435000000-N SP	GUARDRAIL PREFAB POSTS	25 EA	DELETED
0025-3435000000-N SP	REMOVE & REPLACE GUARDRAIL END UNIT, TYPE CAT-1	16 EA	18 EA
0028-3435000000-N SP	REMOVE & RESET GUARDRAIL END UNITS, TYPE CAT-1	11 EA	5 EA

The Contractor's bid must include these pay item revisions.

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

The contract will be prepared accordingly.

Sincerely,

DocuSigned by:  
  
 F81B6038A47A442...

Ronald E. Davenport, Jr., PE  
 State Contract Officer

RED/cms  
 Attachments

cc: Mr. Boyd Tharrington, PE  
 Mr. D. Chad Kimes, PE  
 Mr. Ken Kennedy, PE  
 Mr. Mike Gwyn  
 Project File (2)

Mr. Forrest Dungan, PE  
 Ms. Jaci Kincaid  
 Mr. Jon Weathersbee, PE

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

PROPOSAL

**INCLUDES ADDENDUM No. 1 DATED 07-06-2023**

DATE AND TIME OF BID OPENING: **Jul 18, 2023 AT 02:00 PM**

CONTRACT ID        C204833  
WBS                    47988.3.1

FEDERAL-AID NO.    4798831  
COUNTY             NEW HANOVER, PENDER  
T.I.P NO.             I-6039  
MILES                 12.992  
ROUTE NO.            I-40  
LOCATION                I-40 FROM MM-420 TO MM-408 AT NC-210.

TYPE OF WORK        PAVEMENT REHABILITATION AND STRUCTURES.

**NOTICE:**

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

**BIDS WILL BE RECEIVED AS SHOWN BELOW:**

**THIS IS A ROADWAY & STRUCTURE PROPOSAL**

**5% BID BOND OR BID DEPOSIT REQUIRED**

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**DROP INLET REPAIR:**

(5-15-07)

SPI

Perform drop inlet repair at locations as directed by the Engineer. The Contractor shall make his own investigation of the existing conditions at the drop inlets so indicated. The Contractor shall perform the work necessary to return each location to a condition in which the drop inlet and associated drainage features operate correctly. Work includes excavation, vegetation clearing, backfilling with suitable earth material furnished by the contractor, furnishing and placing concrete pipe collars, miscellaneous concrete work, sealing around drop inlets, repairing connections of existing underdrain to drop inlets, erosion control (Matting for Erosion Control placed around the perimeter of the DI area and placing Wattles as directed by the Engineer), including Seeding and Mulching all disturbed areas, and removal and disposal of all unsuitable material and debris.

**Construction Methods for Flowable Fill**

Some areas around Drop Inlets may require voids to be filled with flowable fill. Discharge excavatable 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**

*Drop Inlet Repair* will be measured and paid in units of each for drop inlets satisfactorily repaired and accepted. Such price and payment will be full compensation for all work covered by this provision including but not limited to excavation, backfill, concrete pipe collars, miscellaneous concrete work, underdrain repair, removal and disposal of unsuitable material and debris.

Flowable fill will be measured and paid as provided elsewhere in this contract.

Erosion Control items and Seeding and Mulching will be paid separately.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Drop Inlet Repair	Each

**REMOVE & REPLACE CONCRETE APRON FOR DROP INLET:**

Construct concrete aprons for drop inlets in accordance with this provision, Roadway Standard Drawings 840.17, 840.18, and 840.19, and section 840 of the Standard Specifications, as directed by the Engineer. **Pre-cast units that meet the requirements of Section 1077 of the *Standard Specifications* will also be allowed but shall be approved by the Engineer.**

Measurement and payment for *Remove & Replace Concrete Apron for Drop Inlet* shall be made on a per each basis completed and accepted by the Engineer. The cost for removal and disposal of the existing drop inlet apron shall be considered incidental to the work and shall be included in the cost of the new apron.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Remove & Replace Concrete Apron for Drop Inlet	Each

**INCIDENTAL MILLING:**

(11-15-22)(Rev. 1-17-23)

607

SP6 R02R

Revise the *2018 Standard Specifications* as follows:

**Page 6-5, Article 607-3 CONSTRUCTION METHODS**, add the following paragraph after line 45:

Variable depth milling is intended to improve the cross-sectional slope of the pavement.

**Page 6-6, Article 607-3 CONSTRUCTION METHODS, line 9**, delete and replace the first sentence in the sixth paragraph with the following:

The Engineer may require re-milling of any area exhibiting pavement laminations, scabbing or other defects.

**Page 6-6, Article 607-4 TOLERANCE, lines 17-18**, delete and replace the second sentence with the following:

The Engineer may vary the depth of milling by not more than one inch. In the event the directed depth of milling cut is altered by the Engineer more than one inch, either the Department or the Contractor may request an adjustment in unit price in accordance with Article 104-3. In administering Article 104-3, the Department will give no consideration to value given to RAP due to the deletion or reduction in quantity of milling. Article 104-3 will not apply to the item of *Incidental Milling*.

**Page 6-6, Subarticle 607-5(A) Milled Asphalt Pavement, lines 21-23**, delete and replace the first sentence with the following:

Milled Asphalt Pavement, \_\_\_" Depth will be measured and paid as the actual number of square yards of pavement surface milled in accordance with this specification.

**Page 6-6, Subarticle 607-5(A) Milled Asphalt Pavement, lines 24-28**, delete and replace the third and fourth sentence with the following:

The width will be the width required by the plans or directed by the Engineer, measured along the pavement surface. Areas to be paid under this item include mainline travel lanes, full width turn lanes greater than 500 feet in length, collector lanes, shoulders, and any additional equipment

**GUARDRAIL END UNITS & TEMPORARY GUARDRAIL END UNITS, TYPE - TL-3:**

(4-20-04) (Rev. 5-16-23)

862

SP8 R65

**Description**

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

**Materials**

Furnish guardrail end units listed on the NCDOT APL. Units shall not be modified by the manufacturer and installer once approved and on the NCDOT APL.

Prior to installation the Contractor shall submit to the Engineer certified working drawings and assembling instructions from the manufacturer for each guardrail end unit in accordance with Article 105-2 of the *Standard Specifications*.

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 *Standard Specifications* and is incidental to the cost of the guardrail end unit.

**Measurement and Payment**

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

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Guardrail End Units, Type TL-3	Each
Temporary Guardrail End Units, Type TL-3	Each

**REMOVE AND REPLACE EXISTING GUARDRAIL:****Description**

This work shall consist of removing existing guardrail and installing new guardrail at the same location. In addition, existing double-faced cable guiderail posts used for closing former median crossovers will be removed and permanently closed with extended Guardrail End Units and Steel Beam Guardrail.

### Construction Methods

The Contractor shall remove existing guardrail in accordance with Section 863 of the *Standard Specifications* and install new proposed guardrail in the same location in accordance with Section 862 of the *Standard Specifications*.

The Contractor shall fill existing post holes if applicable.

In areas closing former median crossovers, the replaced guardrail section will begin with a Guardrail End Unit TL-3 no less than a 5-foot offset longitudinally from the existing adjacent Guiderail Anchor followed by Steel Beam Guardrail and a Trailing End Unit CAT-1.

### Measurement and Payment

*Remove and Replace Existing Guardrail* will be measured and paid in linear feet of guardrail that has been satisfactorily completed. Such price and payment will include removing existing guardrail, furnishing and erecting posts, offset blocks, rail, miscellaneous hardware and other materials; furnishing and installing additional guardrail posts and additional offset blocks; backfilling; fabrication; welding; galvanizing; and furnishing and installing guardrail delineators; adding dirt to fill existing post holes if applicable and all materials, tools, labor, equipment and incidentals necessary to complete the work. In addition, removal and disposal of existing double-faced cable guiderail posts at median crossovers will be incidental to the cost of Remove and Replace Existing Guardrail.

Payment will be made under:

#### Pay Item

Remove and Replace Existing Guardrail

#### Pay Unit

Linear Foot

### **REMOVE AND RESET EXISTING GUARDRAIL:**

(12-2-13)

SP

The contractor shall remove and reset all existing guardrail to the new height requirement of 2'1" after resurfacing in accordance with the *Roadway Standard Drawings* and the *Standard Specifications*. The Contractor shall avoid previous post hole locations when re-driving guardrail posts. All steel or wood offset blocks, where encountered, shall be replaced with new posts and offset blocks in accordance with the *Roadway Standard Drawings* and the *Standard Specifications*. Damaged posts shall be replaced where directed by the Engineer. ALL EXISTING HOLES SHALL BE BACKFILLED.

Payment for this work shall include all labor, equipment, and materials which may be necessary to complete the work.

*Remove and Reset Existing Guardrail* will be measured and paid for in accordance with Article 864-3 of the *Standard Specifications*.

**REMOVE AND REPLACE GUARDRAIL ANCHOR AND END UNITS:**

This work shall consist of removing and replacing existing guardrail anchor and end units.

The anchor and end units will be measured and paid for in units of each. Such price and payment will be considered full compensation for furnishing all materials, tools, labor, equipment, and incidentals necessary to complete the work.

Any guardrail elements found to be deficient or non-conforming shall be replaced and paid for in accordance with the pay items of this contract. The Engineer shall make the determination of deficient or non-conforming items. Any guardrail elements damaged due to Contractor negligence shall be the responsibility of the Contractor for which no additional payment will be made. Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Remove and Replace Guardrail End Unit, Type _____	Each
Remove and Replace Guardrail Anchor Unit, Type _____	Each

**REMOVE AND RESET GUARDRAIL ANCHOR AND END UNITS:**

(12-15-09) (08-02-20)

SPI 8-29 Rev.

This work shall consist of removing and resetting existing guardrail anchor and end units in accordance with Section 864 of the *Standard Specifications*.

The anchor and end units will be measured and paid for in units of each. Such price and payment will be considered full compensation for furnishing all materials, tools, labor, equipment, and incidentals necessary to complete the work.

Any guardrail elements found to be deficient or non-conforming shall be replaced and paid for in accordance with the pay items of this contract. The Engineer shall make the determination of deficient or non-conforming items. Any guardrail elements damaged due to Contractor negligence shall be the responsibility of the Contractor for which no additional payment will be made.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Remove and Reset Guardrail End Unit, Type _____	Each
Remove and Reset Guardrail Anchor Unit, Type _____	Each

**FOUNDATIONS AND ANCHOR ROD ASSEMBLIES FOR METAL POLES:**

(1-17-12) (Rev. 1-16-18)

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 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 foundations for signal pedestals; see Section 1743 of the *2018 Standard Specifications* and 2018 Roadway Standard Drawing No. 1743.01.

**Materials**

Refer to the *2018 Standard Specifications*.

<b>Item</b>	<b>Section</b>
Conduit	1091-3
Grout, Type 2	1003
Polymer Slurry	411-2(B)(2)
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 *2018 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](http://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 *2018 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 *2018 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 *2018 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 the required slurry properties at all times 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 polymer 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 *2018 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 *2018 Standard Specifications*. A drilled pier will be considered defective in accordance with Subarticle 411-5(D) of the *2018 Standard Specifications* and drilled pier acceptance is based in part on the criteria in Article 411-6 of the *2018 Standard Specifications* except for the top of pier tolerances in Subarticle 411-6(C) of the *2018 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 *2018 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 *2018 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 *2018 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. Place concrete against undisturbed soil or backfill and fill in accordance with Article 410-8 of the *2018 Standard Specifications*. Proper compaction around footings and wings is critical for foundations to resist uplift and torsion forces.

(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:

<b>NUT ROTATION REQUIREMENTS (Turn-of-Nut Pretensioning Method)</b>	
<b>Anchor Rod Diameter, inch</b>	<b>Requirement</b>
$\leq 1 \frac{1}{2}$	1/3 turn (2 flats)
$> 1 \frac{1}{2}$	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:

<b>TORQUE REQUIREMENTS</b>	
<b>Anchor Rod Diameter, inch</b>	<b>Requirement, ft-lb</b>
7/8	180
1	270
1 1/8	380
1 1/4	420
$\geq 1 \frac{1}{2}$	600

If necessary, retighten top nuts in the presence of the Engineer with a calibrated torque wrench to within  $\pm 10$  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 *2018 Standard Specifications*. No payment will be made for remediation of unacceptable drilled piers or post repair testing.

### **OVERHEAD AND DYNAMIC MESSAGE SIGN FOUNDATIONS:**

(1-16-18)

SP9 R07

### **Description**

Sign foundations include foundations for overhead and dynamic message signs (DMS) supported by metal poles or upright trusses. Sign foundations consist of footings with pedestals or drilled

piers with or without grade beams or wings, conduit and anchor rod assemblies. Construct sign foundations in accordance with the contract and accepted submittals. Define “cantilever sign” as an overhead cantilever sign support in accordance with Figure 1-1 of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*.

### **Materials**

Use sign foundation materials that meet the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

### **Subsurface Conditions**

Assume the following soil parameters and groundwater elevation for sign foundations unless these subsurface conditions are not applicable to sign locations:

- (A) Unit weight ( $\gamma$ ) = 120 pcf,
- (B) Friction angle ( $\phi$ ) = 30°,
- (C) Cohesion ( $c$ ) = 0 psf and
- (D) Groundwater 7 feet below finished grade.

A subsurface investigation is required if the Engineer determines these assumed subsurface conditions do not apply to a sign location and the sign cannot be moved. Subsurface conditions requiring a subsurface investigation include but are not limited to weathered or hard rock, boulders, very soft or loose soil, muck or shallow groundwater. No extension of completion date or time will be allowed for subsurface investigations.

### **Subsurface Investigations**

Use a prequalified geotechnical consultant to perform one standard penetration test (SPT) boring in accordance with ASTM D1586 at each sign location requiring a subsurface investigation. Rough grade sign locations to within 2 feet of finished grade before beginning drilling. Drill borings to 2 drilled pier diameters below anticipated pier tip elevations or refusal, whichever is higher.

Use the computer software gINT version V8i or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide boring logs sealed by a geologist or engineer licensed in the state of North Carolina.

### **Sign Foundation Designs**

Design sign foundations for the wind zone and clearances shown in the plans and the slope of finished grade at each sign location. Use the assumed soil parameters and groundwater elevation above for sign foundation designs unless a subsurface investigation is required. For sign locations requiring a subsurface investigation, design sign foundations for the subsurface conditions at each sign location. Design footings, pedestals, drilled piers, grade beams and wings in accordance with the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*. In some instances, conflicts with drainage structures may dictate sign foundation types.

Design footings in accordance with Section 4.4 of the *AASHTO Standard Specifications for*

*Highway Bridges.* Do not use an allowable bearing pressure of more than 3,000 psf for footings. Design drilled piers for side resistance only in accordance with Section 4.6 of the *AASHTO Standard Specifications for Highway Bridges* except reduce ultimate side resistance by 25% for uplift. Use the computer software LPILE version 2016 or later manufactured by Ensoft, Inc. to analyze drilled piers. Provide drilled pier designs with a horizontal deflection of less than 1" at top of piers. For cantilever signs with single drilled pier foundations supporting metal poles, use wings to resist torsion forces. Provide drilled pier designs with a factor of safety of at least 2.0 for torsion.

For drilled pier sign foundations supporting upright trusses, use dual drilled piers connected with a grade beam having a moment of inertia approximately equal to that of either pier. The Broms' method is acceptable to analyze drilled piers with grade beams instead of LPILE. Use a safety factor of at least 3.5 for the Broms' design method in accordance with C13.6.1.1 of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*.

Submit boring logs, if any, working drawings and design calculations for acceptance in accordance with Article 105-2 of the *2018 Standard Specifications*. Submit working drawings showing plan views, required foundation dimensions and elevations and typical sections with reinforcement, conduit and anchor rod assembly details. Include all boring logs, design calculations and LPILE output for sign foundation design submittals. Have sign foundations designed, detailed and sealed by an engineer licensed in the state of North Carolina.

### **Construction Methods**

Construct footings, pedestals, drilled piers, grade beams and wings and install anchor rod assemblies for sign foundations in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

### **Measurement and Payment**

*Overhead Footings* will be measured and paid in cubic yards. Sign foundations will be measured as the cubic yards of foundation concrete for footings, pedestals, drilled piers, grade beams and wings shown in the accepted submittals. The contract unit price for *Overhead Footings* will be full compensation for providing labor, tools, equipment and foundation materials, stabilizing or shoring excavations, supplying and placing concrete, reinforcing steel, conduit, anchor rod assemblies and any incidentals necessary to construct sign foundations. Subsurface investigations required by the Engineer will be paid as extra work in accordance with Article 104-7 of the *2018 Standard Specifications*.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Overhead Footings	Cubic Yard

### **PORTLAND CEMENT CONCRETE PRODUCTION AND DELIVERY:**

(9-15-20)

1000, 1014, 1024

SP10 R01

Revise the *2018 Standard Specifications* as follows:

Page 10-6, Table 1000-1, REQUIREMENTS FOR CONCRETE, replace with the following:

TABLE 1000-1 REQUIREMENTS FOR CONCRETE											
Class of Concrete	Min. Compressive Strength at 28 days	Maximum Water-Cement Ratio				Consistency Maximum 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.
		<i>Units</i>	<i>psi</i>					<i>inch</i>	<i>inch</i>	<i>lb/cy</i>	<i>lb/cy</i>
AA	4500	0.381	0.426	---	---	3.5 <sup>A</sup>	---	639	715	---	---
AA Slip Form	4500	0.381	0.426	---	---	1.5	---	639	715	---	---
Drilled Pier	4500	---	---	0.450	0.450	---	5 - 7 dry  7 - 9 wet	---	---	640	800
A	3000	0.488	0.532	0.550	0.594	3.5 <sup>A</sup>	4.0	564	---	602	---
B	2500	0.488	0.567	0.559	0.630	1.5 machine placed  2.5 <sup>A</sup> hand placed	4.0	508	---	545	---
Sand Light- weight	4500	---	0.420	---	---	4.0 <sup>A</sup>	---	715	---	---	---
Latex Modified	3000 (at 7 days)	0.400	0.400	---	---	6.0	---	658	---	---	---
Flowable Fill excavatable	150 max. (at 56 days)	as needed	as needed	as needed	as needed	---	Flowable	---	---	40	100
Flowable Fill non- excavatable	125	as needed	as needed	as needed	as needed	---	Flowable	---	---	100	as needed
Pavement	4500 Design, field  650 flexural, design only	0.559	0.559	---	---	1.5 slip form  3.0 hand placed	---	526	---	---	---
Precast	See Table 1077-1	as needed	as needed	---	---	6.0	as needed	as needed	as needed	as needed	as needed
Prestressed	per contract	See Table 1078-1	See Table 1078-1	---	---	8.0	---	564	as needed	---	---

- A. The slump may be increased to 6 inches, provided the increase in slump is achieved by adding a chemical admixture conforming to Section 1024-3. In no case shall the water-cement ratio on the approved design be exceeded. Concrete exhibiting segregation and/or excessive bleeding will be rejected. Utilizing an Admixture to modify slump does not relinquish the contractor's responsibility to ensure the final product quality and overall configuration meets design specifications. Caution should be taken when placing these modified mixes on steep grades to prevent unintended changes to the set slope.

**THERMOPLASTIC INTERMIXED BEAD TESTING:**

7-19-22

1087

SP10 R04

Revise the *2018 Standard Specifications* as follows:

**Page 10-183, Subarticle 1087-7(B) Thermoplastic Pavement Marking Material Composition**, delete line 34 and 35.

**Page 10-184, Article 1087-8 MATERIAL CERTIFICATION**, delete and replace with the following after line 34:

Drop-on Glass Beads	Type 3 Material Certification and Type 4 Material Certification
Intermix Glass Beads	Type 2 Material Certification and Type 3 Material Certification
Paint	Type 3 Material Certification
Removable Tape	Type 3 Material Certification
Thermoplastic	Type 3 Material Certification and Type 4 Material Certification
Cold Applied Plastic	Type 2 Material Certification and Type 3 Material Certification
Polyurea	Type 2 Material Certification and Type 3 Material Certification

**THERMOPLASTIC PAVEMENT MARKING MATERIAL – COLOR TESTING:**

3-19-19

1087

SP10 R05

Revise the *2018 Standard Specifications* as follows:

**Pages 10-183 and 10-184, Subarticle 1087-7(D)(1)(b) Yellow**, lines 9-11, delete and replace with the following:

Obtain Color Values Y,x,y per ASTM E1349 using C/2° illuminant/observer. Results shall be  $Y \geq 45\%$ , and x,y shall fall within PR#1 chart chromaticity limits.

**REMOVAL OF PAVEMENT MARKINGS FROM MONOLITHIC ISLANDS:**

This work includes the removal of pavement marking from monolithic islands including removal for long life marking preparation. This work does not include removal of removable tape pavement markings. Remove pavement marking from monolithic islands by acceptable methods to the Engineer.

Prepare the monolithic island to accept pavement markings to insure maximum possible adhesion. Clean, seal and remove curing compound as necessary to insure that the markings

adhere to the monolithic island. Obtain approval for all surface preparation methods before implementing.

Monolithic islands shall be free of grease, oil, mud, dust, dirt, grass, loose gravel, winter surface treatments and other deleterious material, before applying pavement markings.

Prepare the monolithic island surface, including removal of curing compound, at least 2 inches wider than the pavement markings to be placed, such that, an additional 1 inch of prepared area is on all sides of the pavement markings after they are applied.

Remove the grooves caused by concrete grinders before installing the thermoplastic pavement marking.

Remove all curing compound and surface laitance on Portland cement concrete islands where long-life pavement markings will be placed. Perform curing compound removal by high-pressure water blasting or grinding methods. Ensure that the surface is free of all residue, laitance and debris before applying the pavement marking. When surface preparation and curing compound removal operations are completed, blow the pavement surface clean by compressed air immediately before installing the pavement markings.

If required, apply a primer sealer to pavement surfaces before applying pavement marking material as recommended by the manufacturer. Apply primer sealer in a continuous film at least 2 inches wider than the pavement markings in such a way as not to cause any noticeable change in the appearance of the pavement markings.

*Removal of Pavement Marking Lines from Monolithic Islands* will be measured and paid as the actual number of linear feet of pavement marking lines satisfactorily removed and accepted by the Engineer. The quantity of solid lines will be the summation of the linear feet of solid line measured end-to-end of the line. No payment will be made for the removal of removable pavement marking tape.

#### Pay Item

#### Pay Unit

Removal of Pavement Marking Lines from Monolithic Islands

Linear Feet

#### **NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKERS:**

10-19-21 (Rev. 11-16-21)

1086, 1250, 1253

SP10 R08

Revise the *2018 Standard Specifications* as follows:

**Pages 10-177 and 10-178, Subarticle 1086-3 SNOWPLOWABLE PAVEMENT MARKERS,** delete items (A), (B) and (C)(1) and replace with the following:

#### **(A) General**

Use non-cast iron snowplowable pavement markers evaluated by NTPEP. The non-cast iron snowplowable pavement marker shall consist of a housing with one or more glass or plastic face lens type reflective lenses to provide the required color designation. The marker shall be designed or installed in a manner that minimizes damage from snowplow blades. Plastic lens faces shall use an abrasion resistant coating.

**(B) Housings**

## (1) Dimensions

The dimension, slope and minimum area of reflecting surface shall conform to dimensions as shown in the plans. The minimum area of each reflecting surface shall be 1.44 sq.in.

## (2) Materials

Use non-cast iron snowplowable pavement markers that are on the NCDOT Approved Products List.

## (3) Surface

The surface of the housing shall be free of scale, dirt, rust, oil, grease or any other contaminant which might reduce its bond to the epoxy adhesive.

## (4) Identification

Mark the housing with the manufacturer's name and model number of marker.

**(C) Reflectors**

## (1) General

Laminate the reflector to an elastomeric pad and attach with adhesive to the housing. The thickness of the elastomeric pad shall be 0.04".

**Pages 12-14, Subarticle 1250-3(C) Removal of Existing Pavement Markers, lines 19-29**, delete and replace with the following:

Remove the existing raised pavement markers or the snowplowable pavement markers including the housings, before overlaying an existing roadway with pavement. Repair the pavement by filling holes as directed by the Engineer.

When traffic patterns are changed in work zones due to construction or reconstruction, remove all raised pavement markers or snowplowable markers including housings that conflict with the new traffic pattern before switching traffic to the new traffic pattern. Lens removal in lieu of total housing removal is not an acceptable practice for snowplowable markers.

Properly dispose of the removed pavement markers. No direct payment will be made for removal or disposal of existing pavement markers or repair of pavement, as such work will be incidental to other items in the contract.

**Pages 12-16, Subarticle 1253-1 DESCRIPTION, lines 4-5**, delete and replace with the following:

Furnish, install and maintain non-cast iron snowplowable pavement markers in accordance with the contract.

**Pages 12-16 and 12-17, Subarticle 1253-3 CONSTRUCTION METHODS**, delete items (A), (B) and (C) and replace with the following:

**(A) General**

Bond marker housings to the pavement with epoxy adhesive. Mechanically mix and dispense epoxy adhesives as required by the manufacturer's specifications. Place the markers immediately after the adhesive has been mixed and dispensed.

If saw cutting, milling, or grooving operations are used, promptly remove all resulting debris from the pavement surface. Install the marker housings within 7 calendar days after saw cutting, milling, or grooving the pavement. Remove and dispose of loose material from the slots by brushing, blow cleaning, or vacuuming. Dry the slots before applying the epoxy adhesive. Install non-cast iron snowplowable pavement markers according to the manufacturer's recommendations.

Protect the non-cast iron snowplowable pavement markers until the epoxy has initially cured and is track free.

**(B) Reflector Replacement**

In the event that a reflector is damaged, replace the damaged reflector by using adhesives and methods recommended by the manufacturer of the markers and approved by the Engineer. This work is considered incidental if damage occurs during the initial installation of the marker housings and maintenance of initial non-cast iron snowplowable markers specified in this section. This work will be paid for under the pay item for the type of reflector replacement if the damage occurred after the initial installation of the non-cast iron snowplowable pavement marker.

Missing housings shall be replaced. Broken housings shall be removed and replaced. In both cases the slot for the housings shall be properly prepared prior to installing the new housing; patch the existing marker slots as directed by the Engineer and install the new marker approximately one foot before or after the patch. Removal of broken housings and preparation of slots will be considered incidental to the work of replacing housings.

**Pages 12-17, Subarticle 1253-4 MAINTENANCE, lines 5,** delete and replace with the following:

Maintain all installed non-cast iron snowplowable pavement markers until acceptance.

**Pages 12-17, Subarticle 1253-5 MEASUREMENT AND PAYMENT, lines 7-8,** delete and replace with the following:

*Non-Cast Iron Snowplowable Pavement Markers* will be measured and paid as the actual number of non-cast iron snowplowable pavement markers satisfactorily placed and accepted by the Engineer.

**Pages 12-17, Subarticle 1253-5 MEASUREMENT AND PAYMENT, lines 11,** delete and replace with the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Non-Cast Iron Snowplowable Pavement Marker	Each
Replace Snowplowable Pavement Marker Reflector	Each

**MATERIALS FOR PORTLAND CEMENT CONCRETE:**

(9-15-20)

1000, 1024

SP10 R24

Revise the *2018 Standard Specifications* as follows:

**Page 10-52, Article 1024-4, WATER, lines 3-6,** delete and replace with the following:

Test water from wells at all locations. Test public water supplies from all out of state locations and in the following counties: Beaufort, Bertie, Brunswick, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Hyde, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrell and Washington unless the Engineer waives the testing requirements.

**Page 10-52, Table 1024-2, PHYSICAL PROPERTIES OF WATER,** replace with the following:

<b>Property</b>	<b>Requirement</b>	<b>Test Method</b>
Compression Strength, minimum percent of control at 3 and 7 days	90%	ASTM C1602
Time of set, deviation from control	From 1:00 hr. earlier to 1:30 hr. later	ASTM C1602
pH	4.5 to 8.5	ASTM D1293 *
Chloride Ion Content, Max.	250 ppm	ASTM D512 *
Total Solids Content (Residue), Max.	1,000 ppm	SM 2540B *
Resistivity, Min.	0.500 kohm-cm	ASTM D1125 *

\*Denotes an alternate method is acceptable. Test method used shall be referenced in the test report.

**GEOSYNTHETICS:**

(03-21-23)(Rev. 4-18-23)

1056

SP10 R56

Revise the *Standard Specifications* as follows:

**Page 10-77, Article 1056-1 DESCRIPTION, lines 13-16,** delete and replace the second sentence in the second paragraph with the following:

Steel anchor pins shall have a diameter of at least 3/16 inch, a length of at least 18 inches, 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 inches.

**Page 10-77, Article 1056-2 HANDLING AND STORING, lines 20-21,** delete and replace the third sentence in the first paragraph with the following:

Geosynthetics with defects, flaws, deterioration or damage will be rejected by the Engineer.

**Page 10-77, Article 1056-3 CERTIFICATIONS AND IDENTIFICATION, lines 25-27,** delete and replace the first sentence in the first paragraph with the following:

Provide Type 1, Type 2 or Type 4 material certifications in accordance with Article 106-3 for geosynthetics except certifications are not required for Type 1 through Type 5 geotextiles.

**Page 10-77, Article 1056-3 CERTIFICATIONS AND IDENTIFICATION, lines 32-35,** delete the second paragraph.

**Page 10-77, Article 1056-3 CERTIFICATIONS AND IDENTIFICATION, lines 36-41,** delete and replace the third paragraph with the following:

Allow the Engineer to visually identify geosynthetic products before installation. Open packaged geosynthetics just before use in the presence of the Engineer to verify the correct product. Geosynthetics that are missing original packaging or product labels or that have been unwrapped or previously opened will be rejected unless otherwise approved by the Engineer.

**Page 10-77, Article 1056-4 GEOTEXTILES, lines 43-45,** delete the first paragraph.

**Page 10-78, Article 1056-4 GEOTEXTILES, before line 1 and lines 1-5,** delete Table 1056-1 and lines 1-5 and replace with the following:

TABLE 1056-1 GEOTEXTILE REQUIREMENTS						
Property <sup>A</sup>	Requirement (MARV <sup>A</sup> )					Test Method
	Type 1	Type 2	Type 3 <sup>B</sup>	Type 4	Type 5 <sup>C</sup>	
<i>Typical Application</i>	<i>Shoulder Drains</i>	<i>Under Rip Rap</i>	<i>Silt Fence Fabric</i>	<i>Soil Stabilization</i>	<i>Subgrade Stabilization</i>	
Elongation (MD & CD)	≥ 50%	≥ 50%	≤ 25%	< 50%	< 50%	ASTM D4632
Grab Strength (MD & CD) <sup>A</sup>	Table 1 <sup>D</sup> , Class 3	Table 1 <sup>D</sup> , Class 1	100 lb	Table 1 <sup>D</sup> , Class 3	-	ASTM D4632
Tear Strength (MD & CD) <sup>A</sup>			-			ASTM D4533
Puncture Strength			-			ASTM D6241
Ultimate Tensile Strength (MD & CD) <sup>A</sup>	-	-	-	-	Table 12 <sup>D</sup> , Class 4A	ASTM D4595
Permittivity	Table 2 <sup>D</sup> , 15% to 50% <i>in Situ</i> Soil Passing 0.075 mm	Table 6 <sup>D</sup> , 15% to 50% <i>in Situ</i> Soil Passing 0.075 mm	Table 7 <sup>D</sup>	Table 5 <sup>D</sup>	Table 12 <sup>D</sup> , Class 4A	ASTM D4491
Apparent Opening Size						ASTM D4751
UV Stability (Retained Strength)						ASTM D4355

A. MD, CD and MARV per Article 1056-3.

B. Minimum roll width of 36 inches required.

C. Minimum roll width of 13 feet required unless otherwise approved by the Engineer for the application.

D. Per AASHTO M 288.

Page 10-78, Article 1056-5 GEOCOMPOSITE DRAINS, before line 9 and lines 9-10, delete Table 1056-2 and lines 9-10 and replace with the following:

TABLE 1056-2 GEOCOMPOSITE DRAIN REQUIREMENTS				
Property	Requirement			Test Method
	Sheet Drain	Strip Drain	Wick Drain	
Width	≥ 12"	12" ±1/4"	4" ±1/4"	N/A
In-Plane Flow Rate <sup>A</sup> (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 <sup>B</sup> @ applied normal compressive stress of 1.45 psi	ASTM D4716

A. MARV per Article 1056-3.

B. Per foot of width tested.

Page 10-79, Article 1056-5 GEOCOMPOSITE DRAINS, before line 3, delete Table 1056-3 and replace with the following:

TABLE 1056-3 DRAINAGE CORE REQUIREMENTS			
Property	Requirement		Test Method
	Sheet Drain	Strip Drain	
Thickness	1/4"	1"	ASTM D1777 or D5199
Compressive Strength <sup>A</sup>	40 psi	30 psi	ASTM D6364

A. MARV per Article 1056-3.

Page 10-79, Article 1056-5 GEOCOMPOSITE DRAINS, before line 6 and lines 6-11, delete Table 1056-4, lines 6-7 and the last paragraph and replace with the following:

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

A. Per 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 lbs. per 4 inch width in accordance with ASTM D4595 and geotextiles with a permittivity, AOS and UV stability that meet Table 1056-4.

Page 10-80, Article 1056-6 GEOCELLS, before line 1 and lines 1-4, delete Table 1056-5 and lines 1-4 and replace with the following:

Property	Requirement	Test Method
Cell Depth	4"	N/A
Fully Expanded Cell Area	100 sq.in. max	N/A
Sheet Thickness	50 mil -5%, +10%	ASTM D5199
Density	58.4 pcf min	ASTM D1505
Carbon Black Content	1.5% min	ASTM D1603 or D4218
ESCR <sup>A</sup>	5000 hr min	ASTM D1693
Coefficient of Direct Sliding (with material that meets AASHTO M 145 for soil classification A-2)	0.85 min	ASTM D5321
Short-Term Seam (Peel) Strength (for 4" seam)	320 lb min	USACE <sup>C</sup> Technical Report GL-86-19, Appendix A
Long-Term Seam (Hang) Strength <sup>B</sup> (for 4" seam)	160 lb min	

A. Environmental Stress Crack Resistance.

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

C. US Army Corps of Engineers (USACE).

**MATERIAL AND EQUIPMENT STORAGE & PARKING OF PERSONAL VEHICLES:**

11-17-21(Rev. 8-16-22)

1101

SP11 R03

Revise the *2018 Standard Specifications* as follows:

**Page 11-2, Article 1101-8 MATERIAL AND EQUIPMENT STORAGE, line 35-38, delete and replace with the following:**

When work is not in progress, keep all personnel, equipment, machinery, tools, construction debris, materials and supplies away from active travel lanes that meets Table 1101-1.

Posted Speed Limit (mph)	Distance (ft)
40 or less	≥ 18
45-50	≥ 28
55	≥ 32
60 or higher	≥ 40

When vehicles, equipment and materials are protected by concrete barrier or guardrail, they shall be offset at least 5 feet from the barrier or guardrail.

**Page 11-2, Article 1101-9 PARKING OF PERSONAL VEHICLES, line 40-41, delete and replace with the following:**

Provide staging areas for personal vehicle parking in accordance with Article 1101-8 or as directed by the Engineer before use.

**WORK ZONE INSTALLER:**

(7-20-21)(Rev. 8-16-22)

1101, 1150

SP11 R04

Provide the service of at least one qualified work zone installer during the setup, installation, and removal of temporary traffic control within the highway right of way. The qualified work zone installer shall serve as crew leader and shall be on site and directing the installation and removal of temporary traffic control. If multiple temporary traffic control installations or removals are occurring simultaneously, then each shall have a qualified work zone installer.

The work zone installer shall be qualified by an NCDOT approved training agency or other NCDOT approved training provider in the safe and competent set up of temporary traffic control. For a complete listing of approved training agencies, see the Work Zone Safety Training webpage.

A work zone supervisor, in accordance with Article 1101-13 of the *Standard Specifications*, may fulfill the role of the work zone installer during the setup, installation, and removal of temporary traffic control within the highway right of way provided they are on site and directing the installation and removal of temporary traffic control.

All other individuals participating in the setup, installation, and removal of temporary traffic control within the highway right of way shall be certified as a qualified flagger in accordance with Article 1150-3 of the *Standard Specifications*, even if flagging is not being performed as part of the traffic control.

Provide the name and contact information of all qualified work zone installers to the Engineer prior to or at the preconstruction conference. Additionally, provide a qualification statement that all other individuals participating in the setup, installation, and removal of temporary traffic control are qualified flaggers that have been properly trained through an NCDOT approved training agency or other NCDOT approved training provider.

All certification records for qualified work zone installers and flaggers shall be uploaded by the approved training agency or other NCDOT approved training provider to the Department's Work Zone Education Verification App (WZ-EVA) prior to the qualified work zone installer or flagger performing any traffic control duties on the project. For more information about WZ-EVA, see the Work Zone Safety Training webpage.

**PORTABLE CHANGEABLE MESSAGE SIGNS:**

(9-20-22)(Rev. 11-15-22)

1089, 1120

SP11 R10

Revise the *2018 Standard Specifications* as follows:

**Page 10-197, Subarticle 1089-7(D) Controller, line 16**, add the following after the third sentence of the first paragraph:

Change the controller password from the factory default and periodically change the controller password to deter unauthorized programming of the controller.

**Page 10-197, Subarticle 1089-7(D) Controller, lines 16-19**, replace the fourth sentence of the first paragraph with the following:

The password system is recommended to include at least two levels of security such that operators at one level may only change message sequences displayed using preprogrammed sequences and operators at a higher level may create and store messages or message sequences.

**Page 10-197, Subarticle 1089-7(D) Controller, line 24** replace the sentence with the following:

The controller shall be stored in a locked, weather and vandal resistant box when not in use and after changes to the messages are made.

**Page 11-8, Article 1120-3 CONSTRUCTION METHODS, lines 26-32**, replace the second paragraph with the following:

Provide an experienced operator for the portable changeable message sign during periods of operation to ensure that the messages displayed on the sign panel are in accordance with the plans and Subarticle 1089-7(D). Change the controller password from the factory default and periodically change the controller password to deter unauthorized programming of the controller. Using two levels of password security is recommended such that operators at one level may only change message sequences displayed using preprogrammed sequences and operators at a higher level may create and store messages or message sequences. Lock the controller in a weather and vandal resistant box when not in use and after changes to the messages are made.

**LAW ENFORCEMENT:**

(6-21-22)(Rev. 11-15-22)

1190

SP11 R30

Revise the *2018 Standard Specifications* as follows:

**Page 11-19, Article 1190-1 DESCRIPTION, lines 4-5**, replace the paragraph with the following:

Furnish Law Enforcement Officers and official Law Enforcement vehicles to direct traffic in accordance with the contract.

**Page 11-19, Article 1190-2 CONSTRUCTION METHODS, lines 7-10**, replace the first and second paragraph with the following:

Use off duty uniformed Law Enforcement Officers and official Law Enforcement vehicles equipped with blue lights to direct or control traffic as required by the plans or by the Engineer.

Law Enforcement vehicles shall not be parked within the buffer space on any roadway. Law Enforcement vehicles shall not be used to close or block an active travel lane on multilane roadways with a posted speed limit of 45 MPH or higher, except as allowed during rolling roadblock operations as shown in the *Roadway Standard Drawings* or while responding to an emergency.

**Page 11-19, Article 1190-3 MEASUREMENT AND PAYMENT, lines 14-15,** replace the second sentence of the first paragraph with the following:

There will be no direct payment for official Law Enforcement vehicles as they are considered incidental to the pay item.

**EXTRUDED THERMOPLASTIC PAVEMENT MARKING THICKNESS:**

3-19-19 (Rev. 6-21-22)

1205

SP12 R05

Revise the *2018 Standard Specifications* as follows:

**Page 12-6, Subarticle 1205-4(A)(1) General, lines 5-8,** delete the second sentence and replace with the following:

Use application equipment that provides multiple width settings ranging from 4 inches to 12 inches and multiple thickness settings to achieve the required thickness above the surface of the pavement as shown in Table 1205-3.

**Page 12-7, Table 1205-3, THICKNESS REQUIREMENTS FOR THERMOPLASTIC,** replace with the following:

<b>TABLE 1205-3</b>	
<b>MINIMUM THICKNESS REQUIREMENTS FOR THERMOPLASTIC</b>	
<b>Thickness</b>	<b>Location</b>
240 mils	In-lane and shoulder-transverse pavement markings (rumble strips). May be placed in 2 passes.
90 mils	Center lines, skip lines, transverse bands, mini-skip lines, characters, bike lane symbols, crosswalk lines, edge lines, gore lines, diagonals, and arrow symbols

**PORTABLE CONSTRUCTION LIGHTING:**

4-19-22

1413

SP14 R13

Revise the *2018 Standard Specifications* as follows:

**Page 14-24, Article 1413-3 TOWER LIGHT, lines 2-7,** delete and replace the first and second sentence in the first paragraph with the following:

Use tower lights which consist of mercury vapor, metal halide, high pressure sodium, low pressure sodium or light emitting diode (with correlated color temperature of 4000 Kelvin or less) fixtures mounted on a tower approximately 30 feet in height. Use tower light fixtures which are heavy duty flood, area, or roadway style with wide beam spread, have sufficient output to provide the minimum illumination requirements for the Category of work, are weatherproof and supplied with attached waterproof power cord and plug.

**Page 14-24, Article 1413-3 TOWER LIGHT, lines 11-12,** delete and replace the second paragraph with the following:

Provide tower lights of sufficient wattage or quantity to provide the minimum average maintained horizontal illuminance over the work area based on the Category of work as shown in Table 1413-1. For any work not covered in Table 1413-1, provide a minimum average maintained horizontal illuminance of 20.0 footcandles over the work area.

<b>Category</b>	<b>Description of Construction and Maintenance Task</b>	<b>Minimum Average Maintained Horizontal Illuminance</b>
I	Excavation; Embankment, Fill and Compaction; Maintenance of Embankment; Asphalt Pavement Rolling; Subgrade, Stabilization and Construction; Base Course Rolling; Sweeping and Cleaning; Landscaping, Sod and Seeding; Reworking Shoulders.	5.0 footcandle
II	Barrier Wall and Traffic Separators; Milling, Removal of Pavement; Asphalt Paving and Resurfacing; Concrete Pavement; Base Course Grading and Shaping; Surface Treatment; Waterproofing and Sealing; Sidewalk Construction; Guardrails and Fencing; Striping and Pavement Marking; Highway Signs; Bridge Decks; Drainage Structures and Drainage Piping; Other Concrete Structures; Repair of Concrete Pavement; Pothole Filling; Repair of Guardrail and Fencing.	10.0 footcandle
III	Traffic Signals; Highway Lighting Systems; Crack Filling.	20.0 footcandle

**Page 14-24, Article 1413-4 MACHINE LIGHTS, lines 18-21,** delete and replace the first and second sentence in the first paragraph with the following:

Use machine lights which have mercury vapor, metal halide, high pressure sodium, low pressure sodium or light emitting diode (with correlated color temperature of 4000 Kelvin or less) fixtures mounted on supports attached to the construction machine at a height of approximately 13 feet.

**Page 14-24, Article 1413-5 CONSTRUCTION METHODS, lines 33-34,** delete and replace the third and fourth sentence in the first paragraph with the following:

Submit photometric calculations showing the minimum average maintained horizontal illuminance over the work area and the tower spacing to the Engineer for review and approval prior to installation.

**EROSION AND STORMWATER CONTROL FOR SHOULDER CONSTRUCTION AND RECONSTRUCTION:**

(11-16-10) (Rev. 1-21-20)

105-16, 225-2, Division 16

SP16 R03R

Land disturbing operations associated with shoulder construction/reconstruction may require erosion and sediment control/stormwater measure installation. National Pollutant Discharge Elimination System (NPDES) inspection and reporting may be required.

Erosion control measures shall be installed per the erosion control detail in any area where the vegetated buffer between the disturbed area and surface waters (streams, wetlands, or open waters) or drainage inlet is less than 10 feet. The Engineer may reduce the vegetated buffer threshold for this requirement to a value between 5 and 10 feet. Erosion control measures shall be spot checked every 7 days until permanent vegetative establishment.

In areas where shoulder construction/reconstruction includes disturbance or grading on the front slope or to the toe of fill, relocating ditch line or backslope, or removing vegetation from the ditch line or swale, NPDES inspection and monitoring are required every 7 days or within 24 hours of a rainfall event of greater than 1.0 inch. Maintain daily rainfall records. Install erosion control measures per detail.

In areas where the vegetated buffer is less than 10 feet between the disturbed area and waters of the State classified as High Quality Water (HQW), Outstanding Resource Water (ORW), Critical Areas, or Unique Wetlands, NPDES inspection and monitoring are required every 7 days or within 24 hours of a rainfall event of greater than 1.0 inch. The Engineer may reduce the vegetated buffer threshold for this requirement to a value between 5 and 10 feet. The plans or provisions will indicate the presence of these water classifications. Maintain daily rainfall records. Install erosion control measures per detail.

Land disturbances hardened with aggregate materials receiving sheet flow are considered non-erodible.

Sites that require lengthy sections of silt fence may substitute with rapid permanent seeding and mulching as directed by the Engineer.

NPDES documentation shall be performed by a Level II Erosion and Sediment Control/Stormwater certificate holder.

Materials used for erosion control will be measured and paid as stated in the contract.

**FLOWABLE FILL:**

(9-17-02) (Rev 1-17-12)

300, 340, 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 *2018 Standard Specifications*.

**Item**

Flowable Fill

**Section**

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**

Flowable Fill

**Pay Unit**

Cubic Yard

County: NEW HANOVER, PENDER

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
<b>ROADWAY ITEMS</b>						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	1245000000-E	SP	SHOULDER RECONSTRUCTION	73.61 SMI		
0003	1260000000-E	SP	AGGREGATE SHOULDER BORROW	15,986 TON		
0004	1297000000-E	607	MILLING ASPHALT PAVEMENT, **** DEPTH (1-1/2")	42,615 SY		
0005	1297000000-E	607	MILLING ASPHALT PAVEMENT, **** DEPTH (1-1/4')	797,298 SY		
0006	1297000000-E	607	MILLING ASPHALT PAVEMENT, **** DEPTH (2-1/4")	42,735 SY		
0007	1308000000-E	607	MILLING ASPHALT PAVEMENT, **** TO ***** (1-1/4" TO 2-1/4")	53,388 SY		
0008	1524200000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5D	65,736 TON		
0009	1577000000-E	620	POLYMER MODIFIED ASPHALT BINDER FOR PLANT MIX	5,532 TON		
0010	1662000000-E	650	OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED	28,453 TON		
0011	1840000000-E	665	MILLED RUMBLE STRIPS (ASPHALT CONCRETE)	272,020 LF		
0012	2275000000-E	SP	FLOWABLE FILL	18 CY		
0013	2473000000-N	SP	GENERIC DRAINAGE ITEM DROP INLET REPAIR	9 EA		
0014	2473000000-N	SP	GENERIC DRAINAGE ITEM REMOVE & REPLACE CONCRETE APRON FOR DROP INLET	13 EA		
0015	2752000000-E	SP	GENERIC PAVING ITEM REMOVE & REPLACE SHOULDER BERM GUTTER	95 LF		
0016	3030000000-E	862	STEEL BEAM GUARDRAIL	1,560 LF		

County: NEW HANOVER, PENDER

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0018	3287000000-N	SP	GUARDRAIL END UNITS, TYPE TL-3	5 EA		
0019	3345000000-E	864	REMOVE & RESET EXISTING GUARDRAIL	11,990 LF		
0020	3365000000-E	863	REMOVE EXISTING GUIDERAIL	512 LF		
0021	3389200000-E	865	CABLE GUIDERAIL	195 LF		
0022	3389600000-N	865	CABLE GUIDERAIL ANCHOR UNITS	2 EA		
0023	3420000000-E	SP	GENERIC GUARDRAIL ITEM REMOVE AND REPLACE EXISTING GUARDRAIL	3,250 LF		
0025	3435000000-N	SP	GENERIC GUARDRAIL ITEM REMOVE & REPLACE GUARDRAIL END UNIT, TYPE CAT-1	18 EA		
0026	3435000000-N	SP	GENERIC GUARDRAIL ITEM REMOVE & REPLACE GUARDRAIL END UNIT, TYPE TL-3	26 EA		
0027	3435000000-N	SP	GENERIC GUARDRAIL ITEM REMOVE & RESET GUARDRAIL END UNIT, TYPE TL-3	11 EA		
0028	3435000000-N	SP	GENERIC GUARDRAIL ITEM REMOVE & RESET GUARDRAIL END UNITS, TYPE CAT-1	5 EA		
0029	4048000000-E	902	REINFORCED CONCRETE SIGN FOUNDATIONS	7 CY		
0030	4054000000-E	902	PLAIN CONCRETE SIGN FOUNDATIONS	2 CY		
0031	4060000000-E	903	SUPPORTS, BREAKAWAY STEEL BEAM	6,831 LB		
0032	4066000000-E	903	SUPPORTS, SIMPLE STEEL BEAM	1,263 LB		
0033	4109000000-N	904	SIGN ERECTION, TYPE *** (OVERHEAD) (A)	17 EA		
0034	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)	14 EA		

County: NEW HANOVER, PENDER

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0035	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)	2 EA		
0036	4143000000-N	907	DISPOSAL OF SUPPORT, OVERHEAD STRUCTURE	1 EA		
0037	4152000000-N	907	DISPOSAL OF SIGN SYSTEM, STEEL BEAM	14 EA		
0038	4234000000-N	907	DISPOSAL OF SIGN, A OR B (OVERHEAD)	17 EA		
0039	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	584 SF		
0040	4415000000-N	1115	FLASHING ARROW BOARD	4 EA		
0041	4420000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN	8 EA		
0042	4423000000-N	SP	WORK ZONE DIGITAL SPEED LIMIT SIGNS	4 EA		
0043	4424000000-N	SP	WORK ZONE PRESENCE LIGHTING	16 EA		
0044	4434000000-N	SP	SEQUENTIAL FLASHING WARNING LIGHTS	34 EA		
0045	4480000000-N	1165	TMA	2 EA		
0046	4510000000-N	1190	LAW ENFORCEMENT	1,200 HR		
0047	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM RAMP/LOOP CLOSURE	71 EA		
0048	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM SINGLE LANE CLOSURE	800 EA		
0049	4685000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	48,815 LF		
0050	4688000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (6", 90 MILS)	421,882 LF		
0051	4695000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	1,275 LF		

County: NEW HANOVER, PENDER

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0052	4700000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	10,240 LF		
0053	4709000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	215 LF		
0054	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	45 EA		
0055	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	1,320 LF		
0056	4815000000-E	1205	PAINT PAVEMENT MARKING LINES (6")	214,940 LF		
0057	4825000000-E	1205	PAINT PAVEMENT MARKING LINES (12")	2,340 LF		
0058	4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (4")	760 LF		
0059	4855000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (6")	550 LF		
0060	4890000000-E	SP	GENERIC PAVEMENT MARKING ITEM REMOVAL OF PAVEMENT MARKING LINES FROM MONOLITHIC ISLANDS	400 LF		
0061	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	66 EA		
0062	4905100000-N	SP	NON-CAST IRON SNOWPLOWABLE PAVEMENT MARKER	2,368 EA		
0063	5255000000-N	1413	PORTABLE LIGHTING	Lump Sum	L.S.	
0064	6000000000-E	1605	TEMPORARY SILT FENCE	1,000 LF		
0065	6029000000-E	SP	SAFETY FENCE	360 LF		
0066	6030000000-E	1630	SILT EXCAVATION	10 CY		
0067	6036000000-E	1631	MATTING FOR EROSION CONTROL	500 SY		
0068	6071010000-E	SP	WATTLE	500 LF		

County: NEW HANOVER, PENDER

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0069	6084000000-E	1660	SEEDING & MULCHING	1 ACR		
0070	6117500000-N	SP	CONCRETE WASHOUT STRUCTURE	6 EA		
0071	7300000000-E	1715	UNPAVED TRENCHING (*****) (1, 2")	80 LF		
0072	7301000000-E	1715	DIRECTIONAL DRILL (*****) (1, 2")	75 LF		
0073	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	2 EA		
0074	7980000000-N	SP	GENERIC SIGNAL ITEM 10KVA SINGLE PHASE TRANSFORMER	1 EA		
0075	7980000000-N	SP	GENERIC SIGNAL ITEM 5/8" X 10' GROUNDING ELECTRODE	3 EA		
0076	7980000000-N	SP	GENERIC SIGNAL ITEM DIGITAL CCTV CAMERA ASSEMBLY	1 EA		
0077	7980000000-N	SP	GENERIC SIGNAL ITEM DMS ACCESS LADDER	1 EA		
0078	7980000000-N	SP	GENERIC SIGNAL ITEM DMS PEDESTAL STRUCTURE (DUAL DMS)	1 EA		
0079	7980000000-N	SP	GENERIC SIGNAL ITEM DYNAMIC MESSAGE SIGN (TYPE 2C)	2 EA		
0080	7980000000-N	SP	GENERIC SIGNAL ITEM EQUIPMENT CABINET DISCONNECT	1 EA		
0081	7980000000-N	SP	GENERIC SIGNAL ITEM METER BASE/DISCONNECT COMBINATION PANEL	1 EA		
0082	7980000000-N	SP	GENERIC SIGNAL ITEM MODIFY SOLAR POWER ASSEMBLY	1 EA		
0083	7980000000-N	SP	GENERIC SIGNAL ITEM REMOVAL AND DISPOSAL OF EXISTING DMS COMPONENTS	1 EA		
0084	7990000000-E	SP	GENERIC SIGNAL ITEM #4 SOLID BARE COPPER GROUNDING CONDUCTOR	90 LF		

County: NEW HANOVER, PENDER

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0085	7990000000-E	SP	GENERIC SIGNAL ITEM 4-WIRE COPPER FEEDER CONDUCTORS	80 LF		
0086	7992000000-E	SP	GENERIC SIGNAL ITEM OVERHEAD FOOTING	12 CY		
<b>STRUCTURE ITEMS</b>						
0087	8161000000-E	420	GROOVING BRIDGE FLOORS	35,387 SF		
0088	8559000000-E	SP	CLASS II, SURFACE PREPARATION	62.4 SY		
0089	8660000000-E	SP	CONCRETE REPAIRS	4.8 CF		
0090	8678000000-E	SP	EPOXY RESIN INJECTION	16 LF		
0091	8867000000-E	SP	GENERIC STRUCTURE ITEM EXPANSION JOINT SEAL REPAIR	339 LF		
0092	8867000000-E	SP	GENERIC STRUCTURE ITEM FOAM JOINT SEALS FOR PRESERVATION	565 LF		
0093	8867000000-E	SP	GENERIC STRUCTURE ITEM SILICONE JOINT SEALANT FOR SLOPE PROTECTION	912 LF		
0094	8889000000-E	SP	GENERIC STRUCTURE ITEM APPROACH SLAB VOID FILLING	4,000 LB		
0095	8889000000-E	SP	GENERIC STRUCTURE ITEM SLOPE PROTECTION VOID FILLING	6,000 LB		
0096	8892000000-E	SP	GENERIC STRUCTURE ITEM EPOXY COATING	2,644 SF		
0097	8893000000-E	SP	GENERIC STRUCTURE ITEM PLACING AND FINISHING POLYMER CONCRETE OVERLAY	4,211 SY		
0098	8893000000-E	SP	GENERIC STRUCTURE ITEM SCARIFYING BRIDGE DECK	4,211 SY		
0099	8893000000-E	SP	GENERIC STRUCTURE ITEM SHOTBLASTING BRIDGE DECK	4,211 SY		

County: NEW HANOVER, PENDER

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0100	8897000000-N	SP	GENERIC STRUCTURE ITEM EXPANSION BEARING REPAIR (EBR)	14 EA		
0101	8897000000-N	SP	GENERIC STRUCTURE ITEM RETAINER RING (RR)	28 EA		
0102	8897000000-N	SP	GENERIC STRUCTURE ITEM WEEP HOLE FILTERS	60 EA		
***** BEGIN SCHEDULE AA ***** ***** ( 2 ALTERNATES ) *****						
0103 AA1	8881000000-E	SP	GENERIC STRUCTURE ITEM POLYESTER POLYMER CONCRETE MATERIALS	116.8 CY		
*** OR ***						
0104 AA2	8881000000-E	SP	GENERIC STRUCTURE ITEM EPOXY POLYMER CONCRETE MATERIALS	116.8 CY		
***** END SCHEDULE AA *****						

0824/Jul06/Q2123282.41/D545870710000/E102

Total Amount Of Bid For Entire Project :

PROJECT NO.	SHEET NO.
I-6039	11

# SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH	WIDTH	1245000000-E	1260000000-E	1297000000-E			1308000000-E	1524200000-E	1577000000-E	1662000000-E	1840000000-E	2473000000-N		2752000000-E		
												SHOULDER RECONSTRUCTION	AGGREGATE SHOULDER BORROW	1.25" MILLING	1.5" MILLING	2.25" MILLING	1.25" - 2.25" MILLING	SURFACE COURSE, S9.5D	POLYMER MODIFIED ASPHALT BINDER FOR PLANT MIX	OG ASP FRICT FC-1 MODIFIED	MILLED RUMBLE STRIPS	REMOVE & REPLACE CONC. APRON FOR DROP INLET	DROP INLET REPAIR	REM & RPL SHOULDER BERM GUT		
												MI	FT	SMI	TON	SY	SY	SY	SY	TON	TON	TON	LF	EA	EA	LF
47988.3.1	Pender	1	I-40 E	FROM 0.50 MILES W. OF NC 210 INTERCHANGE TO 0.40 MILES E. OF SR 2048 (GORDON RD.) INTERCHANGE [MM 407.50 - MM 420.36]	1	2	MD	NO	NO	12.86	42	25.72	6,430	335,875		16,755	23,654	29,707	2,605	14,199	135,810	7	5			
<b>TOTAL FOR MAP NO. 1</b>												<b>12.86</b>		<b>25.72</b>	<b>6,430</b>	<b>335,875</b>		<b>16,755</b>	<b>23,654</b>	<b>29,707</b>	<b>2,605</b>	<b>14,199</b>	<b>135,810</b>	<b>7</b>	<b>5</b>	
47988.3.1	Pender	2	I-40 W	FROM 0.09 MILES E. OF SR 2048 (GORDON RD.) INTERCHANGE TO 0.50 MILES W. OF NC 210 HWY. INTERCHANGE [MM 420.36 - MM 407.50]	1	2	MD	NO	NO	12.86	42	36.00	6,430	408,931		18,973	23,654	28,031	2,307	11,974	135,810	6	4			
<b>TOTAL FOR MAP NO. 2</b>												<b>12.86</b>		<b>36.00</b>	<b>6,430</b>	<b>408,931</b>		<b>18,973</b>	<b>23,654</b>	<b>28,031</b>	<b>2,307</b>	<b>11,974</b>	<b>135,810</b>	<b>6</b>	<b>4</b>	
47988.3.1	Pender	3	EXIT 408 - I-40 EB EXIT RAMP AT NC 210 HWY.	EXIT RAMP FROM I-40 EB TO NC 210 HWY. [MP 0.09 - MP 0.27]	8	1		NO	NO	0.18	20	0.36	90		2,377			218	12		50			65		
<b>TOTAL FOR MAP NO. 3</b>												<b>0.18</b>		<b>0.36</b>	<b>90</b>		<b>2,377</b>			<b>218</b>	<b>12</b>		<b>50</b>			<b>65</b>
47988.3.1	Pender	4	EXIT 408 - I-40 EB ENTRANCE RAMP AT I-40 EB	ENTRANCE RAMP FROM NC 210 HWY. TO I-40 EB [MP 0.00 - MP 0.22]	7	1		NO	NO	0.22	18	0.44	110		2,508			238	14		50					
<b>TOTAL FOR MAP NO. 4</b>												<b>0.22</b>		<b>0.44</b>	<b>110</b>		<b>2,508</b>			<b>238</b>	<b>14</b>		<b>50</b>			
47988.3.1	Pender	5	EXIT 414 - I-40 EB EXIT RAMP AT SR 1002 (HOLLY SHELTER ROAD)	EXIT RAMP FROM I-40 EB TO SR 1002 (HOLLY SHELTER RD.) [MP 0.04 - MP 0.23]	9	1		NO	NO	0.19	18	0.19	96		2,125			198	11		50					
<b>TOTAL FOR MAP NO. 5</b>												<b>0.19</b>		<b>0.19</b>	<b>96</b>		<b>2,125</b>			<b>198</b>	<b>11</b>		<b>50</b>			
47988.3.1	Pender	6	EXIT 414 - I-40 EB EXIT RAMP AT SR 1002 (HOLLY SHELTER ROAD)	ENTRANCE RAMP FROM SR 1002 (HOLLY SHELTER RD.) TO I-40 EB [MP 0.00 - MP 0.36]	8	1		NO	NO	0.36	18	0.72	180		3,848			354	20							
<b>TOTAL FOR MAP NO. 6</b>												<b>0.36</b>		<b>0.72</b>	<b>180</b>		<b>3,848</b>			<b>354</b>	<b>20</b>					
47988.3.1	Pender	7	EXIT 416A - I-40 EB EXIT RAMP AT I-140 WB	EXIT RAMP FROM I-40 WB TO I-140 WEST [MP 0.27 - MP 0.66]	2	1		NO	NO	0.39	24	0.78	195	5,394				510	45	248	50					
<b>TOTAL FOR MAP NO. 7</b>												<b>0.39</b>		<b>0.78</b>	<b>195</b>	<b>5,394</b>				<b>510</b>	<b>45</b>	<b>248</b>	<b>50</b>			
47988.3.1	Pender	8	EXIT 416B - I-40 EB ENTRANCE RAMP AT I-140/US 17	ENTRANCE RAMP FROM I-40 TO I-40 EB [MP 0.10 - MP 1.11]	2	1		NO	NO	1.01	25	2.02	505	19,252			6,080	1,072	61		518					
<b>TOTAL FOR MAP NO. 8</b>												<b>1.01</b>		<b>2.02</b>	<b>505</b>	<b>19,252</b>			<b>6,080</b>	<b>1,072</b>	<b>61</b>		<b>518</b>			
47988.3.1	Pender	9	EXIT 416B - I-40 EB EXIT LOOP AT I-140 EB	EXIT RAMP FROM I-40 EB TO I-140 EB [MP 0.64 - MP 0.82]	6	1		NO	NO	0.18	22	0.18	50		2,383			206	25	140	50					
<b>TOTAL FOR MAP NO. 9</b>												<b>0.18</b>		<b>0.18</b>	<b>50</b>		<b>2,383</b>			<b>206</b>	<b>25</b>	<b>140</b>	<b>50</b>			
47988.3.1	Pender	10	EXIT 20A - I-140 WB EXIT LOOP AT I-40 EB	EXIT RAMP FROM I-140 WB TO I-40 EB [MP 0.69 - MP 0.87]	6	1		NO	NO	0.18	21	0.18	45		2,301			187	20	134						
<b>TOTAL FOR MAP NO. 10</b>												<b>0.18</b>		<b>0.18</b>	<b>45</b>		<b>2,301</b>			<b>187</b>	<b>20</b>	<b>134</b>				
47988.3.1	Pender	11	EXIT 20 - I-140 EB EXIT LOOP AT I-40 WB	EXIT RAMP FROM I-140 WB TO I-40 WEB [MP 0.10 - MP 0.83]	2	1		NO	NO	0.73	25	1.46	365	11,638				904	95	645						
<b>TOTAL FOR MAP NO. 11</b>												<b>0.73</b>		<b>1.46</b>	<b>365</b>	<b>11,638</b>				<b>904</b>	<b>95</b>	<b>645</b>				
47988.3.1	New Hanover	12	EXIT 20 - I-140 EB ENTRANCE RAMP AT I-40 EB	FROM I-140 EB TO I-40 EB [MP 0.34 - MP 0.56]	2	1		NO	NO	0.22	25	0.22	110	3,266				272	20	194						
<b>TOTAL FOR MAP NO. 12</b>												<b>0.22</b>		<b>0.22</b>	<b>110</b>	<b>3,266</b>				<b>272</b>	<b>20</b>	<b>194</b>				
47988.3.1	New Hanover	13	EXIT 420 - I-40 EB EXIT RAMP AT SR 2048 (GORDON ROAD)	FROM I-40 EB TO SR 2048 (GORDON RD.) [MP 0.04 - MP 0.19]	4	1		NO	NO	0.15	18		45	1,430				134	8							
<b>TOTAL FOR MAP NO. 13</b>												<b>0.15</b>			<b>45</b>	<b>1,430</b>				<b>134</b>	<b>8</b>					
47988.3.1	New Hanover	14	EXIT 420 - I-40 EB ENTRANCE RAMP AT I-40 EB	FROM SR 2048 (GORDON RD.) TO I-40 EB [MP 6.49 - MP 6.73]	3	1		NO	NO	0.24	25			3,871				325	19							
<b>TOTAL FOR MAP NO. 14</b>												<b>0.24</b>				<b>3,871</b>				<b>325</b>	<b>19</b>					
47988.3.1	New Hanover	15	EXIT 420A - I-40 WB EXIT RAMP AT SR 2048 (GORDON ROAD)	FROM I-40 WB TO SR 2048 (GORDON RD.) [MP 0.11 - MP 0.33]	8	1		NO	NO	0.22	24	0.44	110		3,486			292	17							
<b>TOTAL FOR MAP NO. 15</b>												<b>0.22</b>		<b>0.44</b>	<b>110</b>		<b>3,486</b>			<b>292</b>	<b>17</b>					
47988.3.1	New Hanover	16	EXIT 420A - I-40 WB ENTRANCE RAMP AT I-40 WB	FROM SR 2048 (GORDON RD.) TO I-40 WB [MP 0.01 - MP 0.60]	5	1		NO	NO	0.59	18	1.18	295	6,230				527	30							
<b>TOTAL FOR MAP NO. 16</b>												<b>0.59</b>		<b>1.18</b>	<b>295</b>	<b>6,230</b>				<b>527</b>	<b>30</b>					
47988.3.1	New Hanover	17	EXIT 420B - I-40 WB EXIT RAMP AT I-40 WB	FROM I-40 WB TO NC 132 (N. COLLEGE RD.) [MP 9.19 - MP 9.67]	7	1		NO	NO	0.48	20	0.96	240		5,632			476	27							
<b>TOTAL FOR MAP NO. 17</b>												<b>0.48</b>		<b>0.96</b>	<b>240</b>		<b>5,632</b>			<b>476</b>	<b>27</b>					

PROJECT NO.	SHEET NO.
I-6039	12

## SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH	WIDTH	1245000000-E	1260000000-E	1297000000-E			1308000000-E	1524200000-E	1577000000-E	1662000000-E	1840000000-E	2473000000-N		2752000000-E		
												SHOULDER RECONSTRUCTION	AGGREGATE SHOULDER BORROW	1.25" MILLING	1.5" MILLING	2.25" MILLING	1.25" - 2.25" MILLING	SURFACE COURSE, S9.5D	POLYMER MODIFIED ASPHALT BINDER FOR PLANT MIX	OG ASP FRIC FC-1 MODIFIED	MILLED RUMBLE STRIPS	REMOVE & REPLACE CONC. APRON FOR DROP INLET	DROP INLET REPAIR	REM & RPL SHOULDER BERM GUT		
											MI	FT	SMI	TON	SY	SY	SY	SY	TON	TON	TON	LF	EA	EA	LF	
47988.3.1	NewHanover	18	EXIT 416B - I-40 WB EXIT RAMP AT I-140	FROM I-40 WB TO I-140 EB [MP 0.14 - MP 0.60]	2	2		NO	NO	0.46	25	0.92	230	6,747					570	60	406					
<b>TOTAL FOR MAP NO. 18</b>											<b>0.46</b>		<b>0.92</b>	<b>230</b>	<b>6,747</b>				<b>570</b>	<b>60</b>	<b>406</b>					
47988.3.1	NewHanover	19	EXIT 416A - I-40 WB EXIT LOOP AT I-140	FROM I-40 TO I-140 WB [MP 0.04 - MP 0.22]	6	1		NO	NO	0.18	22	0.18	45			2,323			196	25	140					
<b>TOTAL FOR MAP NO. 19</b>											<b>0.18</b>		<b>0.18</b>	<b>45</b>			<b>2,323</b>			<b>196</b>	<b>25</b>	<b>140</b>				
47988.3.1	NewHanover	20	EXIT 20B - I-140 WB EXIT RAMP AT I-40 WB	FROM I-140 TO I-40 WB [MP 0.31 - MP 0.75]	2	1		NO	NO	0.44	24	0.46	115	6,195					523	55	373					
<b>TOTAL FOR MAP NO. 20</b>											<b>0.44</b>		<b>0.46</b>	<b>115</b>	<b>6,195</b>				<b>523</b>	<b>55</b>	<b>373</b>					
47988.3.1	NewHanover	21	EXIT 414 - I-40 WB EXIT RAMP AT SR 1002 (HOLLY SHELTER ROAD)	FROM I-40 WB TO SR 1002 (HOLLY SHELTER RD.) [MP 0.08 - MP 0.39]	8	1		NO	NO	0.31	18	0.62	155		3,624				277	16						
<b>TOTAL FOR MAP NO. 21</b>											<b>0.31</b>		<b>0.62</b>	<b>155</b>		<b>3,624</b>			<b>277</b>	<b>16</b>						
47988.3.1	NewHanover	22	EXIT 414 - I-40 WB ENTRANCE RAMP AT I-40 WB	FROM SR 1002 (HOLLY SHELTER RD.) TO I-40 WB [MP 0.01 - MP 0.17]	9	1		NO	NO	0.16	18	0.16	40		1,913				143	8		50				
<b>TOTAL FOR MAP NO. 22</b>											<b>0.16</b>		<b>0.16</b>	<b>40</b>		<b>1,913</b>			<b>143</b>	<b>8</b>		<b>50</b>				
47988.3.1	Pender	23	EXIT 408 - I-40 WB EXIT RAMP AT NC 210 HWY.	FROM I-40 WB TO NC 210 HWY. [MP 0.03 - MP 0.24]	8	1		NO	NO	0.21	18				3,107				188	11		50				
<b>TOTAL FOR MAP NO. 23</b>											<b>0.21</b>					<b>3,107</b>			<b>188</b>	<b>11</b>		<b>50</b>				
47988.3.1	Pender	24	EXIT 408 - I-40 WB ENTRANCE RAMP AT I-40 WB	FROM NC 210 HWY. TO I-40 WB [MP 0.01 - MP 0.22]	7	1		NO	NO	0.21	18	0.42	105		2,464				188	11		50			30	
<b>TOTAL FOR MAP NO. 24</b>											<b>0.21</b>		<b>0.42</b>	<b>105</b>		<b>2,464</b>			<b>188</b>	<b>11</b>		<b>50</b>			<b>30</b>	
<b>TOTAL FOR PROJ NO. 47988.3.1</b>											<b>33.03</b>		<b>73.61</b>	<b>15,986</b>	<b>797,298</b>	<b>42,615</b>	<b>42,735</b>	<b>53,388</b>	<b>65,736</b>	<b>5,532</b>	<b>28,453</b>	<b>272,020</b>	<b>13</b>	<b>9</b>	<b>95</b>	
<b>GRAND TOTAL</b>											<b>33.03</b>		<b>73.61</b>	<b>15,986</b>	<b>797,298</b>	<b>42,615</b>	<b>42,735</b>	<b>53,388</b>	<b>65,736</b>	<b>5,532</b>	<b>28,453</b>	<b>272,020</b>	<b>13</b>	<b>9</b>	<b>95</b>	



PROJECT NO.	SHEET NO.
I-6039	14

## SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH	WIDTH	3030000000-E	3210000000-N	3287000000-N	3365000000-E	3389200000-E	3389600000-N	3420000000-E	3345000000-E	3435000000-N					
												STEEL BM GUARDRAIL	GUARDRAIL END UNITS, TYPE CAT-1	GUARDRAIL END UNITS, TYPE TL-3	REMOVE EXISTING GUIDERAIL	CABLE GUIDERAIL	CABLE GUIDERAIL ANCHOR UNITS	REMOVE & REPLACE EXISTING GUARDRAIL	REMOVE & RESET EXISTING GUARDRAIL	REMOVE & RESET GUARDRAIL END UNIT, TYPE CAT-1	REMOVE & REPLACE GUARDRAIL END UNIT, TYPE TL-3	GUARDRAIL PREFAB ANCHOR POST	REMOVE & RESET GUARDRAIL END UNIT, TYPE TL-3	REMOVE & REPLACE GUARDRAIL END UNIT, TYPE CAT-1	
											MI	FT	LF	EA	EA	LF	LF	EA	EA	EA	EA	EA			
47988.3.1	NewHanover	18	EXIT 416B - I-40 WB EXIT RAMP AT I-140	FROM I-40 WB TO I-140 EB [MP 0.14 - MP 0.60]	2	2		NO	NO	0.46	25								75.00					1.00	
<b>TOTAL FOR MAP NO. 18</b>											<b>0.46</b>									<b>75.00</b>					<b>1.00</b>
47988.3.1	NewHanover	19	EXIT 416A - I-40 WB EXIT LOOP AT I-140	FROM I-40 TO I-140 WB [MP 0.04 - MP 0.22]	6	1		NO	NO	0.18	22														
<b>TOTAL FOR MAP NO. 19</b>											<b>0.18</b>														
47988.3.1	NewHanover	20	EXIT 20B - I-140 WB EXIT RAMP AT I-40 WB	FROM I-140 TO I-40 WB [MP 0.31 - MP 0.75]	2	1		NO	NO	0.44	24									1,025.00				1.00	
<b>TOTAL FOR MAP NO. 20</b>											<b>0.44</b>										<b>1,025.00</b>			<b>1.00</b>	
47988.3.1	NewHanover	21	EXIT 414 - I-40 WB EXIT RAMP AT SR 1002 (HOLLY SHELTER ROAD)	FROM I-40 WB TO SR 1002 (HOLLY SHELTER RD.) [MP 0.08 - MP 0.39]	8	1		NO	NO	0.31	18														
<b>TOTAL FOR MAP NO. 21</b>											<b>0.31</b>														
47988.3.1	NewHanover	22	EXIT 414 - I-40 WB ENTRANCE RAMP AT I-40 WB	FROM SR 1002 (HOLLY SHELTER RD.) TO I-40 WB [MP 0.01 - MP 0.17]	9	1		NO	NO	0.16	18														
<b>TOTAL FOR MAP NO. 22</b>											<b>0.16</b>														
47988.3.1	Pender	23	EXIT 408 - I-40 WB EXIT RAMP AT NC 210 HWY.	FROM I-40 WB TO NC 210 HWY. [MP 0.03 - MP 0.24]	8	1		NO	NO	0.21	18									575.00				1.00	
<b>TOTAL FOR MAP NO. 23</b>											<b>0.21</b>										<b>575.00</b>			<b>1.00</b>	
47988.3.1	Pender	24	EXIT 408 - I-40 WB ENTRANCE RAMP AT I-40 WB	FROM NC 210 HWY. TO I-40 WB [MP 0.01 - MP 0.22]	7	1		NO	NO	0.21	18									570.00				1.00	
<b>TOTAL FOR MAP NO. 24</b>											<b>0.21</b>										<b>570.00</b>			<b>1.00</b>	
<b>TOTAL FOR PROJ NO. 47988.3.1</b>											<b>33.03</b>		<b>1,560.00</b>		<b>5.00</b>	<b>512.00</b>	<b>195.00</b>	<b>2.00</b>	<b>3,250.00</b>	<b>11,990.00</b>	<b>5.00</b>	<b>26.00</b>		<b>11.00</b>	<b>18.00</b>
<b>GRAND TOTAL</b>											<b>33.03</b>		<b>1,560.00</b>		<b>5.00</b>	<b>512.00</b>	<b>195.00</b>	<b>2.00</b>	<b>3,250.00</b>	<b>11,990.00</b>	<b>5.00</b>	<b>26.00</b>		<b>11.00</b>	<b>18.00</b>

# SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH	WIDTH	4048000000-E	4054000000-E	4060000000-E	4066000000-E	4109000000-N	4110000000-N	4152000000-N	4234000000-N	4600000000-N	2275000000-N				
												REINFORCED CONCRETE SIGN FOUNDATIONS	PLAIN CONCRETE SIGN FOUNDATIONS	SUPPORTS, BREAKAWAY STEEL BEAM	SUPPORTS, SIMPLE STEEL BEAM	SIGN ERECTION, TYPE A (OVERHEAD)	SIGN ERECTION, TYPE A (GROUND MOUNTED)	SIGN ERECTION, TYPE B (GROUND MOUNTED)	DISPOSAL OF SIGN SYSTEM, STEEL BEAM	DISPOSAL OF SIGN, A OR B (OVERHEAD)	SINGLE LANE CLOSURE	RAMP/LOOP CLOSURE	FLOWABLE FILL		
												MI	FT	CY	CY	LB	LB	EA	EA	EA	EA	EA	EA	CY	
47988.3.1	Pender	1	I-40 E	FROM 0.50 MILES W. OF NC 210 INTERCHANGE TO 0.40 MILES E. OF SR 2048 (GORDON RD.) INTERCHANGE [MM 407.50 - MM 420.36]	1	2	MD	NO	NO	12.86	42	7	2	6,831	1,263	17	14	2	14	17	400	9			
<b>TOTAL FOR MAP NO. 1</b>												<b>12.86</b>		<b>7</b>	<b>2</b>	<b>6,831</b>	<b>1,263</b>	<b>17</b>	<b>14</b>	<b>2</b>	<b>14</b>	<b>17</b>	<b>400</b>	<b>9</b>	
47988.3.1	Pender	2	I-40 W	FROM 0.09 MILES E. OF SR 2048 (GORDON RD.) INTERCHANGE TO 0.50 MILES W. OF NC 210 HWY. INTERCHANGE [MM 420.36 - MM 407.50]	1	2	MD	NO	NO	12.86	42										400	9			
<b>TOTAL FOR MAP NO. 2</b>												<b>12.86</b>											<b>400</b>	<b>9</b>	
47988.3.1	Pender	3		EXIT RAMP FROM I-40 EB TO NC 210 HWY. [MP 0.09 - MP 0.27]	8	1		NO	NO	0.18	20											4			
<b>TOTAL FOR MAP NO. 3</b>												<b>0.18</b>												<b>4</b>	
47988.3.1	Pender	4		ENTRANCE RAMP FROM NC 210 HWY. TO I-40 EB [MP 0.00 - MP 0.22]	7	1		NO	NO	0.22	18											4			
<b>TOTAL FOR MAP NO. 4</b>												<b>0.22</b>												<b>4</b>	
47988.3.1	Pender	5		EXIT RAMP FROM I-40 EB TO SR 1002 (HOLLY SHELTER RD.) [MP 0.04 - MP 0.23]	9	1		NO	NO	0.19	18											3			
<b>TOTAL FOR MAP NO. 5</b>												<b>0.19</b>												<b>3</b>	
47988.3.1	Pender	6		ENTRANCE RAMP FROM SR 1002 (HOLLY SHELTER RD.) TO I-40 EB [MP 0.00 - MP 0.36]	8	1		NO	NO	0.36	18											3			
<b>TOTAL FOR MAP NO. 6</b>												<b>0.36</b>												<b>3</b>	
47988.3.1	Pender	7		EXIT RAMP FROM I-40 WB TO I-140 WEST [MP 0.27 - MP 0.66]	2	1		NO	NO	0.39	24											4			
<b>TOTAL FOR MAP NO. 7</b>												<b>0.39</b>												<b>4</b>	
47988.3.1	Pender	8		ENTRANCE RAMP FROM I-40 TO I-40 EB [MP 0.10 - MP 1.11]	2	1		NO	NO	1.01	25											4			
<b>TOTAL FOR MAP NO. 8</b>												<b>1.01</b>												<b>4</b>	
47988.3.1	Pender	9		EXIT RAMP FROM I-40 EB TO I-140 EB [MP 0.64 - MP 0.82]	6	1		NO	NO	0.18	22											2			
<b>TOTAL FOR MAP NO. 9</b>												<b>0.18</b>												<b>2</b>	
47988.3.1	Pender	10		EXIT RAMP FROM I-140 WB TO I-40 EB [MP 0.69 - MP 0.87]	6	1		NO	NO	0.18	21											2			
<b>TOTAL FOR MAP NO. 10</b>												<b>0.18</b>												<b>2</b>	
47988.3.1	Pender	11		EXIT RAMP FROM I-140 WB TO I-40 WEB [MP 0.10 - MP 0.83]	2	1		NO	NO	0.73	25											1			
<b>TOTAL FOR MAP NO. 11</b>												<b>0.73</b>												<b>1</b>	
47988.3.1	New Hanover	12		FROM I-140 EB TO I-40 EB [MP 0.34 - MP 0.56]	2	1		NO	NO	0.22	25											2			
<b>TOTAL FOR MAP NO. 12</b>												<b>0.22</b>												<b>2</b>	
47988.3.1	NewHanover	13		FROM I-40 EB TO SR 2048 (GORDON RD.) [MP 0.04 - MP 0.19]	4	1		NO	NO	0.15	18											3			
<b>TOTAL FOR MAP NO. 13</b>												<b>0.15</b>												<b>3</b>	
47988.3.1	New Hanover	14		FROM SR 2048 (GORDON RD.) TO I-40 EB [MP 6.49 - MP 6.73]	3	1		NO	NO	0.24	25											5			
<b>TOTAL FOR MAP NO. 14</b>												<b>0.24</b>												<b>5</b>	
47988.3.1	NewHanover	15		FROM I-40 WB TO SR 2048 (GORDON RD.) [MP 0.11 - MP 0.33]	8	1		NO	NO	0.22	24											4			
<b>TOTAL FOR MAP NO. 15</b>												<b>0.22</b>												<b>4</b>	
47988.3.1	NewHanover	16		FROM SR 2048 (GORDON RD.) TO I-40 WB [MP0.01 - MP 0.60]	5	1		NO	NO	0.59	18											4			
<b>TOTAL FOR MAP NO. 16</b>												<b>0.59</b>												<b>4</b>	
47988.3.1	NewHanover	17		FROM I-40 WB TO NC 132 (N. COLLEGE RD.) [MP 9.19 - MP 9.67]	7	1		NO	NO	0.48	20											4			
<b>TOTAL FOR MAP NO. 17</b>												<b>0.48</b>												<b>4</b>	







MAP 1 - EAST BOUND I-40 GUARDRAIL													MAP 2 - WEST BOUND I-40 GUARDRAIL															
MILE MARKER/RANGE	SIDE OF RDWY. RT/LT	TL-3 END UNIT (EA)	REMOVE & RESET TL-3 END UNIT (EA)	CAT-1 UNIT (EA)	REMOVE & REPLACE CAT-1 UNIT (EA)	REMOVE & RESET CAT-1 UNIT (EA)	REMOVE & REPLACE TL-3 END UNIT (EA)	REMOVE & REPLACE TL-3 ATTENUATOR END UNIT (EA)	STEEL BEAM GR SHOP CURVED (LF)	REMOVE & REPLACE GR (LF)	STEEL BEAM GUARDR AIL (LF)	GUARDR AIL PRE-FAB ANCHOR POSTS (GENERAL C)	REMOVE & RESET EXISTING GR (LF)	MILE MARKER/RANGE	SIDE OF RDWY. RT/LT	TL-3 END UNIT (EA)	REMOVE & RESET TL-3 END UNIT (EA)	CAT-1 UNIT (EA)	REMOVE & REPLACE CAT-1 UNIT (EA)	REMOVE & RESET CAT-1 UNIT (EA)	REMOVE & REPLACE TL-3 END UNIT (EA)	REMOVE & REPLACE TL-3 ATTENUATOR END UNIT (EA)	STEEL BEAM GR SHOP CURVED (LF)	REMOVE & REPLACE GR (LF)	STEEL BEAM GUARDR AIL (LF)	GUARDR AIL PRE-FAB ANCHOR POSTS (GENERAL C)	REMOVE & RESET EXISTING GR (LF)	
408.03 - 408.06	LT		1			1					75			420.29 - 420.25	RT				1									175
408.30 - 408.32	RT					1	1						100	420.27 - 420.24	LT						1							126
408.94 - 409.01	LT				1		1						258	419.95 - 419.92	LT						1					50		112
408.97 - 409.01	RT		1		1								153	419.90 - 419.82	RT						1							150
413.12 - 413.46	RT		1								40		128	419.89 - 419.85	LT						1					70		
413.67 - 413.70	LT						1				76		86	419.89 - 419.74	RT						1							150
413.97 - 414.01	LT						1				36		123	419.58 - 419.55	RT													100
414.03 - 414.06	LT						1		35	73			65	419.55 - 419.53	LT						1					75		
414.34 - 414.38	LT												64	418.74 - 418.62	RT													375
414.41 - 414.44	LT				1						60		158	418.63 - 418.61	LT						2					125		25
415.36 - 415.47	LT				1									417.33 - 417.27	LT					1								
416.21 - 416.27	LT						1		245	60				416.26 - 416.20	Lt						1					115		
418.62 - 418.75	RT				1		1						632	415.45 - 415.34	RT				1									
418.63 - 418.66	LT						1				97			414.43 - 414.39	RT											50		125
419.51 - 419.53	RT						1						77	414.42 - 414.39	LT						1					47		114
419.53 - 419.56	LT					1	1						22	414.35 - 414.32	LT		1									63		112
419.79 - 419.89	RT						1						490	414.04 - 414.00	Lt											50		
419.85 - 419.89	LT						1				54			413.98 - 413.96	LT						1					76		85
419.93 - 419.96	LT						1				75		114	413.70 - 413.67	LT		1								44		168	
420.05 - 420.11	RT	1			1								293	413.45 - 413.42	LT						1					68		95
420.25 - 420.28	LT		2										75	408.33 - 408.31	RT				1									
														408.07 - 408.04	LT		1			1							81	
<b>MAP 1 - TOTAL</b>		1	5	0	6	3	13	0	0	280	646	0	2,838	<b>MAP 2 - TOTAL</b>		0	3	0	3	2	12	0	0	0	914	0	1,912	

Project No.	Sheet No.
I-6039	28

I-40 RAMPS GUARDRAIL													
MAP NO.	MILE MARKER/RANGE	SIDE OF RDWY. RT/LT	TL-3 END UNIT (EA)	REMOVE & RESET TL-3 END UNIT (EA)	CAT-1 UNIT (EA)	REMOVE & REPLACE CAT-1 UNIT (EA)	REMOVE & RESET CAT-1 UNIT (EA)	REMOVE & REPLACE TL-3 END UNIT (EA)	STEEL BEAM GR SHOP CURVED (LF)	REMOVE & REPLACE GR (LF)	STEEL BEAM GUARDRAIL (LF)	GUARDRAIL PRE-FAB ANCHOR POSTS (GENERIC)	REMOVE & RESET EXISTING GR (LF)
3	0.19 - 0.27	RT	1							100			275
4	0.00 - 0.09	RT											150
8	0.50 - 0.57	LT				1							
8	0.67 - 0.70	LT				1							
13	0.05 - 0.19	RT								125			
13	0.08 - 0.12	LT	1			1				75			217
14	6.48 - 6.72	RT								200			590
14	6.56 - 6.70	LT	1			1				100			125
15	0.23 - 0.29	LT				1				25			294
16	0.10 - 0.46	LT	1										1305
16	0.14 - 0.48	RT		1		1							1787
17	9.18 - 9.48	RT								970			785
17	9.20 - 9.46	LT						1		680			
17	9.54 - 9.58	RT				1				50			157
18	0.24 - 0.60	RT		1						75			
20	0.29 - 0.48	RT				1							1000
23	0.16 - 0.24	RT		1									555
24	0.01 - 0.10	RT				1				570			
<b>RAMPS TOTAL</b>			<b>4</b>	<b>3</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2970</b>	<b>0</b>	<b>0</b>	<b>7240</b>

<b>GRAND TOTAL</b>			<b>5</b>	<b>11</b>	<b>0</b>	<b>18</b>	<b>5</b>	<b>26</b>	<b>0</b>	<b>3250</b>	<b>1560</b>	<b>0</b>	<b>11990</b>
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